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DRAFT  
Revised Updated Application  
for Remediation of  
Polychlorinated Biphenyls  
Former Wastewater Treatment Plant  
Larkspur, California

20 February 2018

Prepared for  
Sanitary District No. 1  
of Marin County  
2960 Kerner Boulevard  
San Rafael, CA 94901

K/J Project No. 1565036.01

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## Section 1: Introduction

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This *Revised Updated Application for Remediation of Polychlorinated Biphenyls* (Application) identifies the processes and procedures that will be implemented by the Sanitary District No. 1 of Marin County (District) to remediate polychlorinated biphenyl (PCB) contaminated debris and soil at the Former Larkspur Wastewater Treatment Plant located at 2000 Larkspur Landing Circle, Larkspur, California (Site). The Site location is shown on Figure 1 and the layout of the former treatment plant is shown on Figure 2.

The District has been working with the United States Environmental Protection Agency (USEPA) Region 9 PCB Coordinator to address PCBs found in debris and soil deposits at the Site per requirements of the Toxic Substances Control Act (TSCA), including the development of the remediation plan presented in this Application.

- The District submitted the *Application for Risk-Based Cleanup of PCB-Impacted Site* (Kennedy/Jenks 2014) to the USEPA on 24 July 2014, in accordance with TSCA regulations for PCBs under 40 Code of Federal Regulations (CFR) 761.61(c), for the Site. The application proposed the interim use of approximately 5 acres of the Site as a commuter parking lot.
- The USEPA provided preliminary approval of the application on 21 October 2014, pending submittal of additional site characterization and construction information for the various site improvements to support the interim parking use. The USEPA documented comments in the letter, *Toxic Substances Control Act, Polychlorinated Biphenyls - Application under 40 CFR 761.61(c), former Ross Valley Sanitary District Waste Water Treatment Plant, Larkspur, CA*, from Jeff Scott (USEPA) to Greg Norby (District) dated 12 November 2014 (USEPA 2014).
- Subsequent to that preliminary approval, the District reconsidered the remedial objectives for the Site and revised their approach to include pursuing unrestricted use of the Site. To that end, the District prepared a Site Characterization Work Plan (Kennedy/Jenks 2016), in consultation with the USEPA, to address the requested additional site characterization information requested by USEPA.

The work scope described herein presents the results of site characterization conducted to date; and procedures for remediation excavation based on an evaluation of the site characterization results to support the final Site closure.

### 1.1 Project Overview

In-place backfill at the Site was shown to be contaminated with the following chemicals of concern (COCs): polychlorinated biphenyls (PCBs). The COCs are present in Site surface and subsurface deposits at levels that pose a potential risk to human and ecological receptors. The presumptive cleanup technique described by the remediation plan presented in this Application will be to excavate debris and contaminated soil and dispose of the material at a properly licensed off-site disposal facility.

Remediation plan addresses the removal and disposal of PCB remediation waste at the Site in compliance with Section 761.61(c) and other applicable parts of 761 to protect human health and the environment. The cleanup plan includes Contingency measures are included in the remediation plan to address potential PCB impacts that may be discovered during implementation of the remediation plan beyond the spatial limits presented herein.

## 1.2 Purpose and Objectives

The District is submitting this application for a risk-based closure of the site under the Toxic Substances Control Act (Code of Federal Regulations, Title 40, Chapter I, Subchapter R, Part 761, Subpart D, 761.61(c) [40 CFR 761.61(c)]), based on unrestricted future land use. The purpose of the remediation plan presented in this Application is to describe the process for removing and disposing of PCB remediation waste in accordance with risk-based cleanup requirements defined in 40 CFR Section 761.61(c).

Concrete debris and soil impacted by PCBs will be removed and properly disposed of at permitted disposal facilities. Site characterization data are included herein to support the development of the remediation plan, and site management protocols are provided due to the potential for encountering concentrations of total PCBs in soil exceeding levels protective of human and/or sensitive ecological receptors. Soil disturbed at the Site will be managed and/or disposed in accordance with the remediation plan presented in this Application and applicable federal, state, and local laws and regulations.

## 1.3 Regulatory Coordination and Remediation Goal

USEPA enforces regulations implementing TSCA, promulgated at 40 CFR, Part 761. This remediation plan is being submitted to USEPA per the requirements of 40 CFR Section 761.61(c) for risk-based cleanup of PCB remediation waste.

The remedial action objective (RAO) for the Site states the ultimate goal for the remedial action and provides a basis for assessing the effectiveness of remedial action implementation. PCBs are the chemicals of concern (COCs) at the Site. Debris and contaminated soil removal performed in accordance with the remediation plan is intended to protect human health and the environment. The RAO for the Site is remediation to an unrestricted use to avoid the imposition of a deed restriction and allow for future unrestricted development of the Site. To meet this RAO, the following remediation goal was established for the Site: 0.24 milligrams per kilogram (mg/kg) total PCBs.

## 1.4 Document Organization

The Application is organized as follows:

- **Section 1 – Introduction**: identifies the purpose and objectives of the Application.
- **Section 2 – Background**: describes the Site and summarizes the Site history.

- **Section 3 – Site Characterization**: summarizes previous Site characterization and remediation activities, recent Site characterization activities, and the current understanding of the nature and extent of chemical impacts at the Site.
- **Section 4 – Remedial Action Design**: identifies the key components of and summarizes the process for detailed design of the remedial action prior to field implementation.
- **Section 5– Remedial Action Plan**: describes the plan for removing contaminated soil and debris identified in Section 3.
- **Section 6 – Restoration Plan**: describes the activities to be performed following removal of contaminated soil and debris at the Site, including restoration of affected areas to approximate pre-construction conditions.
- **Section 7 – Remedial Action Completion Report**: discusses the documentation that will be submitted to USEPA after implementing the remedial action in accordance with this Application.

References used in preparing the Application are identified following Section 7 and supporting tables, figures, and appendices are provided at the end of the Application.

## Section 2: Background, Site History, and Setting

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The District owned and operated the Larkspur Wastewater Treatment Plant (LWTP), located at 2000 Larkspur Landing Circle in Larkspur, California (Figure 1), between 1948 and 1985. The LWTP facility was no longer needed for local wastewater treatment, following completion of the much larger, centralized wastewater treatment plant by the Central Marin Sanitation Agency in 1985. The District began planning for removal of the treatment plant and redevelopment of the approximately 10.5-acre parcel in 1995. In 1998 and 1999, the District demolished the onsite concrete structures and associated piping. The crushed concrete material was mixed with onsite soils and used as a non-expansive engineered fill to backfill the excavations left by the demolition process. The Site is currently used as an operation base for the District and includes two modular buildings and an area for sewer maintenance and operations equipment, vehicles, and materials staging.

### 2.1 Site Description

The former LWTP site was purchased by the District in the 1940's. The LWTP was constructed in 1948 and consisted of a Control Room building and connected Sludge Digester, Clarifiers #1 and #2, Biofilters #1 and #2, and the Sludge Holding Pit. By the early 1960's, Clarifier #3 and Biofilter #3 were added to the LWTP. In the mid-1970's, a Chlorine Contact Chamber and microscreens were added to the southeast portion of the LWTP. The LWTP was decommissioned in 1985 when wastewater treatment for the Ross Valley service area was shifted to the Central Marin Sanitation Agency (CMSA) Wastewater Treatment Plant. A site plan of the former LWTP is included as Figure 2.

### 2.2 Demolition and Material Reuse

Demolition of the former LWTP facilities was conducted in 1998 and 1999. The treatment plant structures were primarily composed of reinforced concrete and concrete block, and steel. The exteriors of the aboveground portions of the LWTP were painted with a cream to light green colored industrial paint. The LWTP structures were demolished and the concrete was crushed onsite for use as backfill material. Records indicate that the thin veneer of paint that had been applied to the exterior surfaces did not chip or flake off and was not practical to remove from the concrete. Some of the concrete pipes removed during the demolition process were also crushed and utilized as fill material.

The crushed concrete was tested for the presence of total and soluble lead, due to the paint that existed on the structures prior to demolition. Lead was known at the time to be a common constituent of industrial paint and testing of building materials and paint for lead was a standard practice. Testing of two crushed samples revealed low levels of lead:

- 42 milligrams per kilogram (mg/kg) total lead in both samples.
- 0.8 milligrams per liter (mg/l) soluble lead in one sample.
- Less than the analytical method reporting limit of 0.50 mg/l soluble lead in the other sample.

The reported total and soluble lead concentrations were below applicable threshold concentrations and not considered to represent an adverse risk to human health or the environment for the intended future site use (residential and commercial mixed use). At the time (1998 to 1999) it was not realized that the paint on the concrete surfaces contained PCBs. The presence of PCBs in paint was a poorly publicized environmental concern, and testing for PCBs in paint on concrete was not a standard practice at the time. Activities conducted during site demolition were reported to the California Department of Toxic Substances Control (DTSC) by Questa Engineering in 2000.

The grading plan for the overall development included filling in excavations created during building demolition, and importing soils to complete the site grading. The crushed concrete material was mixed with site soils and used as backfill in the various excavation areas created during the demolition process. Some of the crushed concrete was mixed with soils at the bottoms of deep excavations to stabilize wet, clayey soils, but a majority of the crushed concrete/soil mixture was used to backfill pits created by the demolition of the three clarifiers, the Sludge Digester with attached Control Room, and the Sludge Holding Pond. These areas had been excavated to relatively deep depths to remove the concrete tanks and structures. A thin layer of crushed concrete/soil mixture (approximately one foot thick) was also placed near surface grade in the areas of the three biofilters, and in other low-lying areas of the site. Figure 3 illustrates the reported approximate extent of the crushed concrete and mixed fill soil in cross sections through the various site locations.

Subsequent to backfilling with the engineered fill, imported fill was brought onto the site and placed over the crushed concrete material. Testing of this imported fill after grading revealed low concentrations of total petroleum hydrocarbons (TPH) as diesel fuel (TPHd), TPH as motor oil (TPHmo), and polychlorinated biphenyls (PCBs). Site remediation activities were conducted in 2005 and 2006 and in October 2006, the DTSC issued a “No Further Action” letter for the site.

## 2.3 Site Stabilization and Grading

In May 2012 the District re-graded the site to minimize erosion and clean-up its appearance, spreading out clean soil stockpiles that were brought onsite by District as surplus emergency construction materials and by the previous property developer (Campus-St. James) in 2007/2008. The District also installed a stormwater conveyance system and erosion control measures onsite; and maintains best management practices to capture and control runoff, including a CalTrans-type grass mix on the sloped and terraced surfaces to prevent stormwater run-on and run-off from eroding the soils

## 2.4 Current Site Use

The Site is currently used as a District vehicle parking area, Supervisory Control and Data Acquisition (SCADA) computer monitor/control building (and building expansion to the adjacent sanitary sewer pump station called “PS 10 Landing B”), sanitary sewer pipeline and manhole storage area (for new spare parts that are used on an as-needed basis), and incidental employee check-in (to the building). The southernmost approximate two acres are used for this area. The site is completely fenced off from the public with an approximately 8-foot high cyclone chain-link fence, and has a locked swing-gate at the main entrance. Lighting is provided by the SCADA Building / PS 10 Building Expansion, which serves as the employee check-in location.

Employees meet here for an hour in the morning, and an hour at the end of the day. The SCADA Building / PS 10 Building Expansion is a pre-fabricated building that will eventually be replaced by a District Headquarters/Corporation Yard building.

## Section 3: Site Characterization

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Several phases of sampling and excavation have been conducted at the Site (as summarized in subsequent sections), and numerous subsurface samples from test pits, soil borings, and verification samples from previous excavations have been collected. This section summarizes investigation and remediation activities performed at the Site and presents a narrative conceptual site model for the Site.

### 3.1 Historical Site Investigation and Remediation Activities

Detailed information on the individual investigations and/or remedial actions can be found in the following reports, which are available on DTSC's Envirostor website:

- 1996 Questa Investigation (Questa 1996)
- 2000 Questa Report, June 12 (Questa 2000)
- 2004 Questa Phase II Investigation (Questa 2004b)
- 2006 EKI, Report documenting removal of contaminated fill (EKI 2006)
- 2006 NFA from DTSC
- 2007/2008 Questa Phase II Investigation (Questa 2008).

The following summarizes the investigation and remediation activities conducted at the Site between 1995 and 2008.

#### 3.1.1 Pre-Demolition Preliminary Site Characterization

A Phase I Environmental Site Assessment and a Phase II Subsurface Investigation of accessible site locations were conducted between 1995 and 1996, as reported by Questa Engineering Corporation (Questa) in September 1996. Information from the Phase I and Phase II investigations was used to identify the areas of the site to be investigated further in conjunction with demolition of site facilities.

#### 3.1.2 LWTP Demolition Sampling

In 1998, District contracted with Nute Engineering to prepare Demolition and Restoration Plans for the LWTP. The Plans called for the crushing of the concrete plant facilities on site and re-using the material as engineered fill.

- **Phase I:** Phase I of the site demolition included removal of the Chlorine Contact Chamber, Sludge Thickener, and the eastern parking lot. Concrete slabs were temporarily stored in the Sludge Holding Pond area, and later crushed for re-use during Phase II of the demolition. Phase I demolition was accomplished between January and May of 1999.

- **Phase II:** Phase II demolition was conducted between July and September 1999. The structures demolished during Phase II included Biofilters No.1, 2, and 3; Clarifiers No.1, 2, and 3; and the Sludge Digester with attached Control Room. The results of samples collected during demolition were presented in a 12 June 2000 Questa report.

### 3.1.3 Import Fill Characterization

In 2004, a characterization of the imported fill was conducted by Questa to determine if any chemicals of potential concern were present in the imported soils. Results were presented in the June 2004 report prepared by Questa. The investigation included collecting samples using hand augers and electric augers. Twenty-six boreholes to depths of 2.5 to 3.0 feet below the ground surface (bgs) were advanced and 88 soil samples were collected and composited for testing. Laboratory results indicated several chemicals of potential concern in the import fill, including TPHd, TPHmo, and PCBs. These constituents were found to occur in four specific site areas that had received imported fill.

### 3.1.4 Remedial Excavation and DTSC No Further Action

Excavation and removal of contaminated fill containing constituents of concern exceeding the site-specific remedial goals approved by the DTSC (TPHd at 100 mg/kg, TPHmo at 500 mg/kg, and total PCBs at 0.22 mg/kg) from the four sub-sites was completed between September and November 2005. Results of confirmation sampling indicated that the residual contaminant concentrations were reduced in the four areas to levels below the site cleanup goals. A fifth sub-site was identified during completion of this work, and removal of soil exceeding the cleanup goals was achieved between February and March 2006. Erler & Kalinowski, Inc. (EKI) submitted a report in 2006 to the DTSC describing the removal actions, and on October 20, 2006, the DTSC issued a no further action letter for the site.

### 3.1.5 Subsequent Site Characterization and Remedial Excavation

In November 2007, TRC/Lowney conducted an additional investigation of fill quality for John Laing Homes. TRC/Lowney's report, dated December 4, 2006, indicated that several additional areas of the imported fill contained TPHd, TPHmo, and PCBs in excess of the site cleanup goals. A follow up investigation was performed by Questa and additional excavation work removed the contaminated imported fill from six small areas. Sampling conducted in 2007, following the additional remediation work, showed that some of the engineered fill (soil mixed with crushed concrete) located below the imported fill (i.e., below 3 feet bgs) contained detectable concentrations of total PCBs, especially in the areas of the former Clarifiers, Sludge Digester, and Control Room Building, where thick sections of fill were placed following demolition of LWTP facilities. Low levels of total PCBs were also found to be prevalent in the location of the concrete crusher but at much shallower depths.

The results from the 2007 sampling event, showing detectable concentrations of PCBs at depths below 3 feet bgs, indicated that further investigation was needed. Additional soil and groundwater sampling was conducted in November 2007 and February 2008, to evaluate the extent of, and PCB concentrations in, the engineered fill material (crushed concrete and soil mixture) placed in the former wastewater treatment plant structure areas following their demolition. In total, the investigation included digging 46 test pits from 5 to 10 feet bgs and

advancing 14 soil borings to depths ranging from 15 to 25 feet bgs. Test pits and boreholes were sited to more fully evaluate the presence of PCBs within the engineered fill material. Sample locations are shown on Figure A-1 in Appendix A and soil and groundwater results are presented in Tables A-1 and A-2, respectively, in Appendix A.

