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OFFICE OF ENVIRONMENT, HEALTH AND SAFETY
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August 10, 2012

Barbara J. Cook, P.E.
Acting Assistant Deputy Director
Brownfields & Environmental Restoration Program
Department of Toxic Substances Control
Attention: Lynn Nakashima
700 Heinz Avenue
Berkeley, CA 94710

Subject: **University of California, Berkeley, Richmond Field Station**
Submittal of the Final Phase III Field Sampling Plan
DTSC Site Investigation and Remediation Order I/SE-RAO 07/07-004 Section 5.16

Dear Ms. Cook:

Please find enclosed the August 10, 2012 Final Phase III Field Sampling Plan (two copies on paper and disk). This version updates the version dated May 21, 2012 and incorporates the edits requested by your June 22, 2012 letter. The final document incorporates the proposed changes outlined in the August 3, 2012 response to comments submitted by Tetra Tech, Inc., and approved by your response letter on August 3, 2012.

If you have any questions or need further information regarding this submittal, please contact me (gjhaet@berkeley.edu, 510-642-4848) or Karl Hans (Khans@berkeley.edu, 510-643-9574).

Sincerely,

Greg Haet, P.E
EH&S Associate Director
Environmental Protection

Enclosure

cc:
Bill Marsh, Edgcomb Law Group
Anthony Garvin, UC Office of the General Counsel
Doug Mosteller, CSV

Final

Phase III
Field Sampling Plan

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

August 10, 2012

Prepared for

Office of Environment, Health & Safety
University of California, Berkeley
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Prepared by

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CONTENTS

Figures

Tables

Appendices

ACRONYMS AND ABBREVIATIONS

µg/L	Micrograms per liter
AST	Above ground storage tank
Bay Trail	East Bay Regional Parks District's Bay Trail
bgs	Below ground surface
CCR	Current Conditions Report
CHHSL	California Human Health Screening Level
COPC	Chemical of potential concern
CSM	Conceptual site model
CTP	Coastal Terrace Prairie
DQO	Data quality objectives
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
FSAP	Field Sampling and Analysis Plan
FSP	Field Sampling Plan
FSW	Field Sampling Workplan
HASP	Health and Safety Plan
IDW	Investigation-derived waste
MCL	Maximum Contaminant Level
MFA	Mercury fulminate area
mg/kg	milligrams per kilogram
Order	DTSC Site Investigation and Remediation Order No. IS/E-RAO 06/07-004
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
QAPP	Quality Assurance Project Plan
QC	Quality control
RI/FS	Remedial Investigation/Feasibility Study
RFS	Richmond Field Station
RSL	Regional Screening Level
SVOC	Semivolatile organic compound
TCE	Trichloroethylene
Tetra Tech	Tetra Tech EM Inc.
TPH-e	Total extractable petroleum hydrocarbons
TPH-p	Total purgeable petroleum hydrocarbons
TRV	Toxicity Reference Values
TSCA	Toxic Substances Control Act
UC	University of California
VOC	Volatile organic compound

1.0 PROJECT DESCRIPTION

The University of California (UC), Berkeley, prepared this Field Sampling Plan (FSP) in response to the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), Site Investigation and Remediation Order No. IS/E-RAO 06/07-004 (Order). In response to the Order, UC Berkeley prepared the Current Conditions Report (CCR) (Tetra Tech EM Inc. [Tetra Tech] 2008). The final CCR, dated November 21, 2008, provided a comprehensive summary of current conditions at the Richmond Field Station (RFS) in accordance with the DTSC Order, including the 96 acres of upland and 13 acres of tidal marsh and transition habitat. This FSP implements Phase III of the sampling strategy introduced in the RFS Field Sampling Workplan (FSW), dated June 2, 2010 (Tetra Tech 2010).

The scope of Phase III was determined based on data gaps identified in the CCR as well as from data collected during Phase I and II events. The proposed Phase III scope consists of:

- Further delineation of the mercury fulminate area (MFA)
- Characterization of the former Dry House explosion area
- Characterization of soil around Building 128
- Characterization of the Building 201 soil mounds
- Phase I additional sampling: further groundwater investigation of the carbon tetrachloride detections at piezometer CTP in the Coastal Terrace Prairie (CTP)
- Phase II additional sampling: step-out sampling at recently sampled transformer locations and in the Corporation Yard exceeding commercial/industrial screening criteria

The draft FSP was submitted to DTSC for review on May 21, 2012. DTSC provided comments on June 22, and a response to comments was provided to DTSC on August 3. DTSC provided concurrence with the response to comments on August 3; this final FSP incorporates the August 3 response to comments. The response to comments and DTSC approval letter are provided as Appendix A.

1.1 PHYSICAL SETTING

The RFS is located at 1301 South 46th Street, Richmond, California, along the southeastern shoreline of the City of Richmond on the San Francisco Bay and northwest of Point Isabel (see Figure 1). The RFS consists of upland areas developed for academic teaching and research activities, an upland remnant coastal terrace prairie, a tidal salt marsh, and a transition zone between the upland areas and the marsh. Between the late 1800s and 1948, several companies, including the California Cap Company, manufactured explosives at the RFS. In 1950, The UC Regents purchased the property from the California Cap Company, and UC Berkeley initially used the RFS for research for the College of Engineering; later, it was also used by other campus departments.

The RFS is described in terms of types of habitat because future uses and potential receptors vary by the type of habitat available. Three habitat type areas have been identified at RFS: (1) the Upland Area, (2) the Transition Area, and (3) the Western Stege Marsh (see Figure 2). All sampling for the Phase III FSP will occur in the Upland Area.

The Upland area consists of 96 acres of land bounded by Meade Street to the north, South 46th Street to the east, the Transition Area to the south, and Meeker Slough and Regatta Boulevard to the west. The Transition Area occupies approximately 5.5 acres and is bounded to the north by the Upland Area at the location of a buried, former seawall believed to have been the edge of the historic mudflats, and to the south by Western Stege Marsh at the 5-foot elevation upper extent of the marsh (National Geodetic Vertical Datum 29). The Transition Area is believed to consist entirely of artificial fill placed on historic mudflats. Western Stege Marsh occupies approximately 7.5 acres and is bounded by the Transition Area to the north, the RFS connector trail to the East Bay Regional Park District Trail (Bay Trail) and Eastern Stege Marsh to the east, the Bay Trail to the south, and Meeker Slough and Marina Bay housing development to the west (see Figure 2).

The RFS consists of a number of distinct and varied habitats resulting from both natural and manmade activities. The Upland Area consists of numerous research facilities, with associated out-buildings surrounded by landscaped trees and plants. The eastern and central portions of the Upland Area are largely developed and few natural ecological conditions exist. The western portion of the Upland contains one of the largest and best-preserved remaining areas of native coastal grasslands once prevalent throughout the San Francisco Bay Area, referred to as the Coastal Terrace Prairie (see Figure 2).

The Transition Area and small patches to the southwest of the U.S. Environmental Protection Agency (EPA) Laboratory (Building 201) consist of mainly coastal scrub and mixed ruderal scrub. Most of the coastal scrub habitat in the Transition Area is disturbed and intermixed with non-native invasive grasses and forbes.

The southern portion of the RFS is the least developed and consists of a low salt marsh, middle salt marsh, high salt marsh, and tidal wetlands. The plants include both native and non-native species and attract a variety of special-status species birds such as the California clapper rail (*Rallus longirostris obsoletus*).

Phase III sampling will occur in the Coastal Terrace Prairie; no sampling will occur in the Transition Area and Western Stege Marsh.

1.2 INVESTIGATION PURPOSE

Section 5.3.1 of the Order required preparation of a FSW to conduct site investigations to address data gaps identified in the CCR that warrant additional characterization or evaluation at the RFS. The FSW, dated June 2, 2010, identified five phases of field investigations to address these data gaps (Tetra Tech 2010). The FSW was a site-wide document covering all phases of the investigation and included a site-wide project background, objectives, conceptual site model (CSM), schedule for investigating the RFS, a Quality Assurance Project Plan (QAPP), and a facility-wide Health and Safety Plan (HASP).

The FSW also included the FSP for Phase I, a site-wide groundwater investigation consisting of installing, developing, and sampling 51 piezometers throughout the RFS (see Figure 3). Data collected from the piezometers included geology, chemical groundwater analyses, and depth to water measurements, and was used to develop a hydrogeologic model of the site, and improve the understanding of overall site-wide groundwater quality.

Consistent with the phased approach for the site-wide investigation described in the FSW, the Phase III FSP scope addresses several new data gaps, and data needs based on Phase I and II sampling results. The proposed Phase III scope consists of:

- Further characterization of the MFA soil
- Characterization of soil in the former Dry House explosion area
- Characterization of soil around Building 128
- Characterization of the Building 201 soil mounds
- Phase I - additional groundwater sampling: further investigation of the carbon tetrachloride detections at piezometer CTP
- Phase II – additional soil sampling: step-out sampling at locations of recently sampled transformers and in the Corporation Yard with data results exceeding commercial screening criteria

Each of the Phase III scope items is presented below; a complete discussion of these areas is presented in Section 2.2, Previous Investigations and shown on Figure 4.

MFA. The MFA area includes the former California Cap Company's mercury fulminate manufacturing plant, but does not include all of the California Cap Company operations where mercury may have been handled. The MFA contains areas with elevated concentrations of mercury in soil which are fenced off to restrict access. Phase III soil samples will supplement historic data for this area (see Appendix B) and help delineate the vertical and lateral extent of mercury-contaminated soil.

Former Dry House Explosion. The historic California Cap Company Dry House area was approximately located between Building 128 and Building 275 (see Figure 4). An explosion reportedly occurred in the area during California Cap Company operations based on a historic photograph (see Appendix C). No site-specific characterization data for explosive residues is available for this area.

Building 128. Building 128 is located west of Asphalt Pad B and was used for blasting cap packaging by the California Cap Company. Subsequently, UC Berkeley used it as a research facility and for storage. Although there are no indications from any sources that spills occurred near Building 128, previous samples collected around the perimeter have been analyzed for a limited set of analytes. Additionally, the location of Building 128 relative to the historic operations of the California Cap Company warrant additional investigation.

Building 201Soil Mounds. Irregular topography or "soil mounds" are present west of Building 201, currently leased by the EPA laboratory. Aerial photographs indicate the soil mounds are the result of soil excavated during the construction of Building 201. Although there is no indication that a release has occurred or there are suspect materials present, this soil will be sampled and characterized.

Groundwater at Piezometer Location CTP. An evaluation of Phase I groundwater sampling data did not identify immediate or potential threats to human health or the environment; however, continued seasonal monitoring is required prior to determining

any final site conclusions. Carbon tetrachloride was detected in all four rounds of the Phase I groundwater samples collected from piezometer CTP. No piezometers are located upgradient of piezometer CTP; therefore, grab groundwater samples will be collected to help characterize upgradient concentrations. If necessary, additional piezometers may be installed following review of the Phase III data.

Phase II Step-out Soil Sampling. The Phase II investigation included collecting soil samples at current and former transformer locations, the Corporation Yard along the eastern property boundary, and piping associated with an aboveground storage tank (AST). An evaluation of the Phase II soil sampling data did not identify immediate or potential threats to human health or the environment; however, concentrations of chemicals of potential concern (COPC) exceeded commercial/industrial screening levels at some locations. Step-out soil sampling will be collected in these areas as part of the Phase III field effort.

This FSP includes background and history for the Phase III investigation areas, purpose for sampling, data quality objectives (DQO), sample locations, site-screening level methodology, and COPCs. Site-specific sampling strategies for these data gaps are included in this FSP based on updated sampling information from Phase I and II. Detailed protocols and field methods are included in the approved Phase I FSW and included by reference.

2.0 SITE HISTORY AND PREVIOUS INVESTIGATIONS

Section 2 discusses the history of the RFS and provides an overview of historical ownership and site features of the Upland Areas, and presents a summary of previous investigations performed in the areas with data gaps to be investigated in Phase III.

2.1 SITE HISTORY

The RFS property has been subject to numerous land alterations throughout its development history. Prior to settlement of the East Bay plain by the Spanish beginning in 1772, the region was an upland treeless plain with creeks. In the late 1800s, portions of the RFS property were developed for the chemical and explosives industry. Between the 1880s and 1948, the California Cap Company operated an explosives manufacturing facility. The facility encompassed several operations including manufacturing explosives (primarily mercury fulminate), shells, and blasting caps; testing explosives; and storing explosives. All components of the blasting caps were manufactured on site, including explosives, shells, copper containers, tin boxes, paper cartons, and insulated wire.

The chief constituent of the explosive used by the California Cap Company was a nitrocellulose (guncotton) base called "tonite." Manufacturing the explosive included the production of mercury fulminate. Mercury fulminate, a whitish-gray solid with the chemical formula $Hg(ONC)_2$, is a key ingredient in blasting caps as the detonator. Mercury fulminate is produced by dissolving mercury in nitric acid and adding ethyl alcohol. The former mercury fulminate plant was located in the southeastern portion of the RFS (see Figure 3). Other former facilities associated with the California Cap Company included the former shell manufacturing areas in the southern portion of the RFS where current Building 128 and the former Dry House explosion area are located. Based on review of the blueprints, mercury fulminate was produced in the circular area identified as the MFA, rinsed in the rinsate area, and then transported to Building 128 for initial assembly of the caps.

According to an article published in the July 1922 edition of the California Cap Company newspaper, *The Detonator*, the manufacturing facility consisted of approximately 150 buildings, including administration buildings, a shell and metal drawing unit, a wire drawing unit, the blasting cap line unit, an electric blasting cap unit, and fulminate nitrating and recovery units. The entire California Cap Company facility covered approximately 30 acres, with an additional 30 acres of trees surrounding the facility. The locations of the former California Cap Company facilities and buildings are shown on Figure 3.

The California Cap Company slowed operations following World War II. In October 1950, the property was purchased by UC with the agreement that the California Cap Company would remove all hazardous materials from the property. However, subsequent site observations and testing revealed the presence of hazardous materials on RFS. For example, several explosions reportedly occurred between 1950 and 1953 during a controlled burn for clearing. These explosions likely were associated with residual chemicals used by the California Cap Company. Previous soil samples collected from the former test pit and explosive storage area identified a single detection of explosives at a concentration near the detection limit.

According to former UC Berkeley researchers, mercury was found under Building 125 during composting research projects in the 1950s. The source of the mercury reportedly was the former

mercury fulminate plant operated by the California Cap Company. At that time, Building 125 was located west of Building 110 (see Figure 5). The building was later moved to its current location in the maintenance area between Buildings 116 and 118. Blueprints for the mercury fulminate plant show an open structure (presumably for ventilation) which could have contributed to aerial deposition of mercury in the areas surrounding the mercury fulminate plant (see Appendix B). Blueprints also identify storage tanks in this area and rinsate areas. These operations could have contributed to elevated deposition of mercury at depth. This area has been targeted for sampling as part of this Phase III sampling investigation.

2.2 PREVIOUS INVESTIGATIONS

This summary of previous investigations is summarized from the CCR and the Phase I and Phase II Sampling Results Technical Memoranda, unless noted otherwise. The CCR provides a comprehensive presentation of RFS site history and site-wide sampling results of previous investigations through November 21, 2008 (Tetra Tech 2008).

2.2.1 Mercury Fulminate Area

Soil sampling in the area of the former mercury fulminate plant was initially conducted in 1982 by the California Department of Health Services and then in subsequent investigations in 1988 and 1990.

Due to the elevated mercury in soils, the area was included in the 1999 Field Sampling and Analysis Plan (FSAP) completed in response to the Regional Water Quality Control Board Order issued for site investigation and cleanup in 1999. Based on the findings of elevated mercury in soil and groundwater during the FSAP implementation, the MFA was determined to be an area requiring additional investigation and possible remediation.

In 2001 through 2005, 43 soil borings were advanced to characterize the area around the former mercury fulminate plant. Mercury was detected at concentrations ranging between 0.025 milligrams per kilogram (mg/kg) and 1,100 mg/kg, with an average detected concentration of 26.68 mg/kg. Vertical distribution of mercury as follows:

- 0 to1 feet below ground surface (bgs): 0.48 mg/kg to 930 mg/kg (see Figure 6)
- 1 to 5 feet bgs: 0.026 mg/kg to 1,100 mg/kg (see Figure 7)
- 5 to 19 feet bgs: 0.035 mg/kg to 67 mg/kg (see Figure 8)

A compilation of the historic data collected near the MFA is included in Appendix B. The following provides a brief summary of previous sampling results for analytes other than mercury. Other metals detected in soil at concentrations exceeding the commercial industrial screening criteria in the MFA include arsenic, cadmium, and lead. These detections were sporadic and do not indicate a larger area of contamination of arsenic, cadmium, or lead in soil. The extent of the soil contamination associated with the MFA will be evaluated through review of mercury analysis as the indicator metal for Phase III; followup removal or remedial action confirmation samples will be analyzed for all metals to address any elevated concentrations of mercury, arsenic, cadmium, or lead in soil.

No pesticides, semivolatile organic compounds (SVOC), or volatile organic compounds (VOC) were detected in the limited number of soil samples analyzed for these analytes. TPH was detected at low levels in the three samples it was analyzed for within the MFA area adjacent to the asphalt pad.

Polychlorinated biphenyls (PCB) as Aroclor 1254 were detected at concentrations exceeding the commercial/industrial California Human Health Screening Level (CHHSL) from soil samples collected adjacent to the transformer west of Building 112 in samples PCB23 and PCB24 at 35 and 2.2 mg/kg from 0 to 2 feet bgs, respectively. This location is currently proposed for additional investigation as part of transformer sampling step-out sampling (see Section 2.2.6). All other samples analyzed for PCBs within the MFA were either not detected or were detected at concentrations below the commercial/industrial CHHSL.

No remedial or removal activities have occurred in the MFA. Adjacent areas of the marsh were excavated in 2004; the outline of this area can be seen on Figure 5.

Groundwater samples collected from piezometer MFA located downgradient of the MFA during Phase I sampling events did not have concentrations of mercury or other constituents above the California or federal Maximum Contaminant Levels (MCL). Piezometer MFA is downgradient of the boreholes exhibiting the highest mercury concentrations.

2.2.2 Former Dry House

The former California Cap Company Dry House was approximately located between Building 128 and Building 275, as determined by its location on a 1930 Sanborn map. An explosion reportedly occurred here during historic California Cap Company operations based on a historic photograph (see Appendix C). No site-specific characterization data for explosive residues in soil is available for this area.

Groundwater samples collected from piezometer DH during Phase I sampling events do not have elevated concentrations of any constituents, including explosive residue (Tetra Tech 2011a). Piezometer DH is located directly at the former Dry House location.

2.2.3 Building 128

Building 128 is located in the southwest corner of the RFS, and was used for blasting cap packaging by the California Cap Company. Subsequently, UC Berkeley used it as a research facility and for storage. There are no indications from any sources that spills occurred near Building 128. Building 128 is located in an area that was once used as press houses, cap sifting houses, and cap packing houses for the California Cap Company operations and served as part of the shell manufacturing area.

In 2004, 22 soil samples were collected around the perimeter of the building to evaluate the potential presence of metals and PCBs. All historical sampling data can be found in the CCR, analytical data for soil sample surrounding Building 128 have been included in Appendix D and historical sampling locations have been included on Figure 9.

Groundwater samples collected from piezometer B128 during Phase I sampling events do not have elevated concentrations of any constituents. Piezometer B128 is adjacent to Building 128. Groundwater samples collected piezometers located down-gradient of Building 128 COPCs did not indicate any COPC exceeding an MCL (Tetra Tech 2012).

2.2.4 Building 201 Soil Mounds

The Building 201soil mounds are located west of the EPA laboratory (Building 201). A review of aerial photographs suggests these disturbed soil mounds were the result of excess soil generated during the construction of Building 201. Although there is no indication of a release or suspect materials, this soil will be characterized.

Groundwater samples collected from piezometer EPA during Phase I sampling events do not have elevated concentrations of any constituents (Tetra Tech 2012). Piezometer EPA is directly downgradient of the Building 201 soil mounds.

2.2.5 Groundwater at Piezometer CTP

The Phase I field sampling activities consisted of a site-wide groundwater sampling investigation to evaluate overall groundwater characteristics and confirm or deny the presence of any unknown groundwater contamination in the shallow groundwater zone. To date, four rounds of shallow groundwater samples have been collected from 51 piezometers: November 2010, April 2011, October 2011, and April 2012. The results of the first three rounds of groundwater data have been presented in sampling results technical memorandums (Tetra Tech 2011a, Tetra Tech 2011b, Tetra Tech 2012). The results from the April 2012 sampling event will be presented in a future technical memorandum which will evaluate all four rounds of data and identify any trends.

One data gap identified during the first three rounds of sampling was the concentrations of carbon tetrachloride reported in groundwater samples collected from piezometer CTP. The concentrations for the first three rounds of sampling were 19 micrograms per liter (µg/L) and 20 µg/L (duplicate sample), 16 µg/L, and 25 µg/L, all of which exceed the MCL of 5 µg/L. The general groundwater flow direction at the RFS is to the southwest (Tetra Tech 2012). There are no piezometers located upgradient of piezometer CTP, and downgradient samples collected from piezometers GEO, B277, and B280A had detectable concentrations of carbon tetrachloride for all three rounds of sampling ranging from 0.5 to 1.4 µg/L (see Figure 10).

As part of the Phase I investigation, four piezometers were installed in the intermediate groundwater zone to assess vertical gradients across the site. One of the deeper piezometers, CTPdeep, is located next to piezometer CTP. During the first three rounds of groundwater sampling, the vertical groundwater gradient between piezometers CTP and CTPdeep was downwards. Therefore, during the fourth round of groundwater sampling in April 2012, samples were collected from piezometer CTP screened from 7 to17 feet bgs, and piezometer CTPdeep screened from 30 to 40 feet bgs. The concentration of carbon tetrachloride in piezometer CTP was 22 µg/L, consistent with previous sampling events, whereas in piezometer CTPdeep it was non-detect at a detection level of 0.5 µg/L. Appendix E contains the April 2012 analytical results for these samples.

2.2.6 Transformer and Corporation Yard Step-outs

The Phase II FSP investigation focused on soil sampling in four areas to address data gaps:

(1) Locations near transformers with potentially PCB-containing oil: No previous soil sampling data was available. Groundwater samples had been collected in the vicinity of, and down gradient of many of the historic transformer locations as part of the Phase I site-wide groundwater investigation. Piezometer locations were chosen to assess if historic transformers had any impacts on shallow groundwater. All PCB results collected as part of the Phase I investigation were non-detect at the laboratory's reporting limit.

During the Phase II investigation, soil samples in the areas of RFS transformer locations were collect from 0 to 0.5 feet bgs and 1.5 to 2 feet bgs using a hand auger. Five locations (B47401, B47402, B15001, B15005, and B11202) had PCB concentrations that exceeded the commercial/industrial CHHSL (see Figure 11). With the exception of B11202, only the shallow samples exceeded the commercial/industrial CHHSL.

(2) Transformer House: Sanborn maps showed a "transformer house" when the California Cap Company operated on the property (see Figure 3). No sampling had been performed in this area and it is unknown what equipment was in the building; therefore, the six samples collected at this location were analyzed for PCBs, metals, pesticides, SVOC, total extractable petroleum hydrocarbons (TPH-e), total purgeable petroleum hydrocarbons (TPH-p), polycyclic aromatic hydrocarbons (PAH), and VOCs. At four of the six sampling locations the PAH concentrations, calculated as total benzo(a)pyrene equivalents, exceeded the commercial/industrial CHHSL for benzo(a)pyrene.

(3) The Corporation Yard: The corporation yard has been used by the RFS Facilities Maintenance Department for chemical and equipment storage. A former incinerator was located inside Building 120, within the corporation yard. The Phase II soil sampling plan addressed concerns of a potential direct release to soil which could have migrated to groundwater. Soil samples were collected at 12 locations at 2-foot intervals from ground surface down to groundwater. Soil samples were analyzed for PCBs, metals, pesticides, SVOCs, TPH-e, TPH-p, PAHs, and VOCs. At three locations, CY04, CY05, and CY06, the surface sample was analyzed for dioxin based on the location of a historic incinerator.

Sampling results for pesticides, SVOCs, TPH-e, TPH-p, and VOCs were below the commercial/industrial CHHSLs. Step-out sampling will occur for PCBs, lead, PAHs, and dioxin at locations where concentrations exceeded commercial/industrial CHHSL values (see Figure 12 and Table 1). One additional borehole will be placed near soil-gas sample location SG-121 collected during a pilot study at the adjacent Campus Bay site as a result of detected trichloroethylene (TCE) (Arcadis 2012).

