TETRA TECH, INC.

December 21, 2022

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

Sara Ziff
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, California 94105

Submitted Electronically Only

Subject: Eastern Transition Area, Revised Proposed Sampling
Richmond Field Station
University of California, Berkeley

Dear Ms. Yuen and Ms. Ziff:

On September 21, 2022, UC Berkeley provided a proposed sampling strategy for the polychlorinated biphenyls (PCB) detected in the Eastern Transition Area (ETA). This revised strategy incorporates comments from EPA provided on October 6, 2022 and DTSC on November 21, 2022. Comments are provided as the final attachment.

Background

On November 2, 2021, Tetra Tech collected 36 discrete soil samples within the Eastern Transition Area (ETA) pursuant to the *Phase V, Western Transition Area Sample Results, Richmond Field Station, UC Berkeley* letter, dated October 16, 2020. UC Berkeley recommended the sampling after finding polychlorinated biphenyl (PCB) in some samples during the Mercury Fulminate Area removal action completed in January 2020. During the removal action, PCBs were identified in confirmation samples at the southwestern-most portion of the Mercury Fulminate Area excavation, on the border of the ETA (Figure 1). The area is outside of the Ridgway's Rail habitat but is within the 200-foot buffer mandating limited activities during the breeding season of February 1 through August 31.

In October 2020, based on discussions with DTSC and EPA, UC Berkeley agreed to include the follow-up sampling as a part of the Phase V investigation, given its proximity to the Western Transition Area and since PCBs are the primary chemical of concern in the Phase V investigation. After subsequent discussions, further investigation of this area will be independent of the Phase V investigation and will be referred to as the ETA PCB Area, as shown on Figure 1.

The source of PCB contamination is unknown. The ETA consists of clean fill imported as part of the Western Stege Marsh removal action conducted by UC Berkeley from 2002 to 2004. The imported fill

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was approved by the California Regional Water Quality Control Board according to industry practices prior. While PCBs were not the primary contaminant of concern of the Western Stege Marsh cleanup activities, there were limited areas with known PCB contamination. Poor soil management practices during the removal action may have led to the PCB contamination identified in the November 2021 sampling event. There are no other known or suspected sources of PCBs in or near this portion of ETA.

Previous Sampling

Four discrete confirmation samples collected during the Mercury Fulminate Area removal action had PCB levels from 2.2 to 53 mg/kg. Confirmation samples were collected from the sidewall surfaces after excavation. Sample locations and results are shown on Figure 2; sample depths and results are presented in Table 1.

Discrete samples were collected between 0 to 0.5 feet below ground surface (ft bgs) and 2.5 to 3.0 ft bgs at 18 locations for a total of 36 samples, as shown on Figure 2. Samples were collected from a continuous core from the direct push drill rig with disposable trowels. Total PCB concentrations within the 36 samples were detected from 0.096 to 23 mg/kg. Sample results indicated Total PCBs greater than the screening level of 1 mg/kg at 6 of the 18 samples locations; all samples above 1 mg/kg were collected at the 2.5 to 3.0 ft bgs interval.

All samples were analyzed for PCBs by EPA Method 8082 with Soxhlet Extraction. Sample collection, handling, chain-of-custody, and shipping protocols were consistent with the Final Phase V Field Sampling Plan.

Proposed Sampling

Incremental Sampling Methodology (ISM) will be applied to collect and analyze soil samples from decision units (DU) DU01 through DU04 as shown on Figure 3. ISM involves collecting many small soil masses (called “increments”) evenly across each decision unit, and then pooling them to form a field sample. ISM was selected to achieve a comprehensive and thorough evaluation of chemical concentrations in a specific volume of soil or within a decision unit. Field quality control (QC), in the form of three independent field samples (i.e., field triplicates), assesses ability of an ISM sample to reliably estimate concentrations within the decision unit and quantify inherent soil and contaminant heterogeneity. A field triplicate will be collected at DU01.

Once received at the laboratory, the ISM sample will be homogenized and then subsampled for analysis. QC to assess adequacy of sample homogenizing, subsampling, and analysis will be conducted on three subsamples taken from one of the field triplicates. The field and laboratory subsampling triplicates form an ISM “nested triplicate” set from which the amount of variability due to field heterogeneity and laboratory procedures will be calculated as a statistic called the relative standard deviation (RSD). An RSD will be calculated for both the field triplicates and laboratory triplicates to measure how much field heterogeneity versus laboratory measurement variability contribute to overall data variability.

While ISM procedures are designed to reduce both field and laboratory contributions to data variability, some variability is inevitable. Measurements provided by a nested triplicate set document whether the procedures sufficiently reduced variability for the site-specific matrix and contaminants. If this QC demonstrates that data variability is too high to support desired decision confidence at the action level, it

also indicates which aspect, field sampling, sample processing and subsampling, or the analysis itself needs corrective action to fix the problem. In contrast, sources of data variability are rarely used in this way in discrete sampling programs, which limits options for corrective action if discrete data variability is too high. Soils contaminated with PCB typically have both high field heterogeneity and high subsampling variability, so meticulous procedures must be implemented. ISM was chosen for this work because ISM procedures will produce PCB data with much lower data variability, and therefore elicit higher confidence than data from discrete sampling.

Field increments will be collected using direct push technology since the target sample depth is 5 ft bgs. Increments will be collected from 0 to 2, 2 to 4, and 4 to 5 ft bgs. A field sample will consist of 30 increments collected from each decision unit at each depth. A field triplicate will be collected at DU01 consisting of three sets of 30 borings each spaced evenly apart within DU01. While 75 increments are preferred when analyzing ISM samples for PCBs, it is not uncommon for a reduction of increments when collecting ISM sample requiring drilling. Since triplicates will be collected, sample results will still indicate the ability of the 30 increments to represent the soil concentrations.

In addition to chemical results, field triplicate results from DU01 will measure the effectiveness of the ISM sample in capturing PCB contaminant variability within the decision unit. The field triplicate results will inherently include any laboratory variability because each field triplicate is analyzed separately.