- **Soil Samples:** Field records confirmed that the engineered fill is present at varying thicknesses within the former LWTP structure backfill areas. Furthermore, laboratory results indicated that these materials contained total PCBs at concentrations varying from trace levels (0.01 mg/kg) to moderate concentrations (up to 47 mg/kg), with a single outlier sample result at 53 mg/kg (QTP-CL#1-1@8'), which likely was due to the presence of paint chips concentrated in the sample tested by the laboratory.
- **Solubility Testing of Soil Samples:** Solubility testing conducted on select soil samples indicated that the PCBs in the paint samples are non-soluble. A summary of these data is presented in Table A-3 of Appendix A.
- **Groundwater Samples:** Groundwater samples were collected from nine open boreholes. Groundwater sample laboratory results indicated that PCBs concentrations in the nine samples were non-detect, at a reporting limit of 0.5 micrograms per liter ( $\mu\text{g/l}$ ) for Aroclor 1254 and Aroclor 1260, the two Aroclors detected in soil samples at the site. Note that groundwater samples were filtered with a 0.425-micron filter by the laboratory prior to analysis. If groundwater sample laboratory analysis is conducted in the future, the results will be reported with a reporting limit less than 0.5  $\mu\text{g/l}$ .
- **Surface Sediment Samples:** A grass lined swale located along the eastern and southern portions of the former plant site collects surface water and transmits it to a storm drain collection system at the southern site boundary, adjacent to Sir Francis Drake Boulevard. Samples of the sediment were collected from the former plant area and tested for the presence of total PCBs. Results of the testing indicated trace levels of total PCBs at or below 0.10 mg/kg wet weight in five of the seven samples collected. Sample locations are shown on Figure A-1 in Appendix A and results are included in Table A-4 in Appendix A. Two samples contained total PCBs at concentrations of 0.8 mg/kg and 1.1 mg/kg by wet weight. These two samples were located within the backfill of Clarifier #3, which contained crushed concrete materials.
- **Surface Water Samples:** During the soil removal activities, groundwater seeped into several excavation areas, and stormwater flowed into several pits. Analysis of filtered water samples showed no detectable concentrations of PCBs in the samples collected.

Note that the sample depths (as measured from ground surface) recorded during previous site investigations have changed because of re-grading activities conducted in 2012. Revised sample depths have been calculated based on elevation changes illustrated on historical cut/fill mapping and are included in the summary tables.

### 3.1.6 Risk Evaluation

A site-specific human health risk assessment (HRA) was prepared in 2008 to support the proposed interim use at the Site (parking). The HRA included a detailed examination of the

exposure pathways and the nature of the PCBs in the soil. Based on the evidence presented in the HRA, the PCBs at the Site were not considered a significant risk to workers, public parkers, or the environment and a cap or cover was not considered warranted to protect human health or the environment for the proposed interim use.

As noted previously, however, the District has adjusted the RAOs for the Site and is seeking clean closure supporting unrestricted reuse of the Site. To that end, a remediation plan is considered herein that removes debris and soil such that remaining soil at the Site would not contain PCB at concentrations equal to or exceeding the remedial goal of 0.24 mg/kg, thereby eliminating any residual risk posed by PCBs to human health and the environment.

### 3.2 2016 Site Characterization Activities

Site characterization was performed in 2016 in accordance with the Work Plan to assess the scope and extent of PCB contamination at the Site. The site characterization activities conducted in 2016 were based on the conceptual site model developed from reviewing the historical site documents identified previously. Historical data summaries are included in Appendix A. The characterization is intended to allow the District to:

- Excavate and remove PCB contaminated material from the Site.
- Select an appropriate offsite disposal facility for the removed contaminated material to be
- Pursue unrestricted land use for the Site.

Sampling and analysis was conducted to characterize the various surface and subsurface materials at the Site that may contain elevated concentrations of PCBs. Sampling and analysis was conducted at the following locations:

- Onsite areas where untested imported fill was used to bring the Site to its current grade in 2012.
- Subsurface deposits of imported fill used to backfill the demolition excavations.
- Subsurface deposits of soil and debris used to backfill the demolition excavations.
- Onsite drainage basins and swales.

Laboratory analytical results have been used for two purposes:

- To evaluate if the sampled materials contain concentrations of total PCBs exceeding the Site remedial goal of 0.24 mg/kg.
- To characterize materials for waste disposal, in support of the presumptive remedial action at the Site – soil and debris excavation and offsite disposal.

Based on the results of the site characterization, drawings showing the extent and depth of proposed remediation (excavation and removal) have been developed.

The Work Plan identifies the locations and describes the procedures for collecting samples for Site characterization. The Work Plan was developed in general conformance with USEPA TSCA guidance (2005). This section summarizes the materials encountered, sampled, and analyzed. Sample collection and laboratory analytical procedures are described in the Work Plan.

### 3.2.1 Planning and Preparation

Planning and preparation included preparation of an OSHA-compliant site-specific Health and Safety Plan (HASP); marking the borings and sample areas and sweeping for utilities; and notification by the District to USEPA and Marin County.

The HASP was kept onsite at all times and the daily safety briefing was documented by all attendees. The borings were marked with white flags and stakes prior to notification of the Underground Service Alert (USA North) network and engaging a geophysical subcontractor who swept the area for potential conflicts with underground utilities. Sample locations and borings were moved as necessary to avoid conflicts.

The borings and sample locations shown on figures in the Work Plan were uploaded to a geographic information system (GIS system) and located in the field using a Sky Blue II GPS unit.

### 3.2.2 Field Implementation

National Exploration Wells and Pumps (National) mobilized a single drill rig to the Site on 17 October 2017. National mobilized a second drill to the site on 24 October 2017 and both rigs were onsite until 10 November 2016 when they demobilized. Borings 001 through 310 were drilled and sampled, and swale, sidewalk, and stockpile samples were collected. Of the four catch basins, one had sufficient sediment to collect a sample (Catch Basin#1). Photographs of the Site, including the swale, sidewalk, stockpile, and grid borings, are included in Appendix B.

Borings advanced prior to 31 October 2016 were drilled in two phases to accommodate the Marin County drilling permit (Appendix C), which is required if borings extend to groundwater (which was expected at approximately 10 feet bgs). The permit had not been received prior to the start of drilling. In the first phase of drilling the borings were drilled and sampled to 10 feet bgs but left unsealed. After 31 October 2016 the borings where native material had not been encountered were revisited and deepened until native material or drilling refusal was encountered. New borings advanced after 31 October 2016 were drilled to native material in one pass.

A hiatus was implemented between the completion of the planned grid sampling in November 2016 and the beginning of the perimeter sampling (the outer perimeter samples to delimit the extent of the PCB contamination, and the internal perimeter samples to delimit the footprint of the former site structures and the demolition backfill) in December 2016. The hiatus was implemented to incorporate the observations and data into a revised conceptual site model and lay out a revised perimeter boring plan. The findings of the grid sampling indicated the original conceptual site model (distinctive material types present in consistent, extensive layers) needed revision – the grid sampling indicated that the different generations of backfill were not reliably

distinguishable; the footprints of the original Site structures were not clearly discernable in the subsurface; and the extent and nature of the demolition backfill was more variable than expected. The initial stratigraphic and chemical data was used to determine the location and proposed sampling depths for subsequent perimeter borings. National remobilized a single rig to the Site on 19 December 2016 to perform the perimeter sampling and remained onsite until 29 December 2016. The December 2016 sampling program successfully completed the planned perimeter boring and sampling.

### 3.2.2.1 Soil Borings

Borings were advanced in general accordance with the locations proposed in the Work Plan. Locations of pre-2016 samples representing soil left in place are shown on Figure 3. The 2016 borings are shown on Figure 4.

- **Grid Borings:** Grid borings were originally laid out on a grid with borings spaced approximately 25 feet apart, with spacing in some cases adjusted to accommodate Site features such as stockpiles and the assets stored in the northeast. As described in the Work Plan, the grid was located within the limits of the former demolition activities to define the lower limits of the excavation. The grid was laid out in advance and borings were numbered sequentially as they were drilled. Positions were recorded using a Sky Blue II GPS system and uploaded to an online GIS system daily. Each boring was drilled until native material was encountered, or drilling refusal was reached.

As sample results were received and stratigraphic observations differing from the existing conceptual site model were made, borings were added to the west (generally from boring 256 west to the fence) and southwest (generally borings 263 southwest to the parking lot). These borings were initially at 100-foot spacing, which was refined to 50-foot spacing in response to USEPA comments on the Work Plan and intended to confirm the depth of the basement material and confirm the extent and nature of the fill layers, described in more detail below.

- **Outer and Interior Perimeter Borings:** As described in the Work Plan, additional borings were drilled around the former demolition area to more fully project the extent of PCB impact (outer perimeter borings), and around the perimeter of deeper excavations within the former demolition area (interior perimeter borings) to refine the extent and depth of the demolition backfill. These perimeter borings shown on Figure 4 are borings 001P through 149P.
  - **Outer Perimeter Borings** – Borings 001P through 075P were the outer perimeter borings (although some were situated to double as interior perimeter borings). They were sited around the former demolition area, between grid borings with a sample that exceeded the remedial goal and a boring with samples that did not (e.g. boring 025P, located between 197 and 255). The intent was to refine the “outer” limit of PCB impacts to optimize potential excavation limits. The final depths were based upon data from the nearest grid boring or historical sample.
  - **Interior Perimeter Borings** – Borings 076P through 149P were interior perimeter borings, located around projected deeper excavations within the former demolition area targeting the deposits of demolition backfill within the interior of the former demolition activity footprint (Figures 4 and 5). These borings were situated between grid borings

where demolition backfill was observed and where it was not (e.g. 124P, located between 176 and 177), so the spacing between interior perimeter and grid borings was approximately 12.5 feet (see Figure 4). If demolition backfill was encountered they were drilled to underlying material (except in cases where drilling refusal was encountered); if demolition backfill was not encountered the borings were drilled to the depth of demolition backfill in the nearest boring.

Debris and soil sampling were conducted in general accordance with the Work Plan, as describe in the following sections.

### 3.2.2.2 Soil Sample Collection

Demolition backfill, fill, and native material samples were collected from the grid and perimeter borings and analyzed to evaluate the concentrations of PCBs within and beyond the limits of the former clarifiers, sludge pit, sludge digester, and biofilters. In general, it was anticipated that samples would be collected from up to four (4) vertical sample intervals at each location, as indicated by the conceptual cross section of backfill materials shown in the Work Plan. The four vertical sample intervals were to characterize the following materials:

- Clean graded surface soil (graded surface and near surface soils). Surface soil (0 to 3 inches bgs) and near-surface (18 to 24 inches bgs) soil samples were collected and analyzed from the grid borings to evaluate the presence of PCBs in surface and near surface soils distributed across the Site from import stockpiles during grading activities in 2012
- Fill imported and used as backfill during demolition.
- Construction debris processed and used as backfill during demolition (demolition debris).
- Underlying native soil (pre-verification depth samples).

Based upon the analytical results, the soil samples were identified as in situ waste characterization samples (material with PCB concentration exceeding the remedial goal), and in situ verification samples (samples with PCBs lower than the remedial goal used to delineate the edge or bottom of a proposed excavation). A subset of the in-situ waste characterization samples underwent additional analyses anticipated to support waste profiling and acceptance by disposal facilities during remediation planning.

Additional details regarding the samples collected follows:

- **Grid Borings:** In situ verification samples were collected from the native material encountered in the grid borings within the limits of the former demolition activities to define the lower limits of excavations. In situ waste characterization samples were collected from the demolition backfill, where encountered, and of fill where concrete fragments were visible. Samples were collected on a vertical spacing to characterize the material types described above.
- **Outer Perimeter Borings:** The soil samples from the outer perimeter samples were collected to pre-confirm the limits of removal and serve as in situ verification sidewall

samples. Soil samples were collected at roughly 2-foot intervals from the surface and submitted for analysis from the upper 12-inches, the demolition backfill (if encountered), the material underlying demolition backfill (if demolition backfill was encountered), or the depth of greatest PCB concentration in the nearest grid boring. Typically, two samples were analyzed, and the remaining samples were kept on “hold” The outer perimeter boring depth was based upon the depth with the maximum PCB concentration in the nearest grid boring.

- **Interior Perimeter Borings:** The in-situ verification interior perimeter samples were collected from the near-surface, fill, and from material underlying demolition backfill (if encountered) to pre-confirm deeper excavations within the former demolition area footprint. In situ waste characterization samples were collected from the demolition backfill (where encountered). Samples were collected at roughly 2-foot intervals from the surface and submitted for analysis from the upper 12-inches, the demolition backfill (if encountered), the material underlying demolition backfill, or the depth of greatest PCB concentration in the nearest grid boring. The interior perimeter boring depth was based upon the demolition backfill in the nearest grid boring.

Soil sampling was conducted in general accordance with the Work Plan, as described below:

- **Direct Push Drilling:** Soil borings were drilled using a GeoProbe-style direct push drill rig using either single-wall (for shallow borings) or dual-wall (for deeper borings) steel casing with inner acetate liners. Upon drilling an interval of 5 feet, the liner is removed, the soil recovery recorded and the soil visually logged, and a sample interval selected.

Samples were retained either by cutting a 6-inch long portion of the acetate liner or opening the acetate liner and transferring the material to a new glass jar provided by the laboratory. Acetate liner sections were sealed with Teflon tape and capped, while jars were closed with their lid; both types of samples were labeled, the information entered on the chain-of-custody and were placed in a plastic bag and placed in a chilled cooler. Samples were retrieved daily or next-day by a courier from the analytical laboratory, Sunstar Laboratories, Inc.

- **Manual Method:** Designated swale samples and the catch basin sample were collected manually, in overall accordance with the Work Plan. Samples were collected using a portion of new acetate liner as a scoop and contained in a new glass jar provided by the laboratory. Samples were labeled and transported in accordance with the Work Plan.
- **Stockpile Sampling:** Stockpile samples were collected using a hand auger at the frequency and depth described in the Work Plan. The material was transferred from the hand auger to a new glass jar provided by the laboratory and labeled and transported in accordance with the Work Plan. The hand auger was decontaminated between stockpiles in accordance with the Work Plan. Note one soil boring (076P) was drilled through a stockpile and into the underlying soil, but in general drill rig access to the top of the stockpiles was limited.
- **Hand Auger Sampling:** Soil samples of the proposed sidewalk route were collected using a hand auger, at locations shown in the Work Plan. The material was collected, labeled, and transported as described above. The hand auger was decontaminated between sample locations in accordance with the Work Plan.

Additional details regarding implementation of the field quality assurance/quality control (QA/QC) and decontamination are described in the following sections.

### **3.2.2.3 Field QA/QC**

Field QA/QC consisted of daily collection of a rinsate blanks and collection of duplicate soil samples. A rinsate blank was collected starting the second day of sampling by pouring commercial distilled water over a freshly decontaminated steel sampling “shoe”. The “shoe” fits on the end of the steel rods and the inner part is the only re-usable part equipment tooling that contacts the soil sample. One rinsate blank was collected from each rig each morning. No PCBs were detected in any rinsate blank at concentration exceeding the laboratory reporting limit of 2 µg/l.

Duplicate soil samples were collected by depositing material from a 12-inch portion of the acetate liner into a new plastic bag, mixing the material, and dividing it between two 6-inch acetate liners (either new, or the 12-inch section halved) or jars, and labeling one as the primary sample and the other as the duplicate sample.

### **3.2.2.4 Decontamination**

National decontaminated steel sampling rods with the pressure washer and decontaminated the steel “shoe” using the double wash/rinse method with hexane described in the Work Plan. Decon water was contained in 55-gallon drums and placed onsite.