(4) AST: No step-out samples were identified from samples collected to assess the AST data gap.

3.0 PHASE III SAMPLING DESIGN

This section discusses the purpose of the data gaps investigations; DQOs; and sampling process design.

3.1 PURPOSE OF INVESTIGATION

Phase III sampling results will provide additional information regarding areas where historic activities may have adversely impacted concentrations of chemicals in soil at the MFA, former Dry House explosion area, Building 128, and the Building 201 soil mounds. Data from samples collected from groundwater near piezometer CTP will be used to evaluate if there is a potential unidentified source of carbon tetrachloride upgradient of CTP. Step-out soil sampling at transformer locations and the Corporation Yard will supplement data collected during the Phase II investigations. Based on a review of site history and previous sampling data, sampling locations have been specified at strategic locations to determine potential impacts to soil or groundwater from previous site activities.

3.2 DATA QUALITY OBJECTIVES

DQOs are intended to help ensure collection of data appropriate for support of defensible decisions. The DQO process is a seven-step iterative approach to prepare plans for environmental data collection activities. It is a systematic approach for defining the criteria that a data collection design should satisfy, including when, where, and how to collect samples or measurements; determining tolerable decision error rates; and identifying the number of samples or measurements that should be collected (EPA 2006). The seven steps for DQO development are defined in the QAPP (Tetra Tech 2010). The DQOs for the Phase III FSP are outlined below.

3.2.1 DQOs for the Mercury Fulminate Area

Step 1: State the Problem

- Additional characterization of soil near the former mercury fulminate plant is needed to improve understanding of the distribution of mercury in this area.
- Historical detected concentrations of mercury need to be confirmed. Previous sampling and contaminant contour maps were based on a screening level not approved under the current Order.
- If mercury is present in soil, exposure to both human and ecological receptors is possible.

Step 2: Identify the Goals of the Study

- What is vertical and lateral distribution of mercury in the MFA?
- Does methyl mercury exist in subsurface soils?
- Is mercury present within the study area in quantities or concentrations requiring immediate response?
- Is mercury present within the study area in quantities or concentrations requiring inclusion of the MFA into the Remedial Investigation/Feasibility Study (RI/FS)?

Step 3: Identify Information Inputs

- Information from historical documents regarding MFA operations and building uses
- Previously conducted soil sampling locations and concentrations
- Boring logs and depth-to-water measurements
- Concentrations of mercury in groundwater up- and down-gradient of the MFA.

Step 4: Define the Boundaries of the Study

- The mercury fulminate plant was located west of Buildings 102 and 110, and is currently partially under Asphalt Pad C.
- The soil at and surrounding the former plant is of interest at varying depths above groundwater, extending to the east and under Buildings 110 and 102, under Asphalt Pad B and C, and in the meadow west of Building 112. The lateral boundaries of the extent of contamination has not been determined; however, based on previous investigation results, the study area should be encompassed by the sample locations shown on Figure 5.
- Horizontal or vertical expansion of the study area has been identified based on preliminary review of the data collected. If additional sampling is recommended during Phase III, an addendum to this FSP will be prepared.
- No temporal boundaries are imposed upon this investigation.

Step 5: Develop the Decision Rules

- The extent of the soil contamination associated with the MFA will be evaluated through review of mercury analysis as the indicator metal. Screening level or cleanup action endpoint concentrations will be determined following review of sample results, and will incorporate protection to human health and ecological receptors.
- If an area within the MFA requires further evaluation following the identification of endpoints, additional samples will be proposed through an addendum to characterize the area.

Step 6: Specify Performance or Acceptance Criteria

- The specific screening levels and endpoints for mercury will be established after data have been received and reviewed by UC Berkeley and DTSC. The screening level will be developed through evaluation of several sets of values, including but not limited to, the CHHSLs, U.S. EPA Region 9 Regional Screening Levels (RSL), and ecological toxicity reference values (TRV). Background considerations for mercury may be evaluated.

Step 7: Optimize Design for Obtaining Data

- Soil samples will be collected at various depths using a direct push rig and analyzed for mercury as total mercury by EPA Method 7471 and methyl mercury through Brooks-Rand Method BR-0011, to assess contaminant concentrations surrounding the former mercury fulminate plant (see Figure 5). Locations selected for methyl mercury analysis were chosen to give a range of representative conditions, including a variety of depths and anticipated concentrations.

- Following the review of total mercury results, seven samples (from approximately 10 percent of the total borehole locations) will be collected for evaluation of elemental mercury. The seven samples will be selected based on the highest total mercury concentrations detected. These samples will be evaluated for elemental mercury through Brooks-Rand Method BR-0013.
- Following receipt and review of the laboratory soil results for mercury, any additional soil sampling ─ if deemed necessary ─ will proceed using the same methodology.

3.2.2 DQOs for the Former Dry House Explosion, Building 128, and Building 201 Soil Mounds

Step 1: State the Problem.

- No site-specific soil sampling data are available for the California Cap Company former Dry House area or the Building 201 soil mounds; additional sampling is proposed in the shallow soil surrounding Building 128. These locations have been identified as data gaps in need of additional characterization to assess whether historic activities have impacted concentrations of chemicals in soil at the RFS.
- Additional characterization is needed to improve understanding of soil for specific locations of known or possible contamination based on previous activities, or in the case of the Building 201 soil mounds, to confirm no contamination is present.
- If contaminants are present in soil, exposure to human and ecological receptors is possible.

Step 2: Identify the Goals of the Study

- Characterize the concentrations of chemicals in soil at the former Dry House location, around Building 128, and the EPA soil mounds.
- Determine if specified contaminants of concern for each of the data gaps are present within the study area(s) in quantities or concentrations requiring an immediate action or inclusion of the area into the RI/FS:
    - Dry House explosion area: dioxins and furans, explosive residue and metals
    - Building 128: metals, PCBs, VOCs, SVOCs, PAHs, TPH-e, TPH-p, and pesticides
    - Building 201 soil mounds: metals, PCBs, VOCs, SVOCs, PAHs, TPH-e, TPH-p, and pesticides

Step 3: Identify Information Inputs

- Information provided within historical documents including the CCR, FSW, Phase I FSP, and Phase II FSP
- Interviews of current and former employees
- Previously conducted sampling locations and concentrations in the areas

Step 4: Define the Boundaries of the Study

- The Phase III FSP study area includes soil in the immediate vicinity of the former Dry House location, within the EPA soil mounds, and the area surrounding Building 128. Specific sampling locations are included on Figure 9.
- For the former Dry House location, the soil from 0 to 2 feet bgs is of interest because it is the most likely horizon for deposition of contaminants from the explosion. Vertical or horizontal expansion of the study area may be necessary if elevated concentrations of contamination are detected in the shallow soil sampling.
- For the soil surrounding Building 128, soil from 0 to 2 feet bgs will be investigated to assess if any historical activities impacted the surface soil. Vertical expansion of the study area may be necessary if elevated concentrations of contamination are detected in the shallow soils.
- For the Building 201 soil mounds, the soil from 0 to 2.5 feet bgs will be investigated since this is the estimated height of the mounds (as elevated in comparison to the surrounding Coastal Terrace Prairie native soil). Actual sampling depths will be determined in the field and considerations will include soil type, depth, and indications of the former native or natural surface soils. Vertical expansion of the study area may be necessary if elevated concentrations of contaminants are detected in the shallow soil sampling.
- No temporal boundaries are imposed upon this investigation.

Step 5: Develop the Decision Rules

- The data provided by this investigation will be reviewed by UC Berkeley and DTSC and screened against applicable screening levels, including the CHHSLs, RSLs, and U.S. EPA Toxic Substances Control Act (TSCA) for PCBs.
- If an area is recommended for further investigation, one or several of the following may occur: further data evaluation or data gap sampling (by expansion of the lateral or vertical boundary of the study area to subsurface or surface soils), inclusion in the RI/FS, or immediate consideration for remedial or response action.

Step 6: Specify Performance or Acceptance Criteria

- The specific screening levels for each constituent will be established after data have been received and reviewed by UC Berkeley and DTSC. The screening levels will be developed through evaluation of several sets of values, including but not limited to, CHHSLs, RSLs, and TSCA values. Concentrations expected from background considerations may be evaluated.

Step 7: Optimize Design for Obtaining Data

- Soil sampling locations are based on best available current and historic information presented in the CCR and FSW (see Figure 9).
- Following receipt and review of the laboratory results from this soil investigation, any additional sampling, if deemed necessary, will proceed following discussion with UC Berkeley and DTSC.

3.2.3 DQOs for Groundwater at Piezometer CTP

Step 1: State the Problem.

- Carbon tetrachloride concentrations have exceeded the federal MCL in shallow groundwater (screened from 7 to 17 feet bgs) at piezometer location CTP for four rounds of groundwater monitoring. Carbon tetrachloride was detected in down gradient piezometers, including GEO, B280A, and B277, at concentrations less than the federal MCL, but exceeding the California MCL. A groundwater sample collected in April 2012 from the nested CTPdeep piezometer (screened from 30 to 40 feet bgs) did not report any detections of carbon tetrachloride, indicating the potential confinement of carbon tetrachloride to shallow groundwater at this location.
- The upgradient source and extent of carbon tetrachloride in the shallow groundwater in the CTP is unknown.
- Additional characterization of the shallow groundwater (7 to 17 feet bgs) near piezometer location CTP is needed to improve understanding of the potential upgradient source of carbon tetrachloride at piezometer CTP.
- If contaminants are present in shallow groundwater, exposure to both human and ecological receptors is possible.

Step 2: Identify the Goals of the Study

- What are the concentrations of carbon tetrachloride up gradient and adjacent to piezometer CTP in shallow groundwater (7 to 17 feet bgs)?
- Is the contaminant originating from an up gradient source either on or off site?
- Is carbon tetrachloride present within the study area at concentrations requiring an immediate response?
- Is carbon tetrachloride present within the study area at concentrations requiring inclusion of the area into RI/FS or the ongoing monitoring program?

Step 3: Identify Information Inputs

- Information from historical documents
- Carbon tetrachloride concentrations from four of Phase I groundwater monitoring collected from piezometer CTP
- Carbon tetrachloride concentrations from piezometer CTPdeep collected in April 2012
- Boring logs and depth-to-water measurements
- VOC concentrations from grab groundwater samples measured using appropriate EPA SW-846 Methods

Step 4: Define the Boundaries of the Study

- The step-out study area for piezometer CTP includes all groundwater located within the property boundaries of the RFS; the initial target area is upgradient of piezometer CTP.
- The shallow groundwater zone is of primary interest.

- Horizontal expansion of the study area may be necessary to investigate potential groundwater plumes.
- No temporal boundaries are imposed upon this investigation.

Step 5: Develop the Decision Rules

- An initial round of sampling data at ten locations will be collected and analyzed on a rush turn-around-time. The CTP piezometer will also be sampled concurrently to help confirm comparability of the piezometer data with a grab groundwater sample collected adjacent to CTP. The data will be reviewed by UC Berkeley and DTSC, and the decision making parties will proceed with evaluation of lines of evidence to determine the location of the remaining ten sampling locations. Further sampling will be conducted on standard turn-around-time for inclusion in the summary report.
- Analytical data will be compared to California and federal MCLs and existing groundwater data at RFS. Sample data will be used to assess the need for additional piezometers to confirm the lateral or vertical boundary of the study area, and if necessary, inclusion in the RI/FS, or immediate consideration for interim remedial action.

Step 6: Specify Performance or Acceptance Criteria

- The carbon tetrachloride results will be compared to California and federal MCLs, and other risk-based values.

Step 7: Optimize Design for Obtaining Data

- The CTP carbon tetrachloride shallow groundwater data gaps will be addressed through collection of grab groundwater samples collected from proposed sampling locations shown on Figure 10. Sampling locations may be moved to optimize data collection following the receipt and review of the initial grab groundwater sampling results.
- Following receipt and review of the laboratory results from either the groundwater or future soil investigations, any additional groundwater sampling ─ if deemed necessary ─ will proceed using the same methodology.

3.2.4 DQOs for the Phase II Step-out Soil Samples

Step 1: State the Problem.

- Some soil samples collected as part of the Phase II investigation of historic transformer locations and the Corporation Yard had COPCs concentrations that exceeded commercial/industrial CHHSLs.
- A soil gas sample collected at SG-121 merits placement of one borehole to identify potential TCE contamination (see Figure 12).
- Additional data is needed to help determine if soil COPC concentrations increase dramatically laterally or horizontally from the original sample locations.
- If elevated concentrations of COPCs are present in soil, exposure to human and ecological receptors is possible.

Step 2: Identify the Goals of the Study

- What are the concentrations of chemicals in soil from soil collected at 5-foot step-outs from historic transformer locations which exceeded the commercial/industrial CHHSL for PCBs and PAHs?
- What are the concentrations of chemicals in soil collected at 15-foot step-outs at the Corporation Yard sampling locations which exceeded the commercial/industrial CHHSLs for PCBs, lead, PAHs, and dioxins?
- Is TCE present in soil samples near boring SG-121 which could indicate a source for the soil vapor TCE result?
- Are COPCs present within the extent of the historic transformer locations and the corporation yard at concentrations requiring an immediate response?
- Are COPCs present within the extent of the historic transformer locations and the corporation yard at concentrations requiring inclusion of the area into the RI/FS?

Step 3: Identify Information Inputs

- Information provided within historical documents including the CCR, FSW, and Phase I and II FSPs, Sampling Results Technical Memoranda, and the Campus Bay Lot 3 Treatability Study.
- Interviews of current and former employees.
- Previously conducted sampling locations and concentrations.

Step 4: Define the Boundaries of the Study

- The sampling area includes Phase II sampling locations at historically oil-filled transformers locations and the Corporation Yard where COPC concentrations exceeded a commercial/industrial CHHSL. Specific sampling locations are included on Figures 11 and 12.
- For the historic transformer locations, the soil from 0 to 2 feet bgs will be investigated since PCBs are readily sorbed to soil and are most likely to stay in the shallow horizon from a surface spill. The sample collected from 1.5 to 2 feet bgs at location B 11202 exceeded the CHHSL; therefore, additional samples will be collected from 3 to 3.5 feet bgs at these step-out locations.
- For the Corporation Yard, all samples exceeding the CHHSL were surface samples; therefore, the step-out samples will be collected from 0 to 0.5 feet bgs and 2 to 2.5 feet bgs. At sampling location CY19, which is intended to investigate the TCE soil-vapor concentration at SG-121, samples will be collected from 0 to 0.5 feet bgs, 2 to 2.5 feet bgs, 4 to 4.5 feet bgs, and 6 to 6.5 ft bgs. Vertical or horizontal expansion of the extent of the historic transformer locations and the corporation yard may be necessary if elevated concentrations of contamination are detected in the shallow soil sampling.
- No temporal boundaries are imposed upon this investigation.

Step 5: Develop the Decision Rules

- The data provided by this investigation will be reviewed by UC Berkeley and DTSC and screened against the commercial/industrial CHHSLs.

- If an area is recommended for further investigation, one or several of the following may occur: further data evaluation or data gap sampling (by expansion of the lateral or vertical boundary of the extent of the historic transformer locations and the corporation yard in surface or subsurface soils), inclusion in the RI/FS, or immediate consideration for remedial or response action.

Step 6: Specify Performance or Acceptance Criteria

- The Phase II and III step-out soil sampling data will be screened against commercial/industrial CHHSLs, U.S. EPA Regional Screening Levels, and other relevant screening levels, as appropriate.

Step 7: Optimize Design for Obtaining Data

- Soil sampling locations are based on best available current and historic information presented in the CCR, FSW, Phase II Technical Memorandum, and Campus Bay Lot 3 Pilot Study (see Figures 11 and 12).
- Following receipt and review of the laboratory results from this soil investigation, any additional sampling, if deemed necessary, will proceed following discussion with UC Berkeley and DTSC.

3.3 SAMPLING PROCESS DESIGN

The sampling strategy for Phase III consists of discrete soil sampling locations located in and around the data gap locations. Soil samples will be collected at varying depths to assess possible impacts from historic site activities. Grab groundwater samples will be collected near piezometer CTP to assess carbon tetrachloride concentrations.

3.3.1 MFA Mercury Sampling

Discrete sampling locations for mercury in the vicinity of the former California Cap Company mercury fulminate plant are shown on Figure 5. At the boring locations, 6-inch brass sleeves will be collected between 0 to 0.5 feet bgs, 2 to 2.5 feet bgs, 4 to 4.5 feet bgs, 6 to 6.5 feet bgs, 8 to 8.5 feet bgs, 10 to 10.5 feet bgs, and 12 to 12.5 feet bgs, capped, and submitted to a State-certified laboratory. Sampling depth varies by location, as described in Table 1. As described in Section 2.1, blueprints for the mercury fulminate plant show an open structure (presumably for ventilation) and air stack which could have contributed to aerial deposition of mercury in the areas surrounding the mercury fulminate plant. The blueprints also identify storage tanks and rinsate areas which appear to be where the highest historical mercury concentrations were detected (see Figure 8). The deepest proposed samples will be collected near this area to confirm historic mercury concentrations, and sampling depths will taper up (shallower) as distance from the former plant increases. This sampling plan is based on historical sampling data as well as the conceptual model for mercury dispersion from the former mercury fulminate plant.

Before sampling begins, water level measurements will be recorded at the piezometer locations on the edge of the marsh and in the central meadow to estimate the depth to groundwater. Samples collected from below the groundwater table will be noted in the field notebook. When collecting soil samples from below the groundwater table it is difficult to assess whether the concentration was attributed to the soil or groundwater. Mercury was detected in the October

2011 groundwater sampling event at location MFA at a concentration of 0.82 µg/L as a dissolved metal. Other groundwater samples collected for the first three rounds of sampling from piezometers MFA, ETA, Bulb1, and Bulb 2 did not detect any mercury in the dissolved fraction. These results suggest that the majority of the mercury in groundwater is attributed to suspended particles and would not have a significant impact on the soil samples collected below the groundwater table. However, the results of the soil samples collected below the groundwater table will be assessed separately from the samples collected above the water table.

During the radiological decommissioning of Buildings 102 and 110, samples were collected for radiological analysis from under the buildings by drilling holes in the floors of the two buildings. Soil samples will be collected from a subset of these locations using a hand auger, at the sampling depth intervals indicated in Table 1.

All samples will be analyzed for mercury by EPA method 7471. Mercury concentrations will be used to further define the extent of contamination. Additionally, 14 samples listed in Table 1 will be analyzed by Brooks-Rand Method BR-0011, to determine if methyl mercury is present at the MFA. The locations selected for additional methyl mercury analysis were chosen to give a range of representative conditions, including the transition area (MFA06), beneath the buildings (MFA17), beneath the former mercury fulminate plant (MFA23), and the upland area (MFA49). These samples will be collected from 0 to 0.5 feet bgs, 2 to 2.5 feet bgs, and 6 to 6.5 feet bgs; additionally a sample will be collected from 12 to 12.5 feet bgs as locations MFA06 and MFA23.

Following the review of total mercury results, seven samples (from approximately 10 percent of the total borehole locations) will be collected for evaluation of elemental mercury. The seven samples will be selected based on the highest total mercury concentrations detected. These samples will be evaluated for elemental mercury through Brooks-Rand Method BR-0013.

3.3.2 Dry House, Building 128, EPA Soil Mounds, and Phase II Step-out Soil Sampling

Four samples will be collected to assess the former Dry House explosion data gap, (see Figure 9) from 0 to 0.5 feet bgs and 1.5 to 2 feet bgs to assess any impacts this explosion may have had on surface soils. The samples will be analyzed for explosive residue, metals, and dioxin, as shown on Table 1.

Six samples will be collected to assess any impacts historic use of the area around Building 128 may have had on the surface soil (see Figure 9). Groundwater samples collected during the first three rounds of the Phase I FSP investigation were reviewed and no COPCs exceeded an MCL from piezometers located down-gradient of Building 128 (Tetra Tech 2012). Therefore, the main concern of this data gap is from historic use and potential surface spills. Samples will be collected from 0 to 0.5 feet bgs and 1.5 to 2 feet bgs and will be analyzed for metals, PCBs, pesticides, PAHs, SVOCs, TPH-e, TPH-p, and VOCs.

Five samples will be collected to characterize the Building 201 soil mounds, as shown on Figure 9. The samples will be collected from 0 to 0.5 feet bgs and 2 to 2.5 feet bgs, as this is the estimated height that the mounds are elevated from the adjacent soils. Because no site-specific characterization data exists for this soil, the samples will be analyzed for metals, PCBs, pesticides, PAHs, SVOCs, TPH-e, TPH-p, and VOCs.

At most of the transformer step-out sampling locations, samples will be collected between 0 to 0.5 feet bgs and 1.5 to 2 feet bgs. Additional samples will be collected at the step-out locations from B11202, from 3 to 3.5 feet bgs, to better assess the vertical extent of PCB contamination in this area. The step-outs are located approximately 5 feet laterally from the original soil sample where PCB or PAH concentrations exceeded their respective CHHSLs. The 5 foot step-out distance was chosen because PCBs are readily sorbed to soil and are not likely to have migrated very far from a surface spill. Samples from areas around the B112, B150, and B474 transformers will be submitted for PCB analysis. The samples collected from the former California Cap Company transformer house will be submitted for PAH analysis. All transformer and transformer house step-out sampling locations are shown on Figure 11.

Discrete step-out sampling locations in the Corporation Yard are shown on Figure 12. The COPCs reported at concentrations exceeding the commercial/industrial CHHSLs were different at each location; step-out soil samples collected will be analyzed for contaminants of concern as listed in Table 1. The step-out samples are located approximately 15 feet laterally from the original sampling location. These samples will provide additional data for COPCs concentrations that exceeded screening values at the original sampling locations. Samples will be collected between 0 to 0.5 feet bgs and 2 to 2.5 feet bgs because all of the CHHSL exceedances were in the 0 to 0.5 feet bgs horizon. At location CY19, samples will be collected between 0 to 0.5 feet bgs, 2 to 2.5 feet bgs, 4 to 4.5 feet bgs, and 6 to 6.5 feet bgs. Before sampling begins, water level measurements will be recorded at piezometer B197. The 6 to 6.5 foot bgs sample may not be collected if it is judged to be below the groundwater table.

The ground cover varies widely between the sampling locations. Asphalt, concrete, or gravel at the surface of any sampling locations will be removed prior to sampling using a backhoe or backhoe-mounted auger, after which sampling will be conducted with a hand auger. Discrete shallow sampling locations are identified on Figures 9, 11, and 12.

3.3.3 Grab Groundwater Sampling

The Phase III field mobilization will begin in the CTP area with a direct push rig collecting approximately ten shallow grab samples for VOC analysis both up- and down-gradient of piezometer CTP. One of the initial locations will be placed in the immediate vicinity of piezometer CTP to evaluate if carbon tetrachloride is detected in the grab groundwater samples at similar concentrations to the reported concentrations from the Phase I sampling events. These results will be used to assess the accuracy and ability of the grab samples to represent groundwater conditions. Proposed grab groundwater sampling locations are identified on Figure 10.

Before sampling begins, water level measurements will be recorded at piezometers B280B, NRLF, CTP, CTPdeep, GEO, and B280A. The grab groundwater samples will be collected in the permeable zone based on the lithology information collected during the installation of the Phase I piezometers. Based on the April 2012 non-detect results for the groundwater sample collected from piezometer CTPdeep, this sampling event will target the shallow groundwater zone. The grab groundwater samples will be submitted to the laboratory for rush analysis. Once the data has been received, it will be reviewed by UC Berkeley and DTSC, and the remaining ten proposed locations may be modified to best characterize the contamination or possible source location.

3.3.4 Sampling Methods

The QAPP provides specific sampling and analysis information to assist the field crew during field activities, including sample identification numbers for the various sampling locations and a summary of the test methods to be performed on each sample. The procedures for decontamination and management of investigation-derived waste (IDW) from sampling activities are provided in the QAPP (Tetra Tech 2010) and will be utilized by the field crew during sampling activities.

All shallow soil samples will be collected from a decontaminated hand auger. At each sampling location, the hand auger will be decontaminated before collecting the surface sample, and again when they reached the top of the second sample to reduce the possibility of cross contamination between sampling depths. Soil samples in the MFA will be collected as 6-inch brass sleeves by a direct push rig. Standard information for planning and conducting field sampling for Phase III, such as such as field equipment calibration and maintenance, sample collection methodology, sample packaging and documentation, is outlined in the QAPP (Tetra Tech 2010) and referenced in Table 2.

