



August 29, 2019

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Sara Ziff
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75 Hawthorne Street
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**Subject: Corporation Yard, Data Gap Sampling Approach
Richmond Field Station
University of California, Berkeley**

Dear Ms. Nakashima and Ms. Ziff:

On behalf of the University of California Berkeley, Tetra Tech, Inc. proposes to conduct a data gap investigation as a follow-up to the removal action conducted at the Corporation Yard in 2017-2018. The purpose of the investigation is to determine the mean concentrations of polychlorinated biphenyls (PCB) within the near surface (0-2 inches below ground surface) within the entire Corporation Yard, Building 185, and north of Building 197 (investigation areas). The investigation areas are shown on Figure 1, as well as PCB results from sampling conducted within the East Meadow in 2018. Figure 2 provides a summary of the PCB confirmation sample results collected during the 2017-2018 removal action.

The mean concentrations will be used to scope additional activities consistent with (1) the Toxic Substance Control Act (TSCA) Risk-Based Disposal Approval Application for the Corporation Yard, dated August 10, 2017, and (2) the Removal Action Workplan for the Corporation Yard, dated July 18, 2014. Additional sampling is required since the cleanup goal of 1 milligram per kilogram (mg/kg) identified in the Removal Action Workplan was not achieved at all excavations during the 2017-2018 removal action.

This letter replaces the July 29, 2019 submittal. Updates include additional rationale for the sampling locations, and Figure 1 no longer includes the restrooms, which have been removed.

Sampling Locations and Protocols

Incremental Sampling Methodology (ISM) will be used to collect soil samples from decision units identified on Figure 1. ISM was selected for this project to provide a comprehensive and thorough evaluation of chemical concentrations in a specific volume of soil, or decision unit. The result of each ISM sample will be used as the mean concentration for the decision unit. ISM is an approved sampling methodology by U.S. EPA under its TSCA Program.

- Decision units were selected to provide lateral characterization of surface soils at areas where the PCB cleanup level of 1 mg/kg was not achieved during the 2017-2018 removal action, consisting of Excavations 3A, 3B, 4, and 8. The investigation area also includes the surface soils subject to

surface flow to the storm drain southwest of Excavation 5, since the storm drain and Excavation 5 contained PCBs above 1 mg/kg.

- Confirmation samples at Excavation 3A exceeded 1 mg/kg at all sidewall samples and within surface samples collected following the removal action, as shown on Figure 2. DU7 and DU8 are intended to further characterize the lateral area adjacent to Excavation 3A. The area southeast of Excavation 3A is not proposed for sampling as it covered by 3-4 inches of concrete.
 - Confirmation samples at Excavation 3B exceeded 1 mg/kg at the north and west sidewalls. The excavation is bound to the south by Excavation 3A and to the east by Building 120. DU5 and DU6 are intended to characterize the lateral areas adjacent to Excavation 3B.
 - Confirmation samples at Excavation 4 exceeded 1 mg/kg at the north and south sidewalls. Excavation 4 is bound to the west by the Building 120 foundation, and to the east by the property boundary. DU4 and DU8 are intended to characterize the lateral areas adjacent to Excavation 4.
 - Confirmation samples at Excavation 8 exceeded 1 mg/kg at the north and west sidewalls. DU1, DU2, and DU3 are intended to characterize the lateral areas adjacent to Excavation 8.
 - DU9 and DU11 through DU 17 are intended to characterize the surface soils potentially transported by stormwater runoff from the Excavation 3A area to the storm drain southwest of Excavation 5.
 - PCBs were not identified as chemicals of concern at Excavations 1, 2, 6, and 7. Confirmation samples for PCBs at Excavation 9 were below 1 mg/kg.
- A minimum of 75 increments will be collected from within each decision unit. The corners and edges of each decision unit will be marked with flags, and the spacing of increments will be determined in the field based on the shape of each decision unit. The precise location of each increment is not critical, as long as they are distributed evenly throughout the decision unit.
 - Increments will be collected from the top 2 inches of the native surface with a disposable scoop or other disposable sampling apparatus. In some areas, the native surface is the current surface cover; however, where gravel is present, the gravel will be removed prior to collecting the increment. Each increment will be approximately 20 grams of soil.
 - Increments from each decision unit will be placed directly into a 32-ounce glass jar, or multiple jars if necessary. The target weight of each ISM sample is approximately 1.5 kilograms. Each jar will be labeled and packed into an insulated cooler; the use of ice packs is not necessary for the preservation of samples analyzed for PCBs. The samples will be transported under chain-of-custody procedures directly to Enthalpy Laboratory in Berkeley, California.

- Field triplicates will be collected from two random decision units. A field triplicate consists of the collection of 75 increments thrice within the same decision unit from different locations. The primary purpose of the field triplicate is to evaluate the effectiveness of the ISM sample to capture any PCB contaminant variability within the decision unit. The field triplicate results will also inherently include any laboratory variability.

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

Analyses and Results

Soil samples will be processed according to Enthalpy's internal ISM protocol. The 1.5 kilogram sample will be subsampled to a final analytical aliquot of 30 grams. Samples will be analyzed for PCBs by EPA Method 8082 with 3540C Soxhlet extraction.

One laboratory triplicate will be identified from each field triplicate set and analyzed for PCBs by the laboratory three times. Each laboratory triplicate will be subsampled and evaluated separately. The primary purpose of the laboratory triplicate is to evaluate the effectiveness of the subsampling protocol and any laboratory variability. Together, the field and laboratory triplicates constitute a nested triplicate.