## **3.2.3 Site Investigation Results**

Characterization of the nature and extent of PCB impacts at the Site is based on the physical (absence or presence of demolition debris backfill) and chemical (PCB concentrations exceeding the remedial goal) results of the investigation. Following is a summary of the site investigation results with notable observations and findings indicated.

### **3.2.3.1 Physical Characterization**

The soil stratigraphy is described and presented on the boring logs included in Appendix D. Generalized cross section locations are shown on Figure 6, and generalized cross sections are presented on Figures 7 through 10.

The field observations during drilling and subsurface soil sample data were modeled in three dimensions using VoxlerR v.4.2.584 by Golden Software. Four views of the Voxler output are presented in Appendix E. The views incorporate a surface showing the ground surface elevation; a surface showing the native material elevation; a three-dimensional (3D) view of the encountered demolition backfill; and a 3D view of the demolition backfill and samples where PCBs exceeded the remedial goal. Note the Voxler outputs incorporate a five times vertical exaggeration.

#### **3.2.3.1.1 Ground and Native Material Surfaces**

The slope of the ground surface from northeast to southwest can be seen on the cross sections and the Voxler output. The contact of the native material also generally slopes northeast to

southwest, with distinct deeper sections as seen on Figures 7 and 8. The Voxler output is useful to illustrate the nature of the ground surface and native material surface.

- The first Voxler output shows how the ground surface has been graded and slopes to the southwest, with a relatively level bench located along the retaining wall in the north.
- The second Voxler output indicates the surface and native materials are close in elevation in the northwest and west portion of the Site (also illustrated by the shallow bedrock contact noted in boring logs and consistent with the recent grading at the Site).

Voxler shows the native elevation is rising at the east Site boundary, which is consistent with the rising topography on that side. The output also illustrates the presence of a channel-like feature in the native material generally coinciding with the former sludge holding pond and illustrates that the native material elevation is deeper in the general area of the former sludge digester and clarifiers.

### **3.2.3.1.2 Stratigraphy**

Soil stratigraphy was evaluated by visually logging the soil core generated during boring and sampling using general practices of visual and manual methods described in ASTM D 2488-90. The stratigraphy is summarized as follows:

- **Upper Surface Graded Fill:** Typically, a yellowish-brown silt or sandy silt with minor gravel, present in the upper 0.5 to 2 feet. As illustrated in the cross sections, this layer is not uniform in thickness, but does extend largely across the Site. Some gravel can be observed on the ground surface and a small amount is present, possibly indicating some mixture of this upper graded material with underlying gravelly material has occurred.
- **General Fill:** Typically silt with gravel to gravelly silt, or silt with sand and gravel. Gravel is typically angular, up to a 0.5-inch diameter, consists of local fine-grained rock, igneous rock (indicating it has been imported to the Site), and in a few borings, sub-rounded concrete fragments. It is typically stiff with low or no plasticity. In some borings, layers of fine sand or other material was encountered, but not on a consistent scale. This silt-gravel fill is present throughout the Site, thinning to the west and north where weathered bedrock is present near the surface.

As described below, PCB concentrations were encountered in this material, but inconsistently. No clear marker bed or indicator material was observed.

- **Demolition Backfill:** Typically encountered as gray to dark gray, very dense, well-graded sand, gravelly sand, or sandy gravel. Gravel is typically angular and up to a 0.5-inch diameter.
- **Pre-Demolition Fill:** Sandy or gravelly silt, with sub-rounded gravel up to 0.25-inches, and coarse sand; typically, very stiff; low or in some cases medium plasticity. It is distinct from general fill because this material has more gravel, the gravel is distinctly rounder and finer, and the coarse sand commonly has a red color.

Over most of the Site it underlies the demolition backfill or is between the general fill and the native material. In the southeast, however, it was encountered overlying the demolition backfill. As illustrated on cross sections, this material is not present throughout the Site.

- **Native Material:** In the west, northeast, southwest, and east, the native material was yellowish brown sandy silt to silt with reddish brown streaks (probably weathered bedrock); it is very dense and typically stopped drilling progress when encountered. In the central portion of the Site the native material was typically fine-grained sandy silt, or silt-clay mixture that was soft and did not have gravel.

Additional discussion regarding the occurrence and extent of demolition backfill deposits is presented below.

### **3.2.3.1.3 Demolition Backfill - Discussion**

The lateral extent of demolition backfill deposits can be seen on Figure 5, profiles can be seen on Figures 7 through 10, and the 3D view can be seen on the Voxler images in Appendix E. The demolition backfill is located in four main areas (Figure 5):

- The northern former sludge holding pond area.
- A large area in the central/southeast (near the former clarifiers and sludge digester).
- The southeast (near former Clarifier No. 3).
- The central-east (near former Biofilter No. 3).

Cross sections illustrate that the material is typically found just above the contact with native material, usually at or near the base of a deep feature in the native material. The cross sections illustrate the deposits do not occur in a uniform layer and are irregular in profile.

The Voxler output illustrates the distribution of the northern zone of demolition backfill, which is separated from the central area by a plateau of native material. Voxler also models the demolition backfill in the central area not as a single mass, but as three relatively distinct bodies. The southeastern demolition backfill deposit is deeper than the deposit in the central area (see Figure 9 Cross Section C-C'). Voxler shows the central-east demolition backfill deposits are small and Voxler does not model them as a contiguous body.

### **3.2.3.2 Chemical Characterization**

Samples were analyzed for PCBs using USEPA Method 3550B – Ultrasonic Extraction. Sample laboratory analytical results are presented in Tables 1 through 8, which organize the results by depth range and sample type, and also include historical samples of material remaining in place from previous investigation and remediation efforts. Tables 9 and 10 present additional analyses conducted on a subset of in situ waste characterization samples. Each table also presents summary statistics, including the number of samples, the number of samples with detectable concentration of PCBs, the detection limit range, the maximum and average concentration, and a count of samples that exceeded the 0.24 mg/kg total PCBs remedial goal.

Laboratory analytical reports for the 2016 samples are included in Appendix F. PCB concentration results are posted on the cross sections. Sample results were modeled in Voxler using the single criteria of whether the sample exceeded or did not exceed 0.24 mg/kg total PCBs remedial goal (see Appendix E).

### 3.2.3.2.1 *Data Management and Review*

Data management and review were conducted in general accordance with the Work Plan.

- **Review:** Sample names and dates on laboratory work orders and results were checked for completion and accuracy. As required, laboratory reports were corrected to show the corrected names. Reporting limits in the laboratory reports were also reviewed for consistency with expected analytical sensitivities.
- **Verification:** Results in the electronic laboratory database submittals (EDDs) were checked against the finalized laboratory report to verify the results were transferred correctly. The EDDs were corrected as needed to conform to the database format.
- **Usability:** Data quality and usability were evaluated in terms of precision, accuracy, representativeness, completeness, and comparability.
  - **Precision** – Precision was evaluated by calculating the relative percent difference (RPD) for duplicate samples. Overall precision was considered to be acceptable as 94 percent of duplicate samples had an acceptable RPD, or a concentration less than five times the reporting limit (in which case the RPD was not calculated). Results were considered acceptable for the samples with RPD exceeding 30 percent because the source of the variability is believed to be sample heterogeneity, and not matrix interference or laboratory imprecision.
  - **Accuracy** – Accuracy was evaluated using surrogate spikes and matrix spike/duplicate (MS/D) samples and was considered acceptable throughout the project. There were no samples with both surrogates below the control limits. Where MS/D percent recoveries were outside of control limits, the laboratory determined the source to be matrix interference.
  - **Representativeness** – Data is considered to be representative because the precision and accuracy measures are acceptable and established sample collection and laboratory analytical procedures were used consistently.
  - **Completeness** – The completeness value is one (1) because all sample results were considered to be acceptable.
  - **Comparability** – The sample collection method was consistent, and the same laboratory used the same analytical and preparation methods throughout, therefore the results are considered comparable.

Data analysis was conducted following completion of the data review described above.

### 3.2.3.2.2 Data Analysis and Comparison to Cleanup Levels

The data tables also present summary statistics presented in the Work Plan, including the number of verified samples, the number of samples with detectable concentration of PCBs, the detection limit range, the maximum and average concentration, and a count of samples that exceed 0.24 mg/kg and 50 mg/kg.

- **Sidewalk:** Based on standard sidewalk designs, samples of the surface and near surface native soils within a 5-foot wide approximately 360-foot long corridor along the western edge of the property were collected and analyzed for the presence of PCBs. Samples were spaced approximately 50 feet apart in an alternating staggered alignment, as shown on Figure 11.

Sidewalk sample results are summarized in Table 1. PCBs were not detected in any of the 16 samples analyzed, so no remediation is proposed.

- **Stockpiles:** Four stockpiles of import soil remain at the Site, as shown on Figure 4. Twenty-three (23) discrete samples were collected for laboratory analysis. Soil beneath the stockpile 1A was sampled in boring 076P. The shape of stockpile 1B prevented access of the drill rig and sampling below the stockpile, although soil borings were located at the base of the stockpile. Borings were also situated at the base of stockpile 2.

Stockpile sample data is summarized in Table 2. Out of 23 samples, PCBs were detected in two samples from Stockpile 2 at less than the 0.24 mg/kg cleanup level. Although the PCB concentration is less than the cleanup level, it is anticipated that the stockpile material will be off-hauled and not re-used onsite. Further sampling will be conducted if re-use is later proposed.

- **Swale:** The drainage swale along the eastern/southern property boundary is approximately 900 feet long, with a top of bank width spanning 8 to 20 feet wide and a depth ranging from 2.5 to 5 feet deep, depending on location along the swale. Designated swale surface samples (001SWA through 010SWA) were collected at approximately 100-foot spacing, alternating from the center to the sides to assess material deposits along the bank and at the flow line of the swale. In addition, several grid and perimeter borings were located within the swale. Including the designated swale samples and the borings located in the swale footprint, a total 43 samples were collected:
  - 27 samples were collected from the surface (0 to 0.5 feet bgs).
  - 16 samples collected between 0.5 and 2.5 feet bgs.

Samples collected within the swale are shown on Figures 13 and 14.

Laboratory analytical results for these designated samples collected in the swale path are included in Table 3. The results from the surface to 2.5 feet for these additional locations are also presented in Table 3. Out of the 43 samples collected, PCBs were detected in seven samples and exceeded the remedial goal in one sample: 091 at 2 feet bgs. The area around 091 is designated for excavation (discussed below).

- **Catch Basin:** The four on-site stormwater catchment basins were inspected to evaluate if they contained a sufficient amount of sediment to collect a sample. Of the four catch basins on the Site, sediment was observed only in Catch Basin #1 (See Table 4 and Figure 12). PCBs were not detected in the sample analyzed.
- **Grid and Perimeter Borings:** As discussed above, grid and perimeter borings were drilled to collect samples to characterize material as in situ waste characterization samples (investigating PCB concentrations exceeding 0.24 mg/kg or the presence of demolition backfill) or in situ verification samples (investigating PCB concentrations less than 0.24 mg/kg). When plotted on maps, shown on cross-sections, and viewed with Voxler 3D modeling, the data discussed below can be used to delineate zones where in situ waste can be identified and excavated, and where in situ verification samples confirm the limit of the needed excavation. The areas, organized by reasonable depth increments (0 to 2 feet, 0 to 5 feet, 0 to 10 feet, 0 to 15 feet, and 0 to 20 feet) and corresponding sampling locations, are shown on Figures 15 through 20 and composited on Figure 21. The figures illustrate areas of removal, which is discussed in greater detail in following sections.

Sample laboratory analytical results are summarized by remedial depth increments in Tables 4 through 8. The analytical results indicate that, in general, samples from the demolition backfill material did not exhibit elevated PCB concentrations. The Voxler output in Appendix E illustrates this. As can be seen in the fourth image of Voxler output, the small red deposits represent areas where PCB concentrations exceed 0.24 mg/kg. In general, most of the samples that exceed the remedial goal occur in a band along the west side of the Site, and in the southeast (see Figure 6 and Appendix E).

Following this review of the data, the results were evaluated based on in situ waste characterization to understand the general limits and nature of waste removal and in situ verification characterization to understand how the general removal limits comply with the remedial goal for the Site.

### 3.2.3.3 In Situ Waste Characterization

As described above, samples of the fill and demolition backfill were collected and analyzed to assess the PCB concentration and characterize the material for disposal prior to excavation. The in-situ waste characterization is intended to provide an understanding of how the material would likely be profiled for disposal prior to implementing the remedial plan presented in Section 5 and allow the contractor to secure waste acceptance in advance of excavation to facilitate direct loading of the material into trucks for transportation to the appropriate disposal facilities, generally avoiding interim stockpiling.

#### 3.2.3.3.1 PCBs

The PCB results from all of the samples are included in Tables 4 through 8, organized by depth range. It is anticipated that excavation will generate two classes of soil, which have different disposal requirements based upon the PCB concentrations. These waste material types include the following:

- **Soil with a Total PCB Concentration of Less Than 50 mg/kg:** This material may be disposed at one of the following locations – an approved PCB facility; or when disposed

pursuant to 40 CFR Part 761.61(a) or (c), a permitted municipal solid waste or non-municipal non-hazardous waste facility; or a RCRA Sec. 3004 or Sec. 3006 permitted hazardous waste landfill. Soil with a total PCB concentration less than 50 mg/kg does not need to be shipped under a Uniform Hazardous Waste Manifest.

- **Soil with a Total PCB Concentration of 50 mg/kg or greater:** This material must be disposed in a RCRA Sec. 3004 or Sec. 3006 permitted hazardous waste landfill or an approved PCB disposal facility. Soil with a total PCB concentration equal to or greater than 50 mg/kg must be shipped under a Uniform Hazardous Waste Manifest.

Fill and demolition backfill samples were analyzed for PCBs to determine which of the above bulk PCB waste categories apply to the sample location and depth interval. The sample results, depth interval, and grid spacing were used to establish excavation areas with the associated offsite disposal requirements to be met during remediation.

Two samples have been analyzed with concentration results greater than 50 mg/kg total PCBs. The historic sample QTP-CL#1-1 at a depth of 11 feet (current depth, corrected for 2012 grading) had 53 mg/kg total PCBs. Sample 219Conf(8) had 73 mg/kg total PCB and its duplicate sample DUP-0-102816 had 11 mg/kg. Upon request Sunstar re-analyzed these samples and the subsequent results were 107 mg/kg and 14.5 mg/kg total PCBs, respectively.

The zone around boring 219 is designated on Figure 17 and the area around QTP-CL#1-1 is shown on Figure 19. Soil in these areas will be segregated from the other excavated soil and disposed of in accordance with appropriate regulations. It is anticipated that additional sidewall and/or basement samples may be collected to optimize the volume of soil that must be segregated.

The remaining samples containing concentrations of PCBs greater than the remedial goal exhibited PCB concentration less than 50 mg/kg. The areas and depths of the excavation zones are shown on Figures 15 through 20 and the areas are composited on Figure 21.

#### **3.2.3.3.2 Additional Analyses**

As discussed above, all soil samples were analyzed for PCBs. Additionally, 38 samples of demolition backfill and general fill were analyzed for the following constituents to facilitate coordination with landfills to secure waste acceptance:

- Total Petroleum Hydrocarbons (TPH) as gasoline, diesel, and motor oil (with silica gel cleanup preparation).
- Volatile Organic Compounds (VOCs).
- Semivolatile Organic Compounds (SVOCs).
- Title 22 metals.
- Pesticides.

Metals results from the waste characterization samples are summarized in Table 9 and organic compound results are summarized in Table 10.

Each of the Title 22 metals were detected in at least one sample, although arsenic and molybdenum were detected in only one sample each and lead was detected in three samples. In two samples nickel was detected at concentrations warranting solubility analysis. In fifteen samples out of the 38 total samples, chromium was detected at concentrations warranting solubility analysis. The two samples with the elevated nickel also have the highest concentrations of most of the other metals.

TPH gasoline and pesticides were not detected in any sample at concentrations equal to or greater than the laboratory reporting limit. TPH diesel and motor oil were each detected in sample 136WC(10.5) at 140 mg/kg and 92 mg/kg, respectively, and in sample 149WC(11.5) at 61 mg/kg and 42 mg/kg, respectively.