The specific ISM procedures for field sampling will be:

1. Corners and edges of each decision unit will be marked with flags to identify borings locations. Triplicate increments for DU01 will be located in a triangle formation equidistant around each point.

2. Increments will be collected from 0 to 2, 2 to 4, and 4 to 5 ft bgs. Each increment from a continuous core borehole will be a wedge of soil from the entire length of the core. The wedge will be collected with a disposable sampling equipment. Each increment will be approximately 50 grams of soil resulting in a sample of approximately 1.5 kilograms. Wedge increments from 0 to 2 ft bgs from each of the 30 borings at each DU will be combined to form the ISM sample for that depth, and similarly for 2 to 4 and 4 to 5 ft bgs.

3. Increments from each decision unit will be placed into freezer-grade, 1-gallon, sealable bags. The target weight of each ISM sample will be approximately 1.5 kilograms. Each bag will be labeled and packed into an insulated cooler and covered with ice packs. The samples will be transported under chain-of custody procedures to McCampbell Analytical, in Pittsburg, California.

Health and safety measures will follow the *Final Field Sampling Workplan, Appendix B, Health and Safety Plan*, dated June 2, 2010.

Laboratory Processing, Subsampling, and Analyses

Soil samples will be processed according to the laboratory's internal ISM protocol, specifically:

1. The 1.5-kilogram sample will be air-dried as necessary, then passed through a 10-mesh sieve to remove non-soil material (i.e., particles larger than a 2-millimeter [mm] diameter).

2. The sieved soil will be ground to the consistency of sifted flour and spread into a shallow layer in a pan to form a "slab cake" and divided into 30 equal-sized grid cells.

3. A 1-gram increment will be taken from each grid cell, and the 30 increments will be pooled to form an analytical subsample weighing 30 grams.

4. Each 30-gram subsample will be analyzed for PCBs via EPA Method 8082 with 3540C Soxhlet extraction.

One of the field samples within the DU01 field triplicate set will be subsampled and analyzed two additional times (for a total of three subsample analyses) to create the laboratory triplicate set. The second and third independent representative subsamples will be collected in the same way by taking separate increments from the same 30 grid cells. The standard operating procedure for McCampbell Analytical Inc. laboratory processing is included as an attachment.

The primary purpose of the laboratory triplicate set is to evaluate effectiveness of homogenizing and subsampling protocols for site-specific contaminants and the soil matrix. If the procedures are effective, the three subsamples should yield numerically close results. The closer the agreement among the results, the lower the data variability and RSD for the triplicate set. Variability in the analytical processes of sample extraction, extract cleanup, and instrumental measurement is an unavoidable inclusion in subsampling variability.

Together, the field triplicate set and laboratory triplicates from one of the field triplicates constitute a nested triplicate.

Data Evaluation

Field and laboratory triplicates will be evaluated quantitatively and qualitatively to determine overall data usability. Quantitative evaluation involves calculating an RSD of results from the three field and laboratory triplicates as a measure of variability. Qualitative evaluation involves assessing whether concentration of triplicates agree generally (low, moderate, or elevated), and whether they exceed the action level. Low or high variability can indicate complexity of the matrix. Consistently high variability may indicate a complex matrix with "particle effects" that cannot be fully eliminated even by enhanced laboratory protocols such as milling the sample. A data usability determination will be recommended based on results of the quantitative and qualitative analyses.

This field investigation is exploratory in nature, given the unknown history of PCB contamination in the area. Total PCB results will be compared to 1 mg/kg as a screening tool, and no statistical evaluation is currently proposed. Sample results may result in additional investigation, proposed excavation activities, or other cleanup alternatives. UC Berkeley will consult with EPA and DTSC upon receipt of the sample results to determine the appropriate data evaluation or follow-up actions.

If you have any questions or comments regarding this submittal, please call me at (415) 497-9060 or Alicia Bihler at (510) 725-2528.

Sincerely,

Jason Brodersen, P.G.
Project Manager

Attachments: Figure 1 Site Map
Figure 2 Previous PCB Results
Figure 3 Proposed Decision Units
Table 1 Eastern Transition Area PCB Sample Results
McCampbell Analytical Inc. Laboratory Processing Standard Operating Procedure
Regulatory Comments