Grab groundwater samples will be collected using a direct push rig. All samples will be collected at a depth determined in the field based on groundwater depth at nearby piezometers using low flow pumps to minimize disturbance.

3.3.5 Analytical Methods and Quality Control

The soil samples will be submitted for analysis using the analytical methods listed in the QAPP and referenced in Table 2. Samples for chemical analysis will be submitted to BC Laboratories, a State-certified analytical laboratory. Additional descriptions of the analytical methods, including the selection of analytical laboratories and project analytical requirements, can be found in the QAPP.

To assess the quality of field data and sample representativeness, field quality control (QC) samples will be collected and analyzed at 10 percent of sampling locations as referenced in Table 2. Field QC samples will be collected in triplicate (stepping out 2 feet from the original location) at the same depth intervals as the original samples. Laboratory QC samples will be collected at 5 percent of sampling locations, and will be analyzed in accordance with referenced analytical method protocols to ensure laboratory procedures are conducted properly and the quality of the data is known. Testing, inspection, and maintenance procedures for field equipment are also critical for accurate data collection. Procedures for these QC practices are explained in the QAPP.

The procedures for decontamination and management of IDW from sampling activities are provided in the QAPP (Tetra Tech 2010) and will be utilized by the field crew during sampling activities.

4.0 PROJECT ROLES AND RESPONSIBILITIES

This section presents key staff and responsibilities. Additional project organization information pertaining to sampling and laboratory quality is presented in the QAPP (Tetra Tech 2010).

Name and Affiliation	Roles	Responsibilities
Greg Haet (UC Berkeley Office of Environment, Health & Safety)	Project Coordinator	Directs environmental health and safety compliance of the project. Receives notices, comments, approvals, and related communications from DTSC and forwards them to Respondents' representatives. Reports to and interacts with the DTSC for all Order tasks and/or public outreach.
Kate Bolton (UC Berkeley Capital Projects)	Project Manager	Manages contracts, schedules, and budgets. Authorizes work to proceed.
Karl Hans (UC Berkeley Office of Environment, Health & Safety)	Project Scientist/ On-Site EH&S Coordinator	Acts as UC on-site environmental health and safety project coordinator. Assists in managing the project and in reporting to and interacting with the DTSC and Respondents. Reviews all submittals and notifications to DTSC and other agencies for quality and completeness.
Jason Brodersen, P.G. (Tetra Tech EM Inc.)	Project Consultant/ Project Geologist	Directs and supervises hazardous waste site cleanup work. Provides expert advice on environmental management during the investigation and remediation phases of the project. Led development of reports and other deliverables required by the Order.
Gene Barry, P.E. (4LEAF, Inc.)	Project On-Site Coordinator	Performs construction management and oversight duties during various construction phases of the project and other on-site activities. Assists the project consultant and project coordinators in managing project information and data and completion of project deliverables.
Anthony Garvin (UC Office of the General Counsel)	Respondent Representatives	Provide input to, and receive input from Project Coordinator regarding project management, task completion, and DTSC interaction.
Brian Spiller (Zeneca)		
John Edgcomb (Edgcomb Law Group- Zeneca/Bayer CropScience)		
Bill Marsh (Edgcomb Law Group- Zeneca/Bayer CropScience)		

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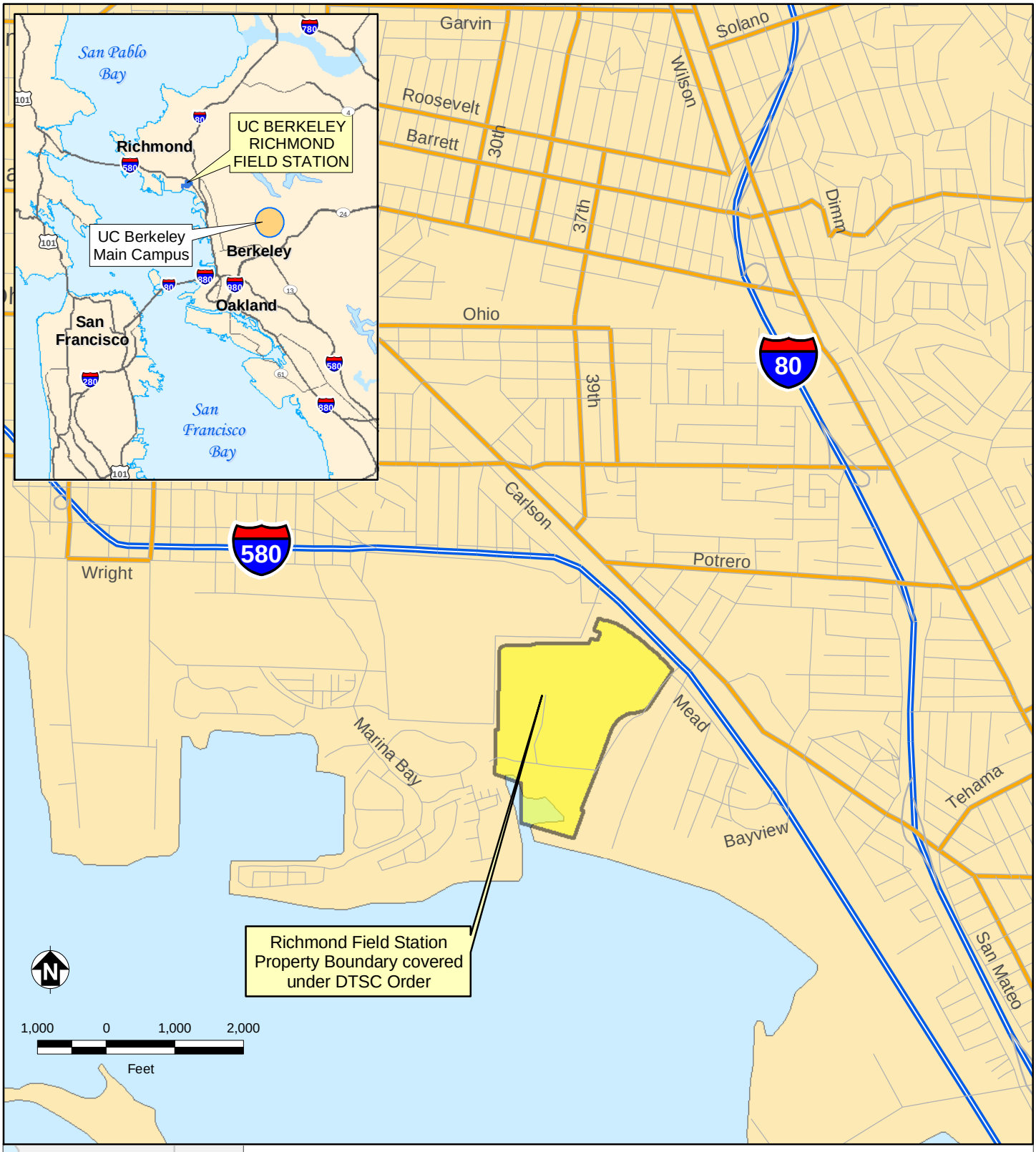
FIGURES



TETRA TECH

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FIGURE 1
SITE LOCATION MAP

Phase III Field Sampling Plan

Bay Trail
Meeker Slough
Western Stege Marsh
Transition Area (Including Bulb)
Upland

Property Boundary
Approximate Property Boundary

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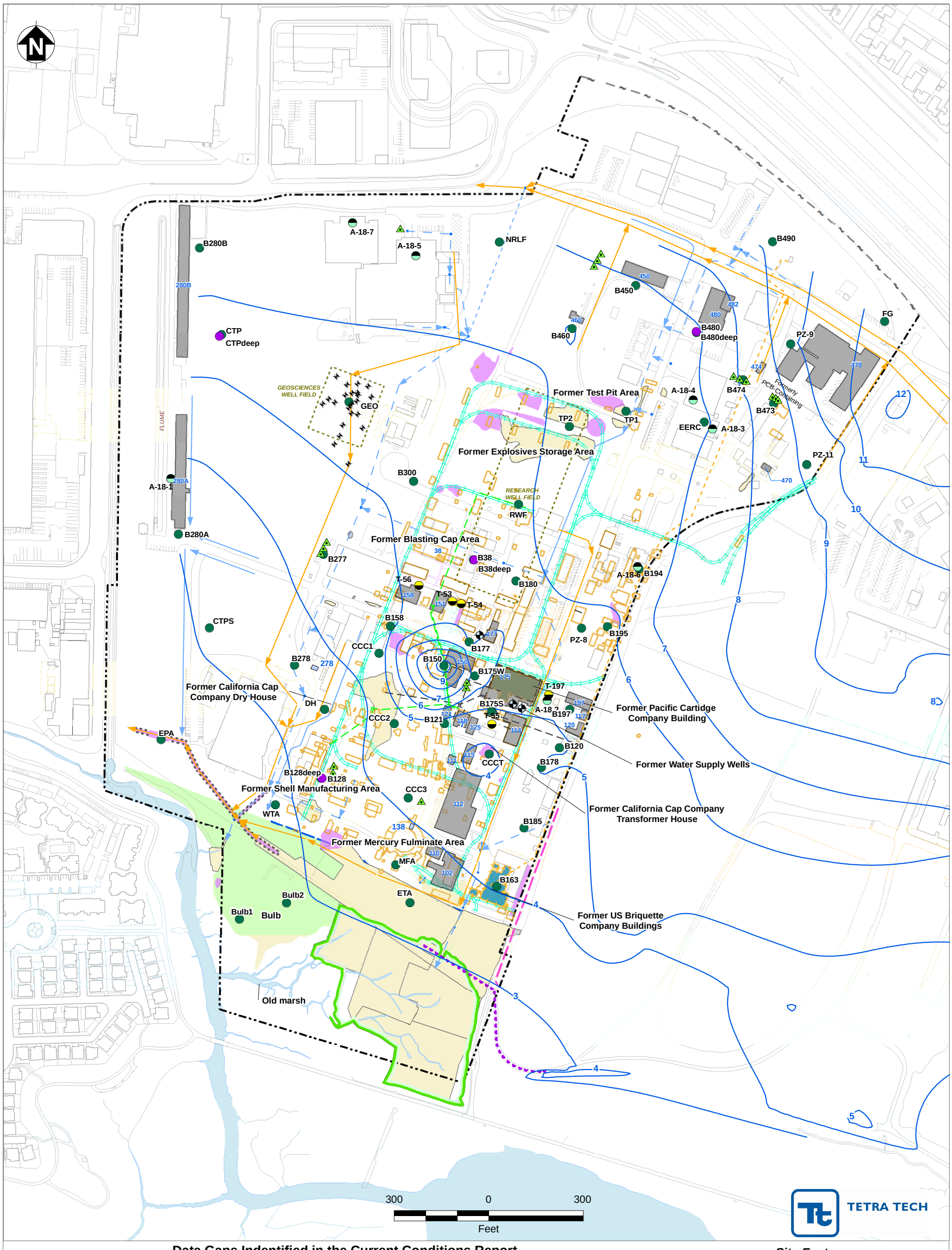
Notes:

EBRPD	East Bay Regional Parks District
EERC	Earthquake Engineering Reseach Center
EPA	Environmental Protection Agency
NRLF	Northern Regional Library Facility
RFS	Richmond Field Station

FIGURE 2
SITE MAP

Phase III Field Sampling Plan



Data Gaps Indentified in the Current Conditions Report

- Existing Buildings Identified as Data Gaps
- Removed Buildings Identified as Data Gaps
- Former California Cap Company Facilities/Buildings
- Former Pacific Cartridge Company Buildings
- Former U.S. Briquette Company Building
- <all other values>
- Remediated Areas
- Known Pyrite Cinders Area
- Suspected Pyrite Cinders Area
- Western Transition Area
- Remediated Marsh
- Well Field Boundary
- Former California Cap Company Tramway

Former California Cap Company Utilities:

- Fuel Line
- Hydraulic Line

Sanitary Sewer Lines:

- Existing Sewer Line
- Abandoned Sewer Line

Storm Drain Lines:

- Open Swale
- Underground Culvert
- Underground Culvert, Abandoned (Grouted at Manholes)
- BAPB Wall
- Former Seawall (Approximate)
- Slurry Wall
- Former Underground Storage Tank (UST)
- Aboveground Storage Tank (AST)
- Open Well (Not in Use)
- Geoscience Well
- Transformer Location

Notes:
Some locations are approximate.

Site Features

- Existing Piezometer Location (shallow)
- Existing Piezometer Location (deep)
- Groundwater Elevation Contour (in feet) Nov 2010
- Property Boundary
- Approximate Property Boundary
- Road Perimeter or other Landscape Feature
- Surface Water

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FIGURE 3
DATA GAPS MAP

Phase III Field Sampling Plan

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Groundwater at Piezometer CTP

Transformer Step-outs

Building 201 Soil Mounds Sampling

Former Dry House Sampling

Corporation Yard Step-outs

California Cap Company Transformer House Step-outs

Building 128 Sampling

Mercury Fulminate Area Sampling

250 0 250

Feet

- Existing Buildings
- Asphalt/Concrete Pads
- Remediated Areas
- Surface Water
- Marsh Boundary
- Property Boundary
- Approximate Property Boundary
- Roads and Other Landscape Features
- Fenceline
- Biologically Active Permeable Barrier Wall
- Former Seawall (Approximate)
- Slurry Wall

Storm Drain Lines:
- Open Swale
- Underground Culvert
- Underground Culvert, Abandoned (Grouted at Manholes)

Sanitary Sewer Lines:
- Existing Sewer Line
- Removed Sewer Line
- Abandoned Sewer Line
- Proposed Grab Groundwater Sampling Locations
- Proposed Soil Sampling Locations

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University of California, Berkeley

FIGURE 4
PHASE III
PROPOSED SAMPLING AREAS

Phase III Field Sampling Plan

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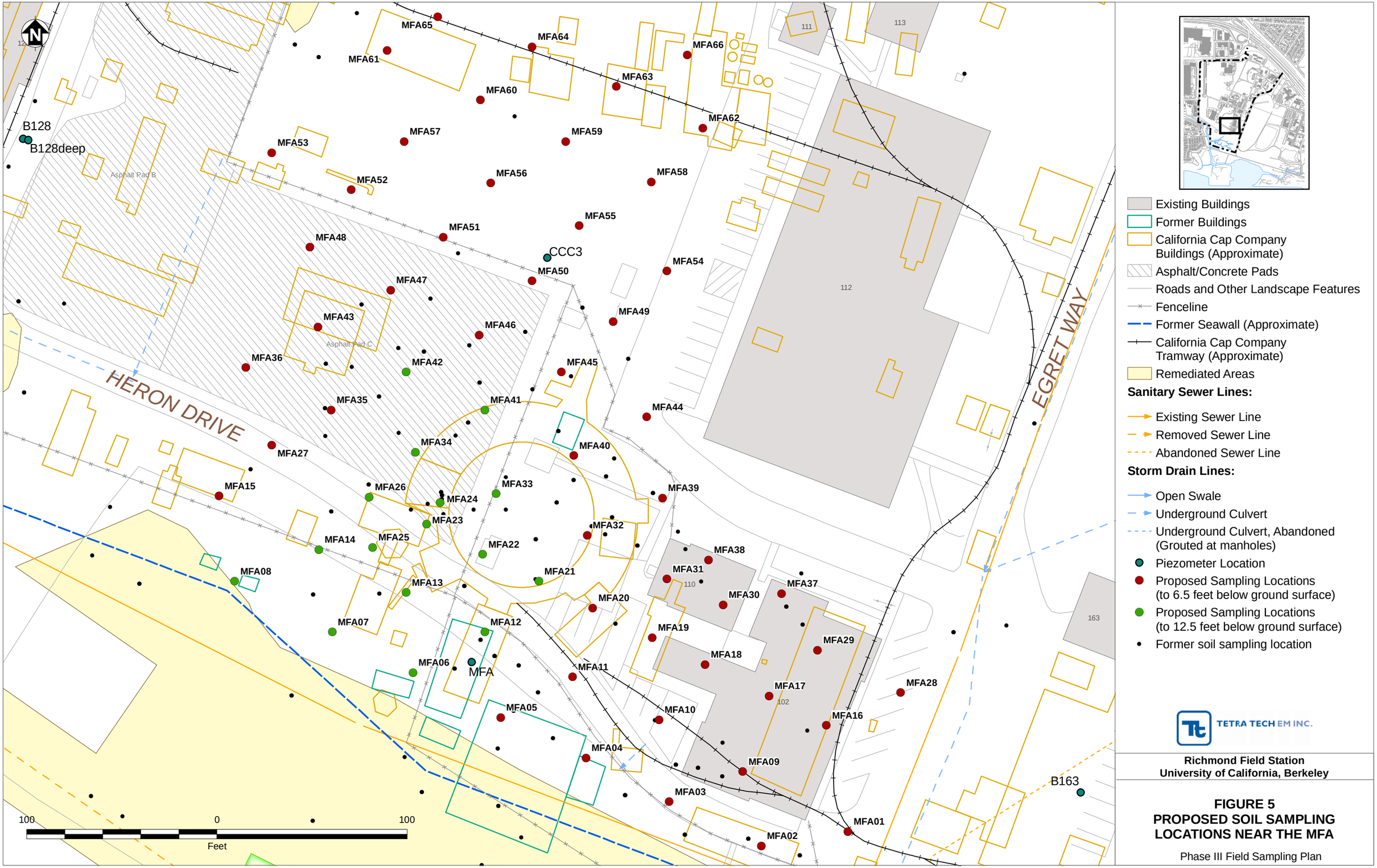

Existing Buildings
Former Buildings
California Cap Company Buildings (Approximate)
Asphalt/Concrete Pads
Roads and Other Landscape Features
Fenceline
Former Seawall (Approximate)
California Cap Company Tramway (Approximate)
Remediated Areas

Sanitary Sewer Lines:

Existing Sewer Line
Removed Sewer Line
Abandoned Sewer Line

Storm Drain Lines:

Open Swale
Underground Culvert
Underground Culvert, Abandoned (Grouted at manholes)
Piezometer Location
Proposed Sampling Locations (to 6.5 feet below ground surface)
Proposed Sampling Locations (to 12.5 feet below ground surface)
Former soil sampling location

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FIGURE 5
PROPOSED SOIL SAMPLING LOCATIONS NEAR THE MFA

Phase III Field Sampling Plan

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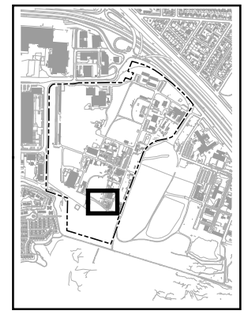
Point ID	Sample Date	Sample Depth	Analytical Result
AOCU7-D1	Mar-05	--	270
AOCU7-D2	Mar-05	--	37
AOCU7-D3	Mar-05	--	12
AOCU7-D4	Mar-05	--	24
BLDG 102-1	Mar-05	0.5	58
BLDG 102-2	Mar-05	0.5	19
BLDG 102-3	Mar-05	0.5	280
BLDG 102-4	Mar-05	0.5	330
BLDG 102-5	Mar-05	0.5	19
BLDG 102-6	Mar-05	0.5	5.4
BLDG 110-1	Mar-05	0.5	3
BLDG 110-2	Mar-05	0.5	3
MF102	Mar-00	0	3.6
MF103	Feb-00	0	50
MF105	Feb-00	0	4.6
MF107	Jun-01	0	0.65
MF111	Jun-01	0	280
MF112	Jun-01	0	41
MF113	Jun-01	0	7.9
MF2-1	Sep-02	0	1.3
MF2-13	Dec-02	0	73
MF2-14	Jan-03	0	150
MF2-15	Jan-03	0	1.3
MF2-16	Jan-03	0	29
MF2-17	Jan-03	0	11
MF2-18	Jan-03	0.5	370
MF2-2	Sep-02	0	44
MF2-20	Jan-03	0.27	470
MF2-21	Jan-03	0.18	11
MF2-3	Sep-02	0	5.2
MF2-7	Sep-02	0	2.7
MF3-1	May-03	0.12	2.4
MF3-10	Jun-04	0.5	930
MF3-5	Apr-04	0.5	1.8
MF3-7	Apr-04	0.5	15
MF3-8	Apr-04	0.5	0.91
MF3-9	Apr-04	0.5	3.8
MF4-1	Mar-05	0.5	75
MF4-2	Mar-05	0.5	2.2
SL103	Feb-00	0	0.48
SL103	Feb-00	0.89	9.2
SM2-1	Sep-02	0	13
SM3-2	Apr-04	0.5	12



- > C/I CHHSL (180 mg/kg)
- > Residential CHHSL (18 mg/kg)
- < Residential CHHSL (18 mg/kg)
- Not Detected
- Remediated Areas
- Marsh Boundary
- Asphalt/Concrete Pads
- California Cap Company Buildings (Approximate)
- Former Seawall (Approximate)
- Fenceline
- Roads and Other Landscape Features

Storm Drain Line:
- Underground Culvert

Sanitary Sewer Lines:
- Existing Sewer Line
- Removed Sewer Line
- Abandoned Sewer Line

Notes:
Residential CHHSL (18 mg/kg)
Commerical/Industrial CHHSL (180 mg/kg)
Sample Depth is bottom depth in feet bgs.

bgs	Below ground surface
CHHSL	California Human Health Screening Level
C/I	Commerical/Industrial
MFA	Mercury Fulminate Area
mg/kg	Milligram per kilogram
RFS	Richmond Field Station
U	Not detected

40 0 40
Feet

TETRA TECH EM INC.