The only detected VOCs were in sample 059WC(10.5): m,p-xylene was detected 19 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) and o-xylene was detected at 11  $\mu\text{g}/\text{kg}$ . Six SVOCs were detected in 079PWC(12.5); the maximum was pyrene at 1,200  $\mu\text{g}/\text{kg}$ .

#### **3.2.3.4 In Situ Verification Characterization**

Samples with concentrations of PCBs exceeding the remedial goal identify material to be removed and off-hauled, samples with concentrations of PCBs less than the remedial goal characterize the soil remaining at the Site and serve as in situ verification samples to set the excavation limits. The in-situ verification data is summarized in Tables 11 through 15. Borings with samples used to set excavation limits are shown on Figures 15 through 19.

As described in sections above, grid borings and perimeter borings were drilled and sampled to evaluate the extent and limits of impacted material. A total of 459 borings were drilled in the 2016 program (310 grid borings and 149 perimeter borings). A total of 2,260 samples were collected from the borings, of which 1,772 were analyzed for PCBs. Of those samples analyzed, PCBs were not detected in 1,426 samples, PCBs were detected below the remedial goal in 255 samples, and PCBs were detected above the remedial goal in 91 samples.

As illustrated in Figure 5 and Figures 15 through 21, the borings where PCBs were detected at concentrations exceeding the remedial goal are situated within the demolition area of the LWTP. Although many samples of general fill material were collected and analyzed from the extended grid borings located to the west and south, the sample analytical results did not exhibit PCB concentrations greater than the remedial goal.

### **3.3 Conceptual Site Model**

The following summary integrates the previous site characterization and remediation information with recent and current site characterization information to describe an updated conceptual model of the Site, focused on combining the following key areas of understanding:

- Physical setting, primarily backfill deposits that may contain PCBs.
- Nature and extent of contamination in soil at the Site.
- Fate and transport of contaminants in soil at the Site.

Data limitations are acknowledged, and potential additional subsurface characterization work is identified to address the information gaps.

### 3.3.1 PCB Source Identification

Literature review, field observations, and additional crushed concrete material sampling was completed for the Work Plan to identify the probable source of the low levels of total PCBs. During literature review, it was found that PCBs have been used in various industrial applications in addition to their common usage in transformer oils (<http://www.epa.gov/pcb/>). Most notably for the site are references to PCBs being present in industrial paints at other sites in the United States and as pipe coatings in water and wastewater applications. A plasticizer was reportedly manufactured by Monsanto Corporation that included concentrations of PCBs between 5 and 14 percent. This plasticizer was sold to independent paint manufacturers and suppliers who added the plasticizer to paint to create paint with a smooth glossy durable finish. This was reportedly used predominantly in industrial paints and other products (Environmental Protection, April 2001, Vol. 12, No. 4, page 58).

Prior to the 2016 program, samples collected from several excavation areas revealed the presence of crushed concrete with painted surfaces and the presence of coated or glazed crushed ceramic pipes. Samples were prepared following USEPA Method 3550B with a sulfuric acid cleanup following USEPA Method 3665 and analyzed following USEPA Method 8082. Laboratory analysis of these materials revealed concentrations of total PCBs in paint chips scraped from concrete at a concentration of 48,000 mg/kg; and crushed painted concrete samples at 0.75 mg/kg. Samples from pipe coatings had trace (0.078 mg/kg) to low (4.5 mg/kg) concentrations of total PCBs.

The 2016 investigation further illustrated the following elements:

- The surface layer was not consistent in thickness across the site, and gravel was present in the near-surface in many areas.
- Crushed concrete used to fill the former excavations may occur as a coarse gravel, or sand-gravel mixture like aggregate base material.
- The crushed concrete deposits were found in relatively confined areas, at relatively specific depth intervals. Typically, these deposits were present near the bottom of deeper historic excavations. Mapping illustrates that the upper and lower boundaries are irregular in depth and 3D modeling illustrates that the bodies can be discontinuous.
- Paint, glaze, or coating was not observed on gravel in the crushed concrete deposits.
- The imported excavation backfill (referred to as general fill), was encountered throughout the Site below the uppermost surface soil. This material contained gravel derived from offsite and small amounts of broken concrete. Paint, glaze, or coating was not observed on these concrete fragments. It is not known if the concrete fragments observed in this fill were generated from the onsite crushing, or from the source of the import.
- The general fill was more widespread than expected based upon the historic documents.

Chemical distribution based upon the 2016 program is discussed below.

### 3.3.2 Chemicals of Concern

Site soils and imported fill materials were tested for the presence of total petroleum hydrocarbons and associated volatile organic compounds (VOCs), lead, and PCBs, based on the known historical industrial activities conducted at the Site. Laboratory results of samples collected in 2004 and 2005 identified TPHd, TPHmo, and PCBs as chemicals of concern in the imported fill material and demolition debris backfill used onsite. In 2006, the District excavated impacted soils containing those compounds at concentrations that exceeded the site-specific remedial goals. The DTSC issued a no further action letter for the site in October 2006. In 2007, an investigation conducted by a prospective property developer identified additional areas of the site where elevated concentrations of PCBs existed in the engineered fill. No other compounds are known or suspected to be present at the site at concentrations that would represent a human health or an environmental concern.

Soil borings and samples were collected in 2016 as described in the sections above to further delineate the extent of PCBs in soil and fill material. Borings and samples were concentrated on the LWTP area but were extended to the west and south as the fill material was found to extend farther than anticipated. Samples were analyzed for PCBs and a subset was analyzed for additional parameters for disposal characterization. No additional COCs were identified during the 2016 investigation.

### 3.3.3 Nature and Extent of PCBs

Past Site characterization activities have identified residual PCBs in the paint adhered to the crushed concrete as the constituents of concern for the Site. As such, PCBs were expected to occur at depths greater than 4 feet bgs, at locations where engineered fill was previously used onsite, and where crushed concrete was used to backfill excavations. Based on the recent site characterization information compiled herein, the nature and extent of onsite material deposits containing PCBs is summarized as follows:

- **Surface Deposits:** The uppermost material was expected to be comprised of clean import soil used for infrastructure repair projects throughout the District and include clean soils imported in 2008 to support development activities. Surplus material was stockpiled at the Site and then subsequently graded into the ground surface to promote positive drainage at the Site. The lateral extent of the material is mainly over the LWTP demolition footprint.

In the 2016 program, the upper 1 to 2 feet was found to typically consist of silt or sandy silt, however in many areas the uppermost material contained enough gravel so that it could not be distinguished from the underlying imported excavation backfill (i.e., general fill). It is possible that in some areas clean import was laid on the surface and was mixed with underlying fill during grading through the movement of heavy grading equipment.

Samples of the uppermost material with PCBs exceeding the remedial goal were located in the southeast and a small zone in the northwest. These samples are shown on Figure 15, which also shows proposed excavation areas where only shallow samples exhibited concentrations of PCBs exceeding the remedial goal. The data indicate, however, that over

the remainder of the Site, PCBs are not present at concentrations greater than the remedial goal in the surface deposits to 2 feet bgs.

- **Imported Excavation Backfill (General Fill)**: This material is comprised of import soil backfilled on top of demolition debris backfill during grade restoration following the facility demolition activities. Sampling and analysis following backfilling with this material indicated that the import soil contained PCBs. The spatial extent of the material was expected to be collocated with the demolition debris backfill, however in the 2016 program this fill was encountered across the Site, as far as the east and west fences and the southern parking lot, exclusive of areas at the fringes in the north, northwest, and west where native material (weathered bedrock) was encountered at approximately 1-foot depth.

As described in sections above, this material contains abundant gravel, including small amounts of gravel-sized crushed concrete. The 2016 sample with the highest PCB concentration was of this material, with crushed concrete gravel.

The locations of samples of this material that exceed the remedial goal are shown on Figures 15 through 19. These figures also show areas of proposed excavations, organized by depth range. The excavation limits are based upon the concentration of PCBs and the presence of the demolition debris backfill.

- **Demolition Excavation Backfill – Demolition Debris**: This material is comprised of crushed concrete from the demolition of the facility. Demolition debris was reused at the Site as backfill and generally placed at depth into the facility foundation demolition excavations, which extend as deep as approximately 20 feet bgs. Historic sampling and analysis following backfilling with this material indicates that the demolition debris contains PCBs. Cross sections and the Voxler output generally confirm that the demolition backfill resides at depth.

This material was extensively sampled in the 2016 program to map its extent to evaluate excavation limits and evaluate its chemical concentrations for disposal purposes. In most samples, PCBs were not detected or the concentrations were low. The spatial extent of this material is shown on Figure 5, the relation to excavations is shown on Figures 15 through 19, profiles are shown the cross sections, and 3D models are shown on the Voxler outputs in Appendix E. The proposed excavation limits shown on Figures 15 through 19 incorporate both the demolition debris backfill and samples exhibiting concentrations of PCB that exceed the remedial goal.

- **Pre-Demolition Fill**: A fourth distinct layer was identified in the 2016 program, referred to as pre-demolition fill. The genesis of this material is not clear, but it was typically found beneath the demolition backfill or beneath the general fill, just above the contact with the native material. It contained abundant red to ochre colored coarse sand and fine, sub-rounded multicolored gravel, and was very stiff. It was distinguishable from the other types of fill.

PCBs detected in onsite samples include Aroclor 1254 and Aroclor 1260. In general, the samples with the highest concentrations of PCBs are located in the west and northwest portion of the Site, west of the demolition backfill deposits, which are located in the north portion of the Site, south, and southeast.

In the 2016 program the detectable concentrations of total PCBs in soil ranged from 0.01 mg/kg to 73 mg/kg, with only one sample equal to or greater than the 50 mg/kg TSCA threshold. That sample was 219CONF(8); its duplicate contained 11 mg/kg total PCBs. Historical samples include one that exceeded the 50 mg/kg TSCA threshold and one additional sample exceeding the 25 mg/kg threshold for low occupancy use (40 CFR Part 761.61 (a)(4)(i)(B)(1)). The two samples are QTP-08-17 (47 mg/kg @ 5.9 feet bgs), and QTP-CL#1-1 (53 mg/kg at 11 feet bgs).

The spatial extents of PCBs in soil divided by depth ranges at the Site are shown on Figures 15 through 19, and a conceptual cross section of the fill horizons is shown on Figure 22. Results are also posted on the cross sections (Figures 7 through 10). The 2016 samples with PCB concentrations exceeding the remedial goal of 0.24 mg/kg are located throughout the LWTP demolition footprint, at depths ranging from 0.3 to 12.7 feet bgs. Historical samples with PCBs exceeding 0.24 mg/kg range in depth from 0.7 to 16 feet bgs (depth corrected to conform to current ground surface elevation).

Remedial plans are discussed in following sections.

#### 3.3.4 Additional Characterization

The network of grid and perimeter borings adequately delineates the extent of PCBs horizontally and vertically to guide remediation related to concentrations of PCBs in remaining soil.

Data gaps are present in some of the proposed excavation areas, as summarized in Table 16. For example, area 5-9 on Figure 16 is a proposed excavation to depth of 5 feet bgs to address sample QTP-08-02 at 4.5 feet bgs; 2016 borings delineate the perimeter of the excavation but there is no in situ verification data below 4.5 feet bgs to establish the bottom. During excavation a sample from the bottom will be needed to confirm that the PCBs have been removed. Specific excavation zones with such data gaps are summarized in Table 16, and the contingency plan described in Section 5 will be implemented to address these data gaps.

## Section 4: Remedial Action Design

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The drawings, means, and methods discussed in Section 5 Remedial Action Plan will be issued by the District for Bid as part of the construction contractor selection process. The Remedial Action Plan drawings illustrate existing Site features, structures, and utilities; excavation areas and depths; final grading contours; and details for drainage, slope stabilization, and restoration features. The Remedial Action Plan details the requirements for the contractor to execute the various project elements. The Remedial Action Plan will be provided to the contractor for implementation.

Remedial implementation, including excavation, transportation, and disposal, is anticipated to involve the following specific activities:

- Protection, removal, and/or diversion of existing utilities.
- Protection of adjacent cultural and natural resources, including potentially historic deposits and wetland habitat.
- Demolition of the existing concrete drainage-related culvert and access portals. These small structures are located in the footprint of 10- and 15-foot deep excavations and will be demolished. The demolished material will be segregated, stockpiled, sampled, and analyzed for waste characterization purposes prior to removal and disposal.
- Removal of surface vegetation, clearing, and grubbing in preparation for excavation activities.
- Removal of debris and soil containing concentrations of COCs exceeding the cleanup goals.
- Contingent excavation beyond pre-defined excavation limits where unanticipated deposits of debris and/or contaminated soil are encountered during excavation. Under these conditions, verification soil sampling and analysis will be performed for soil to remain following the contingent additional excavation operation documenting compliance with the cleanup goal.
- Waste disposal profiling, loading, transport, and disposal of excavated material to permitted offsite disposal facilities.
- Backfilling with imported soil and grading to generally restore topography.
- Installation of stormwater management and erosion control features.
- Site stabilization by installation of erosion control materials.

The District is required to request and receive solicitations for the work, select the Contractor, and execute the construction contract. The District anticipates the bidding process will require a minimum of 60 days to complete, once it receives formal District Board approval. The construction means and methods for the planned remedial activities are included in this Remedial Action Plan.

The Remedial Action Plan includes a description of clearing and grubbing activities, stormwater control feature installation, as well as the construction materials (backfill) to be used. The District understands that the USEPA will review the means and methods to evaluate whether disturbance of any potential PCB-laden soils will result in an adverse risk to site workers, the public, nearby residents, or the environment. -. The District understands that the USEPA may review and provide comments on the construction means and methods.

## Section 5: Remedial Action Plan

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The District will implement the remedial actions for the Site in accordance with applicable local, state, and federal regulations, as well as specific regulations and/or operating procedures established for cleanup work at the Site.

A “cleanup site” is defined in 40 CFR 761.3 as:

*“Cleanup site means the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of a cleanup of PCB remediation waste, regardless of whether the site was intended for management of waste.”*

The excavation areas where removal of the contaminated material is planned meets the definition of a “cleanup site”. The remedial action consists of removal of debris and soils where sample data indicates the total PCB concentrations exceed 0.24 mg/kg. The excavation areas are presented in the figures included in this Application. It is anticipated that the District will select a licensed contractor to implement the remedial action. The preconstruction, construction, and post-construction activities associated with implementation of the remedial actions are described below.

### 5.1 Excavation Plan

The limits of the excavations are shown on the figures. The details and precise scheduling of the specific excavation and offhauling sequence will be the responsibility of the contractor to arrange to optimize progress. However, the work is expected to follow this general sequence:

1. Complete the pre-construction activities and notifications as described below.
2. Excavate the two zones where soil with PCB concentration > 50 mg/kg was detected. These zones are pits 10-1B and 20-2B, with an estimated volume of 356 cu yd and 370 cu yd, respectively (see Figure 17 and Figure 19). This soil will be handled as hazardous waste.
3. Excavate the pits 2-1 through 2-5, including relevant parts of the swale, and offhaul the soil for disposal.
4. Over the remainder of the remedial area, remove the top two feet of soil, and stockpile it for use in Site restoration.
5. Begin the remedial excavations in the remaining areas to the extent and depth shown on the figures included in this plan. The excavation (including necessary pit stabilization measures), temporary stockpiling to facilitate loading, loading, offhauling, transportation, non-stormwater water management, air and dust monitoring, stormwater compliance, safety, and all other matters related to the remedial work will be done in accordance to applicable local, state, and federal regulations and standards as described in the following sections.

6. Restore the Site, by backfilling excavation pits with acceptable material, grading the surface to return to the existing topography, and installing erosion control measures.

The jobsite and execution of the work will be under control of the contractor, who will also be responsible for site control and access, the detailed work sequence, and conducting the excavations in compliance with applicable OSHA safety standards. Applicable standards include the evaluation of specific soil conditions to design and implement any necessary shoring, sloping, or benching to stabilize the excavations.