cc: Alicia Bihler, UC Berkeley EH&S
John Edgcomb, Edgcomb Law Group

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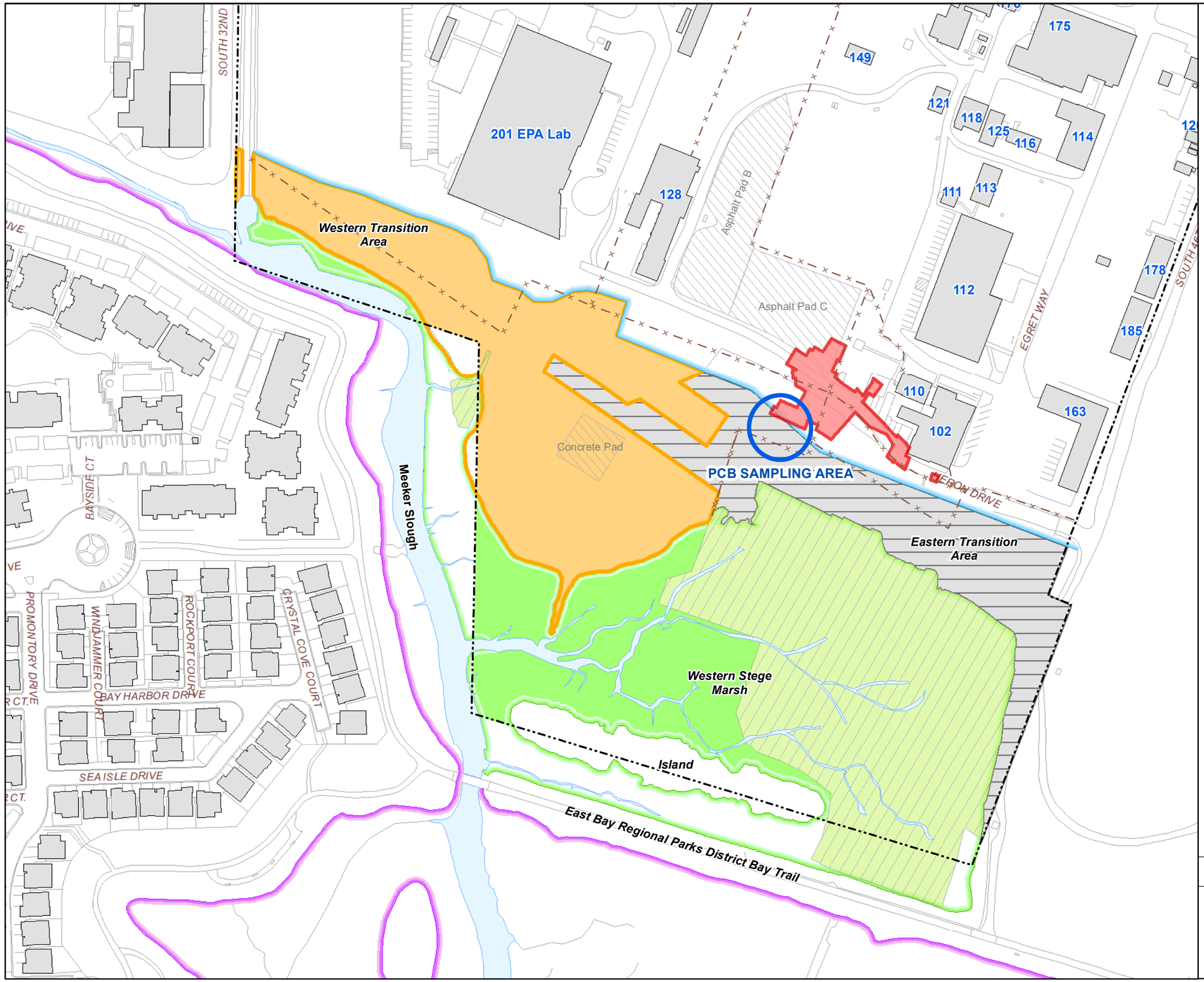

Western Stege Marsh

- Phase V Investigation Area – Old Marsh within UC Property Boundary
- Western Stege Marsh (4.5 ft NGVD)
- Remediated Portion of Western Stege Marsh

Transition Area

- Phase V Investigation Area - Western Transition Area on UC Property
- Western Transition Area
- Eastern Transition Area
- PCB Sampling Area
- Mercury Fulminate Area Excavation Boundary
- Fence Line
- Surface Water
- Former Seawall
- Marsh Boundary West of Meeker Slough (4.5 ft NGVD)
- Richmond Field Station Site

N

0 75 150 300

Feet

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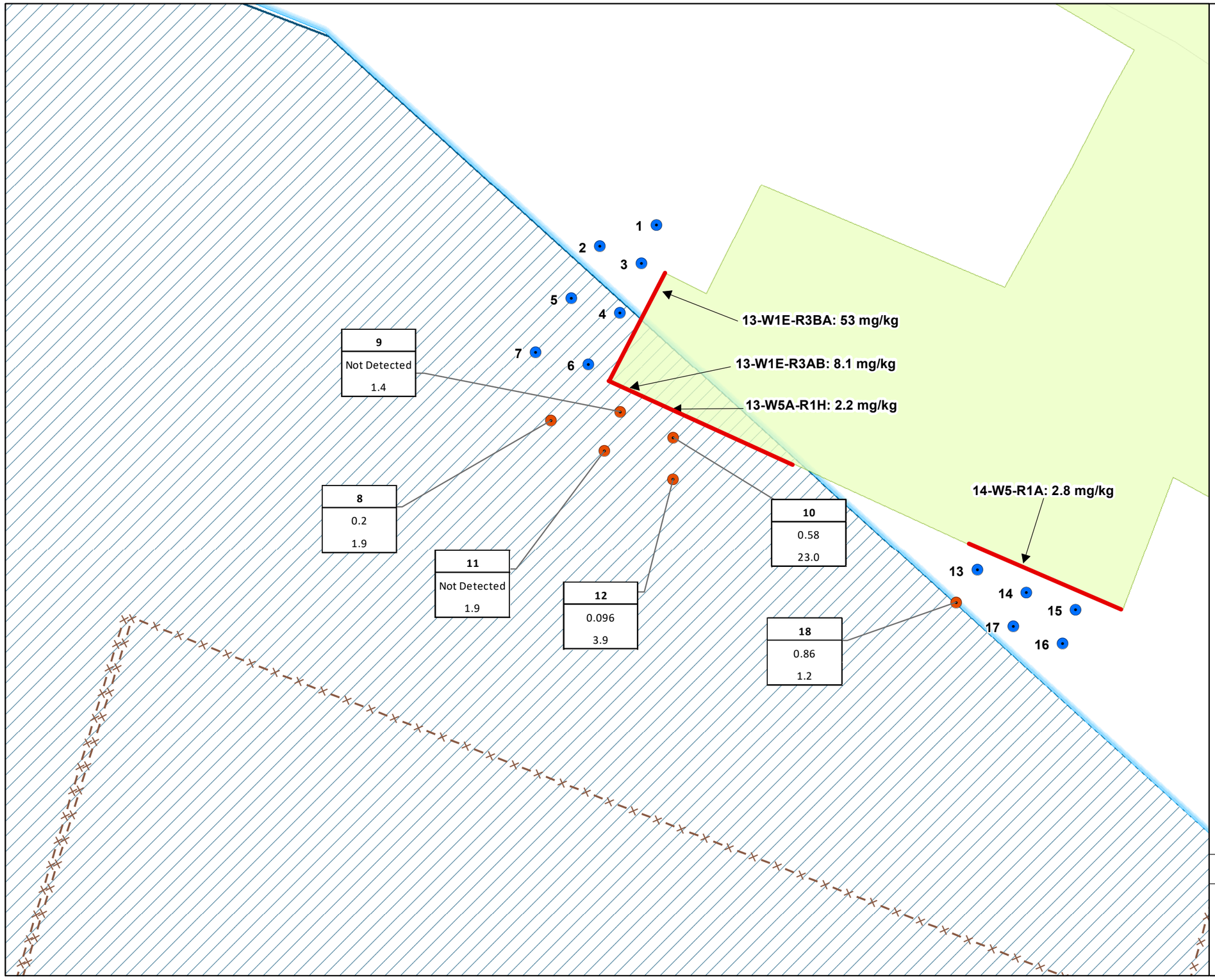
Richmond Field Station Site
University of California, Berkeley