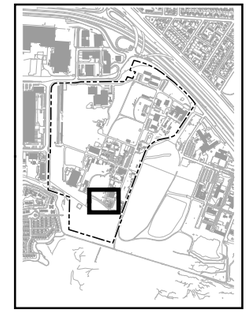
Richmond Field Station
University of California, Berkeley

FIGURE 6
HISTORIC MERCURY CONCENTRATIONS IN SOIL AND SEDIMENT AT THE MFA, 0 TO 1 FEET BGS

Phase III Field Sampling Plan

2012-5-14 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_Sampling_Workplan\Phase_III\Mercury_MFA_0-1.mxd TtEMI-OAK CF

Point ID	Sample Date	Sample Depth	Analytical Result
B1	May-90	3	3.5
B10	May-90	3	90
B10SH	Feb-91	1.3	40.2
B11	May-90	3	25
B12	May-90	3	180
B13	May-90	3	7.4
B13SH	Feb-91	1.3	0.3
B16SH	Feb-91	1.3	1.17
B1MF	Feb-91	1.3	317
B2	May-90	3	9.6
B22	May-90	3	11
B23	May-90	3	2.2
B27	May-90	3	1.2
B2MF	Feb-91	1.15	11
B2MF	Feb-91	1.5	4.39
B2MF	Feb-91	4	2.6
B3	May-90	3	3.3
B30	May-90	3	4.4
B31	May-90	3	6.7
B37	May-90	3	0.73
B4	May-90	3	4.8
B46	May-90	3	14
B47	May-90	3	4.7
B48	May-90	3	0.41
B5	May-90	3	19
B6	May-90	3	22
B7	May-90	3	26
B8	May-90	3	28
B9	May-90	3	61
B9SH	Feb-91	1.3	18.8
BLDG 102-1	Apr-05	2.5	0.25
BLDG 102-1	Apr-05	4.5	0.38
BLDG 102-3	Apr-05	2.5	51
BLDG 102-4	Apr-05	2.5	13
BLDG 102-4	Apr-05	4.5	81
BLDG 102-6	Apr-05	1.5	1.4 U
HD2-5	Dec-02	3.99	0.62
HD2-6	Dec-02	1.39	1.8
HD2-6	Dec-02	2.89	0.1
MF101	Feb-00	4.59	45
MF102	Mar-00	3	23
MF103	Feb-00	1.76	11
MF103	Feb-00	4.76	13
MF105	Feb-00	1.85	15
MF105	Feb-00	4.85	9.2
MF106	Feb-00	1.41	28
MF106	Feb-00	4.41	0.15
MF107	Jun-01	4	40
MF108	Jun-01	4.31	220
MF109	Jun-01	3.34	40
MF110	Jun-01	3.87	80
MF111	Jun-01	4	3.4
MF112	Jun-01	4	21
MF113	Jun-01	4	4.6
MF2-1	Sep-02	2	3.2
MF2-10	Dec-02	1.36	2.1 J
MF2-10	Dec-02	3.36	0.073 J
MF2-11	Dec-02	1.83	0.3 J
MF2-11	Dec-02	3.33	0.04 J
MF2-12	Dec-02	1.99	33
MF2-12	Dec-02	3.99	0.026 J
MF2-13	Dec-02	2	0.11
MF2-14	Jan-03	2	84
MF2-14	Apr-05	2.5	84
MF2-14	Apr-05	4.5	6.6
MF2-15	Jan-03	2	0.18
MF2-16	Jan-03	2	0.08
MF2-17	Jan-03	2	0.17
MF2-18	Jan-03	2.5	11
MF2-18	Jan-03	4	180
MF2-2	Sep-02	2	0.52
MF2-20	Jan-03	1.77	380
MF2-20	Jan-03	3.27	82
MF2-20	Jan-03	4.77	38
MF2-21	Jan-03	2.18	0.33
MF2-21	Jan-03	4.68	0.28
MF2-22	Jan-03	2.66	0.29
MF2-22	Jan-03	4.16	31
MF2-3	Sep-02	2	6.6
MF2-4	Sep-02	2.37	0.83
MF2-4	Sep-02	4.37	0.23 U
MF2-5	Sep-02	2.29	19
MF2-5	Sep-02	4.29	2.9
MF2-6	Sep-02	3.29	200
MF2-7	Sep-02	2	0.22
MF2-9	Dec-02	5	1100
MF3-1	May-03	2.12	17
MF3-10	Jun-04	2.5	8.1
MF3-10	Apr-05	4.5	0.15
MF3-10	Jun-04	4.5	940
MF3-5	Apr-04	2.5	0.65
MF3-5	Apr-04	4.5	22
MF3-6	Apr-04	4.5	5.8
MF3-7	Apr-04	2.5	5.1
MF3-7	Apr-04	4.5	0.14
MF3-8	Apr-04	2.5	67
MF3-8	Apr-04	4.5	0.68
MF3-9	Apr-04	2.5	45
MF3-9	Mar-05	4.5	15
MF3-9	Apr-04	4.5	40
MF4-1	Mar-05	2.5	0.15
MF4-1	Mar-05	4.5	1
MF4-2	Mar-05	2.5	1.4
MF4-2	Mar-05	4.5	3.3
SL102	Feb-00	2	0.78
SM2-1	Sep-02	2	0.71
SM3-2	Apr-04	2.5	0.85



- > C/I CHHSL (180 mg/kg)
- > Residential CHHSL (18 mg/kg)
- < Residential CHHSL (18 mg/kg)
- Remediated Areas
- Marsh Boundary
- Asphalt/Concrete Pads
- California Cap Company Buildings (Approximate)
- Former Seawall (Approximate)
- Fenceline
- Roads and Other Landscape Features

Storm Drain Line:
- Underground Culvert

Sanitary Sewer Lines:
- Existing Sewer Line
- Removed Sewer Line
- Abandoned Sewer Line

Notes:
Residential CHHSL (18 mg/kg)
Commerical/Industrial CHHSL (180 mg/kg)
Sample Depth is bottom depth in feet bgs.

bgs	Below ground surface
CHHSL	California Human Health Screening Level
C/I	Commerical/Industrial
MFA	Mercury Fulminate Area
mg/kg	Milligram per kilogram
RFS	Richmond Field Station
U	Not detected

40 0 40
Feet

TETRA TECH EM INC.

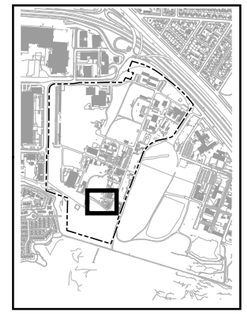
Richmond Field Station
University of California, Berkeley

FIGURE 7
HISTORIC MERCURY CONCENTRATIONS IN SOIL AND SEDIMENT AT THE MFA, 1 TO 5 FEET BGS

Phase III Field Sampling Plan

2012-5-14 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_sampling_plan\Phase_III\Mercury_MFA_1-5.mxd TtEMI-OAK CF

Point ID	Sample Date	Sample Depth	Analytical Result
2AU-12	Apr-02	9.42	3.3
2AU-22	Apr-02	8.68	0.047
2AU-22	Apr-02	10.68	0.26 J
2AU-22	Apr-02	11.68	0.71 J
2AU-23	Jul-02	12.29	0.15
2AU-23	Jul-02	13.29	0.14
2AU-24	Jul-02	9.49	0.13
2AU-25	Jul-02	8.91	0.068
2AU-25	Jul-02	12.91	0.23
2AU-25	Jul-02	13.91	0.15
2AU-30	Jul-02	15.01	6.7
2AU-30	Jul-02	18.01	0.27
2AU-30	Jul-02	19.01	4
2AU-31	Jul-02	14.51	7.2
2AU-31	Jul-02	15.51	1.3
2AU-6	Apr-02	6.6	2.3
2AU-6	Apr-02	7.6	2.2
2AU-7	Apr-02	6.78	0.67 J
2AU-7	Apr-02	7.78	0.48 J
2AU-9	Apr-02	12.25	0.77
A4-7	Oct-01	8.51	0.44
B2MF	Feb-91	6.5	0.46
B2MF	Feb-91	9	0.12 U
B2MF	Feb-91	11.5	1.63
B2MF	Feb-91	14	2.03
BLDG 102-1	Apr-05	7	0.087
BLDG 102-4	Apr-05	5.5	0.53
BLDG 102-4	Apr-05	5.5	8.6
HD2-5	Dec-02	5.49	1.6
HD2-5	Dec-02	6.99	1.1
MF101	Feb-00	6.59	54
MF101	Feb-00	9.59	67
MF102	Mar-00	6	0.11
MF102	Mar-00	13	1.1
MF107	Jun-01	7	32
MF108	Jun-01	8.31	11
MF108	Jun-01	11.31	0.33
MF109	Jun-01	7.34	5.1
MF109	Jun-01	10.34	0.13
MF110	Jun-01	7.87	59
MF110	Jun-01	10.87	0.2
MF111	Jun-01	7	1.1
MF112	Jun-01	7	0.89
MF113	Jun-01	8	5.1
MF119	Jun-01	9.81	0.16
MF2-14	Apr-05	6.5	0.054
MF2-14	Apr-05	8	0.077
MF2-14	Apr-05	9.5	0.15
MF2-18	Jan-03	7.5	0.098
MF2-18	Jan-03	10.5	0.11
MF2-20	Jan-03	6.77	17
MF2-22	Jan-03	7.66	0.99
MF2-6	Sep-02	5.29	2.7
MF2-8	Sep-02	10.77	370
MF2-8	Sep-02	12.77	810
MF2-8	Sep-02	14.27	360
MF2-9	Dec-02	7.5	2.5
MF2-9	Dec-02	8.5	0.29
MF2-9	Dec-02	10.5	22
MF2-9	Dec-02	11	55
MF2-9	Dec-02	12.5	0.91
MF2-9	Dec-02	15	0.61
MF2-9	Dec-02	16.5	3.1
MF2-9	Dec-02	17	0.91
MF2-9	Dec-02	19	0.61
MF3-10	Apr-05	6.5	0.1
MF3-10	Apr-05	8.5	0.13
MF3-10	Apr-05	10	0.13
MF3-6	Apr-04	6.5	1.1
MF3-6	Apr-04	8.5	0.57
MF3-9	Mar-05	6.5	0.027 U
MF3-9	Mar-05	8	0.06
MF4-1	Mar-05	6.5	0.035
MF4-1	Mar-05	8	0.053
MF4-2	Mar-05	6.5	0.056
PB19	Aug-02	5.08	0.14
SL102	Feb-00	10	0.22



- > C/I CHHSL (180 mg/kg)
- > Residential CHHSL (18 mg/kg)
- < Residential CHHSL (18 mg/kg)
- Remediated Areas
- Marsh Boundary
- Asphalt/Concrete Pads
- California Cap Company Buildings (Approximate)
- Former Seawall (Approximate)
- Fenceline
- Roads and Other Landscape Features

Storm Drain Line:
- Underground Culvert

Sanitary Sewer Lines:
- Existing Sewer Line
- Removed Sewer Line
- Abandoned Sewer Line

Notes:
Residential CHHSL (18 mg/kg)
Commerical/Industrial CHHSL (180 mg/kg)
Sample Depth is bottom depth in feet bgs.

bgs	Below ground surface
CHHSL	California Human Health Screening Level
C/I	Commerical/Industrial
MFA	Mercury Fulminate Area
mg/kg	Milligram per kilogram
RFS	Richmond Field Station
U	Not detected

40 0 40
Feet

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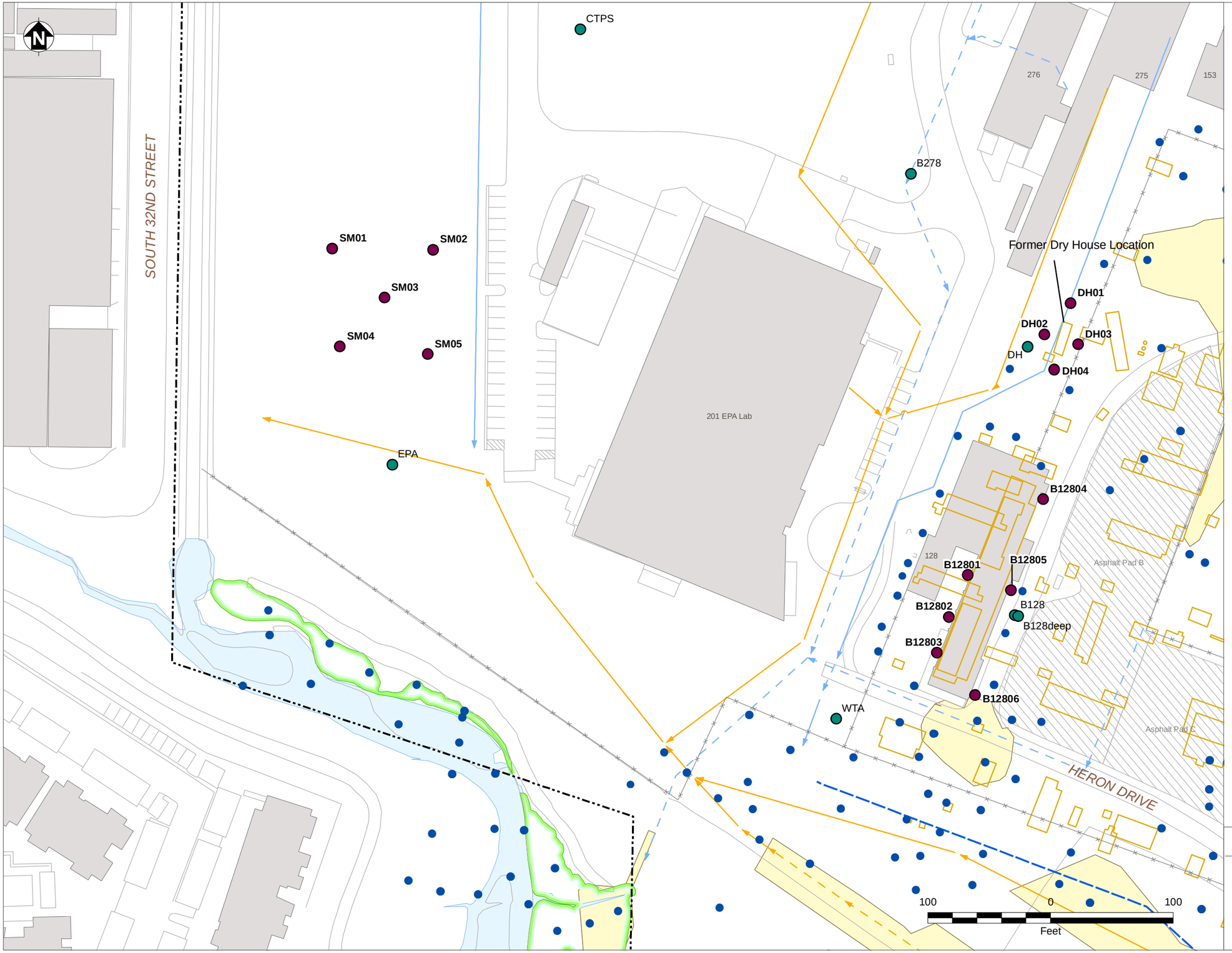
University of California, Berkeley

FIGURE 8
HISTORIC MERCURY CONCENTRATIONS IN SOIL AND SEDIMENT AT THE MFA, 5 TO 19 FEET BGS

Phase III Field Sampling Plan

2012-4-14 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_Sampling_Workplan\Phase_III\Mercury_MFA_5-10.mxd TtEMI-OAK CF



Existing Buildings
California Cap Company Buildings (Approximate)
Asphalt/Concrete Pads
Property Boundary
Approximate Property Boundary
Roads and Other Landscape Features
Fenceline
Former Seawall (Approximate)
Marsh Boundary
Surface Water
Remediated Areas

Sanitary Sewer Lines:

Existing Sewer Line
Removed Sewer Line
Abandoned Sewer Line

Storm Drain Lines:

Open Swale
Underground Culvert
Underground Culvert, Abandoned (Grouted at manholes)
Proposed Sampling Locations
Former soil sampling location
Piezometer Location

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FIGURE 9
PROPOSED SOIL SAMPLING LOCATIONS AT B201 SOIL MOUNDS, B128, AND FORMER DRY HOUSE
Phase III Field Sampling Plan

2012-04-09 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_Sampling_Workplan\Phase_III\Phase_III_samples.mxd TtEMI-OAK CF

B280B	10/01/2010	.5U
	04/14/2011	.5U
	10/06/2011	.5U

CTP	9/30/2010	19
	9/30/2012	20
	4/14/2011	16
	10/6/2011	25
	4/3/2012	22

CTPdeep	4/3/2012	.5 U

B280A	09/16/2010	.9
	04/14/2011	1.1
	10/06/2011	1.4

CTPS	09/30/2010	.5U
	04/19/2011	.5U
	10/07/2011	.5U

GEO	09/03/2010	1.1
	04/20/2011	1.2
	10/06/2011	1

B277	09/15/2010	.5
	04/18/2011	1
	10/05/2011	.8

B300	09/09/2010	.5U
	04/15/2011	.5U
	10/06/2011	.5U

B158	09/08/2010	.5U
	04/15/2011	.5U
	10/05/2011	.5U

Existing Buildings
Asphalt/Concrete Pads
Remediated Areas
Property Boundary
Approximate Property Boundary
Roads and Other Landscape Features

Groundwater Sampling Locations
Piezometer Location
Proposed Sampling Location

Storm Drain Lines:
Open Swale
Underground Culvert
Underground Culvert, Abandoned (Grouted at Manholes)

Sanitary Sewer Lines:
Existing Sewer Line
Removed Sewer Line
Abandoned Sewer Line

250 0 250
Feet

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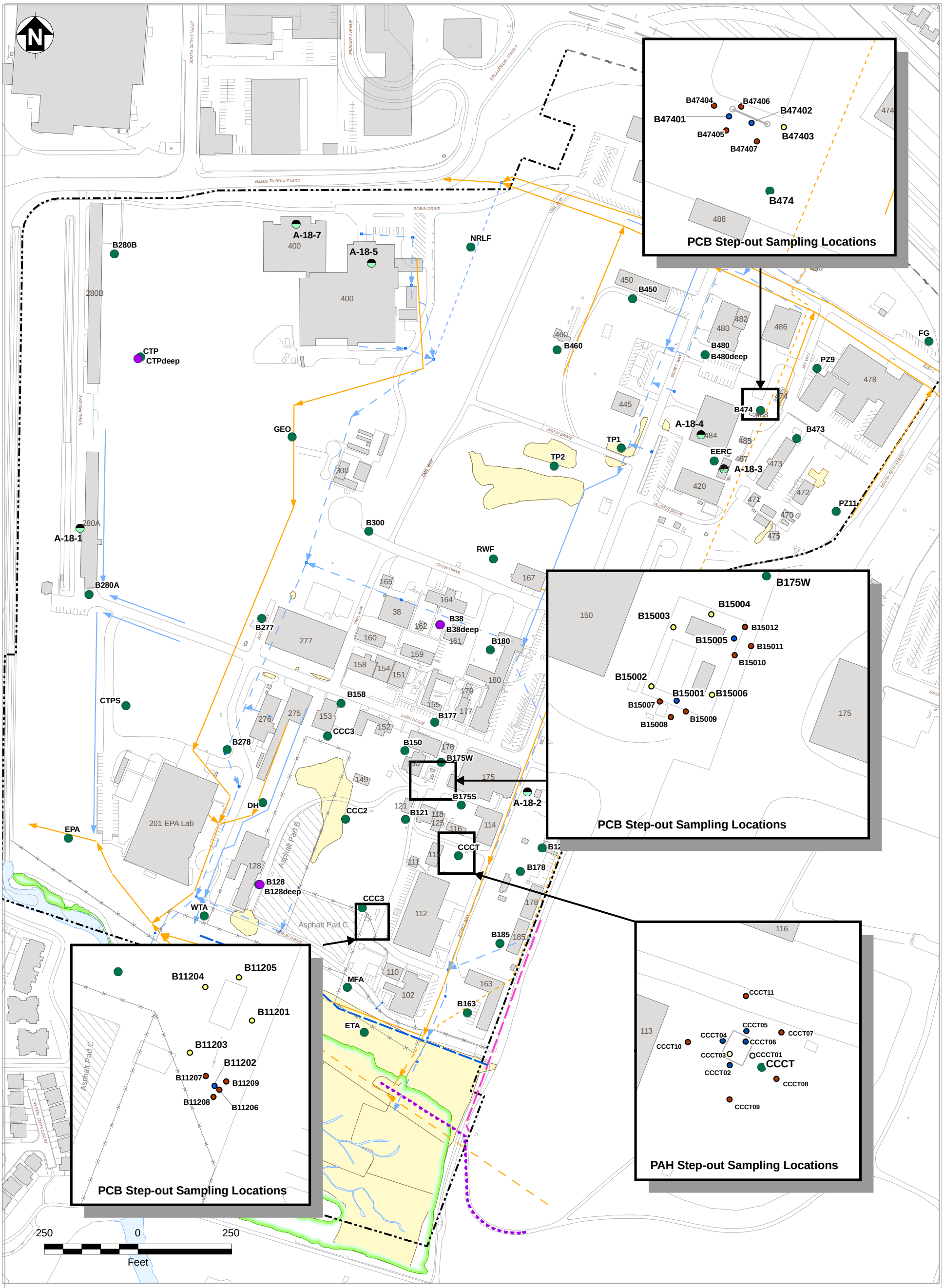
FIGURE 10
PROPOSED CTP GRAB GROUNDWATER SAMPLING LOCATIONS

Phase III Field Sampling Plan

2012-2-21 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_Sampling_Workplan\Phase_III\CTP_CarbonTet.mxd TtEMI-SF cjf



- Existing Buildings
- Asphalt/Concrete Pads
- Remediated Areas
- Surface Water
- Marsh Boundary
- Property Boundary
- Approximate Property Boundary
- Roads and Other Landscape Features
- Fenceline
- Biologically Active Permeable Barrier Wall
- Existing Piezometer Location (shallow)
- Existing Piezometer Location (deep)
- Former Seawall (Approximate)
- Slurry Wall

Storm Drain Lines:
- Open Swale
- Underground Culvert
- Underground Culvert, Abandoned (Grouted at Manholes)

Sanitary Sewer Lines:
- Existing Sewer Line
- Removed Sewer Line
- Abandoned Sewer Line
- Aboveground Storage Tank (AST)

- Phase II Sampling Location (no step-outs)
- Phase II Sampling Location (step-outs)
- Proposed Step-out Sampling Location

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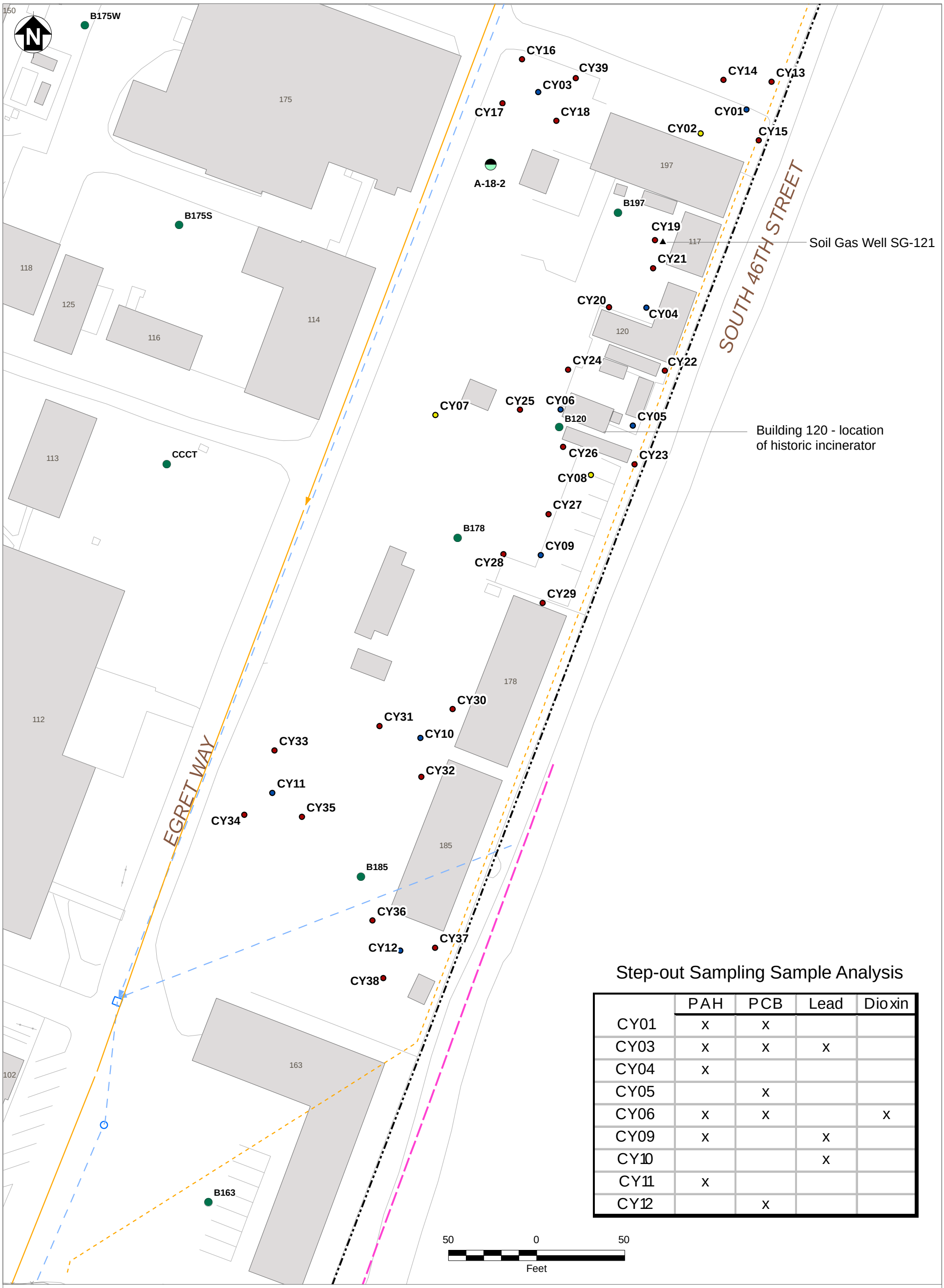
FIGURE 11
FORMER PCB TRANSFORMER PROPOSED STEP OUT SAMPLING LOCATIONS

Phase III Field Sampling Plan



Step-out Sampling Sample Analysis

	PAH	PCB	Lead	Dioxin
CY01	x	x		
CY03	x	x	x	
CY04	x			
CY05		x		
CY06	x	x		x
CY09	x		x	
CY10			x	
CY11	x			
CY12		x		

Existing Buildings
Asphalt/Concrete Pads
Surface Water
Marsh Boundary
Property Boundary
Approximate Property Boundary
Roads and Other Landscape Features
Fenceline
Biologically Active Permeable Barrier Wall
Former Seawall (Approximate)
Slurry Wall
Aboveground Storage Tank (AST)

Storm Drain Lines:
Open Swale
Underground Culvert
Underground Culvert, Abandoned (Grouted at Manholes)

Sanitary Sewer Lines:
Existing Sewer Line
Removed Sewer Line
Abandoned Sewer Line

Existing Piezometer Location
Proposed Step-out Sampling Location
Phase II CY Sampling Location (step-outs)
Phase II CY Sampling Location (no step-outs)