## 5.2 Excavation Limits

The final detailed excavation plan presented in the Remedial Design Documents will be based on the general excavation limits shown on Figures 15 through 19. These general excavation limits are intended to remove crushed concrete debris previously used as engineered fill and soil containing concentrations of total PCBs exceeding the remedial goal, which in some cases may require re-excavation of pits that had been backfilled in order to access the pit bottom or sidewall where historical sample were collected, and includes a portion of the swale bounding the Site on the east. The figures show proposed outlines and depths of each excavation, in feet below the existing grade, as well as the in-situ verification sample locations used to delineate these general excavation limits, which are summarized in Tables 11 through 15. To facilitate ease of construction, five (5) general excavation layers and 36 distinct excavation zones comprise this general plan for excavation:

- Surface to 2 feet bgs Layer – five (5) zones (2-1 through 2-5) totaling approximately 295 cubic yards.
- 2 to 5 feet bgs Layer – ten (10) zones (5-1 through 5-10) totaling approximately 1,037 cubic yards.
- 5 to 10 feet bgs Layer – eleven (11) zones (10-1 through 10-11) totaling approximately 11,418 cubic yards.
- 10 to 15 feet bgs Layer – five (5) zones (15-1 through 15-5) totaling approximately 21,056 cubic yards.
- Deeper than 15 feet bgs Layer – five (5) (20-1 through 20-4, 22-1) totaling approximately 5,984 cubic yards.

As summarized in Table 16, some data gaps exist in some of the proposed excavations. In-situ verification sample data was used to delineate the excavations, but in some locations a sample was not collected from the desired depth, creating a data gap. These data gaps will be resolved during excavation by collecting verification samples as noted in Table 16 and described below. Shallow soil in the area of point 086 will be addressed in the course of excavating adjacent pits 10-2 and 5-3, located south and west of pit 2-5.

The estimated excavation quantities are summarized in Table 17. Total debris and soil removal based on this general plan is estimated to be approximately 39,790 cubic yards.

Based upon the grid sampling results, the upper two feet of excavated material, except where noted for disposal (i.e. Zones 2-1 through 2-5), is suitable for reuse at depth during restoration of the excavations, as described below:

- The upper two feet of excavation in all excavation zones totals approximately 6,400 cubic yards.
- Of this total, approximately 300 cubic yards in Zones 2-1 through 2-5 would be removed and off hauled to an appropriate offsite disposal facility due to chemical concentrations of PCBs exceeding the cleanup goal of 0.24 mg/kg. This excavation will be done first.
- The remaining 6,100 cubic yards of soil from 0 – 2 ft bgs over the Site does not exceed the cleanup goal and is proposed for reuse. After Zones 2-1 through 2-5 are excavated, the remaining 6,100 cubic yards from 0 – 2 ft bgs will be excavated from each zone and stockpiled as shown on Figure 23. This material will be used as backfill at the completion of excavation activities.
- The deeper excavations (10 to 15 ft bgs and 10 to 20 ft bgs) total approximately 10,000 cubic yards.
- The 6,100 cubic yards of shallow soil excavated and stockpiled for reuse would be placed at the bottom of the deeper excavations, thereby situating the reused material at a depth equal to or greater than 10 ft bgs.

Certain locations may require additional verification sampling in accordance with the contingency plan. In the other excavation zones, the 2016 and historic samples are considered adequate for characterizing the remaining in situ soil.

### 5.3 Pre-Excavation Activities

Pre-excavation activities include obtaining approvals and permits for performing the work, clearing existing utilities, and establishing temporary facilities such as fencing and staging areas.

The staging area, loading areas, truck route are shown on Figure 23. The western part of the Site, where no excavations are located, will be used for contractor parking and as a staging area. If temporary stockpiles are formed to facilitate loading, they will be located in the loading zones shown on Figure 23.

#### 5.3.1 Regulatory Approvals and Notifications

Prior to the start of construction, the District will receive necessary approvals from USEPA, whose review and approval will be sought for the following key components of the remedial action:

- This Application, which addresses remediation by debris and soil removal.

- Completion of the additional site characterization, evaluation of the findings, and adjustment to the remediation plan, as appropriate and if required by USEPA to address data gaps.
- Excavation verification sample analytical results for final closure of the Site, if needed due to encountering deposits of debris and contaminated soil not previously delineated.

Prior to the start of construction, the District will:

- Notify USEPA three (3) weeks prior to commencing with construction activities. Notify disposal facilities in accordance with 40 CFR 761.205.
- Hold a project kickoff meeting attended by the District and other stakeholders to coordinate site activities.
- Prepare a construction Stormwater Pollution Prevention Plan (SWPPP) and implement erosion control and stormwater management measures in conformance with the Regional Water Quality Control Board (Water Board) General Construction Permit Order No. 2009-0009-DWQ.
- Review and approve the contractor's submittals, including the Health and Safety Plan, Decontamination Plan, Waste Disposal Plan, and Dust Control Plan.
- Prepare a construction schedule.

Conditions, restrictions, and/or requirements identified and imposed by the above activities will be incorporated by addendum into the scope of remediation activities described in this Application.

### 5.3.2 Utility Clearance

Prior to commencing with excavation activities, Underground Service Alert (USA) will be contacted at least 48 hours in advance to identify the location of utilities that enter the affected area. Proposed excavation areas will be clearly marked with paint or surveyor's flagging as required by USA. USA will contact utility owners-of-record within the Site vicinity to notify them of the intent to excavate. The utility owners-of-record are then expected to clearly mark the position of their utilities on the ground surface throughout the designated area.

### 5.3.3 Temporary Facilities and Site Controls

Prior to the start of construction, the contractor will provide and maintain temporary facilities and controls at the Site as follows:

- **Access:** Establish temporary parking, truck, and heavy equipment staging areas. The contractor may prepare these areas by placing a layer of gravel to protect and stabilize the ground surface.

Storage of fuel and chemicals will be stored in accordance with applicable local and/or state regulations. The contractor will be responsible for making any required notifications in compliance with the regulations.

Signs and placards conforming to 40 CFR 761 will be placed on the construction entrance and at temporary stockpiles by the contractor. Because the perimeter of the Site is fenced and the single entrance is controlled, no temporary interior fencing will be installed.

- **Amenities:** Mobilize temporary facilities, including a trailer to be installed at a staging area, sanitary facilities for workers, and equipment storage units. Sanitary waste will be removed and disposed at an offsite facility in accordance with applicable laws and regulations.
- **Fencing:** Maintain perimeter fencing and signage around the project work area. Controlled ingress and egress points will be established so that impacts to local traffic are minimized. Exclusionary fencing will be used, as appropriate, to protect existing natural resources, as described in below. Signs will conform with 40 CFR 761.
- **Erosion and Sediment Controls:** Install stormwater management, erosion control, and sediment tracking control measures for construction, as described in Section 5.5.7 below.
- **Survey Controls:** Establish survey control points, as described in Section 5.5.2.
- **Stockpile Areas:** Prepare and maintain onsite excavation staging facilities for stockpiling of excavated material, in conformance with 40 CFR 761.65(c)(9) as described below.
- **Decontamination Areas:** Provide an area for truck and equipment decontamination, as described in Section 5.3 below.

Following the completion of field activities, temporary facilities and site controls will be removed to restore the site to approximate pre-construction conditions.

## 5.4 Excavation Activities

Following completion of the pre-construction activities, debris and soil removal activities will commence. The specific remediation activities associated with implementation of the remedial plan include:

- Standard site preparation activities performed prior to earthwork activities.
- Waste classification and profiling.
- Debris and soil excavation, stockpiling, loading, and off-hauling.
- Sampling and analysis to confirm compliance with the remedial goals.
- Associated construction mitigation measures.

Activities performed following removal of contaminated materials from the Site are described in Section 6 as part of the restoration activities.

#### 5.4.1 Excavation

The sequencing of the excavation and grading activities will be determined by the contractor to maximize efficiency and logistics of material management, profiling, loading, and off-hauling. It is anticipated that debris and soil will be removed using standard earthmoving equipment (e.g. backhoe, front-end loader, hydraulic excavator, etc.). If not directly loaded into trucks, the excavated debris and soil will be stockpiled until characterization and disposal arrangements are completed as described below. Excavated debris and soil may be segregated based on sampling data, field observations, and field screening into discrete stockpiles to facilitate loading and off-hauling. Stockpiling and segregation activities may be limited by space constraints and excavation timeframes.

The District will require the contractor to perform earthwork, including excavation, backfilling, compaction, and grading, in the dry. The contractor will be required to develop the specific strategy to be employed to manage water encountered during earthwork activities if applicable/necessary, as it will be a function of the contractor's means and methods, however, the contractor will be required to use a strategy and techniques consistent with protection of natural and physical resources, including nearby drainage receptors. The contractor may apply water for dust control during various phases of the project. The volume of water will be controlled to prevent runoff or undesired Site conditions.

Upon completion of excavation activities, the contractor will restore the Site in accordance with the restoration plan presented in this Application.

#### 5.4.2 Incidental Water Management

Incidental water management may be required depending on precipitation and the depth of soil and debris removal operations. Rainwater and groundwater coming into contact with debris and contaminated soil may be extracted to the extent necessary to perform the work and containerized (in tanks or drums) for chemical analysis prior to discharge as described in Section 5.4.5. Water will be managed in accordance with applicable regulations with 40 CFR 761.79, health and safety requirements, and the applicable procedures described in this Application.

Dewatering water containing chemical concentrations exceeding applicable discharge limits may require pre-treatment to reduce contaminant concentration to comply with discharge limits. Site history and data suggests that PCBs are associated with solid particles, so appropriate filtration would be expected to successfully decontaminate the water. Filtration tests will be conducted and samples will be collected and used to submit for an appropriate discharge permit.

If pre-treatment is infeasible, then dewatering water will be collected into DOT-approved containers for offsite transport and disposal at an appropriate facility in accordance with 40 CFR 761.79(b).

### 5.4.3 Contingency Plan

Additional excavation, verification sampling, and analysis may be conducted if field observations suggest that debris and/or soil warrants further consideration for removal and disposal characterization. In that case, the material will be excavated, segregated, and further characterized for proper disposal. Following this additional excavation, additional verification sampling and analysis will be conducted and additional excavation performed until subsequent sampling and analysis demonstrate compliance with the remedial goals. Additional details regarding this contingency plan are discussed below.

#### 5.4.3.1 Additional Excavation

If new areas of potential PCB contamination beyond the initial excavation limits presented herein are identified as a result of visual observations during implementation or subsequent verification activities included in this remediation plan (e.g., crushed concrete deposits and/or soil staining observed extending beyond the limits of excavation, etc.), the District may proceed with removal of the debris or soil.

Floor or sidewall samples from the expanded excavation will be collected in accordance with the procedures outlined below and analyzed for PCBs. Where additional excavation is conducted, a figure will be prepared showing the additional excavation footprint and depth, and the location of verification samples. Verification samples will also be collected where data gaps were identified in Table 16.

Following completion of the additional excavation, verification samples will be collected to assess the removal of contaminated material by comparing analytical results to the applicable cleanup goals. If verification sample analytical results indicate further excavation is required to meet cleanup goals, additional material will be excavated and subsequent verification sampling and analysis performed, as needed and in accordance with the following:

- If total PCBs are not detected, or are detected at concentrations below the remedial goal, then excavation will not extend farther and backfilling, re-grading, and Site restoration activities will commence.
- If total PCBs are detected at concentrations exceeding the remediation goal in verification samples collected at the excavation limits, the District, will continue to excavate and collect additional confirmation samples until laboratory analytical results indicate that total PCB concentrations are below the remedial goal in each sample collected

Over-excavated areas will be sampled and analyzed in accordance with the verification protocols described below. If verification sample analytical results or field observations indicate that contaminated material extends into the saturated zone, the excavation will be dewatered, and the water will be stored and disposed of in accordance with 40 CFR 761.79 as described in sections below. During the 2016 sampling, perched groundwater was encountered in the permeable layers of crushed concreted debris, but otherwise groundwater is not expected to be a major factor in excavations.

### 5.4.3.2 Verification Sampling and Analysis

Following additional excavation, verification samples will be collected, processed, and analyzed to evaluate the concentrations of PCBs remaining in soil at the excavation limits. Sampling, handling, laboratory, and QA/QC procedures for verification sampling and analysis will generally follow those described in the Work Plan and summarized below. The total PCBs concentration in verification samples will be compared to the remedial goal of 0.24 mg/kg.

The need for, and extent of, future additional excavation is unknown. If further excavation and sampling is required during construction, revised tables and figures showing the sample locations, depths, and results will be prepared.

#### 5.4.3.2.1 Sample Collection and Analysis

Verification sampling and analysis will be conducted as follows:

- **Procedures:** Soil sampling will be performed at the base and sidewall of the expanded excavation.
  - Soil samples will be collected in clean 6-inch long stainless steel, brass, or acetate tubes driven into the soil either by hand or using a slide hammer, if the pit dimensions allow entry. At locations where the sidewalls or floor cannot be directly sampled, the excavator will be directed to dig soil from a focused area into the bucket; the tube will then be pushed into soil within the bucket until the tube is completely full.
  - The ends of the sample tubes will be sealed with Teflon tape, capped, and labeled with unique sample identification according to the excavation zone and depth from which the sample was collected.
  - Sample containers will be placed in a cooler containing crushed water ice and held at four degrees Celsius (4°C), pending delivery to the analytical laboratory.
  - Samples will be shipped to the laboratory for sample preparation and analysis. The sample name, date, and time of collection will be recorded on the chain-of-custody form that will accompany the samples to the laboratory.

General procedures for collecting soil samples were presented in the Work Plan and will be followed during verification sampling. Standard sample custody procedures will be used to document sample integrity during the collection, transportation, storage, and analytical processes. Procedures for sample custody and documentation will be followed as previously presented in the Work Plan.

Samples of groundwater or rainwater that may collect in the excavation pits will be collected. If the pit can be entered and water is deep enough, water will be collected by dipping a new 1-liter amber glass container provided by the laboratory into the water and filling it. If the water depth is shallow, two containers will be used: one (a new plastic or glass container) to dip water which will be decanted into a second new 1-liter amber glass container. If the pit cannot be entered, a new disposable bailer will be used from the to collect water to then be decanted into a new glass container. The sample will be labeled with the pit from which it

was collected, the pit depth, the date and time collected. The sample will be entered onto a chain-of-custody and transferred to the laboratory as described above for soil samples.

- ◆ **Sample Preparation:** Sample preparation will be performed in accordance with 40 CFR Parts 761.272 and 761.292. Extraction and cleaning to remove potential interferences will be conducted for all samples by USEPA Method 3540C – Soxhlet Extraction for Solid Samples.

Soxhlet extraction will be the first preference for sample preparation for PCB analysis. If a laboratory cannot conduct a Soxhlet extraction in a timely fashion, then ultrasonic extraction may be performed after notification and concurrence by USEPA.

- **Analyses:** Samples will be analyzed for PCBs using USEPA Method 8082A (or latest revision). Soil sample results will be reported on a dry-weight basis as micrograms of PCBs per gram of sample. Analytical reporting limits consistent with the remedial goal field quality control samples will be analyzed per the same analytical method used to analyze the parent samples as identified above. Turn-around times for sample analyses are anticipated to be expedited to facilitate execution of the excavation activities, as needed.

#### **5.4.3.2.2 Quality Assurance/Quality Control**

Field quality control samples will be analyzed per the same analytical method used to analyze the parent samples as identified above. Quality control requirements will be instituted during sampling and analysis, as described below.