FIGURE 1
SITE MAP

8/31/2022 C:\misc_GIS\Richmond_Field_Station\Projects\WTA-MFA PCB Sampling\Figure1_SiteMap.mxd - michelle.handley



18	Sample Location Number
0.86	Total PCB Result (mg/kg) at 0 to 0.5 ft bgs
1.2	Total PCB Result (mg/kg) at 2.5 to 3 ft bgs

- Total PCB Results Below 1 mg/kg
- Total PCB Results Above 1 mg/kg
- Mercury Fulminate Area Excavation Boundary
- Sidewall Sample
- Eastern Transition Area (Clean Imported Fill)
- Fence Line
- Former Seawall

Notes:
ft bgs feet below ground surface
mg/kg milligrams per kilogram
PCB polychlorinated biphenyls

N

0 4.5 9 18
Feet

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FIGURE 2
PREVIOUS PCB RESULTS

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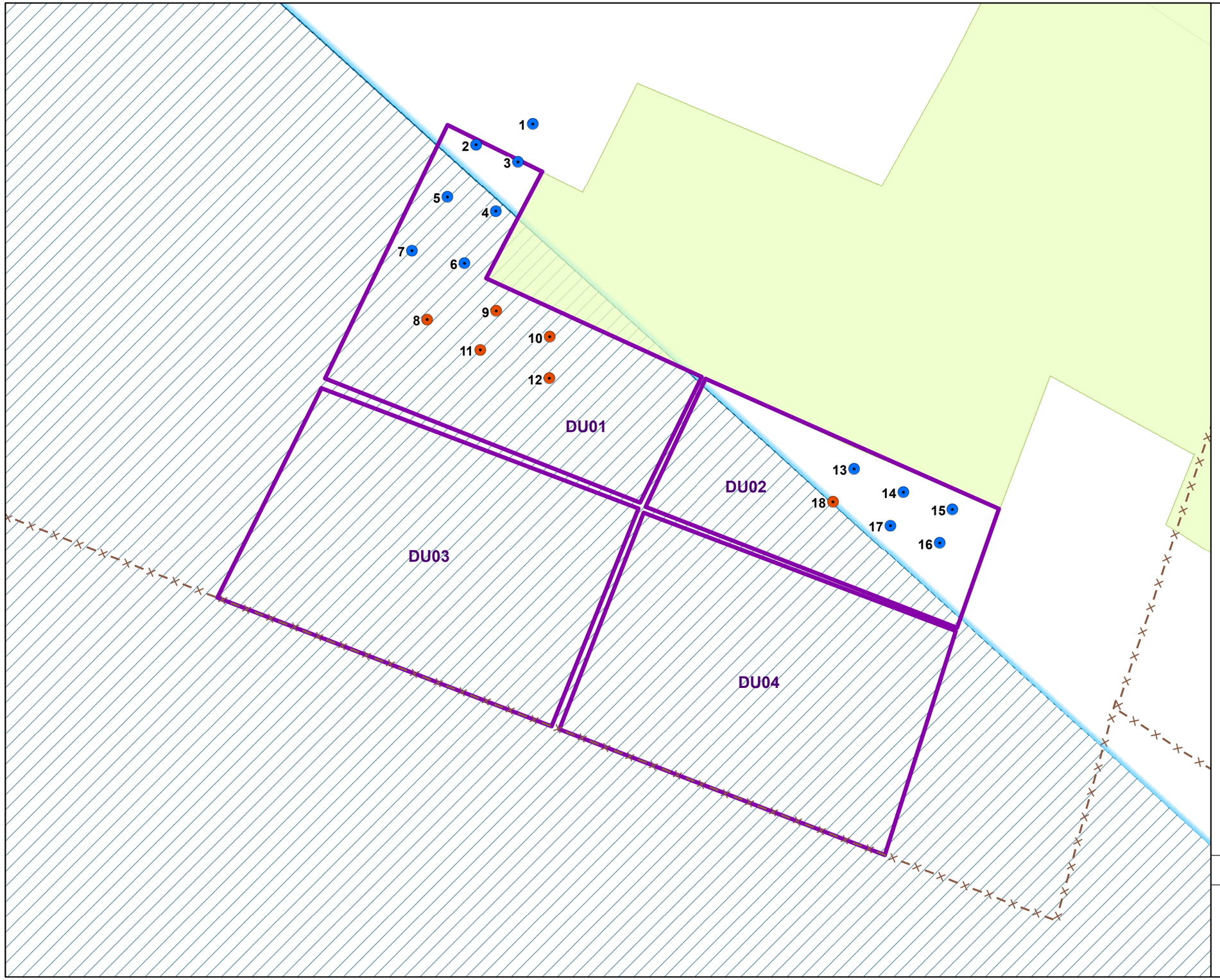

Previous Sample Location - Blue
Previous Sample Location - Red
Proposed Decision Unit
MFA Excavation Boundary
Eastern Transition Area (Clean Imported Fill)
Fence Line
Former Seawall