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FIGURE 12
PROPOSED CORPORATION YARD STEP-OUT SAMPLING LOCATIONS

Phase III Field Sampling Plan

2012-3-30 V:\Misc_GIS\Richmond_Field_Station\Projects\Field_Sampling_Workplan\Phase_III\corp_yard_step_out_sampling_v1.mxd TtEMI-OAK CF

TABLES

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury *** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA01	MFA0101	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA01	MFA0102	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA01	MFA0103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA01	MFA0104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA02	MFA0201	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA02	MFA0202	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA02	MFA0203	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA02	MFA0204	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA03	MFA0301**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA03	MFA0302**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA03	MFA0303**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA03	MFA0304**	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA04	MFA0401	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA04	MFA0402	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA04	MFA0403	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA04	MFA0404	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA05	MFA0501	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA05	MFA0502	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA05	MFA0503	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA05	MFA0504	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA06	MFA0601	0-0.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental mercury concentration from mercury fulminate plant
MFA06	MFA0602	2.0-2.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental and methyl mercury close to marsh
MFA06	MFA0603	4.0-4.5			.		X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA06	MFA0604	6.0-6.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental and methyl mercury close to marsh
MFA06	MFA0605	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA06	MFA0606	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA06	MFA0607	12-12.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental and methyl mercury close to marsh
MFA07	MFA0701	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0702	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0703**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0704	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0705	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0706	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA07	MFA0707	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0801	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0802	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA08	MFA0803	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0804	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0805	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0806	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA08	MFA0807	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA09	MFA0901	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA09	MFA0902	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA09	MFA0903	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA09	MFA0904	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA10	MFA1001	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA10	MFA1002	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA10	MFA1003	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA10	MFA1004	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA11	MFA1101**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA11	MFA1102	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA11	MFA1103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA11	MFA1104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1201**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1202**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1203**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1204**	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1205**	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1206**	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA12	MFA1207	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1301	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1302	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1303	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1304	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1305	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1306	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA13	MFA1307	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1401	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1402	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1403	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1404	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1405	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

		Analysis	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA14	MFA1406	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA14	MFA1407	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA15	MFA1501	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA15	MFA1502	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA15	MFA1503	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA15	MFA1504	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA16	MFA1601	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA16	MFA1602	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA16	MFA1603	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA16	MFA1604	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA17	MFA1701	0-0.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental mercury concentration from mercury fulminate plant
MFA17	MFA1702	2.0-2.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental and methyl mercury under buildings
MFA17	MFA1703	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA17	MFA1704	6.0-6.5					X	X						1 6-inch sleeve capped 1 4oz Plastic Jar	Assess elemental and methyl mercury under buildings
MFA18	MFA1801	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA18	MFA1802	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA18	MFA1803	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA18	MFA1804	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA19	MFA1901	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA19	MFA1902	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA19	MFA1903	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA19	MFA1904	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA20	MFA2001	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA20	MFA2002	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA20	MFA2003	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA20	MFA2004	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2101	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2102**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2105	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2106	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA21	MFA2107	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2201	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2202	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2203	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA22	MFA2204	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2205**	8-8.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2206	10-10.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA22	MFA2207	12-12.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA23	MFA2301	0-0.5					X	X						**1 6-inch sleeve capped 1 4oz Plastic Jar**	Assess elemental mercury concentration from mercury fulminate plant
MFA23	MFA2302	2.0-2.5					X	X						**1 6-inch sleeve capped 1 4oz Plastic Jar**	Assess elemental and methyl mercury near highest historic concentrations
MFA23	MFA2303	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA23	MFA2304	6.0-6.5					X	X						**1 6-inch sleeve capped**	Assess elemental and methyl mercury near highest historic concentrations
MFA23	MFA2305	8-8.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA23	MFA2306	10-10.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA23	MFA2307	12-12.5					X	X						**1 6-inch sleeve capped 1 4oz Plastic Jar**	Assess elemental and methyl mercury near highest historic concentrations
MFA24	MFA2401	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2402	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2403	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2404	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2405	8-8.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2406	10-10.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA24	MFA2407	12-12.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2501	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2502	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2503	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2504	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2505	8-8.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2506	10-10.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA25	MFA2507	12-12.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2601**	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2602**	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2603**	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2604**	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2605**	8-8.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2606**	10-10.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA26	MFA2607**	12-12.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA27	MFA2701	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA27	MFA2702	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA27	MFA2703	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA27	MFA2704	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Point Location ID	Sample ID	Depth (feet bgs)	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
Analysis															
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Mercury Fulminate Area Samples															
MFA28	MFA2801	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA28	MFA2802	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA28	MFA2803	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA28	MFA2804	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA29	MFA2901	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA29	MFA2902	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA29	MFA2903	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA29	MFA2904	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA30	MFA3001	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA30	MFA3002	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA30	MFA3003	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA30	MFA3004	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA31	MFA3101	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA31	MFA3102	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA31	MFA3103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA31	MFA3104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA32	MFA3201	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA32	MFA3202	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA32	MFA3203	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA32	MFA3204	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3301	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3302	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3303	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3304	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3305	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3306	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA33	MFA3307	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3401	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3402	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3403	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3404	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3405	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3406	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA34	MFA3407	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA35	MFA3501	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA35	MFA3502	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Point Location ID	Sample ID	Depth (feet bgs)	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
Analysis															
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Mercury Fulminate Area Samples															
MFA35	MFA3503	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA35	MFA3504	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA36	MFA3601	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA36	MFA3602	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA36	MFA3603	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA36	MFA3604	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA37	MFA3701	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA37	MFA3702	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA37	MFA3703	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA37	MFA3704	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA38	MFA3801	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA38	MFA3802	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA38	MFA3803	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA38	MFA3804	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA39	MFA3901**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA39	MFA3902**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA39	MFA3903**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA39	MFA3904**	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA40	MFA4001	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA40	MFA4002	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA40	MFA4003	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA40	MFA4004	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4101	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4102	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4105	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4106	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA41	MFA4107	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4201	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4202	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4203	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4204	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4205	8-8.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4206	10-10.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA42	MFA4207	12-12.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA43	MFA4301	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA43	MFA4302	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA43	MFA4303	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA43	MFA4304	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA44	MFA4401	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA44	MFA4402	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA44	MFA4403	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA44	MFA4404	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA45	MFA4501	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA45	MFA4502	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA45	MFA4503	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA45	MFA4504	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA46	MFA4601	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA46	MFA4602	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA46	MFA4603	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA46	MFA4604	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA47	MFA4701	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA47	MFA4702	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA47	MFA4703	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA47	MFA4704	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA48	MFA4801	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA48	MFA4802	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA48	MFA4803	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA48	MFA4804	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA49	MFA4901	0-0.5					X	X						**1 6-inch sleeve capped** **1 4oz Plastic Jar**	Assess elemental mercury concentration from mercury fulminate plant
MFA49	MFA4902	2.0-2.5					X	X						**1 6-inch sleeve capped** **1 4oz Plastic Jar**	Assess elemental and methyl mercury in central meadow
MFA49	MFA4903	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA49	MFA4904	6.0-6.5					X	X						**1 6-inch sleeve capped** **1 4oz Plastic Jar**	Assess elemental and methyl mercury in central meadow
MFA50	MFA5001	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA50	MFA5002	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA50	MFA5003	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA50	MFA5004	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA51	MFA5101	0-0.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA51	MFA5102	2.0-2.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA51	MFA5103	4.0-4.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant
MFA51	MFA5104	6.0-6.5					X							**1 6-inch sleeve capped**	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days	SAMPLE CONTAINERS	RATIONALE
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA52	MFA5201	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA52	MFA5202	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA52	MFA5203	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA52	MFA5204	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA53	MFA5301	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA53	MFA5302	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA53	MFA5303	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA53	MFA5304	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA54	MFA5401	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA54	MFA5402	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA54	MFA5403	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA54	MFA5404	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA55	MFA5501	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA55	MFA5502	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA55	MFA5503	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA55	MFA5504	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA56	MFA5601	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA56	MFA5602	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA56	MFA5603	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA56	MFA5604	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA57	MFA5701	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA57	MFA5702	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA57	MFA5703	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA57	MFA5704	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA58	MFA5801	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA58	MFA5802	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA58	MFA5803	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA58	MFA5804	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA59	MFA5901	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA59	MFA5902	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA59	MFA5903	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA59	MFA5904	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA60	MFA6001	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA60	MFA6002	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA60	MFA6003	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA60	MFA6004	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days	SAMPLE CONTAINERS	RATIONALE
Point Location ID	Sample ID	Depth (feet bgs)													
Mercury Fulminate Area Samples															
MFA61	MFA6101	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA61	MFA6102	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA61	MFA6103	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA61	MFA6104	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA62	MFA6201**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA62	MFA6202**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA62	MFA6203**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA62	MFA6204**	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA63	MFA6301	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA63	MFA6302	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA63	MFA6303	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA63	MFA6304	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA64	MFA6401	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA64	MFA6402	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA64	MFA6403	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA64	MFA6404	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA65	MFA6501**	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA65	MFA6502**	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA65	MFA6503**	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA65	MFA6504**	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA66	MFA6601	0-0.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA66	MFA6602	2.0-2.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA66	MFA6603	4.0-4.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
MFA66	MFA6604	6.0-6.5					X							1 6-inch sleeve capped	Assess elemental mercury concentration from mercury fulminate plant
Transformer Step-Out Samples															
B11206	PCB103	0-0.5								X				1 8oz Glass Jar	Step-out from B11202
B11206	PCB104	1.5-2.0								X				1 8oz Glass Jar	Step-out from B11202
B11206	PCB105	3-3.5								X				1 8oz Glass Jar	Step-out from B11202
B11207	PCB106	0-0.5								X				1 8oz Glass Jar	Step-out from B11202
B11207	PCB107	1.5-2.0								X				1 8oz Glass Jar	Step-out from B11202
B11207	PCB108	3-3.5								X				1 8oz Glass Jar	Step-out from B11202
B11208	PCB109	0-0.5								X				1 8oz Glass Jar	Step-out from B11202
B11208	PCB110	1.5-2.0								X				1 8oz Glass Jar	Step-out from B11202
B11208	PCB111	3-3.5								X				1 8oz Glass Jar	Step-out from B11202
B11209	PCB112**	0-0.5								X				1 8oz Glass Jar	Step-out from B11202
B11209	PCB113	1.5-2.0								X				1 8oz Glass Jar	Step-out from B11202

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days	SAMPLE CONTAINERS	RATIONALE
Point Location ID	Sample ID	Depth (feet bgs)													
Transformer Step-Out Samples															
B11209	PCB114	3-3.5								X				1 8oz Glass Jar	Step-out from B11202
CCCT07	PCB118	0-0.5							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT07	PCB119	1.5-2.0							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT08	PCB120	0-0.5							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT08	PCB121	1.5-2.0							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT09	PCB122	0-0.5							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT09	PCB123	1.5-2.0							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT10	PCB124	0-0.5							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT10	PCB125**	1.5-2.0							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT11	PCB126	0-0.5							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
CCCT11	PCB127	1.5-2.0							X					1 8oz Glass Jar	Step-out for PAHs at CCCT locations
B15007	PCB128	0-0.5								X				1 8oz Glass Jar	Step-out fromB15001
B15007	PCB129	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15001
B15008	PCB130	0-0.5								X				1 8oz Glass Jar	Step-out fromB15001
B15008	PCB131	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15001
B15009	PCB132	0-0.5								X				1 8oz Glass Jar	Step-out fromB15001
B15009	PCB133	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15001
B15010	PCB134	0-0.5								X				1 8oz Glass Jar	Step-out fromB15005
B15010	PCB135**	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15005
B15011	PCB136	0-0.5								X				1 8oz Glass Jar	Step-out fromB15005
B15011	PCB137	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15005
B15012	PCB138	0-0.5								X				1 8oz Glass Jar	Step-out fromB15005
B15012	PCB139	1.5-2.0								X				1 8oz Glass Jar	Step-out fromB15005
B47404	PCB140	0-0.5								X				1 8oz Glass Jar	Step-out from B47401
B47404	PCB141	1.5-2.0								X				1 8oz Glass Jar	Step-out from B47401
B47405	PCB142	0-0.5								X				1 8oz Glass Jar	Step-out from B47401
B47405	PCB143	1.5-2.0								X				1 8oz Glass Jar	Step-out from B47401
B47406	PCB144	0-0.5								X				1 8oz Glass Jar	Step-out from B47402
B47406	PCB145**	1.5-2.0								X				1 8oz Glass Jar	Step-out from B47402
B47407	PCB146	0-0.5								X				1 8oz Glass Jar	Step-out from B47402
B47407	PCB147	1.5-2.0								X				1 8oz Glass Jar	Step-out from B47402
Corporation Yard Step-Out Samples															
CY13	CY1301	0-0.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY13	CY1302	2.0-2.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY14	CY1401	0-0.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY14	CY1402	2.0-2.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY15	CY1501	0-0.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY15	CY1502	2.0-2.5							X	X				1 8oz Glass Jar	Step-out from CY01
CY16	CY1601	0-0.5					LEAD		X	X				1 8oz Glass Jar	Step-out from CY03
CY16	CY1602	2.0-2.5					LEAD		X	X				1 8oz Glass Jar	Step-out from CY03

Table 1 – Sample Registry and Rationale

Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days	SAMPLE CONTAINERS	RATIONALE
Point Location ID	Sample ID	Depth (feet bgs)													
Corporation Yard Step-Out Samples															
CY17	CY1701	0-0.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY17	CY1702**	2.0-2.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY18	CY1801	0-0.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY18	CY1802	2.0-2.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY39	CY3901	0-0.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY39	CY3902	2.0-2.5					**LEAD**		**X**	**X**				**1 8oz Glass Jar**	Step-out from CY03
CY19	CY1901	0-0.5		**X**										**3 Encores**	Step out from SVE detection at SG-121
CY19	CY1902	2.0-2.5		**X**										**3 Encores**	Step out from SVE detection at SG-121
CY19	CY1903	4.0-4.5		**X**										**3 Encores**	Step out from SVE detection at SG-121
CY19	CY1904	6.0-6.5		**X**										**3 Encores**	Step out from SVE detection at SG-121
CY20	CY2001	0-0.5							**X**					**1 8oz Glass Jar**	Step-out from CY04
CY20	CY2002**	2.0-2.5							**X**					**1 8oz Glass Jar**	Step-out from CY04
CY21	CY2101	0-0.5							**X**					**1 8oz Glass Jar**	Step-out from CY04
CY21	CY2102	2.0-2.5							**X**					**1 8oz Glass Jar**	Step-out from CY04
CY22	CY2201	0-0.5								**X**				**1 8oz Glass Jar**	Step-out from CY05
CY22	CY2202	2.0-2.5								**X**				**1 8oz Glass Jar**	Step-out from CY05
CY23	CY2301	0-0.5								**X**				**1 8oz Glass Jar**	Step-out from CY05
CY23	CY2302	2.0-2.5								**X**				**1 8oz Glass Jar**	Step-out from CY05
CY24	CY2401	0-0.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY24	CY2402	2.0-2.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY25	CY2501	0-0.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY25	CY2502**	2.0-2.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY26	CY2601	0-0.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY26	CY2602	2.0-2.5							**X**	**X**			**X**	**1 8oz Glass Jar** **1 4 oz Glass Jar**	Step-out from CY06
CY27	CY2701	0-0.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY27	CY2702	2.0-2.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY28	CY2801	0-0.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY28	CY2802	2.0-2.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY29	CY2901	0-0.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY29	CY2902	2.0-2.5					**LEAD**		**X**					**1 8oz Glass Jar**	Step-out from CY09
CY30	CY3001	0-0.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY30	CY302**	2.0-2.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY31	CY3101	0-0.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY31	CY3102	2.0-2.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY32	CY3201	0-0.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY32	CY3202	2.0-2.5					**LEAD**							**1 8oz Glass Jar**	Step-out from CY10
CY33	CY3301	0-0.5							**X**					**1 8oz Glass Jar**	Step-out from CY11
CY33	CY3302	2.0-2.5							**X**					**1 8oz Glass Jar**	Step-out from CY11

Table 1 – Sample Registry and Rationale

Point Location ID	Sample ID	Depth (feet bgs)	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
Analysis			TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
Holding Time			14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Corporation Yard Step-Out Samples															
CY34	CY3401	0-0.5							X					**1 8oz Glass Jar**	Step-out from CY11
CY34	CY3402	2.0-2.5							X					**1 8oz Glass Jar**	Step-out from CY11
CY35	CY3501	0-0.5							X					**1 8oz Glass Jar**	Step-out from CY11
CY35	CY3502	2.0-2.5							X					**1 8oz Glass Jar**	Step-out from CY11
CY36	CY3601**	0-0.5								X				**1 8oz Glass Jar**	Step-out from CY12
CY36	CY3602	2.0-2.5								X				**1 8oz Glass Jar**	Step-out from CY12
CY37	CY3701	0-0.5								X				**1 8oz Glass Jar**	Step-out from CY12
CY37	CY3702	2.0-2.5								X				**1 8oz Glass Jar**	Step-out from CY12
CY38	CY3801	0-0.5								X				**1 8oz Glass Jar**	Step-out from CY12
CY38	CY3802**	2.0-2.5								X				**1 8oz Glass Jar**	Step-out from CY12
Costal Terrace Prairie Groundwater Samples															
CTP01	CTP01	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP02	CTP02	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP03	CTP03	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP04	CTP04	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP05	CTP05	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP06	CTP06	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP07	CTP07	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP08	CTP08	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP09	CTP09	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP10	CTP10**	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP11	CTP11	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP12	CTP12	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP13	CTP13	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP14	CTP14	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP15	CTP15	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP16	CTP16	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP17	CTP17	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP18	CTP18	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP19	CTP19	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
CTP20	CTP20**	10-20		X										**3 40oz VOA Vials (HCl)**	Step-out from piezometer CTP
Building 201 Soil Mounds Samples															
SM01	SM0101	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM01	SM0102	2.0-2.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM02	SM0201	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM02	SM0202	2.0-2.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds

Table 1 – Sample Registry and Rationale

Point Location ID	Sample ID	Depth (feet bgs)	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals/ Mercury ** (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)	SAMPLE CONTAINERS	RATIONALE
		Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days		
Building 201 Soil Mounds Samples															
SM03	SM0301	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM03	SM0302	2.0-2.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM04	SM0401	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM04	SM0402	2.0-2.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM05	SM0501	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate B201 Soil Mounds
SM05	SM0502**	2.0-2.5	X	X	X	X	X		X	X	X			**4 8oz Glass Jar, 12 encore samples**	Investigate B201 Soil Mounds
Building 128 Soil Samples															
B12801	B1280101	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12801	B1280102	1.5-2.0	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12802	B1280201	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12802	B1280202	1.5-2.0	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12803	B1280301	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12803	B1280302	1.5-2.0	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12804	B1280401	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12804	B1280402	1.5-2.0	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12805	B1280501	0-0.5	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
B12805	B1280502**	1.5-2.0	X	X	X	X	X		X	X	X			**2 8oz Glass Jar, 6 encore samples**	Investigate Historic Activities at B128
Dry House Soil Samples															
DH01	DH0101	0-0.5					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH01	DH0102	1.5-2.0					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH02	DH0201	0-0.5					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH02	DH0202	1.5-2.0					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH03	DH0301	0-0.5					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH03	DH0302	1.5-2.0					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH04	DH0401	0-0.5					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion
DH04	DH0402**	1.5-2.0					X					X	X	**1 8oz Glass Jar, 1 4 oz Glass Jar**	Investigate Dry House Explosion

Table 1 – Sample Registry and Rationale

QC SAMPLES															
	Analysis	TPH-P (EPA Method 8015B modified)	VOCs (EPA Method 8260B)	TPH-E (EPA Method 8015B modified)	SVOCs (EPA Method 8270C)	Metals (EPA Method 6020A/7400 series)	Methyl Mercury (Brooks-Rand BR 0011)	PAH (EPA Method 8270-SIM)	PCB (EPA Method 8082)	Pesticides (EPA Method 8081A)	Explosive Residue (EPA Method 8330A)	Dioxins and Furans (EPA Method 8290)		
	Holding Time	14 Days	14 Days	14 Days	7/40 days	Metals – 6 Months (except Mercury – 28 Days)	48 hours	7/40 days	7/40 days	7/40 days	14 Days	30/45 days	SAMPLE CONTAINERS	
Point Location ID	Sample ID	Depth (feet bgs)													
Water IDW	FSPIII-W-IDW0X	1 per drum of IDW water	**Sample analyses will be based on disposal criteria**												
Soil IDW	FSPIII-S-IDW0X	1 per drum of IDW soil	**Sample analyses will be based on disposal criteria**												
MS/MSD* 5% of sample locations	Same as original sample		**Sample analyses based on original sample**										**Triple original sample volume**		
Field Replicate 10% of locations **	Add "D1" and "D2" to end of original sample ID		**Sample analyses based on original sample**												
Trip Blank	FSPIIITB0X	1 per shipping container containing VOC or TPH-p samples	**X**	**X**									**4 40oz VOA Vials (HCl)**		
Equipment Rinsate	FSPIIIER0X	1 per day per type of non-disposable sampling equipment	**Sample analyses and bottles will be based on the samples collected each day**												
Source Water Blank	FSPIIISW0X	1 per source of decontamination water	**Sample analyses and bottles will be based on the samples collected each day**												
Temperature Blank	no sample ID	1 per shipping container													

Notes:

Holding Times	Listed time is to preservation/extraction by the lab.
*MS/MSD	Use the same sample ID as original sample
**	Field replicate sample to be collected at location
***	Mercury Fulminate Area Samples will be submitted for mercury analysis, not all metals
Preservation	All samples must be put on ice in coolers after collection and shipped to the lab maintaining a temperature of 4°C +_ 2°C.

bgs	Below ground surface	PCB	Polychlorinated biphenyl
EPA	U.S. Environmental Protection Agency	QC	Quality control
ID	Identification	SVOC	Semivolatile organic compound
IDW	Investigation derived waste	TPH-E	Total petroleum hydrocarbons - extractable
MS/MSD	Matrix spike/matrix spike duplicate	TPH-P	Total petroleum hydrocarbons - purgeable
PAH	Polycyclic aromatic hydrocarbon	VOC	Volatile organic compound

Table 2 – QAPP Reference Locations

Preparation for Field Activities	Reference Section in QAPP
Utility Clearance	Section 4.12
Health and Safety Plan (HSP)	See Appendix B, HSP
Analytical Methods	Section 7.2
Analytical Laboratory Selection	Section 7.4
Analytical Requirements	Section 7.3 and Table A-13
Field Sampling	
Chain-of-Custody Requirements	Section 5.4
Soil Sampling from a Hand Auger	Section 4.1.1.1
Soil Sampling from a Direct Push Rig	Section 4.1.3.1
Grab Groundwater Sampling from a Direct Push Rig	Section 4.3.1
VOC Encore Sampling	Section 4.1.2.1
Management of Investigation-Derived Waste	Section 4.11
Decontamination	Section 4.10
Field Quality Control Samples	
Equipment Rinsate Samples	Section 4.9 and 3.2.2
Source Water Blank	Section 4.9 and 3.2.2
Temperature Blanks	Section 4.9 and 3.2.2
Trip Blanks	Section 4.9 and 3.2.2
Laboratory Quality Control Samples	
Method Blanks	Section 3.2.2
Matrix Spike and Matrix Spike Duplicates (MS/MSD)	Section 3.2.2
Laboratory Control Samples	Section 3.2.2
Surrogate Standards	Section 3.2.2
Field Equipment Testing, Inspection and Maintenance	
Calibration of Field Equipment	Section 6.1
Maintenance of Field Equipment	Section 11.1

APPENDIX A

RESPONSE TO COMMENTS ON DRAFT FSP AND DTSC APPROVAL LETTER

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

Mark Vest, P.G.
Senior Engineering Geologist
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Enclosures

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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

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

Response to Comments
Department of Toxic Substances Control, June 22, 2012

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
1	N/A	Mercury Fulminate Area: Presentations of samples associated with the mercury fulminate area are limited to analysis for elementals 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 DTCS to determine whether analysis for additional chemicals is needed to characterize this area.	All chemical data for historic samples collected in the MFA have been added to Appendix A. Text was also amended to include a brief summary of previous sampling results exceeding commercial screening criteria in the MFA.
2	N/A	Transformer Area: The figures and text discussing step-out samples about 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 (Arochlor 1254; 0.49 mg/kg). The tables, text, and figures need to be revised as well as the proposed step-out sampling locations.	The text, tables, and figures have been revised to propose step-out sampling at boring B15005.
3	N/A	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.	The historic California Cap Company buildings are shown on Figure 9. The original footprint of Building 128 has not changed; however, additional building space was added on in subsequent years. The proposed sampling provides comprehensive coverage of the original Building 128 boundaries.
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.	Figure 11 has been updated to show that the locations at the former California Cap Company transformer house exceeded the commercial/industrial CHHSL for benzo(a)pyrene.
5	Page 12, Section	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 heights 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.	The estimated elevation of the mounds was based on field observations during site walks; therefore, it is assumed that the max sampling depth will be approximately 2.5 feet below ground surface. Actual sampling depths will be evaluated in the field during sampling activities and considerations will include soil type, depth, and indications of the former native or natural surface soils.
6	Pages 13 to 15	DQOs for Groundwater at Piezometer CTP: 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 samples 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).	The text has been revised to indicate that the piezometer CTP will be sampled at the same time as the collection of grab groundwater samples. The DQOs have been clarified to define the purpose of the investigation in the CTP area: to identify potential sources of carbon tetrachloride upgradient of the CTP piezometer, not to provide comprehensive vertical or lateral extent of carbon tetrachloride detections. The piezometer CTPdeep, screened from 30 to 40 feet, indicated no detections of carbon tetrachloride in groundwater during one event. Continuous coring or CPT are not proposed for this investigation, as the intent is to focus on the concentrations detected at piezometer CTP which is screened from 7-17 feet bgs. Groundwater samples for this investigation will be collected from this interval. Additional text has been added to further clarify the data quality objectives for this task.
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 for methyl mercury samples.	Methyl mercury will be analyzed through Brooks-Rand method BR-0011. Text has been amended accordingly.