- **Field QA/QC:** The purpose of collecting field QC samples is to demonstrate the reliability and defensibility of data. QC samples collected in the field will be used to assess the overall quality of the sampling and analysis processes. Field QC samples will include source-water blanks, equipment rinsate blanks, and field duplicate samples.
  - **Source-Water Blanks** – Source-water blanks are used to evaluate the quality of the water used for the last rinse in the decontamination process. The purpose of the source-water blank is to confirm that no contamination originating in the rinsing water was added to the sampling tools. The source-water blank consists of deionized water used for the final rinse and is analyzed for the same analytical suite as the samples collected with the equipment. Source-water blanks are collected at a frequency of one per sampling event, provided the same source of water is used for the final rinse. Multiple containers of the same lot number of deionized or distilled water are considered the same source.
  - **Equipment Blanks** – Samples may be collected using non-disposable equipment (e.g., slide hammers, etc.). Equipment rinsates demonstrate whether the decontamination procedure is effective in removing contaminants from field equipment used to collect samples. An equipment rinsate is collected after a sampling device is subjected to standard decontamination procedures. Water for the intended analysis will be poured over or through the sampling equipment, reserved in a sample container, and sent to the laboratory for analysis.

Contamination in the equipment rinsate indicates that the cleaning procedure for field equipment is not sufficient, allowing for the possibility of cross-contamination. The frequency of collection for equipment rinsates has been established based on the activity-specific requirements of this project. Criteria used to determine the collection frequency for equipment rinsates include factors such as the type of sampling equipment being used and the expected level of contamination at the Site. For this Site, one equipment rinsate will be collected per sampling device type per day of sampling. The total number of equipment rinsates should not generally exceed 10 percent of the total number of samples collected. Rinsates will be analyzed for the same parameters as the field samples collected. The results of equipment rinsate analyses will be used to qualify data or to evaluate analyte levels in the field samples.

- **Field Duplicates** – Field duplicates are additional samples collected at a sampling location to enable statistical analysis of the resulting data. Field duplicate samples are two samples collected at the same time, from the same source, at the same depth or sample location as the associated field sample. Field duplicates will be collected at a frequency of one for every 10 samples (i.e. 10 percent) of the same matrix.

A soil sample duplicate will be collected by mixing a portion of soil in a new plastic container, such as a resealable bag, and dividing the contents between two sample containers.

- **Laboratory QA/QC:** Laboratory quality assurance will be implemented according to the analytical laboratory's quality assurance program, plan, and standard operating procedures.
  - **QC Checks** – The analytical laboratory will perform quality control checks as required by the individual analytical methods to be used. These quality control checks are used to determine precision and accuracy and to demonstrate the absence of laboratory induced interferences and/or contamination. Quality control data may be derived from laboratory duplicates, matrix spikes/matrix spike duplicates (MS/MSDs), laboratory control samples (LCSs), and/or laboratory blanks. Results of the quality control analysis will be included in the laboratory report. Analytical methods and quality control measurements and criteria are based on current Contract Laboratory Program (CLP) and SW-846 requirements, and USEPA guidance.
  - **Calibrations** – Calibration of laboratory instruments will be performed in accordance with the published methods and procedures approved by the analytical laboratory and included in the laboratory's quality assurance manual. Instruments and equipment will be initially calibrated and continuously calibrated at required intervals as specified by either the manufacturer or more updated methodology requirements. Calibration standards used as reference standards will be traceable to USEPA, National Institute of Standards and Technology, or another recognized reference standard source.

#### **5.4.3.2.3 Results and Data Evaluation**

Results of verification sample analyses will be compared to remedial goal of 0.24 mg/kg to assess whether contaminant concentrations in soil remaining following excavation would be present at levels that pose a risk and to assess if further excavation would be necessary.

### 5.4.3.3 Inaccessible Areas

USEPA will be notified if areas requiring debris and soil removal are found to be inaccessible during implementation of the remedial plan. An action plan will be developed in consultation with USEPA and is anticipated to involve the following:

- If inaccessible areas are identified, the concrete and soils in those areas will be sampled in situ to determine if, and to what extent, PCBs are present.
- The circumstances around these areas will be documented in the Remedial Action Completion Report with a written summary of the conditions restricting access to the area for excavation.
- The inaccessible area will be physically segregated in-place from the surrounding accessible excavation area(s) by installing a permeable nonwoven polypropylene geotextile fabric (or similar) installed at the subsurface boundaries of the inaccessible area.

### 5.4.4 Stockpiling

Debris and soil management will typically involve direct loading into trucks for off-hauling. However, to facilitate off-hauling logistics, excavated debris and soil may be temporarily stored in stockpiles within the area from which they were excavated. Also, where unanticipated deposits of debris and/or contaminated soil are encountered, these materials may be temporarily stockpiled near the excavation locations to facilitate profiling, loading, and off-site disposal.

The contractor will prepare and maintain staging facilities for stockpiling of excavated material. Separate stockpiles will be established to segregate discrete waste streams at the Site and minimize the potential for cross contamination. The following minimum procedures will be followed when generating stockpiles:

- Stockpiles will be managed in accordance with 40 CFR 761.65(c)(9). Soil will be placed on a liner, covered, and surrounded by a perimeter berm.
- Stockpiles will be removed from the Site within 180 days in accordance 40 CFR 761.65 unless directed otherwise by EPA in the final application approval.
- When material is not being placed or removed, the Contractor will cover the stockpiles with a weighted plastic cover.
- Liners and covers will be comprised of minimum 10-mil polyethylene sheeting. Sandbags, or other weights, will be used to keep the plastic covers in place, as required by prevailing wind conditions.
- Perimeter berms comprised of soil, straw bales, or straw wattles will be installed to facilitate collection of free liquids draining from the stockpile.
- Covers and perimeter berms will be secured in-place when not in use and at the end of each work day, or as necessary to prevent offsite migration by wind and/or stormwater runoff. To

prevent contact of rain water with the stockpiled soil, stockpiling activities will be avoided on rainy days or immediately prior to predicted precipitation.

- Accumulated free liquids will be collected in containers for proper disposal.
- Construction materials for the stockpiles that contact waste may be disposed of as contaminated debris.

Construction mitigation measures for dust, erosion, and soil tracking control described subsequently will be implemented for stockpiles. Following completion of field activities, the contractor will remove and dispose of the liners and covers offsite. The underlying soil may be characterized, if there is visual evidence the liner was compromised and the stockpiled soil adversely affected the underlying soil.

#### 5.4.5 Waste Management

Waste management will include management of materials generated from the excavation activities. The waste streams associated with the subsurface disturbance activities may include:

- Investigation-Derived Wastes (IDW), including personal protective equipment (PPE) and soil cuttings associated with site characterization operations.
- Uncontaminated general construction debris (e.g. caution tapes, barricades, signs, packing materials, etc.) ancillary and incidental to the material removal activities.
- Soil, concrete, asphalt, or other debris generated during the removal activities and/or site characterization activities.
- Wastewater incidental to the removal activities, including generated contact water, decontamination water, and dewatering water.

Wastes generated from these activities will be profiled, managed, and disposed in accordance with applicable federal, state, and local regulations. Samples will be collected and submitted for chemical analyses to evaluate disposal alternatives. Off-site disposal of contaminated material will be conducted based on the stockpile analytical results under appropriate documentation.

##### 5.4.5.1 Waste Classification Requirements

Wastes generated during the excavation activities must be classified to determine applicable management requirements and restrictions. Both federal and state standards will be considered in the waste classification. The federal standards were developed pursuant to Resource Conservation and Recovery Act (RCRA) and are found in Title 40 of the Code of Federal Regulations (40 CFR). Requirements for disposal will conform with 40 CFR 761.61(a)(5) for bulk PCB remediation waste.

State regulations are found in Title 22 of the California Code of Regulations (CCR). Because RCRA and Title 22 methods and standards differ in some respects, it is possible for a material to be classified as a hazardous waste in California but not classified as a hazardous waste under RCRA (i.e. non-RCRA hazardous waste).

Excavation of debris and soil may generate four general waste types, categorized according to the anticipated location for offsite disposal. These waste types may include the following:

- Contaminated material for which offsite disposal at a Class I (RCRA) facility is anticipated.
- Contaminated material for which offsite disposal at a Class I (Non-RCRA) facility is anticipated.
- Contaminated material for which offsite disposal at a Class II (Non-Hazardous) facility is anticipated.
- Material that is not contaminated and for which offsite disposal at a municipal landfill is anticipated.

Samples will be collected in coordination with the disposal facilities and submitted to a state-certified laboratory for analyses requested by the disposal facilities.

#### **5.4.5.2 Waste Sampling, Analysis, and Profiling**

Waste material will be profiled in accordance with the requirements of the offsite disposal facilities. Collection and analysis of composite and/or discrete samples will be utilized to determine the waste classification of the material and the appropriate facilities for offsite disposal.

Based on the in-situ waste characterization described in Section 3, it is anticipated that the excavation activities will generate two classes of waste material that have different disposal requirements based upon the PCB concentrations. Excavated material will be treated as bulk PCB remediation waste. These waste material types include the following:

- **Soil with a Total PCB Concentration of Less Than 50 mg/kg:** This material may be disposed at one of the following locations – an approved PCB facility; or when disposed pursuant to Sec. 761.61(a) or (c), a permitted municipal solid waste or non-municipal non-hazardous waste facility; or a RCRA Sec. 3004 or Sec. 3006 permitted hazardous waste landfill. Soil with a total PCB concentration less than 50 mg/kg does not need to be shipped under a Uniform Hazardous Waste Manifest.
- **Soil with a Total PCB Concentration of 50 mg/kg or greater:** This material must be disposed of in a RCRA Sec. 3004 or Sec. 3006 permitted hazardous waste landfill or an approved PCB disposal facility. Soil with a total PCB concentration equal to or greater than 50 mg/kg must be shipped under a Uniform Hazardous Waste Manifest.

Corresponding disposal facilities will be identified during coordination for waste acceptance. Ultimately, the receiving facility will determine the waste acceptance criteria, which may require the collection of additional samples for analysis, as directed by the disposal facility, to supplement the existing in situ waste characterization data.

Where additional excavation performed in accordance with the contingency plan presented herein results in waste material not previously characterized for disposal, the stockpiled waste material will be profiled in accordance with the requirements of the offsite disposal facilities.

Collection and analysis of discrete and/or composite samples will be utilized to determine the waste classification of the soil and the appropriate facilities for offsite disposal. The samples will be submitted under chain of custody protocols for analysis using appropriate USEPA methods at a state-certified analytical laboratory. Analytical data will be used to characterize the stockpiled material in accordance with RCRA and Title 22 of the California Code of Regulations. Although sampling frequencies and analytical requirements are dependent upon disposal facility requirements, it is anticipated that the following analytical data, in addition to PCBs, may be required by disposal facilities:

- Title 22 metals.
- Volatile Organic Compounds (VOCs).
- Semi-Volatile Organic Compounds (SVOCs).
- Total Petroleum Hydrocarbons.
- Pesticides.

Ancillary waste, including the PPE worn by the field personnel, disposable sampling equipment and supplies, and rinsate from decontamination activities will be managed as follows:

- Spent disposable sampling equipment and PPE will be disposed as PCB remediation waste following the requirements of 40 CFR Part 761.61(a)(5).
- Wastewater from decontamination activities, will be accumulated in a water-tight container and stored disposed at their current PCB concentration following 40 CFR Part 761.65.
- Water may enter pits as rainwater or groundwater. This water will be temporarily stored onsite and depending on volume will be disposed of at its current PCB concentration or decontaminated in accordance with 40 CFR 761.79(b). The Site history and data suggests that PCBs are associated with solid particles, so appropriate filtration would be expected to successfully decontaminate the water. Filtration tests will be conducted, and samples will be collected and used to submit for an appropriate discharge permit.

These waste materials will be characterized, managed, and transported off-site in general conformance with Subpart D of 40 CFR Part 761.79 (Storage and Disposal).

#### **5.4.5.3 Transportation and Disposal**

The transportation and disposal of waste materials will be coordinated in accordance with applicable laws and regulations. Haulers licensed for commercial transportation will transport non-hazardous wastes and haulers licensed in accordance with 49 CFR 171-179 will transport hazardous wastes.

Notification shall be made to EPA Headquarters in accordance with 40 CFR 761.205, including submittal of EPA Form 7710-53, prior to removal of the soil with PCB > 50 mg/kg. The receiving facility will be notified in writing at least 15 days prior to the first shipment of bulk PCB remediation waste in accordance with 40 CFR 761.61.

Waste management protocols will require the following minimum information:

- Name of the disposal facilities to which the waste materials will be shipped.
- As needed, procurement of an EPA identification number.
- Method of shipment and an estimate of the number of loads needed for the identified waste shipment.
- Method for tracking the waste leaving the Site and arriving at the disposal facility.
- Established truck hauling routes.
- Bills of lading/waste manifests for waste/recycle material leaving the Site.

Following acceptance of the waste material by the disposal facility, the solid material will be loaded into trucks and transported directly to the permitted disposal facility. Trucks will maintain DOT safety regulations and procedures during off-hauling operations. The hauler will observe the following practices when transporting wastes off site:

- Obey applicable state, federal, and local requirements for transportation of wastes.
- Follow safety and spill response procedures outlined in the contractor's HASP.
- Decontaminate vehicles prior to reuse, other than hauling contaminated material.
- Minimize impacts to the public and traffic.
- Line and cover trucks/trailers used for hauling contaminated materials to prevent releases and contamination, as appropriate.
- Seal trucks transporting liquids, as applicable.
- Clean up material spilled in transit.

The construction equipment and other appurtenances will be staged in designated areas. When off-hauling occurs, traffic controls will be implemented to minimize disruption to traffic and pedestrians. All vehicles carrying waste will be securely tarped and inspected before leaving the Site. Disposal will be documented with appropriate manifests, weight tickets, and bills of lading.

Liquids will be containerized in accordance with DOT requirements presented in 40 CFR 761.65.

#### 5.4.6 Decontamination

Decontamination procedures will be used during removal of debris and contaminated soil to reduce tracking offsite. The decontamination process will involve the removal of contaminants such as accumulated soil, dust, and other contamination from earthwork equipment, vehicles, and personnel, while these items are physically located within a designated decontamination

area. The proper onsite management and offsite disposal of decontamination wastes such as wash water and contaminated protective equipment used by onsite personnel will be required. Self-implementing decontamination shall conform to applicable sections of 40 CFR 761.79(c). The principal components of the decontamination process are summarized below:

- Location of facilities for removal of debris and soil from personnel, equipment, and vehicles prior to egress from the Site.
- Removal and containment of soil and other material from equipment and transportation vehicles. Decontamination will entail the use of physical devices such as brushes, brooms, sponges, rags, and a double wash and rinse process consistent with Sections 761.79 (c)(2)(i) and 761.375, except that the second wash and rinse may be conducted using a concentrated or industrial strength detergent or non-ionic surfactant solution instead of an organic solvent. The use of water for decontamination will be minimized to the extent reasonable. Use of solvents to decontaminate equipment or use of petroleum products to prevent soil from adhering to the excavation equipment will not be allowed.
- Decontamination of personnel and equipment exiting exclusion zones. Every item of any sort mobilized to the Site that has been exposed to any contamination including dust, soil, or debris will either be treated as contaminated material and disposed of in accordance with applicable laws or will be decontaminated prior to leaving the Site or prior to demobilization from the Site.
- Plans for temporary containerization and storage in accordance with 40 CFR 761.65(c)(6), characterization, and treatment or offsite disposal of decontamination wastes generated during decontamination activities. The time frame for storage will accord with 40 CFR 761.65(a); the storage location will be determined when work begins but will most probably be near the west boundary of the excavation area.
- EPA will be notified of changes to the decontamination procedures in accordance with 40 CFR 761.79(h).

Disposable equipment intended to be used only once will not be decontaminated, but rather contained and managed as investigation-derived waste and disposed of according to 40 CFR 761.61(a)(5)(v). Decontamination records will be maintained to document compliance with 40 CFR Part 761.79(f).

## 5.5 Construction Monitoring and Mitigation Measures

Construction monitoring and control measures to mitigate potential construction-related impacts during soil disturbing activities will be performed, where applicable, to facilitate safe and quality construction. However, these general guidelines do not replace industry standards for construction. These construction monitoring and mitigation measures include:

- Deliberate communication with stakeholders and the project team.
- Construction quality control monitoring.

- Establishing and complying with health and safety protocols.
- Monitoring and controlling air quality impacts during debris and soil removal operations.
- Stormwater management and erosion and sediment control.