N

0 4.5 9 18
Feet

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FIGURE 3
PROPOSED DECISION UNITS

8/23/2022 C:\misc_GIS\Richmond_Field_Station\Projects\WTA-MFA PCB Sampling\Figure3_ProposedDUs.mxd - michelle.handley

Table 1
Eastern Transition Area PCB Sample Results

Sample ID	Depth (ft bgs)	Total PCBs (mg/kg)
13-W1E-R3AB	1.0 – 1.5	8.1
13-W1E-R3BA	1.5 – 2.0	53
13-W5A-R1H	3.5 – 4.0	2.2
14-W5-R1A	1.4 – 2.0	2.8
1	0 - 0.5	Not detected
	2.5 - 3.0	Not detected
2	0 - 0.5	Not detected
	2.5 - 3.0	0.36
3	0 - 0.5	Not detected
	2.5 - 3.0	Not detected
4	0 - 0.5	Not detected
	2.5 - 3.0	Not detected
5	0 - 0.5	0.082
	2.5 - 3.0	Not detected
6	0 - 0.5	Not detected
	2.5 - 3.0	Not detected
7	0 - 0.5	Not detected
	2.5 - 3.0	0.39
8	0 - 0.5	0.2
	2.5 - 3.0	1.9
9	0 - 0.5	Not detected
	2.5 - 3.0	1.4
10	0 - 0.5	0.58
	2.5 - 3.0	23
11	0 - 0.5	Not detected
	2.5 - 3.0	1.9
12	0 - 0.5	Not detected
	2.5 - 3.0	3.9
13	0 - 0.5	Not detected
	2.5 - 3.0	Not detected
14	0 - 0.5	0.32
	2.5 - 3.0	0.7
15	0 - 0.5	Not detected
	2.5 - 3.0	0.47
16	0 - 0.5	0.17
	2.5 - 3.0	Not detected
17	0 - 0.5	0.21
	2.5 - 3.0	0.67
18	0 - 0.5	0.86
	2.5 - 3.0	1.2

Notes:

ft bgs	Feet below ground surface
mg/kg	Milligrams per kilogram
PCB	Polychlorinated biphenyls
1.9	Sample results in red are above 1 mg/kg

Incremental Sampling Methodology (ISM)

Laboratory Processing For PCBs and Semi-Volatiles Compounds

Document No. Samp-ISM	**Rev No.** 02	**Effective Date:** 02/15/2021

Reviewed and Approved By: _____ 02-05-2021
Angela Rydelius — Date

Reviewed and Approved By: Theresa Johnson 02-08-2021
Theresa Johnson — Date

Disclaimer

The current TNI Standard, Volume 1, Module 2 Quality Systems General Requirements, Section 4.2.8.5 states with regard to laboratory SOPs.

a. These documents, for example, may be equipment manuals provided by the manufacturer, or internally written documents with adequate detail to allow someone similarly qualified, other than the analyst, to reproduce the procedures used to generate the test result.

b. The laboratory shall have and maintain an SOP for each accredited analyte or method.

c. The documents that contain sufficient information to perform the tests do not need to be supplemented or rewritten as internal procedures, if the documents are written in a way that they can be used as written. Any changes, including the use of a selected option must be documented and included in the laboratory's methods manual.

d. The test methods may be copies of published methods as long as any changes or selected options in the methods are documented and included in the methods manual. .

In accordance with these instructions, this SOP is an internally written document that acts as a supplement to the published method it references. This SOP does not stand alone and is to be used in conjunction with the published method. Instrument specific instructions, quality control summaries, as well as internal MAI policies are referenced in this SOP, including any deviations from the published method, if any such deviations exist. In the absence of a stated deviation, this SOP adheres strictly to all the requirements of the published method, regardless of whether or not those requirements are explicitly stated in this document.

1.0 Scope and Application

1.1 This Standard Operating Procedure describes MAI procedure and/or Guidance on handling and processing of whole soil and sediment samples for representative subsampling and analysis using the Incremental Sampling Methodology (ISM, see reference 4). The ISM method is designed to statistically reduce or limit the variability associated with discrete sampling and to generate a single representative sample for a given area (or 'decision unit').

2.0 Method Summary

2.1 All field collected incremental subsamples – representing a single unit – are combined and processed (by mixing/homogenizing) into a single sample. The composited sample is air dried under a hood to constant dryness. The dried sample then undergoes particulate size reduction by grinding using the Retsch grinder/crusher.

2.2 Sample particulate size is reduced to the level required to pass through a <2mm sieve. The homogenized sample is either: 1) systematically subsampled from a flat tray in 30 different locations (an additional multi-increment sampling) or 2) is split using a rotary sample splitter/divider.

2.3 The resulting composited aliquot is analyzed according to the required method procedure(s).

3.0 Definitions

3.1 Definitions are in the Quality Manual, section 3.3 Glossary and Acronyms.

4.0 Interferences

4.1 Not applicable to this procedure.

5.0 Safety

5.1 Proper Personal Protective Equipment (PPE) is used in all instances of laboratory practice to assure safety of laboratory personnel at all times. A laboratory coat, eye protection, and gloves are the minimum requirements.

5.2 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined however, each chemical compound should be treated as a potential health hazard, and exposure to these chemicals must be reduced to the lowest possible level by whatever means available.

6.0 Equipment & Supplies

6.1 Retsch BB50 grinder.

6.2 Sieve (2mm opening: #10 US).

6.3 Drying trays.

6.4 Dust mask (toxic dust respirator preferred, e.g., MSA Safety #817664 mask).

6.5 Sample splitter (or tray method).

7.0 Reagents & Standards

7.1 This section is not applicable to the process.

8.0 Sample Collection, Preservation, Shipment & Storage

8.1 Samples can be collected in various containers in a sealed container. Once received the samples are stored between 0-6 ºC. There is no specified hold time.

9.0 Quality Control

9.1 One Method Blank must be analyzed with each analysis batch. The results must be below the RL before continuing the analysis. If not, corrective action must be taken.