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
8	Figures 6-8	Historic Mercury Concentrations: Please superimpose the outline of the relevant California Cap Company Buildings on these figures.	Historic California Cap Company buildings have been added to Figures 6, 7, and 8.
9	Figure 7	Historic Mercury Concentrations 1 to 5 feet bgs: Please add the location label for sample MF 2-9. 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 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.	Figures 6, 7, and 8 have been reviewed to ensure they include all sample location labels. The color of the sample location indicates the highest concentration recorded at that location for the applicable depth interval presented in the respective figure.
10	Figure 11	Indicate on this figure which samples will be analyzed for PCBs and which samples will be analyzed for PAHs.	Figure 11 has been updated to indicate which samples will be analyzed for PCBs and PAHs.
11	Table 1	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 locations CY18 to CY1802. b) Point Location CY22 and 23: It is unclear why lead is included for analysis for these samples as the concentrations 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, CY28, 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, CY31, and CY32: Based on the elevated concentrations of arsenic (27.8 mg/kg) found in location CY10, add arsenic to these samples locations. e) Point Locations CY36, CY37, and CY38: Based on the elevated concentrations of arsenic (29.9 mg/kg) found in location CY12, add arsenic to these samples locations.	a) Lead and PAHs have been added to the analysis for the step-out samples around boring CY03. An additional step-out sample has been added to the northeast to bound the contaminants in this direction. The sample IDs in Table 1 were reviewed and corrected. b) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY05 are not considered for step-out samples. Lead is not proposed as an analyte for Phase III at these locations. c) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY09 are not considered for step-out samples. Lead has been added to the list of analytes for CY09. d) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY10 are not considered for step-out samples. e) Point locations with elevated concentrations of arsenic related to pyrite cinders identified at CY12 are not considered for step-out samples.
12	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.	No removal actions have occurred in the MFA; this has been clarified in the text. The remediated area south of the MFA has been added to this figure.
13	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.	The text has been amended to clarify that the screening value is the commercial/industrial CHHSL.

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
14	Page 9, Section 2.2.6 / Figure 12	Transformer and Corporation Yard step-outs. 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.	The former incinerator was located inside of Building 120. This information is mentioned in the text and has been added to Figure 12.
15	Page 10, Section 3.2.1	DOOs 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 DOO goal of the study of the MFA should be the speciation of mercury detected in this area.	Soil samples will be analyzed for total metals via EPA method 7471 and methyl mercury through Brooks-Rand method BR-0011. Text has been amended to state that following review of total mercury results, seven samples (from approximately 10 percent of the total borehole locations) will be collected for evaluation of elemental mercury. The seven samples will be selected based on the highest total mercury concentrations detected. These samples will be evaluated for elemental mercury through Brooks-Rand method BR-0013.
16	Page 12, Section 3.2.2	DOOs 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.	A) These samples will also be analyzed for dioxin. B) Buildings 128 and 275 have existed in their current locations since their first identification in Sanborn maps. This area was not disturbed during previous remedial activities in Area 4 and the construction of the asphalt pad. No evidence exists that grading occurred at this area, and to the best knowledge of staff interviews and historical information, no grading has occurred in this area.
17	Page 15, Section 3.2.4	DOOs 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.	A) The Zeneca soil gas well with detected levels of TCE was mistakenly identified as UCB-3. The well is actually SG-121. This soil gas well has been added to Figure 12, and Figure 12 is referenced in the text. B) The term “soil condition” has been clarified in as the concentrations of chemicals present in the 6-inch sample sleeve submitted for analysis. C) The text has been amended to clarify that the “study area” is the extent of the historic transformer locations and the corporation yard.
18	Page 16, Section 3.2.4	DOOs 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".	The text has been amended to state, “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.”

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
19	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.	Rationale for locations and depth of methyl mercury samples have been added to Section 3.3.1.
20	Page 18, Section 3.3.2 and Figure 12	Dry House, Building 128, EPA Soil Mounds, and Phase II Step-out Soil 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.	Figure 12 has been updated to include a small table that indicates the location ID and the analyses that will be performed at the step-out locations.
21	Figure 3	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.	A) The remediated area has been added to this figure. B) The US Briquette Company buildings have been identified as a data gap in the CCR. This area will be sampled in a later phase of the FSW.
22	General Comment	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 the 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.	All chemical data for historic samples collected in the MFA have been added to Appendix A, detection limits for non-detect data are provided in the appendix indicated by a U qualifier.
23	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.	The paragraph refers to the entire property within RFS. There is significant habitat for ecological receptors, including endangered species, within the Western Stege Marsh. Most of the sampling for this phase of the investigation will take place in the Upland Area, and some samples for the MFA investigation will be collected in the transition area, as indicated in the text.
24	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 intervals.	It is assumed that no industrial activities occurred in this area. Soil sampling is not proposed during this phase of the investigation. If, following the collection of additional groundwater samples it is apparent that soil samples need to be collected to close this data gap, soil samples will be proposed in a later phase of the FSW.

UC Berkeley Ref. No.	Page/ Sect No.	DTSC Comment	UC Berkeley Response
25	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.	Rationale for locations and depth of methyl mercury samples have been added to Section 3.3.1. Additional samples for 0.0-0.5 foot bgs interval have been included in this discussion. Methyl mercury will be analyzed through Brooks-Rand method BR-0011.

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

August 03, 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) reviewed the document entitled *Phase III Field Sampling Plan, University of California, Richmond Field Station Site, May 21, 2012 Response to Comments, Department of Toxic Substances Control, June 22, 2012* (RTC). The July, 2012 RTC was prepared and submitted by Tetra Tech EM, Inc. for the University of California (UC).

Based on our completed review, including discussions with UC and Tetra Tech staff, we recommend that the Phase III Field Sampling Plan be amended and field work may begin consistent with the comments and discussion results. Submit the amended sampling plan with all changes identified for final review by DTSC within seven days of the date of this letter.

If you have any questions, please contact me at (510) 540-3839 or email at lnakashi@dtsc.ca.gov.

Sincerely,

Lynn Nakashima

Mark Vest

Lynn Nakashima, Project Manager
Senior Hazardous Substances Scientist
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cc: next page

Printed on Recycled Paper

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8800 Cal Center Drive
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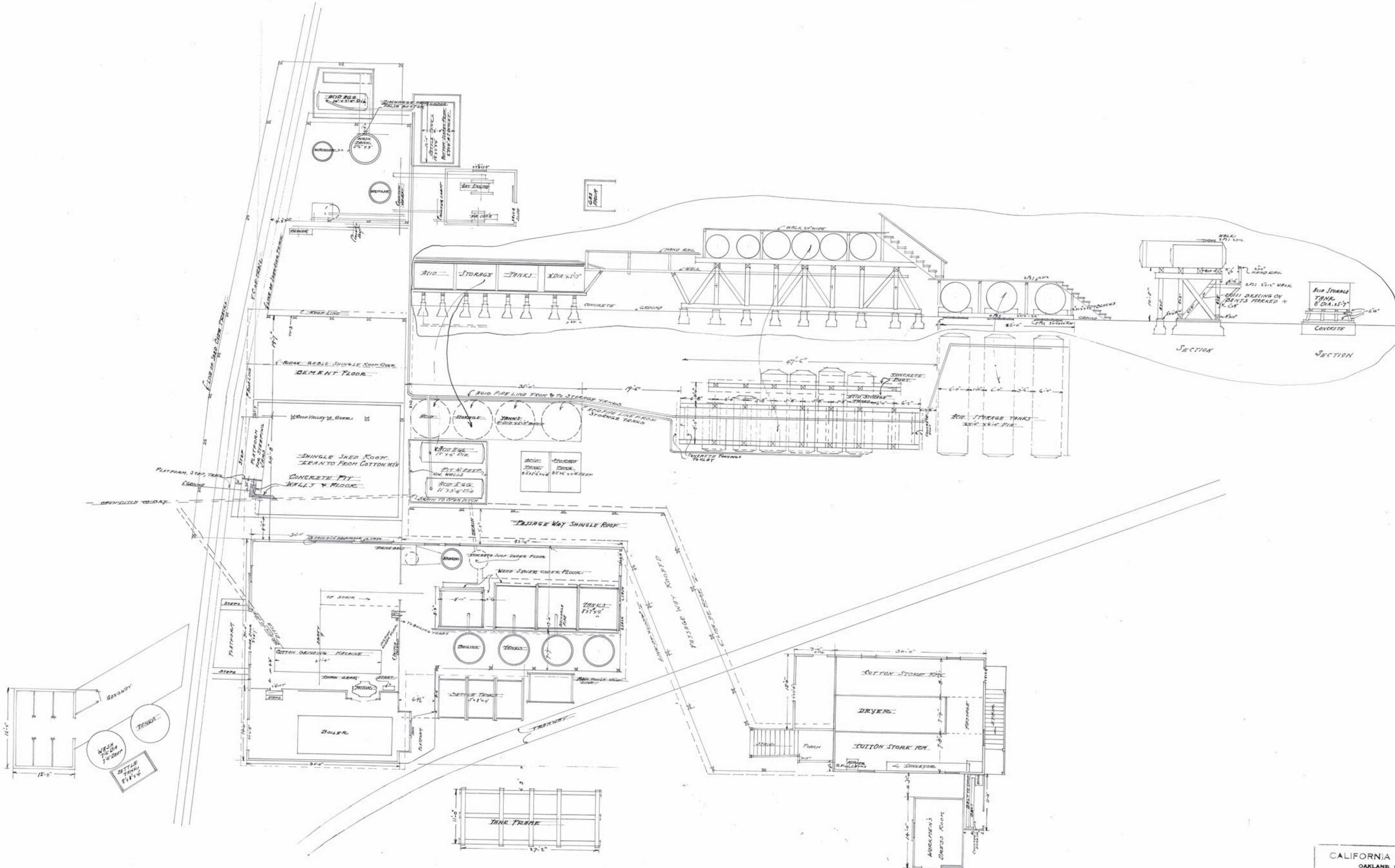
APPENDIX B

MERCURY FULIMINATE AREA BLUEPRINTS AND HISTORIC DATA



CALIFORNIA CAP CO. OAKLAND, CAL.		
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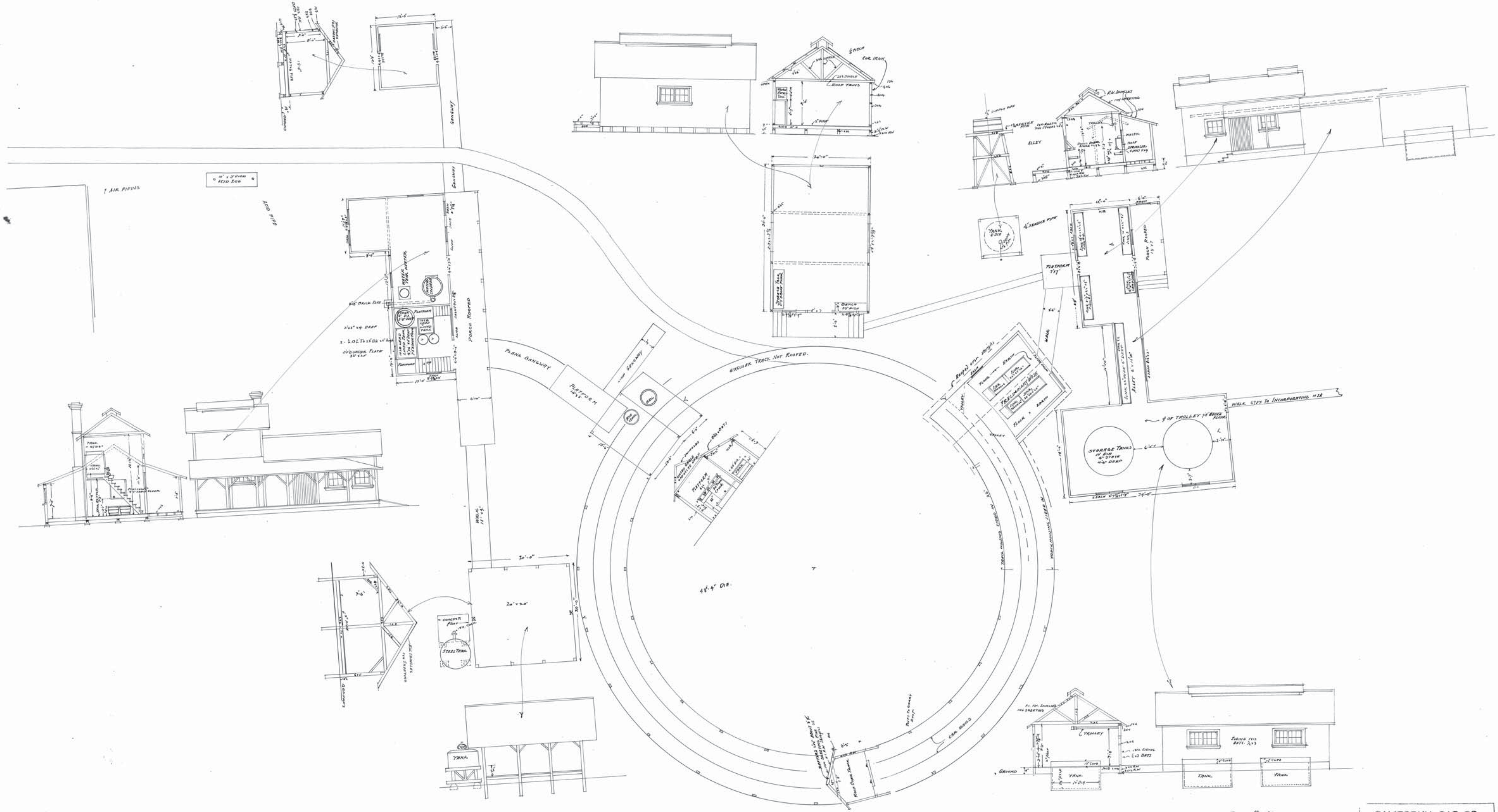

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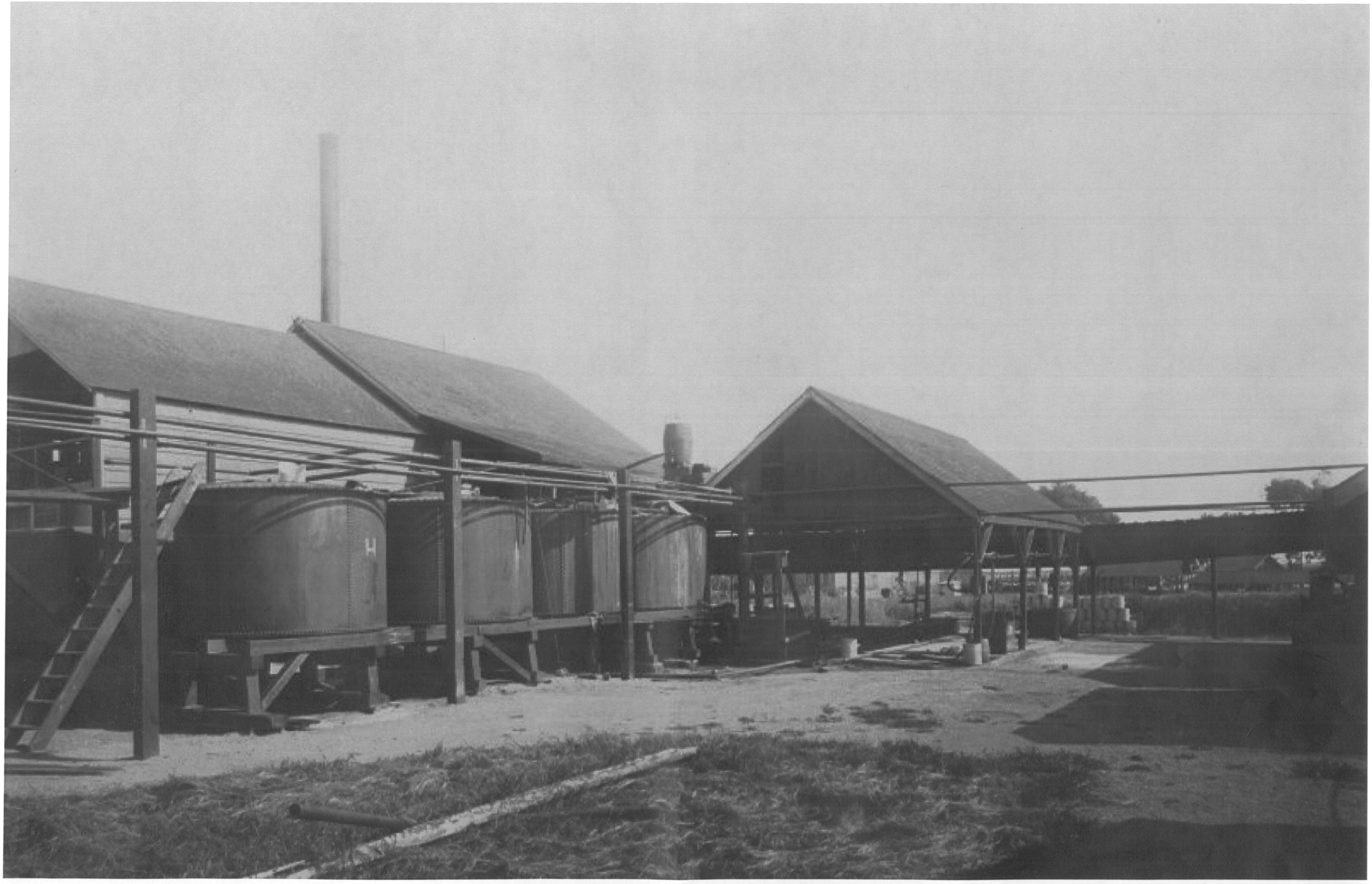

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
		Residential CHHSL		30		16	1.7	100000	3000	80	18	1600	380	380	5	23000	
		Commercial/Industrial CHHSL		380		190	7.5	100000	38000	320	180	16000	4800	4800	63	100000	
		Background			16												
2AU-12	16-Apr-02	9.42	9.42	3.3 UJ	3.2	0.67	1	44	23	3.8	3.3	54	0.31	0.28 U	0.5	200	5.7
2AU-22	18-Apr-02	8.68	8.68	3.4 UJ	9.7	0.71	1.8	57	290	8.3	0.047	66	0.28 U	0.28 U	0.28 U	340	5.4
2AU-22	18-Apr-02	10.68	10.68	3.8 UJ	1.8	0.61	1.2	57	150	6.9	0.26 J	82	0.31 U	0.31 U	0.31 U	200	5.2
2AU-22	18-Apr-02	11.68	11.68	3.8 UJ	4.9	0.47	1.1	41	19	3.5	0.71 J	55	0.32 U	0.32 U	0.32 U	37	7
2AU-23	9-Jul-02	12.29	12.29	2.8 UJ	5.5	0.39	1.1	38	20	3.8	0.15	66	1.6	0.24 U	1.3	75	7.4
2AU-23	9-Jul-02	13.29	13.29	3.8 UJ	5.4	0.45	1.2	39	21	5	0.14	66	0.73	0.31 U	1.5	75	6.9
2AU-24	9-Jul-02	9.49	9.49	3.6 UJ	7.5	0.36	1.1	49	22	6.9	0.13	54	1.6	0.3 U	0.37	54	7
2AU-25	9-Jul-02	8.91	8.91	3.1 U	3.5	0.22	0.79	31	10	2.7	0.068	43	0.47	0.26 U	0.39	32	--
2AU-25	9-Jul-02	12.91	12.91	2.6 UJ	5.8	0.4	1.4	35	24	4.2	0.23	65	0.71	0.22 U	0.71	200	7
2AU-25	9-Jul-02	13.91	13.91	3.2 UJ	8	0.54	1.8	49	28	5.7	0.15	85	1.1	0.27 U	1.3	190	6.9
2AU-30	22-Jul-02	15.01	15.01	3.1 U	2.2	0.28	1.5	35	9.6	1.5	6.7	57	0.26 U	0.26 U	0.26 U	49	--
2AU-30	22-Jul-02	18.01	18.01	3.4 U	4.8	0.33	1.2	34	15	23	0.27	41	0.46	0.29 U	1.2	43	--
2AU-30	22-Jul-02	19.01	19.01	3.5 U	4.5	0.38	1.3	38	17	26	4	43	0.29 U	0.29 U	1	43	--
2AU-31	22-Jul-02	14.51	14.51	3.8 U	3.8	0.45	1.5	40	32	14	7.2	67	0.72	0.32 U	0.84	59	--
2AU-31	22-Jul-02	15.51	15.51	3.3 U	3.8	0.42	1.4	40	22	15	1.3	68	0.62	0.28 U	1	48	--
2AU-6	17-Apr-02	6.6	6.6	2.9 UJ	17	0.4	1.1	40	23	9	2.3	52	0.24 U	0.24 U	0.24 U	44	8
2AU-6	17-Apr-02	7.6	7.6	2.9 UJ	1.1	0.3	0.73	37	17	4.8	2.2	44	0.24 U	0.24 U	0.24 U	39	8
2AU-7	18-Apr-02	6.78	6.78	3.8 UJ	26	0.52	1.7	41	20	3.6	0.67 J	63	0.32 U	0.32 U	0.32 U	44	7.7
2AU-7	18-Apr-02	7.78	7.78	3.3 UJ	2.6	0.47	1.2	37	14	3.4	0.48 J	48	0.28 U	0.28 U	0.28 U	33	7.8
2AU-9	17-Apr-02	12.25	12.25	3.1 U	5.6	0.47	1.3	53	20	3.5	0.77	73	0.26 U	0.26 U	0.84	39	--
A4-7	12-Oct-01	8.51	8.51	3.5 U	3.1	0.17	1.2	22	35	9.8	0.44	29	0.29 U	0.29 U	0.29 U	40	5.2
AOCU7-D1	17-Mar-05	--	--	1.9 U	5.1	0.36	0.18	33	51	20	270	37	1.2	0.16 U	0.16 U	60	4.6
AOCU7-D2	17-Mar-05	--	--	--	--	--	--	--	--	--	37	--	--	--	--	--	--
AOCU7-D3	17-Mar-05	--	--	--	--	--	--	--	--	--	12	--	--	--	--	--	--
AOCU7-D4	17-Mar-05	--	--	2.3 U	8.3	0.34	0.34	33	75	11	24	35	1.3	0.2	0.19 U	140	6.9
B1	1-May-90	0	3	--	--	--	--	--	--	--	3.5	--	--	--	--	--	--
B1	1-Jul-91	1	1	--	--	--	1.1	--	94	15	--	--	0.4 U	--	--	450	--
B1	1-Jul-91	2	2	--	--	--	0.2	--	19	11	--	--	0.4 U	--	--	130	--
B1	1-Jul-91	3	3	--	--	--	0.3	--	19	18	--	--	0.4 U	--	--	41	--
B10	1-May-90	0	3	--	--	--	--	--	--	--	90	--	--	--	--	--	--
B10SH	1-Feb-91	1.3	1.3	--	7.4	--	2.2	20.9	188	87.4	40.2	--	0.72 U	--	--	260	--
B11	1-May-90	0	3	--	--	--	--	--	--	--	25	--	--	--	--	--	--
B12	1-May-90	0	3	--	--	--	--	--	53	--	180	--	--	--	--	65	--
B13	1-May-90	0	3	--	--	--	--	--	--	--	7.4	--	--	--	--	--	--
B13SH	1-Feb-91	1.3	1.3	--	2.8	--	0.87	28	24.8	9.2	0.3	--	0.76 U	--	--	43.2	--
B16SH	1-Feb-91	1.3	1.3	--	3.6	--	0.88	22.4	804	9.3	1.17	--	0.76 U	--	--	71.4	--
B1MF	1-Feb-91	1.3	1.3	--	9.3	--	0.98	32.9	102	91.5	317	--	0.88 U	--	--	214	--
B2	1-May-90	0	3	--	--	--	--	--	--	--	9.6	--	--	--	--	--	--
B2	1-Jul-91	1	1	--	--	--	0.6	--	74	120	--	--	0.4 U	--	--	110	--
B2	1-Jul-91	2	2	--	--	--	0.2	--	13	196	--	--	0.4 U	--	--	37	--
B22	1-May-90	0	3	--	--	--	--	--	--	--	11	--	--	--	--	--	--
B23	1-May-90	0	3	--	--	--	--	--	--	--	2.2	--	--	--	--	--	--
B27	1-May-90	0	3	--	--	--	--	--	--	--	1.2	--	--	--	--	--	--
B2MF	1-Feb-91	1.15	1.15	--	0.2	--	92	46.5	451	1140	11	--	0.9 U	--	--	1550	--
B2MF	1-Feb-91	1.5	1.5	--	33.7	--	437	52.4	209	388	4.39	--	8.9 U	--	--	2150	--

