Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

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

Edmund G. Brown Jr.
Governor

June 22, 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 draft Phase III Field Sampling Plan (Sampling Plan) for the University of California Berkeley Richmond Field Station Site, located in Richmond, California. The Sampling Plan was prepared by Tetra Tech EM Inc. on behalf of the University of California Berkeley and describes sampling goals and locations in upland areas of the site. Areas to be investigated include: soil at the former California Cap Company mercury fulminate area, dry house, and Building 128; soil mounds near Building 201; and step-out soil sampling in the corporation yard, certain transformer locations, and the shallow ground water at the coastal terrace prairie area. We have reviewed the Sampling Plan along with DTSC's Human and Ecological Risk Office (HERO), and our comments are as follows. Enclosed are comments from HERO and the Ecological Risk Assessment Section.

1. Mercury Fulminate Area: Presentations of samples associated with the mercury fulminate area are limited to analysis for elemental and methyl mercury. The historic data presented for this area in the Sampling Plan is also limited to mercury. Chemical data in additional to the mercury data needs to be provided in order for DTSC to determine whether analysis for additional chemicals is needed to characterize this area.

2. Transformer Area: The figures and text discussing step-out samples around Building 150 indicate that PCB concentrations were elevated at boring B15006; however, review of the data from the Phase II report indicates that the elevated PCBs levels were found at boring B15005 (Aroclor 1254: 0.49 mg/kg). The tables, text, and figures need to be revised as well as the proposed step-out sampling locations.

3. Building 128: Clarify whether Building 128 is the original building that was used by the California Cap Company or whether the footprint of the building has been

altered. If there have been alterations to the building footprint this should be identified and the location of samples may need to be amended to reflect any changes.

4. Page 8, Section 2.2.6, Transformer House: Include a figure identifying the locations of the samples that exceeded the commercial/industrial CHHSL for benzo(a)pyrene equivalents and provide the screening value.

5. Page 12, DQOs for Building 201 Mounds: The depth of sampling within the soil mounds is identified as 0 to 2.5 feet below ground surface, based on the estimated height of the mounds in comparison to the surrounding coastal terrace prairie. Actual sample depths should be evaluated based on field observations and the samples should also be collected in the fill just above the native soil interface.

6. Pages 13 to 15, DQOs for Groundwater at Piezometer CTP and Pages 18 and 19, Sampling Process Design: The Sampling Plan proposes that initial grab sample locations will include sampling near Piezometer CTP to compare the two sampling methods (grab versus piezometer sampling). Specify that the piezometer will be sampled at the same time. The Sampling Plan proposes that grab ground water samples will be collected in the permeable zone based on the information collected during the installation of the Phase I piezometers. Specify continuous coring or CPT at grab sample locations to characterize the shallow lithology and to identify the permeable zone that is targeted for sampling at each location. Also, plan on confirming the total depth of contamination at multiple locations by sampling from underlying water-bearing zone(s).

7. Page 17, Section 3.3.1, MFA Mercury Sampling: Please identify the sample collection method, sample preparation and analytical method that will be used to for methyl mercury samples.

8. Figures 6-8, Historic Mercury Concentrations: Please superimpose the outline of the relevant California Cap Company buildings on these figures.

9. Figure 7: Historic Mercury Concentrations 1 to 5 Feet BGS: Please add the location label for sample MF2-9. In addition, it appears that when multiple samples were collected from soil borings, the highest concentration is not identified on the figure. For example, boring MF2-20 is identified as a green triangle, but one of the concentrations detected is 380 mg/kg. This concentration is greater than the commercial/industrial CHHSL of 180 mg/kg and should be depicted with a blue triangle. The data set presented on this figure should be reviewed and the correct icons included.

10. Figure 11: Indicate on this figure which samples will be analyzed for PCBs and which samples will be analyzed for PAHs.