9.2 Matrix spike and Matrix spike duplicate may be analyzed with every batch of samples as required by the COC.

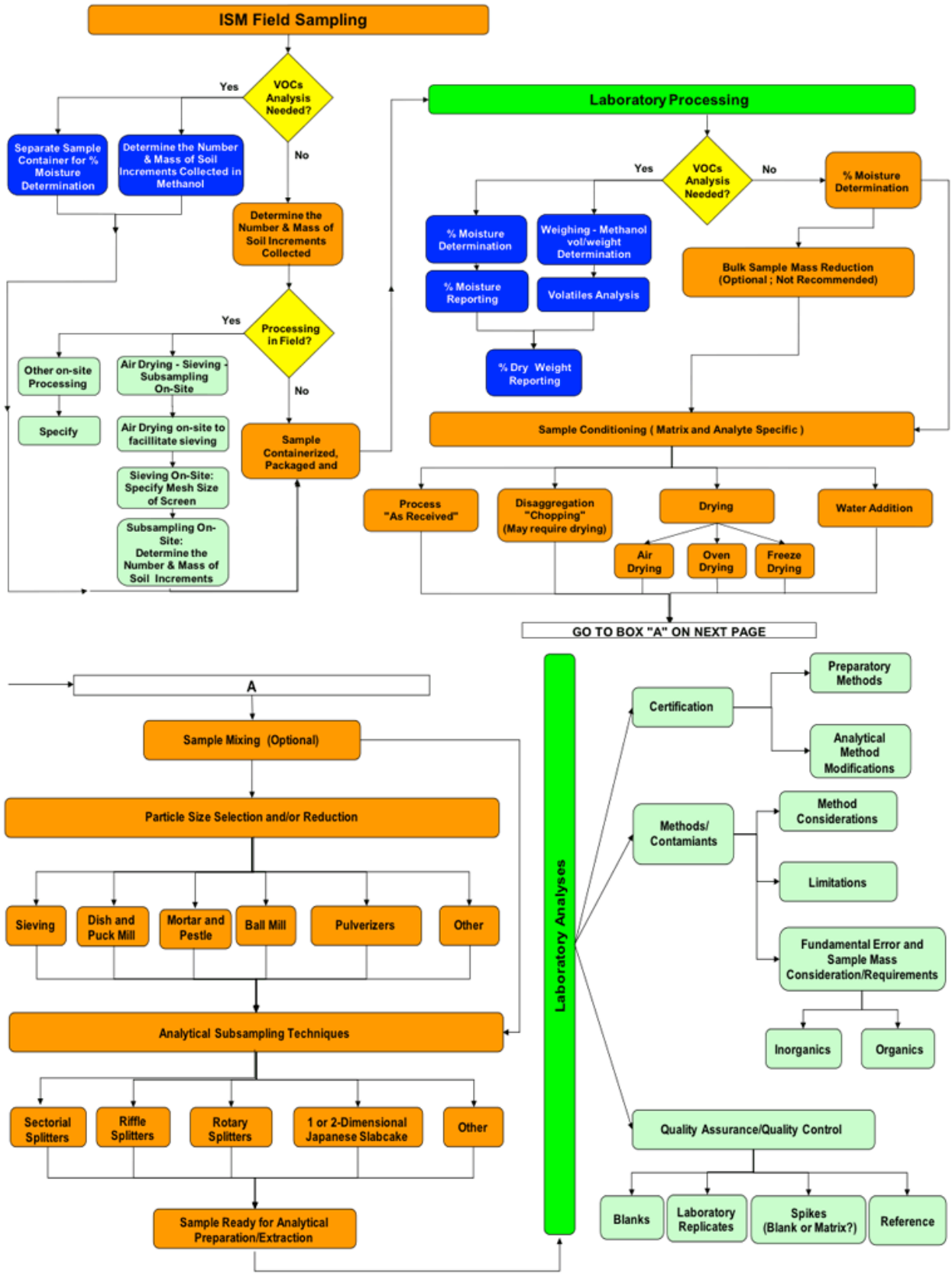
9.3 A Lab Control Sample (LCS) may be prepared and analyzed with each analysis batch as required by the COC.

10.0 Calibration & Standardization

10.1 This section is not applicable to the ISM process.

11.0 Workflow

11.1 The figure below is the official Incremental Sampling Methodology workflow as depicted in the ISM-1 published method (Interstate Technology & Regulatory Council (ITRC) 2012). This is Figure 6.1 from the ISM-1 method indicating: the state of the sample(s) upon acceptance by the laboratory, the laboratory processing required the subsampling methodology and the various laboratory analysis pathways.


ISM Field Sampling
VOCs Analysis Needed?
Yes
No
Separate Sample Container for % Moisture Determination
Determine the Number & Mass of Soil Increments Collected in Methanol
Determine the Number & Mass of Soil Increments Collected
Processing in Field?
Yes
No
Other on-site Processing
Specify
Air Drying - Sieving - Subsampling On-Site
Air Drying on-site to facillitate sieving
Sieving On-Site: Specify Mesh Size of Screen
Subsampling On-Site: Determine the Number & Mass of Soil Increments
Sample Containerized, Packaged and
Laboratory Processing
VOCs Analysis Needed?
Yes
No
% Moisture Determination
Weighing - Methanol vol/weight Determination
% Moisture Reporting
Volatiles Analysis
% Dry Weight Reporting
% Moisture Determination
Bulk Sample Mass Reduction (Optional ; Not Recommended)
Sample Conditioning (Matrix and Analyte Specific)
Process "As Received"
Disaggregation "Chopping" (May require drying)
Drying
Water Addition
Air Drying
Oven Drying
Freeze Drying
GO TO BOX "A" ON NEXT PAGE
A
Sample Mixing (Optional)
Particle Size Selection and/or Reduction
Sieving
Dish and Puck Mill
Mortar and Pestle
Ball Mill
Pulverizers
Other
Analytical Subsampling Techniques
Sectorial Splitters
Riffle Splitters
Rotary Splitters
1 or 2-Dimensional Japanese Slabcake
Other
Sample Ready for Analytical Preparation/Extraction
Laboratory Analyses
Certification
Preparatory Methods
Analytical Method Modifications
Methods/ Contamiants
Method Considerations
Limitations
Fundamental Error and Sample Mass Consideration/Requirements
Inorganics
Organics
Quality Assurance/Quality Control
Blanks
Laboratory Replicates
Spikes (Blank or Matrix?)
Reference