Additional details related to the construction monitoring and mitigation measures to be implemented during construction are as follows.

### 5.5.1 Construction Communications

Construction monitoring activities will be performed to facilitate site safety and compliance with the remediation plan.

- **Field Oversight:** The District or its representative will oversee the excavation and disposal of debris and contaminated soil. Construction quality assurance will involve observing, testing, and documenting activities related to the earthwork and sampling and analyses during management of debris and contaminated soil. This District or its representative will arrange to conduct tests in general accordance with USEPA, ASTM, and other applicable standards. The District or its representative will document the field activities as described below.
- **Field Documentation:** Field documentation of remediation activities will consist of:
  - Daily field reports.
  - Waste characterization and profile documentation.
  - Copies of manifests or bill of lading for each off-haul.

The District or its representative will prepare reports documenting daily activities during management of debris and contaminated soil. When applicable, daily reports will include monitoring logs and testing data forms. At a minimum, daily reports, logs, and data forms will include the following information:

- The date, project name, location, and other relevant identification.
- A summary of the weather conditions.
- A record of locations where construction is occurring.
- Equipment and personnel at the Site.
- A summary of field meetings and attendees.
- A description of materials used and references of results of testing and documentation.
- A summary of test data and results.

Construction activities will be photographed over the duration of the project to document work progress, construction issues, and subsequent mitigation activities. Photographs used for documentation will be identified with the date, time, and location of the photograph.

## 5.5.2 Construction Quality Control

Construction quality assurance (CQA) activities will include monitoring excavation activities, monitoring placement of fill, and monitoring compaction during Site stabilization.

- **Surveying:** The design excavation limits and other pertinent site features will be surveyed. Routine surveys of the excavation areas will be performed to document the extent of debris and soil removal. Upon completion of the work, the horizontal locations and elevations of the limits of excavations, verification sample locations (if collected), and final graded topography will be surveyed.

Surveying will be conducted by a State of California Licensed Land Surveyor. Datum and benchmarks used will be consistent with previous surveys conducted in 2012. Locations will be surveyed within 0.1 foot relative to the North American Vertical Datum of 1988 (NAVD88), California State Plane Coordinate System, Zone 3. Elevations will be surveyed to within 0.01 foot relative to the 1988 North American Vertical Datum (NAVD88).

- **Compaction Testing:** Excavation areas will be backfilled and graded to provide proper grades, drainage, and protection from erosion, as necessary. Compaction testing will be performed in accordance with ASTM standards.

Materials used during construction will be checked against the requirements specified in the Remedial Design Documents.

## 5.5.3 Protection of Existing Resources

The following measures will be taken prior to commencing with debris and contaminated soil removal activities to protect cultural and natural resources at the Site. In general, the contractor will monitor implementation of the remedial measures and identify cultural and natural resources to be protected following protocols and procedures established. In the Remedial Design Documents These protocols and procedures will be discussed at the pre-construction kickoff meeting. The contractor will notify the District or its representative in the event of discovered cultural and/or natural resources to facilitate site visits during site preparation and excavation activities to determine the nature of the resources and whether they require protection.

### 5.5.3.1 Natural Resources Protection

A summary description and mapping of biotic habitats in and around the immediate area of the Site are included in the Biotic Habitat Report (WRA 2017). Based on the habitat mapping, remedial action activities at the Site will occur within 20 feet of potential jurisdictional wetlands along the eastern edge of the Site, including:

- Potential wetland habitat at the northeast corner of the Site.
- Potential wetland habitat within the drainage swale along the eastern boundary of the Site.

To protect these resources, the following mitigation measures will be implemented:

- Protective fencing will be installed to separate potential wetland areas from the contractor's operations.
- A qualified biological monitor will be present, as needed, during construction activities within or near this sensitive habitat. The biological monitor will provide the following services to facilitate protection of natural resources:
  - Train the contractor in the identification and ecological needs of nearby sensitive species.
  - Assist in determining the alignment for protective high-visibility fencing to exclude construction activities from sensitive habitat.
  - Periodically monitor sensitive habitat near the Site and, if these areas are found to be affected by the construction activities, may recommend realignment of exclusionary fencing, as needed.
  - Note potential impacts to terrestrial fauna due to the construction activities.
  - Erosion and sediment mobilization control measures, which may include installation of silt fences, straw wattles, hay bales, and erosion control blankets around the wetland boundaries, will be implemented during construction to protect and minimize disturbance to the wetland areas.

The restoration grading plan for the Site will avoid altering the hydrology of the area on which the wetlands are dependent.

### **5.5.3.2 Cultural Resources Protection**

There are certain historical and cultural Native American resources known to be present at the Site, and others may be discovered during Site preparation and excavation operations. To protect these resources, the following mitigation measures will be implemented:

- Protective fencing will be installed to separate culturally sensitive areas from the contractor's operations.
- A qualified archeological monitor will be present, as needed, during construction activities within or near culturally sensitive areas. The archeological monitor will provide the following services to facilitate protection of historical and cultural resources:
  - Train the contractor in the identification and historical significance of nearby culturally sensitive areas.
  - Assist in determining the alignment for protective high-visibility fencing to exclude construction activities from culturally sensitive areas.

If previously unidentified archaeological resources or human remains are encountered during construction, the contractor will adhere to the following inadvertent discovery protocols for management of significant cultural resources discovered during remedial activities.

- The contractor will immediately halt all ground-disturbing activities in the vicinity of the discovery.
- The contractor will contact the archeological monitor immediately.
- The archeological monitor will evaluate the discovery and ensure proper treatment of the resource.
- Ground-disturbing activities will not resume in the vicinity of the discovery until the archeological monitor has evaluated the discovery and authorized work to resume.

Based on the nature of the inadvertent discovery, the contractor may be required to maintain the work stoppage, redirect field activities, and possibly assist the District in addressing potential archeological finds unearthed during implementation of the remedial action.

#### 5.5.4 Health and Safety Requirements

Health and safety protocols will be prepared and implemented that, at a minimum, conform to the general requirements of Occupational Safety and Health Administration (OSHA) standards (29 CFR 1910.120) and California Occupational Safety and Health Program (Cal-OSHA) standards (8 CCR GIS0 5192) for protecting workers and the community from construction hazards and the Site COCs.

Actual, potential, or anticipated hazards to be addressed by the health and safety protocols include, but are not limited to:

- Hazardous substances.
- Fall protection.
- Confined spaces.
- Trenches or excavations.
- Lockout/tagout.
- Heat/cold stress.
- Water hazards.
- Respiratory hazards.
- Hearing conservation.

A Site-Specific Health and Safety Plan (HASP), which will address identification of hazards, hazard mitigation, safe work practices and emergency response procedures, will be prepared containing the following health and safety protocols.

- The name and contact information of individual(s) who has been designated as the Project Manager and Project Health and Safety Representative.
- Requirements for worker training, including current 40-hour OSHA 1920.120 certification.
- Site controls to be implemented during construction activities to prevent the public from entering the limits of work.
- Identification of potential physical and chemical hazards.

- Requirements for personal protective equipment (PPE).
- An emergency action plan in the event of an accident, or serious unplanned event (e.g., fire, structure collapse, etc.) that requires notifying any response agencies (e.g., fire departments, PG&E, rescue teams, etc.), including emergency telephone numbers and emergency room/hospital routes.

The HASP will reflect a commitment to exercise extreme care when handling or disposing of materials or substances that are identified as hazardous substances. A copy of the HASP will be available within the limits of work at all times.

The contractor will take responsibility for all job-site safety issues as required by the general industry safety orders and all laws and regulations. The health and safety protocols will apply to all personnel working at, or visiting the Site including, but not limited to, contractor's employees, sub-contractor's suppliers, vendors, and truckers. Persons who do not have the required training and protective equipment will be excluded from the excavation area.

#### 5.5.5 Dust Control Plan

To mitigate the potential emission of fugitive dust during soil disturbing activities, dust control practices will be implemented to minimize the occurrence of visual dust at the perimeter of the construction zone. Dust control measures will be performed in accordance with applicable requirements from the Bay Area Air Quality Management District (BAAQMD). Dust control techniques may include the following:

- Applying water to areas to be excavated before starting excavation.
- Monitoring excavation activities and excavation rates.
- Misting or spraying the exposed areas with water to prevent formation of dust while excavating, transferring material onsite, or loading transportation vehicles.
- Covering stockpiles, if present, with weighted plastic sheeting.
- Minimizing drop heights while loading transport vehicles.
- Limiting vehicle speeds on the Site.
- Sweeping streets as needed.

Perimeter air monitoring will be performed (at select upwind and downwind locations) and dust control measures may be increased and/or modified as necessary to minimize fugitive dust. If either observations or measurements during perimeter air monitoring or complaints by air pollution control authorities or nearby residents indicate the need for more stringent dust control, the magnitude and frequency of the dust control measures may be increased. Palliatives may be added to the dust control water. If further dust control measures are needed due to meteorological conditions, such as strong winds, then certain portions of work may be stopped, windscreens may be constructed, or enclosed loading operations may be implemented.

## 5.5.6 Air Monitoring Plan

Real-time perimeter air monitoring will be performed to monitor the efficacy of dust control measures. Air monitoring will be conducted during activities that generate dust such as remedial excavations in the demolition area, stockpiling and loading of soils.

### 5.5.6.1 Particulate Action Level

Airborne particles can be classified by their particle diameter and health effects. Large particles typically settle out of the air rapidly and pose a limited health risk, but small particles may remain in the air for longer time periods and can penetrate deeply into the human respiratory system where they can cause harmful health effects. Particles 10 microns or smaller in diameter (PM10) and particles 2.5 microns or smaller in diameter (PM2.5; i.e., respirable particles) pose the greatest health risk because they can penetrate deeply in to the respiratory system. In addition to the health effects caused by the particles themselves, chemicals sorbed to the dust particles can also pose a risk.

An action level at the perimeter of the Site was established to monitor for potential migration of airborne dust. The recommended action level for respirable dust (PM10), which will trigger an increase in dust suppression efforts is based on the California Ambient Air Quality Standard of 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), which is a 24-hour time-weighted average (TWA; California Code of Regulations, Title 17, Section 70200). Available data from San Francisco Bay Area air monitoring stations indicate that annual average regional background PM10 concentrations are approximately  $20 \mu\text{g}/\text{m}^3$  (BAAQMD). Assuming that  $20 \mu\text{g}/\text{m}^3$  is a reasonable estimation of average background PM10 concentrations at the Site, 8-hour TWA PM10 concentrations of up to  $110 \mu\text{g}/\text{m}^3$  could occur during soil loading and off hauling activities at the Site without exceeding the 24-hour TWA of  $50 \mu\text{g}/\text{m}^3$  for PM10.

Instantaneous perimeter dust concentrations using portable dust monitors will be measured periodically during dust generating activities. If instantaneous dust concentrations measured using the portable monitors exceed  $110 \mu\text{g}/\text{m}^3$ , dust suppression efforts will be increased. The portable dust monitoring equipment does not distinguish between particle sizes and will therefore monitor dust with a range of diameters. Dust particles larger than 10 microns are likely to be associated with the material handling operations, and therefore comparison of data from the portable dust monitoring to these action levels is considered to be protective. Compliance with the 8-hour TWA PM10 action level of  $110 \mu\text{g}/\text{m}^3$  will be confirmed by the stationary perimeter dust monitors.

To account for short-term variations in dust emissions, an equivalent five (5) minute TWA of approximately one (1) milligram per cubic meter ( $\text{mg}/\text{m}^3$ ) will serve as the stop work action level.

### 5.5.6.2 Methods and Equipment

Perimeter air monitoring will be accomplished using a combination of portable and stationary real-time direct-reading instruments.

#### **5.5.6.2.1 Perimeter Dust**

Air monitoring will be conducted to assess whether airborne dust in excess of typical ambient concentrations is present at the Site perimeter as a result of the remedial activities. Stationary perimeter monitoring stations are shown on Figure 23.

Dust monitors utilizing a light-scattering technique with size-selective features will be used to provide real-time monitoring data. A sampling pump is used to continuously draw ambient air through a sensing chamber where laser light is scattered by dust particles, collected by a high resolution optical cell, and measured by a photodiode detector. This signal is processed to give a result that is correlated with the atmospheric mass concentration and particle size to provide readings of instantaneous as well as averaged dust concentrations. The monitors will also be capable of providing information regarding maximum and average daily dust concentrations in the form of a printed report through use of a data logger or similar printing apparatus.

In addition to stationary locations, instantaneous particulate matter concentrations will be measured along the perimeter of the Site using a portable dust monitor at least four times per day while dust-generating activities are being conducted. The portable dust monitoring equipment does not distinguish between particle sizes and will therefore monitor dust with a range of diameters. Dust particles larger than 10 microns are likely to be associated with the soil, and therefore comparison of portable dust monitor data to respirable dust action levels is considered to be conservative.

#### **5.5.6.2.2 Meteorological Conditions**

The wind speed and direction will be measured using an anemometer and wind direction sensor, which utilizes a potentiometer.

#### **5.5.6.3 Air Monitoring Stations**

The locations of air monitoring stations will be chosen so that risks of exposure to dust and odors can be adequately monitored. The optimum number and location of the perimeter air monitoring locations will be chosen based on assessment of the following factors:

- Security of Site perimeter and potential offsite locations.
- Length of perimeter boundaries.
- Proximity of Site activities to nearby offsite receptors.
- Directional location of loading and off hauling activities with respect to nearby offsite receptors.
- Predominant wind directions, based on meteorological measurements.
- Ability and ease of repositioning monitors.

It is anticipated that local meteorological conditions in the immediate Site vicinity will be monitored daily during the loading and off hauling activities. The anemometer and direction

sensor will be mounted at least 20 feet away from and four (4) feet above site features or other obstructions that could affect ambient air flow patterns.

Perimeter air monitoring stations will be placed along the interior side of the fenced perimeter of the Site at breathing height based on the predominant wind direction, as suggested below and shown on Figure 23.

- Station, No. 1 will be located in the southwest (toward the Bay), generally upwind of the excavations and near the truck route.
- Station No. 2 will be located near the construction entrance, where trucks exit
- Station No. 3 will be placed near the east fence, at the base of the slope below the newly constructed housing
- Station No. 4 will be placed near the northern retaining wall.

The predominant direction of wind at San Francisco is from the northwest to US Department of Agriculture.

#### **5.5.6.4 Tasks and Frequency**

Routine continuous and instantaneous real-time perimeter air monitoring will be conducted only during dust-generating activities, such as soil handling, loading, and transport activities. Dust monitors will be used continuously during the workday to monitor particulate matter concentrations at the proposed perimeter air monitoring stations. In addition, instantaneous particulate matter concentrations will be measured at least four times during such work days along the perimeter of the Site using a portable dust monitor. The frequency of perimeter air monitoring may be reduced if dust monitoring indicates that the excavation, loading and off hauling activities are not resulting in significant dust impacts.

Field personnel will operate, maintain, and calibrate the air monitoring equipment in accordance with the manufacturer's recommendations. The instantaneous and daily data collected at each perimeter air monitoring station will be recorded on air monitoring field data sheets. At all times during air monitoring activities, proper health and safety procedures will be followed.

##### **5.5.6.4.1 Baseline Monitoring**

To characterize baseline airborne dust concentrations at the perimeter of the Site, baseline air monitoring will be conducted prior to beginning excavation and off hauling activities. Baseline air monitoring will be performed at each of the perimeter air monitoring locations at the Site during the typical project work hours for the project. To establish background levels for the instantaneous monitoring, meter readings will be taken upwind of the Site in the beginning of the day and at least one other time during the day. Monitoring will be performed using the same methods and equipment that will be used for perimeter air monitoring during the soil loading and off hauling activities. Potential dust-generating activities will not be conducted at the Site on the days that baseline air monitoring is being performed.

#### **5.5.6.4.2 Perimeter Dust Monitoring**

For monitoring of particulate matter, the following activities will be performed during excavation and soil handling and off hauling activities that could potentially generate nuisance airborne dust and/or particulate matter. The frequency of dust monitoring may be increased or decreased depending on specific Site conditions, activities involved, and field observations.