11. Table 1 – Sample Registry and Rationale:

a. Due to the elevated concentrations of lead and PAHs in sample CY03, add lead and PAHs to the analysis of samples. In addition, a fourth sample point, located to the northeast of location CY03 needs to be added to bound the contaminants previously detected. Also, correct the Sample ID for point location CY18 CY02 to CY1802.
b. Point Location CY22 and 23: It is unclear why lead is included for analysis for these samples as the concentration of lead from boring CY05 ranged from 5.82 – 25.1 mg/kg. It appears that the analysis should be for arsenic.
c. Point Location CY27, 28 and 29: Based on the elevated concentrations of arsenic (31.7 mg/kg) and lead (571 mg/kg) found in sample CY09, samples from these locations should be analyzed for lead and arsenic.
d. Point Locations CY30, 31 and 32: Based on the elevated concentration of arsenic (27.8 mg/kg) found in location CY10, add arsenic analysis to these sample locations.
e. Point Locations CY36, 37 and 38: Based on the elevated concentration of arsenic (29.9 mg/kg) found at location CY12, include arsenic analysis to these sample locations.

A revised Sampling Plan addressing the above comments as well as the enclosed comments should be submitted within 30 days of the date of this letter.

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

Sincerely,

Lynn Nakashima

Mark Vest

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 Restoration Program
Sacramento Office - Geologic Services

Enclosures

cc next page:

Karl Hans
University of California, Berkeley
Environmental Health & Safety
317 University Hall, No 1150
Berkeley, California 94720

Jason Brodersen
Tetra Tech EM Inc.
1999 Harrison Street, Suite 500
Oakland, CA 94612

Kimi Klein, Ph.D.
Human and Ecological Risk Office
Department of Toxic Substances Control
700 Heinz Avenue
Berkeley, CA 94710

J. Michael Eichelberger, Ph.D.
Ecological Risk Assessment Section
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

Department of Toxic Substances Control

Matt Rodriguez
Secretary for
Environmental Protection

Deborah O. Raphael
Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

MEMORANDUM

TO: Lynn Nakashima
Senior Hazardous Substances Scientist
Brownfields and Environmental Restoration Program
700 Heinz Avenue, Suite 200
Berkeley, CA 94710

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

DATE: June 21, 2012

SUBJECT: Phase III Field Sampling Plan
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 provided technical support for this site since 2005. At a meeting held on April 12, 2012, proposed criteria and sampling locations for the Phase III sampling effort were discussed.

Document Reviewed

The HERO reviewed a document entitled "Phase III Field Sampling Plan, University of California, Berkeley, Richmond Field Station, Richmond, California", dated May 21, 2012, and prepared by Tetra Tech EM Inc., for the University of California, Berkeley. The HERO received this plan on May 31, 2012.

General Comments

The HERO reviewed the entire document but focused on those issue areas that could affect human health risk assessment. The HERO did not critically evaluate the data quality objectives (DQO) processes and assumes that other DTSC staff has reviewed the DQOs for adequacy in setting out field sampling plan goals and the work plan for appropriateness of sample locations and proposed analytical methods.

Phase III sampling will all take place in the upland area of this site and will consist of further soil sampling, except for additional groundwater investigation in the ecologically significant Coastal Terrace Prairie (CTP) area. Soil sampling is proposed for the characterization of the historic mercury fulminate area (MFA); the former Dry House explosion area; Building 128, associated with historic blasting cap packaging; and, the soil mounds near Building 201, the U.S. Environmental Protection Agency (EPA) laboratory. Further soil sampling is also proposed to fill data gaps identified in the Phase II sampling effort, including step-out sampling at certain transformer locations where polychlorinated biphenyls (PCBs) were detected in soil and in the Corporation Yard where trichloroethylene (TCE), metals, polycyclic aromatic hydrocarbons (PAHs), dioxins, and polychlorinated biphenyls (PCBs) were detected in soil.

The HERO has the following specific comments.

Specific Comments

1. Page 6 Section 2.2.1 Mercury Fulminate Area. This section summarizes previous investigations that took place in this area. A sub-section should be added describing any removal of mercury-contaminated soil in the MFA. The figures depicting the MFA should be revised to clearly show the boundaries of those removal actions.