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA
Phase III Field Sampling Plan
University of California, Berkeley, Richmond Field Station, Richmond, California

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
B2MF	1-Feb-91	4	4	--	46.8	--	5.3	36.5	159	697	2.6	--	9.9 U	--	--	676	--
B2MF	1-Feb-91	6.5	6.5	--	3.2	--	1.6	51	44	7.4	0.46	--	10 U	--	--	68.8	--
B2MF	1-Feb-91	9	9	--	1.1	--	2	53.7	29.2	5	0.12 U	--	0.96 U	--	--	57.4	--
B2MF	1-Feb-91	11.5	11.5	--	1.3	--	0.82	45.8	22.7	4.3	1.63	--	8.9 U	--	--	63.9	--
B2MF	1-Feb-91	14	14	--	2.3	--	2.5	35	34.7	5.6	2.03	--	0.88 U	--	--	53.2	--
B3	1-May-90	0	3	--	--	--	--	--	--	--	3.3	--	--	--	--	--	--
B3	1-Jul-91	1	1	--	--	--	2	--	110	18	--	--	0.4 U	--	--	600	--
B3	1-Jul-91	2	2	--	--	--	2.1	--	41	20	--	--	0.4 U	--	--	440	--
B3	1-Jul-91	3	3	--	--	--	1.9	--	15	11	--	--	0.4 U	--	--	31	--
B3	1-Jul-91	3	3	--	--	--	0.3	--	23	13	--	--	0.4 U	--	--	95	--
B30	1-May-90	0	3	--	--	--	--	--	--	--	4.4	--	--	--	--	--	--
B31	1-May-90	0	3	--	--	--	--	--	--	--	6.7	--	--	--	--	--	--
B37	1-May-90	0	3	--	--	--	--	--	--	--	0.73	--	--	--	--	--	--
B4	1-May-90	0	3	--	--	--	--	--	--	--	4.8	--	--	--	--	--	--
B4	1-Jul-91	1	1	--	--	--	1.9	--	710	16	--	--	0.4 U	--	--	260	--
B4	1-Jul-91	2	2	--	--	--	1 U	--	40	25	--	--	0.4 U	--	--	180	--
B4	1-Jul-91	3	3	--	--	--	1 U	--	20	9	--	--	0.4 U	--	--	49	--
B46	1-May-90	0	3	--	--	--	--	--	--	--	14	--	--	--	--	--	--
B47	1-May-90	0	3	--	--	--	--	--	--	--	4.7	--	--	--	--	--	--
B48	1-May-90	0	3	--	--	--	--	--	--	--	0.41	--	--	--	--	--	--
B5	1-May-90	0	3	--	--	--	--	--	--	--	19	--	--	--	--	--	--
B5	1-Jul-91	1	1	--	--	--	1 U	--	240	12	--	--	0.4 U	--	--	160	--
B5	1-Jul-91	2	2	--	--	--	1 U	--	380	7	--	--	0.4 U	--	--	140	--
B5	1-Jul-91	3	3	--	--	--	1 U	--	320	6	--	--	0.4 U	--	--	150	--
B6	1-May-90	0	3	--	--	--	--	--	--	--	22	--	--	--	--	--	--
B6	1-Jul-91	1	1	--	--	--	1 U	--	280	9	--	--	0.4 U	--	--	180	--
B6	1-Jul-91	2	2	--	--	--	1 U	--	160	4 U	--	--	0.4 U	--	--	260	--
B6	1-Jul-91	3	3	--	--	--	1 U	--	450	4 U	--	--	0.4 U	--	--	180	--
B7	1-May-90	0	3	--	--	--	--	--	--	--	26	--	--	--	--	--	--
B7	1-Jul-91	1	1	--	--	--	1 U	--	73	24	--	--	0.4 U	--	--	170	--
B7	1-Jul-91	2	2	--	--	--	1 U	--	4160	6	--	--	0.4 U	--	--	1300	--
B7	1-Jul-91	3	3	--	--	--	1	--	220	6	--	--	0.4 U	--	--	480	--
B8	1-May-90	0	3	--	--	--	--	--	--	--	28	--	--	--	--	--	--
B8	1-Jul-91	1	1	--	--	--	1	--	30	7	--	--	0.4 U	--	--	1200	--
B8	1-Jul-91	2	2	--	--	--	4	--	84	7	--	--	0.4 U	--	--	1100	--
B8	1-Jul-91	3	3	--	--	--	1 U	--	260	5	--	--	0.4 U	--	--	400	--
B9	1-May-90	0	3	--	--	--	--	--	--	--	61	--	--	--	--	--	--
B9SH	1-Feb-91	1.3	1.3	--	6.3	--	1.9	14.8	70.5	187	18.8	--	0.7 U	--	--	132	--
BLDG 102-1	18-Mar-05	0	0.5	3.1 U	11	0.5	0.56	56	480	120	58	33	2.2	0.69	0.26 U	220	--
BLDG 102-1	14-Apr-05	2	2.5	2.6 U	2	0.6	0.21 U	38	41	7.3	0.25	35	1.3	0.21 U	0.21 U	32	--
BLDG 102-1	14-Apr-05	4	4.5	2.8 U	3.3	0.62	0.23 U	51	20	5.7	0.38	57	1.8	0.23 U	0.23 U	32	--
BLDG 102-1	14-Apr-05	6.5	7	2.4 U	8.5	0.27	0.2 U	34	15	3.4	0.087	35	1.5	0.2 U	0.2 U	29	--
BLDG 102-2	18-Mar-05	0	0.5	3.3 U	6.3	0.47	0.28 U	44	300	28	19	35	1.3	0.28 U	0.28 U	81	--
BLDG 102-3	18-Mar-05	0	0.5	3.9 U	13	2.5	0.81	37	440	220	280	44	3.8	0.63	0.32 U	1400	--
BLDG 102-3	14-Apr-05	2	2.5	3 U	2.3	0.38	0.25 U	36	17	6.5	51	22	1.2	0.25 U	0.25 U	37	--
BLDG 102-4	18-Mar-05	0	0.5	3.9 U	10	0.57	0.75	38	670	59	330	28	2.1	0.32 U	0.32 U	300	--

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA
Phase III Field Sampling Plan
University of California, Berkeley, Richmond Field Station, Richmond, California

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
BLDG 102-4	14-Apr-05	2	2.5	3.1 U	2.6	0.12	0.26 U	35	51	24	13	16	0.89	0.26 U	0.26 U	29	--
BLDG 102-4	14-Apr-05	4	4.5	2.3 U	4	0.64	0.19 U	30	18	6.2	81	21	0.56	0.19 U	0.19 U	36	--
BLDG 102-4	14-Apr-05	5	5.5								0.53		--	--	--	--	--
BLDG 102-4	14-Apr-05	5	5.5	3 U	8.3	0.42	0.25 U	32	120	170	8.6	30	1.5	0.38	0.25 U	92	--
BLDG 102-5	18-Mar-05	0	0.5	4 U	13	0.27	0.33 U	51	600	63	19	22	1.1	1.4	0.33 U	71	--
BLDG 102-6	30-Mar-05	0	0.5	4.4 U	3.6	0.54	0.37 U	55	690	20	5.4	30	1.6	0.37 U	0.37 U	83	--
BLDG 102-6	14-Apr-05	1	1.5	3.2 U	5.3	0.48	0.26 U	47	21	8.7	1.4 U	57	1.2	0.26 U	0.26 U	35	--
BLDG 110-1	18-Mar-05	0	0.5	3.4 U	6.3	0.5	0.29 U	58	24	22	3	51	1.3	0.29 U	0.29 U	44	--
BLDG 110-2	18-Mar-05	0	0.5	3.4 U	6.3	0.5	0.29 U	58	24	22	3	51	1.3	0.29 U	0.29 U	44	--
HD2-5	11-Dec-02	3.99	3.99	0 R	5.4	0.49	1.4	33	26 J	21	0.62	44	0.55	0.24 U	0.7	69	9.1
HD2-5	11-Dec-02	5.49	5.49	0 R	5.2	0.61	1.1	45	15 J	13	1.6	69	0.41	0.27 U	0.38	30	7.7
HD2-5	11-Dec-02	6.99	6.99	0 R	3.7	0.45	0.84	35	11 J	10	1.1	38	0.36	0.27 U	0.48	22	8
HD2-6	11-Dec-02	1.39	1.39	0 R	4.6	0.65	1.2	55	110 J	14	1.8	43	0.58	0.29 U	0.35	73	6.8
HD2-6	11-Dec-02	2.89	2.89	0 R	4.2	0.43	1	37	13 J	6.7	0.1	65	0.45	0.26 U	0.83	26	8
MF101	25-Feb-00	4.59	4.59	5.2 U	9.7 J	0.33	2.1	24	84	59	45	37	1.5 J	0.93	1.2 J	430	6.6
MF101	25-Feb-00	6.59	6.59	3.8 U	3.3 J	0.51	0.85	24	9.8	8.3	54	52	1.1 J	0.31 U	3.4 J	17	5.6
MF101	25-Feb-00	9.59	9.59	3.7 U	9.6 J	0.46	1.7	40	23	5.5	67	85	0.31 UJ	0.31 U	0.67 J	38	7.7
MF102	17-Mar-00	0	0	3.3 U	2.2	0.37	1.5	16 J	370	5.7	3.6	14 J	0.27 U	0.27 U	0.41	380	6.9
MF102	17-Mar-00	3	3	3.8 U	2.5	0.46	0.8	25 J	12	5.7	23	47 J	0.82	0.31 U	2.8	20	7.5
MF102	17-Mar-00	6	6	180 U	14	6.1 U	16 U	33	29	9.2 U	0.11	210 J	15 U	0.31 U	15 U	61 U	8.2
MF102	17-Mar-00	13	13	3.6 U	1.6	0.2	1	48 J	16	4.6	1.1	36 J	0.3 U	0.3 U	0.68	33	7.9
MF103	25-Feb-00	0	0	3.5 U	6.7 J	0.2	1.6	19	340	130	50	23	0.82 J	1.1	0.72 J	290	6.9
MF103	25-Feb-00	1.76	1.76	3.8 U	2.2 J	0.44	1.3	21	16	4.8	11	59	0.69 J	0.32 U	2.5 J	130	6.8
MF103	25-Feb-00	4.76	4.76	3.8 U	6.1 J	0.47	1.6	37	25	4.5	13	57	0.32 UJ	0.32 U	0.32 UJ	43	8
MF105	25-Feb-00	0	0	3.6 U	3.3 J	0.42	0.71	23	9.6	5.2	4.6	41	0.65 J	0.3 U	1.2 J	16	6.6
MF105	25-Feb-00	1.85	1.85	3.6 U	1.7 J	0.38	0.64	20	9	3.7	15	32	0.3 UJ	0.3 U	0.66 J	17	7.5
MF105	25-Feb-00	4.85	4.85	3.8 U	4.5 J	0.4	1.3	32	17	3.2	9.2	49	0.31 UJ	0.31 U	0.31 UJ	29	8.4
MF106	28-Feb-00	1.41	1.41	3.7 U	1.6	0.43	0.81	24	12	4.1	28	41	0.31 U	0.31 U	0.46	25	7
MF106	28-Feb-00	4.41	4.41	3.6 U	6.5	0.49	1.6	38	28	6	0.15	73	0.5	0.3 U	1.3	38	7.6
MF107	7-Jun-01	0	0	--	--	--	--	--	--	--	0.65	--	--	--	--	--	--
MF107	7-Jun-01	4	4	--	--	--	--	--	--	--	40	--	--	--	--	--	--
MF107	7-Jun-01	7	7	--	--	--	--	--	--	--	32	--	--	--	--	--	--
MF108	7-Jun-01	4.31	4.31	--	--	--	--	--	--	--	220	--	--	--	--	--	--
MF108	7-Jun-01	8.31	8.31	--	--	--	--	--	--	--	11	--	--	--	--	--	--
MF108	7-Jun-01	11.31	11.31	--	--	--	--	--	--	--	0.33	--	--	--	--	--	--
MF109	7-Jun-01	3.34	3.34	--	--	--	--	--	--	--	40	--	--	--	--	--	--
MF109	7-Jun-01	7.34	7.34	--	--	--	--	--	--	--	5.1	--	--	--	--	--	--
MF109	7-Jun-01	10.34	10.34	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--
MF110	7-Jun-01	3.87	3.87	--	--	--	--	--	--	--	80	--	--	--	--	--	--
MF110	7-Jun-01	7.87	7.87	--	--	--	--	--	--	--	59	--	--	--	--	--	--
MF110	7-Jun-01	10.87	10.87	--	--	--	--	--	--	--	0.2	--	--	--	--	--	--
MF111	7-Jun-01	0	0	--	--	--	--	--	--	--	280	--	--	--	--	--	--
MF111	7-Jun-01	4	4	--	--	--	--	--	--	--	3.4	--	--	--	--	--	--
MF111	7-Jun-01	7	7	--	--	--	--	--	--	--	1.1	--	--	--	--	--	--
MF112	7-Jun-01	0	0	--	--	--	--	--	--	--	41	--	--	--	--	--	--
MF112	7-Jun-01	4	4	--	--	--	--	--	--	--	21	--	--	--	--	--	--

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
MF112	7-Jun-01	7	7	--	--	--	--	--	--	--	0.89	--	--	--	--	--	--
MF113	7-Jun-01	0	0	--	--	--	--	--	--	--	7.9	--	--	--	--	--	--
MF113	7-Jun-01	4	4	--	--	--	--	--	--	--	4.6	--	--	--	--	--	--
MF113	7-Jun-01	8	8	--	--	--	--	--	--	--	5.1	--	--	--	--	--	--
MF119	28-Jun-01	9.81	9.81	--	--	--	--	--	--	--	0.16	--	--	--	--	--	--
MF2-1	9-Sep-02	0	0	3.3 U	0.88	0.56	0.49	7.7	5.9	15	1.3	18	0.46	0.27 U	0.27 U	33	6.6
MF2-1	9-Sep-02	2	2	3.1 U	2.1	0.42	0.71	26	9.7	21	3.2	22	0.26 U	0.26 U	1.1	64	5.1
MF2-10	12-Dec-02	1.36	1.36	2.8 UJ	2.8	0.36	1.2	41	27	11	2.1 J	39	0.78	0.24 U	0.61	130	4.8
MF2-10	12-Dec-02	3.36	3.36	3.2 UJ	2.1	0.3	0.95	43	7.9	8.8	0.073 J	34	0.59	0.27 U	0.27 U	25	5.3
MF2-11	12-Dec-02	1.83	1.83	3.1 UJ	3	0.41	0.62	27	12	7.3	0.3 J	36	0.73	0.25 U	1.4	22	5.5
MF2-11	12-Dec-02	3.33	3.33	2.9 UJ	2.9	0.31	1	44	9.4	9.3	0.04 J	33	0.68	0.24 U	0.24 U	27	5.6
MF2-12	12-Dec-02	1.99	1.99	3.2 UJ	4.5	0.41	0.84	24	28	42	33	29	0.63	0.26 U	1	75	5.2
MF2-12	12-Dec-02	3.99	3.99	2.6 UJ	2.7	0.35	0.87	38	4.9	9.9	0.026 J	28	0.21 U	0.21 U	0.21 U	23	6.2
MF2-13	12-Dec-02	0	0	3.5 UJ	5.2	0.46	1	30	32	36	73	36	0.95	0.29 U	1.7	120	5
MF2-13	12-Dec-02	2	2	3.2 UJ	2.8	0.39	0.89	38	6.1	9.2	0.11	28	0.36	0.27 U	0.27 U	29	5.2
MF2-14	17-Jan-03	0	0	3.3 UJ	7.6	0.33	2.9	110	97	94	150	34	0.43	0.4	0.27 U	400	7.3
MF2-14	14-Apr-05	2	2.5	3.6 UJ	6.3	0.27	0.59	15	110	57	84	9.3	0.3 U	0.3 U	0.74	44	5.4
MF2-14	17-Jan-03	2	2	3.6 UJ	6.3	0.27	0.59	15	110	57	84	9.3	0.3 U	0.3 U	0.74	44	5.4
MF2-14	14-Apr-05	4	4.5	--	--	--	--	--	--	--	6.6	--	--	--	--	--	--
MF2-14	14-Apr-05	6	6.5	--	--	--	--	--	--	--	0.054	--	--	--	--	--	--
MF2-14	14-Apr-05	7.5	8	--	--	--	--	--	--	--	0.077	--	--	--	--	--	--
MF2-14	14-Apr-05	9	9.5	3.3 U	6.8	0.3	0.27 U	75	18	5.3	0.15	40	1.5	0.27 U	0.27 U	32	--
MF2-15	17-Jan-03	0	0	3.6 UJ	2.8	0.57	1.3	14	12	13	1.3	29	0.3 U	0.3 U	0.3 U	37	4.8
MF2-15	17-Jan-03	2	2	3.8 UJ	2.3	0.71	1.6	49	15	13	0.18	44	0.32 U	0.32 U	0.55	75	6.8
MF2-16	17-Jan-03	0	0	3.2 UJ	4	0.35	1.3	20	30	41	29	25	0.27 U	0.27 U	0.57	150	6.4
MF2-16	17-Jan-03	2	2	3.2 UJ	3.2	0.55	1.6	41	12	12	0.08	42	0.27 U	0.27 U	0.27 U	22	5
MF2-17	17-Jan-03	0	0	3.4 UJ	6.4	0.53	1.9	50	71	74	11	41	0.28 U	0.28 U	0.71	100	6.8
MF2-17	17-Jan-03	2	2	3.4 UJ	3.2	0.53	1.2	34	11	9.3	0.17	32	0.28 U	0.28 U	0.28 U	20	5.4
MF2-18	31-Jan-03	0.5	0.5	3.5 UJ	19	0.16	9.2	21	220	72	370	46	3.2	0.56	0.29 U	270	--
MF2-18	31-Jan-03	2.5	2.5	3.5 UJ	3.1	0.16	1.6	38	28	8.8	11	23	0.75	0.29 U	0.29 U	25	--
MF2-18	31-Jan-03	4	4	3.6 UJ	4.9	0.12 U	2.3	36	100	36	180	24	0.85	0.3 U	0.3 U	42	--
MF2-18	31-Jan-03	7.5	7.5	3.5 U	4.3	0.7	2.3	78	23	27	0.098	120	0.29 U	0.29 U	1.5	42	--
MF2-18	31-Jan-03	10.5	10.5	2.8 U	2.9	0.31	1.3	40	13	6.5	0.11	40	0.23 U	0.23 U	0.23 U	33	--
MF2-2	9-Sep-02	0	0	2.4 U	1.9	0.37	0.63	21	13	11	44	20	0.26	0.2 U	0.85	49	8.6
MF2-2	9-Sep-02	2	2	3.5 U	2.8	0.71	0.99	35	17	16	0.52	58	0.29 U	0.29 U	1.4	32	8.8
MF2-20	31-Jan-03	0.27	0.27	3.2 UJ	7	0.35	3	33	220	91	470	45	1.1	0.35	0.27 U	160	--
MF2-20	31-Jan-03	1.77	1.77	3.5 UJ	3	0.41	2.1	44	83	21	380	35	0.66	0.3 U	0.3 U	51	--
MF2-20	31-Jan-03	3.27	3.27	3.6 UJ	2.9	0.58	1.4	28	11	10	82	49	0.69	0.3 U	0.77	43	--
MF2-20	31-Jan-03	4.77	4.77	3.4 U	3.6	0.54	1.8	44	16	10	38	51	0.29 U	0.29 U	0.29 U	34	--
MF2-20	31-Jan-03	6.77	6.77	3.3 U	4.8	0.52	1.9	49	20	12	17	56	0.27 U	0.27 U	0.27 U	37	--
MF2-21	31-Jan-03	0.18	0.18	3.6 UJ	18	0.29	4.1	38	280	220	11	40	1.5	0.89	0.3 U	140	--
MF2-21	31-Jan-03	2.18	2.18	3.3 UJ	1.8	0.5	1.3	28	14	9.1	0.33	40	0.57	0.28 U	0.28 U	19	--
MF2-21	31-Jan-03	4.68	4.68	3.8 UJ	3.5	0.48	1.9	37	20	13	0.28	42	0.46	0.32 U	0.32 U	30	--
MF2-22	31-Jan-03	2.66	2.66	2.9 UJ	3.8	0.57	2.2	15	20	14	0.29	35	0.46	0.24 U	0.29	53	--
MF2-22	31-Jan-03	4.16	4.16	3.7 UJ	2.1	0.53	2.2	39	190	13	31	36	0.67	0.31 U	0.31 U	210	--
MF2-22	31-Jan-03	7.66	7.66	3.5 UJ	3.4	0.49	2.3	40	14	11	0.99	41	0.29 U	0.29 U	0.29 U	60	--