- Monitors will be calibrated in accordance with the manufacturer's recommendations.
- Monitors will be zeroed with pure air and checked for functioning monitor and charged battery at the beginning and end of each work day following the manufacturer's instructions.
- Monitoring parameters, including the times when the pumps are turned on and off, and the flow rates at the beginning and end of the monitoring period, will be recorded on the field data sheets.
- Monitor readings will be collected along the Site perimeter to set baseline conditions prior to initiating and at the completion of soil handling and off hauling activities.
- Monitors will be placed at breathing height at the designated perimeter air monitoring stations or other locations if it is determined that such locations would better monitor soil handling and off hauling activities and dust generation and migration. Each monitor will be secured and locked to prevent theft or damage. All monitors will remain within the fenced perimeter area.
- Each monitor will be set to continuously record dust concentrations throughout the duration of the workday. Each monitor will be checked periodically to assess the continued proper operation of the unit.
- Instantaneous monitoring will be conducted periodically during the workday and will consist of walking the fenced perimeter of the Site, at a slow pace, while observing the monitor. The monitoring circuit will begin in the upwind portion of the Site, where background concentrations will be recorded. The monitoring circuit will proceed around the fenced perimeter of the Site, at a slow pace, with continuous observation of the monitoring readings. If readings exceeding the respirable dust action level of  $110 \mu\text{g}/\text{m}^3$  are observed, the monitoring personnel will stop walking and obtain a stabilized reading. If the stabilized reading exceeds  $110 \mu\text{g}/\text{m}^3$ , the location of the reading will be recorded on the field data sheet and dust suppression efforts will be increased. If readings exceeding the 5-minute TWA stop work action level of  $1 \text{mg}/\text{m}^3$  are observed, the monitoring personnel will stop walking and obtain a 5-minute TWA of dust concentrations. If the observed 5-minute TWA is above  $1 \text{mg}/\text{m}^3$ , the location of the reading will be recorded on the field data sheet and the soil handling and/or off hauling activities will be suspended until more stringent dust control practices are implemented.
- At the end of the day, the monitors will be retrieved and the data downloaded. Average and maximum dust concentrations for the day will be stored from the monitors using the data logger. Once the daily information has been recorded, each monitor will be turned off and locked away until activities resume the following workday.

#### **5.5.6.4.3 Meteorological Measurements**

Wind speed and direction measurements will be collected continuously at the Site during dust-generating activities. The wind speed and direction measurements will be checked at least once per hour, and if there is an indication that a significant and sustained shift in wind direction has occurred, the perimeter air monitoring stations may be repositioned, as appropriate.

The wind speed and direction will be measured using an anemometer and wind direction sensor, which utilizes a potentiometer. The anemometer and direction sensor will be mounted at least 20 feet away from and four (4) feet above site features or other obstructions that could affect ambient air flow patterns. Average wind speed and direction will be printed out daily in a tabular format and retained with the field logs.

#### **5.5.6.5 Record Keeping**

Records of the perimeter air monitoring activities will be prepared for each circuit of the Site perimeter and will include the following information:

- Date and time of monitoring.
- Operator name.
- Instrument type.
- Date/time of last calibration.
- General weather conditions (wind speed and direction, temperature, precipitation, cloud cover).
- Location and measurement of background concentration.
- Location and description of odor observations.
- Location and stabilized measurement for elevated readings.
- Summary of contractor activities and suspected source of odors or elevated readings (only needed if odors or elevated readings are encountered).
- Follow-up response actions.

#### **5.5.6.6 Quality Assurance/Quality Control**

Calibration and data management procedures will be documented to establish and maintain data quality records. Instrument maintenance activities will be documented on the field logs to demonstrate the proper application of quality control measures to the monitoring equipment. Typically, the manufacturer's manuals provided with the monitoring equipment are sufficient guides for conducting calibrations, but the calibration results should be documented.

Calibration and check out procedures for the dust monitor will be performed in accordance with manufacturer's recommendations. Because monitoring equipment may be influenced by changes in environmental parameters such as ambient temperature and humidity, the monitoring equipment may also be calibrated during the middle of the workday. Each instrument will be zeroed at the beginning of the workday using pure air or Dräger tubes provided by the manufacturer. Prior to each use, the monitor response and battery charge will be checked. No other quality control procedures are anticipated for the monitoring activities.

### 5.5.7 Stormwater Management and Erosion Control

The District will comply with the requirements of the State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (General Permit; SWRCB Order No. 2009-0009-DWQ, NPDES No. CAS000002). A Stormwater Pollution Prevention Plan (SWPPP) will be prepared by a Qualified SWPPP Developer (QSD) and implemented by a Qualified SWPPP Practitioner (QSP) in compliance with the State Water Resources Control Board's regulatory requirements for construction stormwater pollution management.

The SWPPP will include proposed measures to address the following:

- Identify a risk category for the project in accordance with regulatory requirements.
- Identify the relevant drainage areas to be protected during construction activities.
- Identify pollutant sources, including sources of sediment that may affect the quality of stormwater discharges associated with construction activities.
- Identify non-stormwater discharges.
- Identify best management practices (BMPs) to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the Site during construction, including control of stormwater, erosion control, control of drainage from stockpile areas, and monitoring and control of truck loading areas.
- Develop a maintenance schedule for BMPs installed during construction that are designed to reduce or eliminate pollutants after construction is completed (post-construction BMPs). The identified BMPs will be employed to reduce the sediment load in runoff from the Site.

BMPs will be installed and maintained in accordance with industry standard practices described in the California Stormwater Quality Association's (CASQA's) Storm Water Best Management Practice Handbook Construction (CASQA 2009). Specific BMPs presented in the CASQA Handbook and expected to be included in the SWPPP and employed at the Site are listed in Table 18. The categories of the BMPs include:

- Erosion Control (standard practices for post-construction stabilization measures such as mulch, hydroseeding, etc.)
- Non-Stormwater Management Control (standard practices for dewatering excavations, crossing waterways, cleaning vehicles, etc.)
- Sediment Control (standard practices for controlling sediment transport, including silt fences, sediment traps, fiber rolls, etc.)
- Tracking Control (standard practices for building a construction entrance/exit and tire wash station)

- Waste Management and Materials Pollution (standard practices for stockpiling and loading waste materials, including debris and soils)
- Wind Erosion Control (standard practices to prevent or reduce windblown dust)

Regular inspections will be conducted by the contractor's QSP to maintain, adjust, and update the implemented stormwater pollution controls

Possible practices to reduce the sediment load in stormwater runoff from the Site include the following:

- Grading the Site to prevent stormwater from running offsite, installing stormwater control devices (diversion ditches, straw bale barriers, fiber rolls, etc.) around the perimeter of the Site, and protecting existing storm drains and culverts with straw bales or filter inserts.
- Placement of fiber rolls or straw bales at the toe and top of slopes and slope faces to minimize run-on to and runoff from disturbed areas in advance of an anticipated rainfall.
- Sediment tracking controls will be implemented along access routes and haul roads, including construction entrances and exits. Drainage inlet filters will be installed to protect storm drains in the vicinity of the access routes and haul road.
- Material that must be stockpiled for further characterization will be held in a separate stockpile staging area and covered with plastic sheeting.
- Fuel and chemicals will be stored in such a manner as to prevent accidental spills from being released to the environment and/or impacting stormwater.
- Materials and equipment will be stored and handled in such a manner as to prevent non-stormwater discharges from being released to the environment and or impacting stormwater.

#### 5.5.8 Consideration of Standard Guide for Greener Cleanups

ASTM Standard E2893-16, Standard Guide for Greener Cleanups, is a "guide" that describes "a process for evaluating and implementing activities to reduce the environmental footprint of a cleanup project." ASTM identifies sets of BMPs that can be utilized "when deemed appropriate" to reduce the environmental footprint of a project. The ASTM guidance is not a statutory requirement but was considered herein. Specifically, the guidance was reviewed to identify BMPs that could be employed to reduce the environmental footprint of the remediation project. The design of the remediation project and construction mitigation measures previously described already includes several elements consistent with BMPs outlined in ASTM E2893-16, Table X3.1 (Greener Cleanup BMP Table). In Table 19, ASTM entries from Table X3.1 are presented with the proposed measures and examples of specific actions that can be taken. The measures include the following:

- Reuse of uncontaminated soils onsite.
- Minimizing idling times to minimize emissions, greenhouse gases, and fuel consumption.

- Utilizing dust control measures to minimize the release of pollutants.
- The use of stormwater BMPs to protect water quality.
- Avoidance of impacts to wetlands and waters.

Other measures that could be employed, where feasible, to reduce the footprint of the project include:

- The use of biodiesel and/or biodegradable hydraulic fluids.
- The use of electric, hybrid, ethanol, or compressed natural gas vehicles.
- Using local staff (including subcontractors) when possible to minimize transportation impacts.
- Encouraging the use of public transportation and ride-sharing for site staff.
- Designating collection points for compostable materials and routine recycling of single-use items.
- Minimizing hauling distance, by using backfill material from a local source.
- Restrict onsite traffic to confined corridors to minimize soil compaction and land disturbance during site activities.
- Selecting waste disposal and recycling facilities closest to the site to minimize transportation impacts.
- Employing a closed-loop graywater washing system for decontamination of trucks and other equipment.
- Using biodegradable seed matting, or erosion control fabrics.
- Restoring the site using a suitable native hydroseed mix to preserve or improve biodiversity and related ecosystem services; for grass, use no- or low-mowing species.
- Replace grassed swales/channels and other types of vegetated areas to enhance gradual infiltration and evapotranspiration and prevent soil and sediment runoff.

The remedial design documents will identify the above measures and encourage the contractor to employ these BMPs, where feasible.

## Section 6: Restoration Plan

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Post-construction restoration activities include the tasks required to restore the Site to stable conditions. These activities include the Contractor's demobilization of construction equipment, facilities, and Site controls, and installation of post-construction best management practices.

### 6.1 Backfill and Restoration Operations

Following removal of contaminated soil and debris, the excavations will be backfilled and the areas restored to approximate pre-construction grades.

- **Import Material Evaluation:** Backfill material, where required to restore grade, may be sourced from the soil stockpiled from the top two feet of the excavations, as described previously, or imported from offsite. The potential backfill material will meet the following minimum requirements prior to use within the excavations:
  - The potential fill material will be geotechnically suitable and compatible to allow adequate compaction and stable contact with the exposed native surfaces. Testing for geotechnical conformance will be performed, including compaction (ASTM D 1557) and particle size (ASTM D 422) in accordance with approved design documents. Bulk samples will be collected directly from the source stockpiles. These bulk samples will then be shipped to a soil testing laboratory and tested in accordance with the corresponding ASTM standards.
  - The potential fill material will be sampled and analyzed at each fill source at a frequency and analytical suite consistent with DTSC's Information Advisory, Clean Imported Fill Material guidance (DTSC 2001) to document that concentrations of COCs in import fill material do not present significant risks to human health or the environment.
  - The soil type for potential backfill material will be compatible with site-specific restoration and/or development plans, if available.
  - The potential fill material will attain USEPA concurrence of acceptability.
- **Site Restoration Requirements:** Backfilling operations will begin following concurrence from USEPA that debris and contaminated soil removal have been adequately performed. Fill will be placed in lifts and compacted in accordance with geotechnical and/or horticultural recommendations. Following backfilling operations, excavation areas will be re-graded to provide proper drainage and protected with erosion control measures, as necessary and consistent with the SWPPP.

Construction quality assurance activities may be performed consistent with industry standards and will include monitoring placement of fill (onsite reuse material, imported material, and landscape amendments, as needed) and monitoring of compaction requirements (in place density and moisture content). Over-excavation and backfilling will be performed in accordance with geotechnical best practices to key-in backfilled areas where excavated slopes are required to be re-graded.

## 6.2 Site Stabilization

After remedial construction is completed at the Site, the District will stabilize the area to address potential site erosion and subsequent sediment migration into the nearby drainage course. The contractor will install erosion and sediment migration control measures in accordance with the SWPPP. The District will monitor post-construction erosion on exposed soil surfaces and graded slopes. Installation of BMPs may include:

- Native mulch.
- Straw ground cover.
- Erosion control blankets.
- Fiber rolls.
- Straw bales.
- Silt fence.

## 6.3 Demobilization

The Contractor will demobilize from the Site in the following sequence of operations:

- Clean the project limits and potentially impacted areas beyond the project limits of debris that may have been left behind or deposited during the remedial activities.
- Remove temporary gates, fences, and barricades, and signs
- Remove temporary facilities, including decontamination pads, parking areas, etc.
- Repair roadways or objects damaged by remediation activities.

Prior to the Contractor's demobilization activities, the District will perform a final walk through of the Site with USEPA and the Contractor. A punch list of remaining activities will be prepared for the Contractor to implement during the demobilization phase of the project.

## Section 7: Remedial Action Completion Report

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A Remedial Action Completion (Report) will be prepared at the conclusion of the remedial action. The Report will summarize and present information and data collected during the contaminated soil and debris removal and Site restoration activities, including:

- A summary of the field activities completed:
  - Cleanup timeline.
  - Description of excavation, decontamination, sampling and analysis, waste disposal, and Site restoration.
  - Deviations from the remediation plan.
  - Account of regulatory interactions during the remediation process and the outcomes as they pertain to cleanup attainment and approval of backfill or non-attainment of cleanup.
- Tabulated data summaries:
  - Geospatial information, including northings, eastings, and elevations of surveyed excavation limits and other points of interests.
  - Excavation volumes.
  - Waste profiling analytical data.
  - Waste manifests and supporting waste disposal information, including quantities of contaminated soil and debris disposed at offsite facilities.
  - Sources of and test results for imported backfill.
- Graphical displays of remedial and restoration activities:
  - As-built drawings for excavation, including the areal extent and depth of excavations to remove debris and soil containing concentrations of total PCBs exceeding the remedial goal.
  - As-built drawings for post-construction restoration, including final grades and Site stabilization features.
- Copies of laboratory analytical reports and chain-of-custody records.
- Copies of waste profiles, waste acceptance applications and approvals, waste manifests, and transport and disposal documentation for PCB remediation waste (e.g., debris and contaminated soil).
- Copies of equipment decontamination records.
- Photographic documentation of the field work.

If additional deposits of debris and/or contaminated soil are identified and removed beyond the limits of excavation identified in this Application or the Remedial Design Documents, then the associated verification sampling, analysis, and data evaluation performed to determine compliance with cleanup goals will be presented in the Report, including:

- A summary of the field activities completed:
  - Description of excavation, decontamination, sampling and analysis, waste disposal, and Site restoration.
  - Account of regulatory interactions during the remediation process and the outcomes as they pertain to cleanup attainment or non-attainment of cleanup.
- Tabulated data summaries:
  - Geospatial information, including location name, sample name, northings, eastings, and elevations of surveyed verification sampling locations.
  - Verification sample analytical results, including location name, sample name, individual Aroclor results, and total PCBs.
- Graphical displays of verification sampling activities:
  - Verification sample analytical results, including location name, sample name, elevation, individual Aroclor results, and total PCBs.
  - As-built drawings for additional excavation, including the areal extent and depth of excavations to remove debris and soil containing concentrations of total PCBs exceeding the remedial goal beyond the limits of excavation identified in this Application or the Remedial Design Documents
- Field sampling records.
- Copies of laboratory analytical reports, chain-of-custody records, and data validation reports, if applicable.

Deviations from the remediation plan will be identified in the Report. In particular, modifications to the limits of excavation will be narratively described and graphically presented in the Report, including.

- Areas inaccessible for cleanup where debris and/or soil may remain containing concentrations of PCBs exceeding the cleanup goal. The lateral extent and depths beyond which additional excavation may be required will be indicated.
- Areas where debris and/or soil containing concentrations of PCBs exceeding the cleanup goal extends beyond the property boundary.

A draft of the Report will be provided to USEPA for review and comment within approximately 120 days of the date of USEPA concurrence for backfilling the excavations, followed by final submittal of the Report, signed and stamped by a California-licensed Professional Engineer or Geologist.

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