2. Page 9 Section 2.2.6 Transformer and Corporation Yard Step-outs. This section summarizes previous investigations that took place in these areas. In the last paragraph of bullet (2), it is stated that total benzo(a)pyrene equivalents concentrations exceeded its California Human Health Screening Level (CHHSL). The text should be revised to clearly identify that the CHHSL used for comparison is the CHHSL assuming commercial/industrial land use.

3. Page 9 Section 2.2.6 Transformer and Corporation Yard Step-outs; and, Figure 12 Proposed Corporation Yard Step-Out Sampling Locations. In bullet (3), three locations in the Corporation Yard were analyzed for dioxins based on the historic location of an incinerator. The approximate location of that incinerator should be shown on Figure 12.

4. Page 10 Section 3.2.1 DQOs for the Mercury Fulminate Area. As one of the goals of the study of this area, it will be determined if methyl mercury exists in sub-surface soil. In addition to methyl mercury, it should be determined if any residual mercury from historic manufacturing exists in its elemental form. Therefore, a DQO goal of the study of the MFA should be the speciation of mercury detected in this area.

5. Page 12 Section 3.2.2 DQOs for the Former Dry House Explosion, Building 128, and Building 201 Soil Mounds. A) The goal of the characterization of the former Dry House explosion area is to determine if explosive residue and metals are present. Please provide a rationale for not analyzing soil for dioxins that could have formed as a result of the explosion. B) Soil from zero to two feet below ground surface (bgs) will be investigated for deposition of contaminants from that explosion event. Since the explosion occurred many years ago, provide evidence that no grading has taken place in the intervening time period that could affect the depth at which contaminants from that event might be detected.

6. Page 15 Section 3.2.4 DQOs for the Phase II Step-out Soil Samples; and, Figure 12 Proposed Corporation Yard Step-Out Sampling Locations. A) The soil gas sample, UCB-3, is identified in the problem statement. The location of that sample should be specified in the text and Figure 12 should be cited. B) The term "soil conditions" is used as a goal in several instances. This term should be clarified or another term used to describe the goal of the step-out samples. C) As a goal, chemicals of potential concern will be identified in the "study area". This term needs to be further defined in the bullets as the historic transformer locations or the Corporation Yard.

7. Page 16 Section 3.2.4 DQOs for the Phase II Step-out Soil Samples. Under acceptance criteria, the text states that "The Phase II step-out soil sampling data will be screened against the commercial/industrial CHHSLs". This sentence should be revised to state that "the Phase II step-out soil sampling data will be screened against commercial/industrial CHHSLs, US EPA Regional Screening Levels, and other relevant screening levels, as appropriate".

8. Page 17 Section 3.3.1 MFA Mercury Sampling. It is proposed to analyze ten samples for methyl mercury within the MFA. Provide the criteria for choosing the sample locations to be so analyzed.

9. Page 18 Section 3.3.2 Dry House, Building 128, EPA Soil Mounds, and Phase II Step-out Soil Sampling; and, Figure 12 Proposed Corporation Yard Step-Out

Sampling Locations. Step-out soil sampling will take place to further investigate the boundaries of chemicals of potential concern detected in the Corporation Yard. Those chemicals should be listed in the text, and the locations where those chemicals will be analyzed for should be shown on Figure 12.

10. Figure 3 Data Gaps Map. A) This figure is incomplete, as the remediated area south of the mercury fulminate area is not identified. Please correct the figure. B) This figure shows the location of the former US Briquette Company Buildings. If this location has never been investigated for PAHs, a common component of briquettes, this may be an additional data gap.

Conclusions

This work plan has numerous deficiencies as described in the specific comments above that must be addressed before the HERO can recommend its acceptance by the Department of Toxic Substances Control.

If you have further questions, please contact me at Kklein@dtsc.ca.gov or by telephone at 510 540 3762.