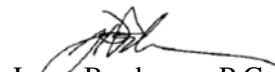
The field and laboratory triplicates will be used to calculate a relative standard deviation (RSD) which can be used to help evaluate field precision, representativeness, and reproducibility. UC Berkeley recommends that an RSD of 35 be used as a benchmark for evaluation; however, other factors such as the relative difference between the measured concentrations and the action level will also be considered. The benchmark is not intended to be used as a pass/fail criteria.

Sample results will be compared to the cleanup criteria of 1 mg/kg as identified in the Removal Action Workplan.

The sample results will be presented in a sampling letter report and help provide the basis for scoping the completion of the objectives of the original removal action. The data collected during this investigation will be presented with the comprehensive data from the Corporation Yard removal action.

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

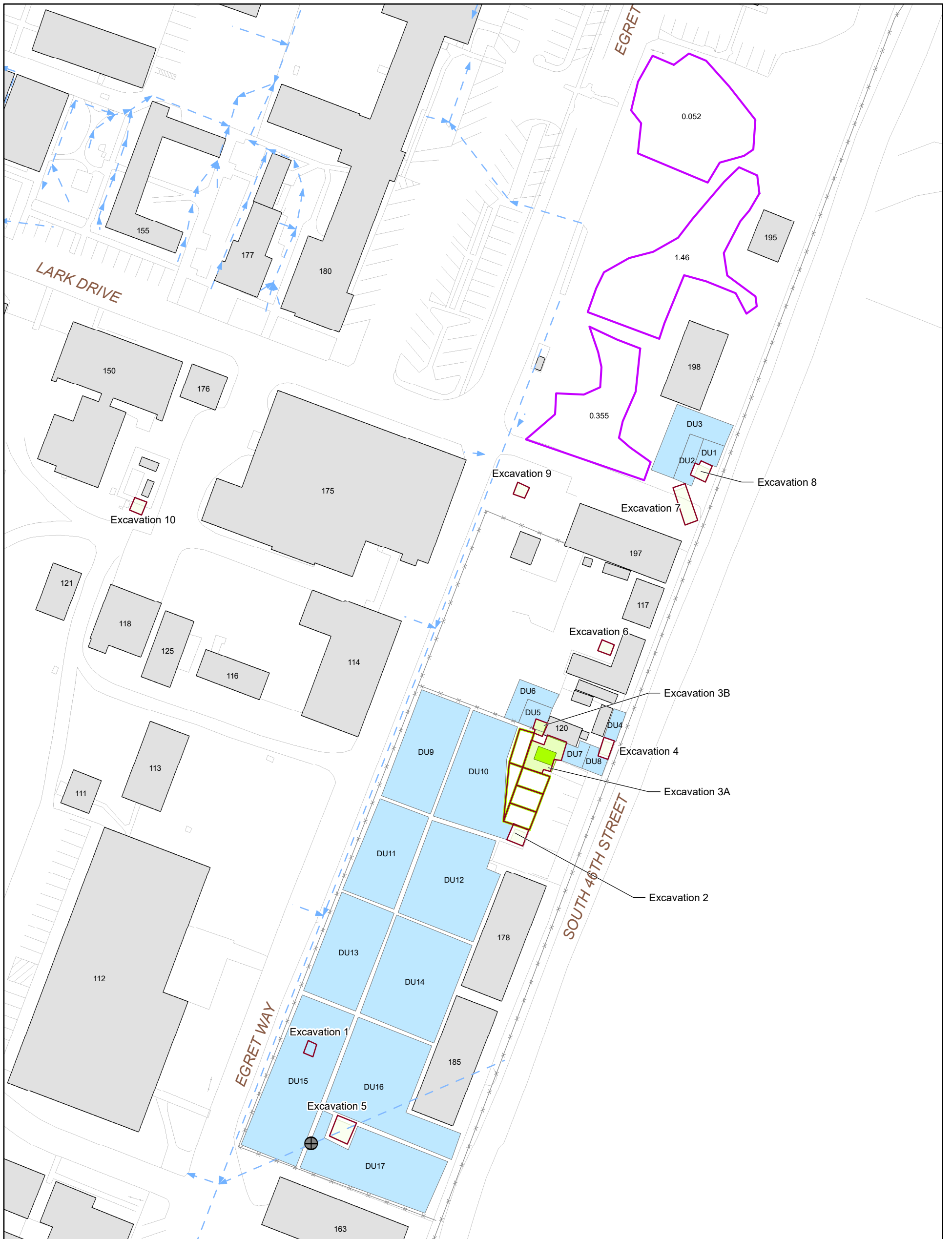
Sincerely,



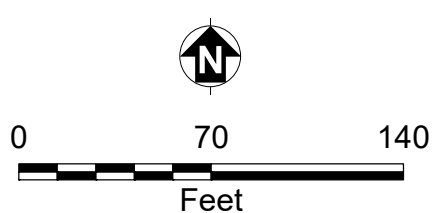
Jason Brodersen, P.G.
Project Manager

Attachment: Figures 1 and 2

cc: Alicia Bihler, UC Berkeley EH&S



- Final Excavation Depth 1.5 feet
- Final Excavation Depth 3.5 feet
- East Meadow Decision Unit, PCB totals from incremental samples shown in mg/kg
- Proposed New Decision Unit
- Buildings
- Fenceline
- Roads and other Landscape Features
- Storm Water Lines and Direction of flow
- Storm Water Inlet



Richmond Field Station Site
University of California, Berkeley

FIGURE 1



- Final Excavation Depth 1.5 feet
- Final Excavation Depth 3.5 feet
- Buildings
- Fenceline
- Roads and other Landscape Features

Note:
1. PCB samples not collected from Excavations 2 and 7.



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FIGURE 2