12.0 Procedure

12.1 Compositing

12.1.1 An ISM sample is a composite sample made up of 30+ smaller individual samples, typically core samples of uniform size and weight. If we receive a single large sample (1 kg or more) we assume that the 30+ smaller individual samples have already been combined by the client in the field. If the sample arrives at the lab as a collection of small samples (30+ tubes or cores) then the individual cores will be combined into a single sample.

12.1.2 The COC must indicate whether vegetation, oversized material, or decantable water are to be included or excluded from the sample. Decantable water can be poured off the top of the settled sample. Vegetation and oversized material can be manually removed with tweezers or spatulas but may be removed more reproducibly by sieving once the sample is dried. The excluded materials can be weighed and documented via photographs; and weight adjusted/removed when appropriate.

12.2 Sample Drying

12.2.1 The samples must be dry enough to pass through the grinder without sticking or jamming. Weigh the sample to determine initial weight of the sample. Dry the entire soil sample, including organic material, at room temperature (or less) to a constant weight, being careful not to expose the samples to direct sunlight (final weight = constant weight).

12.2.2 Use trays to dry the samples under the hood (see Figure 1). Once the entire sample is air-dried large pebbles and vegetation (sticks) should be removed prior to grinding. The drying process may take several days for wet soils.

Figure 1 - Drying the (composited) sample

12.3 Sample Grinding

12.3.1 The entire dried sample is ground using the Retsch BB50 Grinder to a final particulate size of 2 mm or less (passes through a #10 sieve). The most common sieve size for ISM samples is <2 mm (standard #10 sieve), but specific objectives may necessitate a smaller or larger sieve.

12.4 Subsampling

12.4.1 To obtain a representative subsample the entire sample should be spread out on a clean tray (use aluminum foil if Al content is unimportant) to a thickness of 1 to 2 cm. This work should take place in a fume hood designed to prevent the spread of dust and minimize possible inhalation. Mark out a grid of 30 squares on the top surface of the sample (see Figure 2, below).

12.4.2 A small sub-sample is then taken by removing material that represents the entire vertical column of the cake – a small plastic corer will work. The sub-sampled material is placed in a receiving container. This process is repeated for every grid of the entire spread-out sample. The resulting subsample is typically 10-30g in size. However, as the entire subsample should be used for an analysis the sample size collected should match the size required for that particular analysis.

12.4.2.1 This will help eliminate inhomogeneity issues arising from using only part of a sampled aliquot. 0.33g collected from 30 grids will yield a 10g sample. To further reduce the uncertainty this sample should be mixed in a bladed mixer prior to analysis – unless the entire 10-30g sample will be used for a given analysis.

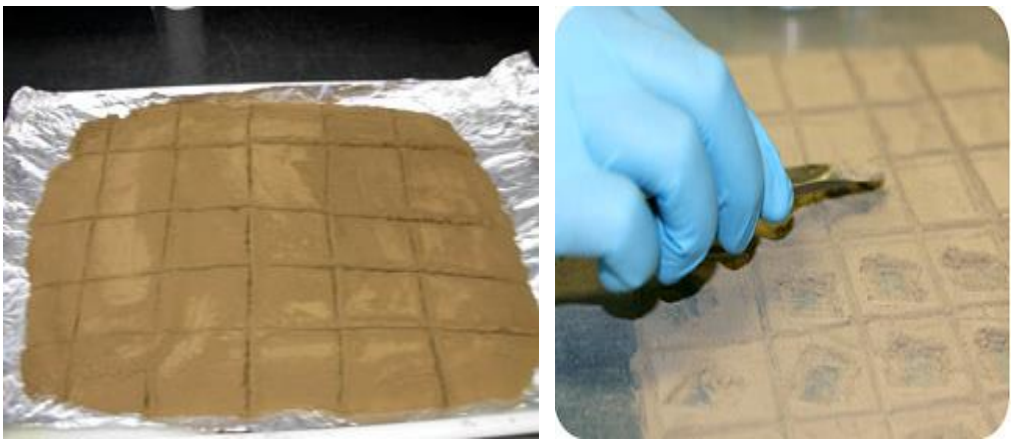


Figure 2 - 30 square grid marked on sample; sampling the grids

Note: If a rotary sample splitter is available then the entire sample is placed in the splitter hopper and one or more aliquots are collected from the entire dried sample.

12.5 **Sample Extraction**

12.5.1 The resulting 10-30g soil sample aliquots are extracted according to the particular method extraction procedure.

13.0 Data Analysis & Calculations

13.1 This section is not applicable to the ISM process.

14.0 Method Performance

14.1 True method performance can only be measured by verifying sample homogeneity between subsample aliquots. In general, multi-incremental sample replicates are usually normally distributed with very few outliers.

15.0 Pollution Prevention

15.1 This method does not contain any specific modifications that serve to minimize or prevent pollution.

15.2 The chemicals used in this method pose little threat to the environment when properly managed.

15.3 All standards and reagents should be prepared in volumes consistent with laboratory use to minimize the volume of disposable waste.

15.4 For further information on pollution prevention consult Less is Better: Laboratory Chemical Management for Waste Reduction, available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street NW, Washington D.C. 20036, (202) 872-4477.