Kimiko Klein Sh:

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

Matt Rodriques
Secretary for
Environmental Protection

Department of Toxic Substances Control

Deborah Raphael, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G Brown,
Governor

MEMORANDUM

TO: Lynn Nakashima
Site Mitigation and Brownfields Reuse Program
Department of Toxic Substances Control
700 Heinz Avenue, Suite 200
Berkeley, CA 90630

FROM: J. Michael Eichelberger, Ph.D.
Staff Toxicologist
Ecological Risk Assessment Section (ERAS)
Human and Ecological Risk Office (HERO)
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

DATE: June 12, 2012

SUBJECT: PHASE III FIELD SAMPLING PLAN UNIVERSITY OF CALIFORNIA, BERKELEY, RICHMOND FIELD STATION, RICHMOND, CALIFORNIA DTSC SITE INVESTIGATION AND REMEDIATION ORDER I/SE-RAO 07/07-004 SECTION 5.16

PCA: 11050 Site Code: 201605-00

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 2001. The site includes upland habitats including rare costal prairie and wetlands consisting of saltwater marsh. This memorandum is in response to the DTSC project manager request for review of the Phase III Field Sampling Plan which is a follow on

study to investigate data gaps identified in the Current Conditions Report and from the Phase I and Phase II sampling.

DOCUMENT REVIEWED

ERAS reviewed "Phase III Field Sampling Plan University of California, Berkeley, Richmond field Station, Richmond, California DTSC Site Investigation and Remediation Order I?SE-RAO 07/07-004 Section 5.16" prepared by Tetra Tech Em Inc. (Oakland, California) and dated May 21, 2012. ERAS received the report for review via an Envirostor work request dated May 29, 2012.

SCOPE OF 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.

GENERAL COMMENTS

The area of investigation with the potential exception of the building 201 Soil Mounds is located in developed areas of little or no habitat. It appears that the soil mounds are located within viable habitat and the sampling appears to be appropriate for its investigation. Table 1 of the report lists several classes of Chemicals of Potential Concern (COCs) but does not list detection limits appropriate for protection of human health and ecological receptors. Since this investigation is a continuation of previous studies, the report needs to include the detection limits from the earlier studies in the current report.

SPECIFIC COMMENTS

1. Page 1, Section 1.1, Physical Setting, third paragraph. Reference to the site as consisting of three types of habitat is a little confusing since the bulk of the sampling is occurring in areas occupied by areas of the Field Station where site research and maintenance activities are occurring. There is no significant 'habitat' for ecological receptors in these areas.

2. Page 2, Section 1.1, Physical Setting, final paragraph of section. The report states '*Phase III sampling will occur in the Coastal Terrace Prairie, no sampling will occur in the Transition Area and Western Stege Marsh.*' It is apparent the only sampling planned for the Coastal Terrace Prairie is additional groundwater sampling for carbon tetrachloride. ERAS understands it is assumed there were no assumed industrial activities in the prairie but there remains an apparent soil data gap for the prairie. At a minimum, soil samples should be proposed for the 0.0-0.6 inch below ground surface (bgs) and 1.0-2.0 depth interval.

3. Page 17, Section 3.3.1, MFA Mercury Sampling. Please add a discussion of methyl mercury sampling in this section. Table 1, (Sample Registry and rationale)

lists 10 methyl mercury sampling locations. Please provide the rationale for the selection of methyl mercury sampling locations. Sample analysis is proposed to a depth of 12.5 feet but there is no proposal for the upper 0.0-0.5 below ground level (bgs) foot interval where the bulk of exposure most likely would occur. ERAS proposes addition of this sampling depth for analysis. Also, please state the methyl mercury test method. Data for other Chemicals of Concern in the MFA are not included in the report, inclusion of sampling for other COCs known to occur within the UC Field Station boundaries needs to be included in this section.

CONCLUSIONS

Methyl mercury analysis should include the upper 0.0-0.5 ft bgs depth interval and the report needs to include the test method and rationale for the sample location selection. The proposed sampling for the mound area appears to be adequate to determine potential site related soil contamination in this area.

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

cc: James, M. Polisini, Ph.D.
Senior Toxicologist, ERAS