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
MF2-3	9-Sep-02	0	0	2.8 U	3.6	0.42	1.9	29	37	28	5.2	56	0.65	0.48	0.82	77	6.9
MF2-3	9-Sep-02	2	2	2.7 U	1.6	0.42	0.76	25	12	8.3	6.6	25	0.23 U	0.23 U	0.31	21	5.4
MF2-4	9-Sep-02	2.37	2.37	3.1 U	4	0.41	2	28	670	39	0.83	25	0.7	0.28	1.3	160	4.7
MF2-4	9-Sep-02	4.37	4.37	3 U	1.9	0.2	0.77	25	47	10	0.23 U	20	0.25 U	0.25 U	0.25 U	82	5.6
MF2-5	9-Sep-02	2.29	2.29	2.8 U	4.8	0.37	1.1	28	44	50	19	38	0.52	0.24 U	1.2	76	6
MF2-5	9-Sep-02	4.29	4.29	2.9 U	2.3	0.51	0.72	24	10	11	2.9	36	0.78	0.24 U	2.6	17	6.2
MF2-6	9-Sep-02	3.29	3.29	3.2 U	5.2	0.31	1.1	22	190	48	200	26	0.27 U	0.27 U	0.55	150	5.9
MF2-6	9-Sep-02	5.29	5.29	3.1 U	2.7	0.27	0.79	27	6.1	15	2.7	19	0.26 U	0.26 U	0.43	18	5.3
MF2-7	9-Sep-02	0	0	2.9 U	19	0.64	0.9	15	23 J	67 J	2.7	26	0.24 U	0.24 U	1.5	230	6.7
MF2-7	9-Sep-02	2	2	3.2 U	1.4	0.55	0.53	27	10 J	9.2 J	0.22	25	0.26 U	0.26 U	0.26 U	22	6.2
MF2-8	9-Sep-02	10.77	10.77	3.7 UJ	6	0.46	5	37	47	13	370	53 J	0.31 U	0.31 U	0.31 U	49	6.4
MF2-8	9-Sep-02	12.77	12.77	3.2 U	5.6	0.45	5.6	54	32	17	810	65	0.57	0.27 U	0.27 U	56	7.2
MF2-8	9-Sep-02	14.27	14.27	2.9 U	2.6	0.36	4.4	43	37	12	360	55	0.54	0.24 U	0.24 U	41	6.3
MF2-9	12-Dec-02	5	5	--	--	--	--	--	--	--	1100	--	--	--	--	--	--
MF2-9	12-Dec-02	7.5	7.5	--	--	--	--	--	--	--	2.5	--	--	--	--	--	--
MF2-9	12-Dec-02	10.5	10.5	--	--	--	--	--	--	--	22	--	--	--	--	--	--
MF2-9	12-Dec-02	8.5	8.5								0.29		--	--	--	--	--
MF2-9	12-Dec-02	11	11								55		--	--	--	--	--
MF2-9	12-Dec-02	12.5	12.5	3.4 UJ	2.7	0.32	0.73	21	9.8	5.9	0.91	39	0.36	0.29 U	0.72	30	8.3
MF2-9	12-Dec-02	15	15	3 UJ	3.5	0.35	0.8	28	11	6.6	0.61	47	0.43	0.25 U	0.47	38	7.9
MF2-9	12-Dec-02	16.5	16.5	--	--	--	--	--	--	--	3.1	--	--	--	--	--	--
MF2-9	12-Dec-02	17	17	3.4 UJ	2.7	0.32	0.73	21	9.8	5.9	0.91	39	0.36	0.29 U	0.72	30	8.3
MF2-9	12-Dec-02	19	19	3 UJ	3.5	0.35	0.8	28	11	6.6	0.61	47	0.43	0.25 U	0.47	38	7.9
MF3-1	23-May-03	0.12	0.12	3.5 U	3.8	0.12 U	0.57	22	74	25	2.4	9.7	0.29 U	0.29 U	0.29 U	18	--
MF3-1	23-May-03	2.12	2.12	3.4 U	17	0.11 U	1.2	29	19	58	17	20	0.3	0.28 U	0.28 U	21	--
MF3-10	17-Jun-04	0	0.5	2.9 U	11	0.4	0.78	27	310	180	930	24	2.4	0.29	0.24 U	270	5.3
MF3-10	17-Jun-04	2	2.5	2.6 U	4.2	0.27	0.22 U	51	20	3.4	8.1	22	0.79	0.22 U	0.22 U	56	3.4
MF3-10	17-Jun-04	4	4.5	3.5 U	5.3	0.53	0.34	48	20	4.6	940	50	0.29 U	0.29 U	0.29 U	49	8.6
MF3-10	14-Apr-05	4	4.5	--	--	--	--	--	--	--	0.15	--	--	--	--	--	--
MF3-10	14-Apr-05	6	6.5	--	--	--	--	--	--	--	0.1	--	--	--	--	--	--
MF3-10	14-Apr-05	8	8.5	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--
MF3-10	14-Apr-05	9.5	10	--	--	--	--	--	--	--	0.13	--	--	--	--	--	--
MF3-5	22-Apr-04	0	0.5	2.7 U	2.8	0.43	0.28	11	9.4	12	1.8	19	0.24	0.23 U	0.23 U	39	7.3
MF3-5	22-Apr-04	2	2.5	2.9 U	1.3	0.46	0.24 U	16	8.6	5.1	0.65	21	0.26	0.24 U	0.24 U	13	6.3
MF3-5	22-Apr-04	4	4.5	2.6 U	1.1	0.41	0.22 U	15	6.7	3.4	22	23	0.22 U	0.22 U	0.22 U	15	7.7
MF3-6	22-Apr-04	4	4.5	3.3 U	1.6	0.25	0.28 U	23	12	3.6	5.8	17	0.44	0.28 U	0.28 U	53	5.9
MF3-6	22-Apr-04	6	6.5	3.3 U	2.2	1.3	0.27 U	20	8	2.7	1.1	28	0.27 U	0.27 U	0.27 U	20	7.1
MF3-6	22-Apr-04	8	8.5	3.4 U	6	0.34	0.28 U	24	11	5.3	0.57	43	0.28 U	0.28 U	0.28 U	22	8.7
MF3-7	22-Apr-04	0	0.5	3.3 U	10	0.49	0.83	40	79	77	15	53	1	0.28 U	0.28 U	110	7.8
MF3-7	22-Apr-04	2	2.5	3.6 U	1.1	0.47	0.51	16	8.4	3.8	5.1	31	0.3 U	0.3 U	0.3 U	180	6.4
MF3-7	22-Apr-04	4	4.5	3.1 U	2.9	0.51	0.26 U	29	16	3.8	0.14	39	0.26 U	0.26 U	0.26 U	32	8.4
MF3-8	22-Apr-04	0	0.5	2.8 U	14	0.48	0.52	34	28	12	0.91	50	0.41	0.23 U	0.23 U	50	8.2
MF3-8	22-Apr-04	2	2.5	3.4 U	2.8	0.48	0.82	18	110	43	67	15	0.28	0.28 U	0.28 U	340	4.7
MF3-8	22-Apr-04	4	4.5	3.1 U	6.3	0.57	0.26 U	28	14	5	0.68	56	0.26 U	0.26 U	0.26 U	23	8.9
MF3-9	22-Apr-04	0	0.5	3 U	8.4	0.59	0.25 U	82	48	22	3.8	110	0.89	0.25 U	0.25 U	74	7.7
MF3-9	22-Apr-04	2	2.5	2.7 U	2	0.42	0.23 U	29	9.5	2.6	45	20	0.57	0.23 U	0.23 U	20	5.9

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA
Phase III Field Sampling Plan
University of California, Berkeley, Richmond Field Station, Richmond, California

				Metals in mg/kg													pH
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC	pH
MF3-9	22-Apr-04	4	4.5	3.2 U	1.1	1.1	0.27 U	26	10	2.8	40	42	0.74	0.27 U	0.27 U	25	7.5
MF3-9	17-Mar-05	4	4.5	--	--	--	--	--	--	--	15	--	--	--	--	--	--
MF3-9	17-Mar-05	6	6.5	--	--	--	--	--	--	--	0.027 U	--	--	--	--	--	--
MF3-9	17-Mar-05	7.5	8	--	--	--	--	--	--	--	0.06	--	--	--	--	--	--
MF4-1	17-Mar-05	0	0.5	--	--	--	--	--	--	--	75	--	--	--	--	--	--
MF4-1	17-Mar-05	2	2.5	--	--	--	--	--	--	--	0.15	--	--	--	--	--	--
MF4-1	17-Mar-05	4	4.5	--	--	--	--	--	--	--	1	--	--	--	--	--	--
MF4-1	17-Mar-05	6	6.5	--	--	--	--	--	--	--	0.035	--	--	--	--	--	--
MF4-1	17-Mar-05	7.5	8	--	--	--	--	--	--	--	0.053	--	--	--	--	--	--
MF4-2	17-Mar-05	0	0.5	--	--	--	--	--	--	--	2.2	--	--	--	--	--	--
MF4-2	17-Mar-05	2	2.5	--	--	--	--	--	--	--	1.4	--	--	--	--	--	--
MF4-2	17-Mar-05	4	4.5	--	--	--	--	--	--	--	3.3	--	--	--	--	--	--
MF4-2	17-Mar-05	6	6.5	--	--	--	--	--	--	--	0.056	--	--	--	--	--	--
PB19	26-Aug-02	5.08	5.08	2.9 U	10	0.61	1.4	29	17	12	0.14	56	0.24 U	0.24 U	0.24 U	34	7.3
SL102	25-Feb-00	2	2	3.7 U	4.3	0.36	0.95	20	22	120	0.78	17	0.38	0.3 U	0.51	33	6.9
SL102	25-Feb-00	10	10	3.6 U	5.5	0.4	1.7	33	30	7.7	0.22	72	0.53	0.3 U	2.5	50	7.4
SL103	25-Feb-00	0	0	3.2 U	2.5	0.38	1.3	16	17	11	0.48	25	0.49	0.26 U	0.99	39	8.5
SL103	25-Feb-00	0.89	0.89	3.6 U	5.5 J	0.29	1.7	37	300	57	9.2	24	0.8 J	0.3 U	0.31 J	110	5.3
SL103	25-Feb-00	7.89	7.89	3.3 U	2 J	0.27	1.1	28	13	3.3	0.19	40	0.27 UJ	0.27 U	0.36 J	30	6.9
SM2-1	9-Sep-02	0	0	2.7 U	13	0.43	1.9	24	340 J	140 J	13	35	1.5	0.22	1.3	160	6
SM2-1	9-Sep-02	2	2	3.2 U	5.8	0.58	1.4	56	21 J	19 J	0.71	65	0.41	0.27 U	2.6	62	5.6
SM3-2	22-Apr-04	0	0.5	3.7 U	3.6	0.45	0.31 U	29	34	38	12	34	0.68	0.31 U	0.31 U	78	5.7
SM3-2	22-Apr-04	2	2.5	3.3 U	1.9	0.26	0.27 U	27	13	14	0.85	24	0.33	0.27 U	0.27 U	24	5.1

Notes:

Indicates the value exceeds the Commerical/Industrial CHHSL

--	Not sampled
bgs	Below ground surface
CHHSL	California Human Health Screening Level
ID	Identification
J	Estimated value
mg/kg	Milligrams per kilogram
U	Not detected

APPEDNDIX B: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan
University of California, Berkeley, Richmond Field Station, Richmond, California

				PCB (mg/kg)							TPH (mg/kg)	
Location ID	Sample Date	Top Depth (feet bgs)	Bottom Depth (feet bgs)	AROCLOR-1016	AROCLOR-1221	AROCLOR-1232	AROCLOR-1242	AROCLOR-1248	AROCLOR-1254	AROCLOR-1260	DIESEL RANGE ORGANICS	MOTOR OIL RANGE ORGANICS
		Residential CHHSL		0.089	0.089	0.089	0.089	0.089	0.089	0.089		
		Commercial/Industrial CHHSL		0.3	0.3	0.3	0.3	0.3	0.3	0.3		
AOCU7-D1	17-Mar-05	--	--	0.0096 U	0.019 U	0.0096 U	0.013	0.0096 U	0.014	0.0096 U	34	160
AOCU7-D2	17-Mar-05	--	--	--	--	--	--	--	--	--	5.7	36
AOCU7-D4	17-Mar-05	--	--	0.0095 U	0.019 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	0.0095 U	1.1	8.9
PCB21	26-Oct-11	0	0.5	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.033 J	0.032 J	--	--
PCB22	26-Oct-11	1.5	2	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	--	--
PCB23	26-Oct-11	0	0.5	0.29 U	0.29 U	0.29 U	0.29 U	35	0.29 U	0.29 U	--	--
PCB24	26-Oct-11	1.5	2	0.036 U	0.036 U	0.036 U	0.036 U	2.2	0.036 U	0.036 U	--	--
PCB25	26-Oct-11	0	0.5	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	--	--
PCB26	26-Oct-11	1.5	2	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	--	--
PCB27	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	--	--
PCB27D	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	--	--
PCB28	26-Oct-11	1.5	2	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	--	--
PCB29	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	--	--
PCB30	26-Oct-11	1.5	2	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	--	--
PCB31	26-Oct-11	0	0.5	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.087	0.037 U	--	--
PCB32	26-Oct-11	1.5	2	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	--	--
PCB33	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.2	0.036 U	--	--
PCB33D	26-Oct-11	0	0.5	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.14	0.037 U	--	--
PCB34	26-Oct-11	1.5	2	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	--	--
PCB35	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.032 J	0.036 U	--	--
PCB36	26-Oct-11	1.5	2	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	--	--
PCB37	26-Oct-11	0	0.5	0.036 U	0.036 U	0.036 U	0.036 U	0.036 U	0.11	0.036 U	--	--
PCB38	26-Oct-11	1.5	2	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	0.037 U	--	--
PCB39	26-Oct-11	0	0.5	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	0.039 U	--	--
PCB40	26-Oct-11	1.5	2	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	0.041 U	--	--
PCB40D	26-Oct-11	1.5	2	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	0.043 U	--	--
HD2-5-0	11-Dec-02	3.99	3.99	0.067 U	0.13 U	0.067 U	0.067 U	0.067 U	0.2	0.067 U	--	--
HD2-5-1.5	11-Dec-02	5.49	5.49	0.015 U	0.03 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	--	--
HD2-5-3	11-Dec-02	6.99	6.99	0.014 U	0.027 U	0.014 U	0.014 U	0.014 U	0.082	0.041	--	--
HD2-6-1.5	11-Dec-02	1.39	1.39	0.016 U	0.032 U	0.016 U	0.016 U	0.016 U	0.016 U	0.016 U	--	--
HD2-6-3	11-Dec-02	2.89	2.89	0.014 U	0.027 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	--	--
MF2-2-0	09-Sep-02	0	0	0.013 U	0.025 U	0.013 U	0.013 U	0.013 U	0.033	0.024	--	--
MF2-3-0	09-Sep-02	0	0	0.013 U	0.025 U	0.013 U	0.013 U	0.013 U	0.1	0.049	--	--
MF2-7-0	09-Sep-02	0	0	0.013 U	0.025 U	0.013 U	0.013 U	0.013 U	0.012 U	0.018	--	--
SL-102-B-10	25-Feb-00	10	10	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	--	--
SL-102-B-2	25-Feb-00	2	2	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	--	--
SL-103-B-10	25-Feb-00	7.89	7.89	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U	--	--
SL-103-B-3	25-Feb-00	0.89	0.89	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U	--	--
SM2-1-0	09-Sep-02	0	0	0.013 U	0.025 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	--	--

Notes:

Indicates the value exceeds the Commerical/Industrial CHHSL	
--	Not sampled
bgs	Below ground surface
CHHSL	California Human Health Screening Level
ID	Identification
J	Estimated value
mg/kg	Milligrams per kilogram
PCB	Polychlorinated biphenyl
TPH	Total petroleum hydrocarbons
U	Not detected

APPENDIX B: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

SVOC AND PAH (mg/kg)

Location ID	Sample Date	1,2,4-TRICHLOROBENZENE	1,2-DICHLOROBENZENE	1,3-DICHLOROBENZENE	1,4-DICHLOROBENZENE	2,4,5-TRICHLOROPHENOL	2,4,6-TRICHLOROPHENOL	2,4-DICHLOROPHENOL	2,4-DIMETHYLPHENOL	2,4-DINITROPHENOL	2,4-DINITROTOLUENE	2,6-DINITROTOLUENE	2-CHLORONAPHTHALENE	2-CHLOROPHENOL	2-METHYLNAPHTHALENE	2-METHYLPHENOL	2-NITROANILINE	2-NITROPHENOL	3,3'-DICHLOROBENZIDINE	3-NITROANILINE	4,6-DINITRO-2-METHYLPHE	4-BROMOPHENYL-PHENYL	4-CHLORO-3-METHYLPHEN	4-CHLOROANILINE	4-CHLOROPHENYL-PHENY	4-METHYLPHENOL	4-NITROANILINE	4-NITROPHENOL	ACENAPHTHENE	ACENAPHTHYLENE
AOCU7-D4	17-Mar-2005	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.67 U	0.33 U	0.33 U	0.33 U	0.33 U	0.067 U	0.33 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.67 U	0.67 U	0.067 U	0.067 U
AOCU7-D1	17-Mar-2005	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.67 U	0.33 U	0.33 U	0.33 U	0.33 U	0.067 U	0.33 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.67 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.67 U	0.67 U	0.067 U	0.067 U

Notes:

ID	Identification
mg/kg	Milligrams per kilogram
PAH	Polycyclic aromatic hydrocarbon
SVOC	Semi volatile organic compound
U	Not detected

APPENDIX A: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

SVOC AND PAH (mg/kg)

Location ID	Sample Date	ANTHRACENE	AZOBENZENE	BENZO(A)ANTHRACENE	BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	BENZO(G,H,I)PERYLENE	BENZO(K)FLUORANTHENE	BENZOIC ACID	BENZYL ALCOHOL	BIS(2-CHLOROETHOXY)ME	BIS(2-CHLOROETHYL)ETH	BIS(2-CHLOROISOPROPYL)	BIS(2-ETHYLHEXYL)PHTH	BUTYLBENZYLPHTHALAT	CHRYSENE	DI-N-BUTYLPHTHALATE	DI-N-OCTYLPHTHALATE	DIBENZ(A,H)ANTHRACEN E	DIBENZOFURAN	DIETHYLPHTHALATE	DIMETHYLPHTHALATE	FLUORANTHENE	FLUORENE	HEXACHLOROBENZENE	HEXACHLOROBUTADIENE	HEXACHLOROCYCLOPENT	HEXACHLOROETHANE	INDENO(1,2,3-CD)PYRENE	ISOPHORONE	N-NITROSO-DI-N-PROPYLA
AOCU7-D4	17-Mar-2005	0.067 U	0.33 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	1.7 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.067 U	0.33 U	0.33 U	0.067 U	0.33 U	0.33 U	0.33 U	0.067 U	0.067 U	0.33 U	0.33 U	0.67 U	0.33 U	0.067 U	0.33 U	0.33 U
AOCU7-D1	17-Mar-2005	0.067 U	0.33 U	0.067 U	0.067 U	0.067 U	0.067 U	0.067 U	1.7 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.067 U	0.33 U	0.33 U	0.067 U	0.33 U	0.33 U	0.33 U	0.067 U	0.067 U	0.33 U	0.33 U	0.67 U	0.33 U	0.067 U	0.33 U	0.33 U

Notes:

ID	Identification
mg/kg	Milligrams per kilogram
PAH	Polycyclic aromatic hydrocarbon
SVOC	Semi volatile organic compound
U	Not detected

APPENDIX A: MERCURY FULMINATE AREA HISTORIC DATA

Phase III Field Sampling Plan

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

SVOC AND PAH (mg/kg)

Location ID	Sample Date	N-NITROSODIMETHYLAMI	N-NITROSODIPHENYLAMI	NAPHTHALENE	NITROBENZENE	PENTACHLOROPHENOL	PHENANTHRENE	PHENOL	PYRENE
AOCU7-D4	17-Mar-2005	0.33 U	0.33 U	0.067 U	0.33 U	0.67 U	0.067 U	0.33 U	0.067 U
AOCU7-D1	17-Mar-2005	0.33 U	0.33 U	0.067 U	0.33 U	0.67 U	0.067 U	0.33 U	0.067 U

Notes:

ID	Identification
mg/kg	Milligrams per kilogram
PAH	Polycyclic aromatic hydrocarbon
SVOC	Semi volatile organic compound
U	Not detected

APPENDIX C

DRY HOUSE EXPLOSION PHOTOGRAPH


CALIFORNIA CAP CO. DRY HOUSE EXPLOSION - STEGE

APPENDIX D

BUILDING 128 HISTORIC DATA

APPENDIX D: BUILDING 128 HISTORIC DATA

Phase III Field Sampling Plan
University of California, Berkeley, Richmond Field Station, Richmond, California

Location ID	Sample Date	Sample Depth*	ANTIMONY	ARSENIC	BERYLLIUM	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	SELENIUM	SILVER	THALLIUM	ZINC
B10SH	1-Feb-91	1.3	--	7.4	--	2.2	20.9	188	87.4	40.2	--	0.72 U	--	--	260
B11SH	1-Feb-91	1.3	--	8.7 U	--	3	28.9	291	313	7.74	--	8.7 U	--	--	437
B2SH	1-Feb-91	1.3	--	3.4	--	1.2	27.7	34	37.1	3.31	--	3.6 U	--	--	40.8
B3SH	1-Feb-91	1.3	--	3	--	1.6	19.2	12.6	7.4	0.12	--	0.7 U	--	--	10.9
B41	1-May-90	0	--	--	--	--	--	--	--	0.34	--	--	--	--	--
B42	1-May-90	0	--	--	--	--	--	--	--	0.16	--	--	--	--	--
B43	1-May-90	0	--	--	--	--	--	--	--	1.6	--	--	--	--	--
B44	1-May-90	0	--	--	--	--	--	--	--	1	--	--	--	--	--
B4SH	1-Feb-91	1.3	--	2.4	--	0.86	16.1	10.5	6.4	0.11 U	--	0.7 U	--	--	10.2
B5SH	1-Feb-91	1.3	--	9.7	--	1.4	25.1	18.1	6.3	0.11 U	--	0.74 U	--	--	43.8
B9SH	1-Feb-91	1.3	--	6.3	--	1.9	14.8	70.5	187	18.8	--	0.7 U	--	--	132
HD2-1	9-Sep-02	7.12	--	--	--	--	--	--	--	0.074	--	--	--	--	--
HD2-10	17-Jan-03	0	3.5 UJ	6.1	0.51	1.7	32	99	63	9.6	38	0.55	0.29 U	0.96	130
HD2-10	17-Jan-03	2	2.5 UJ	3.5	0.58	1.1	33	13	12	0.38	38	0.21 U	0.21 U	0.65	18
HD2-10	17-Jan-03	4.5	3.1 UJ	3.8	0.52	1.1	32	16	11	0.53	37	0.26 U	0.26 U	0.26 U	21
HD2-12	31-Jan-03	0	3 UJ	3.4	0.6	2	16	19	22	34	29	0.51	0.25 U	0.25 U	60
HD2-12	31-Jan-03	2	3.2 UJ	3.5	0.35	2	42	13	8.7	0.13	38	0.27	0.26 U	0.26 U	24
HD2-12	31-Jan-03	3.5	3 UJ	4.4	0.44	2	42	15	7	0.37	46	0.34	0.25 U	0.25 U	32
HD2-3	9-Sep-02	4	--	--	--	--	--	--	--	23	--	--	--	--	--
HD2-3	9-Sep-02	7.5	--	--	--	--	--	--	--	0.058	--	--	--	--	--
HD2-4	11-Dec-02	0.53	0 R	5.3	0.47	0.87	30	88 J	36	0.89	34	0.34	0.19 U	0.93	42
HD2-4	11-Dec-02	2.03	0 R	3.9	0.56	0.83	35	45 J	15	22	37	0.21 U	0.21 U	0.53	34
HD2-4	11-Dec-02	3.53	0 R	6.6	0.8	1	43	16 J	9	7.4	93	0.29 U	0.29 U	0.43	38
RFSTA-B128SWALE -COMP	23-May-06	0	4.8	11	0.43	0.89	98	240	130	10	52	3.1	0.99	0.36	290

APPENDIX D: BUILDING 128 HISTORIC DATA

Phase III Field Sampling Plan

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

			PCB (mg/kg)						
Location ID	Sample Date	Sample Depth*	AROCLOR_1016	AROCLOR_1221	AROCLOR_1232	AROCLOR_1242	AROCLOR_1248	AROCLOR_1254	AROCLOR_1260
HD2-10	1/17/2003	0	0.017 U	0.034 U	0.017 U	0.017 U	0.017 U	0.28	0.087
HD2-10	1/17/2003	2	0.015 U	0.029 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U
HD2-10	1/17/2003	4.5	0.015 U	0.029 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U
HD2-11	1/17/2003	5.56	0.012 U	0.024 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
HD2-11	1/17/2003	7.06	0.012 U	0.024 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
HD2-12	1/31/2003	0	0.013 U	0.026 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
HD2-12	1/31/2003	2	0.015 U	0.03 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U
HD2-12	1/31/2003	3.5	0.013 U	0.027 U	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U
HD2-3	5/6/2004	4	0.015 U	0.03 U	0.015 U	0.015 U	0.015 U	0.015 U	0.015 U
HD2-3	5/6/2004	6	0.014 U	0.027 U	0.014 U	0.014 U	0.014 U	0.014 U	0.014 U
HD2-4	12/11/2002	0.53	0.063 U	0.13 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
HD2-4	12/11/2002	2.03	0.012 U	0.025 U	0.012 U	0.012 U	0.012 U	0.012 U	0.012 U
HD2-4	12/11/2002	3.53	0.014 U	0.029 U	0.014 U	0.014 U	0.014 U	0.1	0.014 U
RFSTA-B128SWALE-COMP	5/23/2006	0	0.017 U	0.035 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U
SD2-4	3/13/2003	0.5	0.12 U	0.24 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U

Notes:

*	Depth in feet below ground surface
ID	Idenification
J	Estimated value
PCB	Polychlorinated biphenyl
U	Not detected