16.0 Corrective Actions for Out of Control data

16.1 Refer to Nonconformance/Corrective Action Report (NC/CAR/PR) Procedure.

17.0 Contingencies for Handling Out of Control Data or Unacceptable Data

17.1 Contact the laboratory manager or technical manager to assess out of control / unacceptable data.

18.0 Waste Management

18.1 All wastes must be disposed of safely, samples and extracts are disposed of following local, state, and federal regulations along with MAI's internal laboratory procedure, G-Waste Disposal.

19.0 References

19.1 EPA Method 8330B. Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

19.2 EPA Contaminated Site Clean-up Information; www.CLU-IN.org; Soil Sampling and Decision Making Using Incremental Sampling Methodology - Part 1; www.clu-in.org/conf/itrc/ISM_110612/

19.3 Test Methods for Evaluating Solid Waste SW846.

19.4 Incremental Sampling Methodology; http://www.itrcweb.org/ism-1/

19.5 Incremental Sampling Methodology, Section 6. Laboratory Sample Processing and Analysis; www.itrcweb.org/ism-1/6_LABORATORY_SAMPLE_PROCESSING_AND_ANALYSIS.html

19.6 State of Alaska Department of Environmental Conservation, Division of Spill Prevention and Response, Contaminated Sites Program, Draft Guidance on Multi-Incremental Soil Sampling, March 2009.

20.0 Revision History

20.1 Provide justification and explanation of change: *The procedure was reviewed and no changes were needed.*

Department of Toxic Substances Control

Meredith Williams, Ph.D., Director
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Berkeley, California 94710-2721

Yana Garcia
Secretary for
Environmental Protection

Gavin Newsom
Governor

M E M O R A N D U M

TO: Nicole Yuen, Project Manager
Senior Environmental Scientist
Cleanup Program, Berkeley Office
Site Mitigation and Restoration Program

FROM: Mark Sorensen, PG 7448
Engineering Geologist
Geological Services Branch – Berkeley
Site Mitigation and Restoration Program

DATE: November 21, 2022

SUBJECT: **REVIEW OF EASTERN TRANSITION AREA, PROPOSED SAMPLING RICHMOND FIELD STATION UNIVERSITY OF CALIFORNIA, BERKELEY**

SITE 201605-00 PCA: 11018 MPC: OTHplan WR 20089404

DOCUMENT REVIEWED

As requested, the Berkeley Geological Services Unit (GSU) has reviewed the *Eastern Transition Area, Proposed Sampling, Richmond Field Station, University of California, Berkeley* (Letter), dated September 24, 2022. The Letter was prepared by Tetra Tech, Inc. The Letter offers recommendations for sampling in this area as a follow-up to the results of PCB samples collected during a removal in the adjoining Mercury Fulminate Area. The Report was reviewed with respect to geologic and hydrogeologic interpretations and technical adequacy.

BACKGROUND

The established cleanup goal for total polychlorinated biphenyls (PCBs) in site soils is 1 milligram per kilogram (mg/kg). UC Berkeley recommended the sampling after finding PCBs in some samples during the Mercury Fulminate Area removal action completed in January 2020. During the removal action, PCBs were identified in confirmation samples

at the southwestern-most portion of the Mercury Fulminate Area excavation, on the border of the Eastern Transition Area (ETA). The source of PCBs in soil is unknown. Sample results indicated total PCBs greater than the cleanup goal of 1 mg/kg at six of the 18 sample locations; all samples above 1 mg/kg were collected at the 2.5 to 3.0 feet below ground surface (ft bgs) interval, while samples from 0 to 0.5 ft bgs were all non-detect for PCBs. As has been the practice at other areas of PCB soil contamination at the Richmond Field Station, Incremental Sampling Methodology (ISM) will be applied to collect and analyze soil samples from decision units (DUs) DU01 through DU04 of concern that have been defined within the ETA.

COMMENTS AND RECOMMENDATIONS

1. *Proposed Sampling, Page 3,* and *Laboratory Processing, Subsampling, and Analyses, Page 4*

   In the fourth paragraph of the Proposed Sampling section, in the description of the field soil sampling increments, the text states

   > "The nested triplicate set at DU01 will consist of 90 borings."

   This statement appears inconsistent with this statement from the Laboratory Processing, Subsampling, and Analyses section on Page 4. It is unclear whether the second and third subsamples of the nested triplicate will be collected from borings distinct from those used to collect the first set of samples. Please clarify this issue by adding the **bold** text as follows:

   > "The second and third independent representative subsamples [at DU01] will be collected in the same way by taking separate increments from **30 different borings each, within** the same 30 grid cells **used to collect the first subsample**."

If you have any questions or comments regarding this memorandum, please contact Mark Sorensen at (510) 540-3947 or Mark.Sorensen@dtsc.ca.gov, or Jon Buckalew (Buck) King at (510) 540-3955 or Buck.King@dtsc.ca.gov.

Reviewed by: Theodore (Ted) Mazzoli, PG
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Geological Services Branch
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From: Ziff, Sara <ZIFF.SARA@EPA.GOV>
Sent: Thursday, October 6, 2022 2:56 PM
To: Brodersen, Jason <Jason.Brodersen@tetratech.com>
Cc: abihler <abihler@berkeley.edu>; John Edgcomb <jedgcomb@edgcomb-law.com>; Yuen, Nicole@DTSC <Nicole.Yuen@dtsc.ca.gov>
Subject: RE: RFS ETA PCB Sampling Letter

Hi Jason,

Thanks for submitting this sampling proposal for the Eastern Transition Area. I have a couple of comments/questions:

- The depth ranges of 0 to 2.5 and 2.5 to 5.0 ft bgs seem a bit wide, but I think these make sense for an initial sampling round. If the proposed remedial action ends up being soil removal, it may make sense to sample additional depth intervals at certain places.

- Is the ETA habitat for the endangered rail? This will inform our decision on whether to require active remediation, similar to the rest of the marsh.

Thanks,
Sara

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The RCRA Program in Region 9 accepts all formal correspondence and documents electronically. Please CC: R9LandSubmit@epa.gov. Thank you!