Pacific Gas and Electric Company®

Ben LePage, Ph.D., PWS
Manager,
Environmental Remediation

3401 Crow Canyon Rd.
San Ramon, CA 94583

(925) 415-6407
(925) 415-6852
Ben.LePage@pge.com

19 November 2015

RECEIVED
By Alameda County Environmental Health 9:34 am, Nov 23, 2015

Alameda County Environmental Heath
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

Subject: 205 Brush Street
Oakland, California
RO0003196

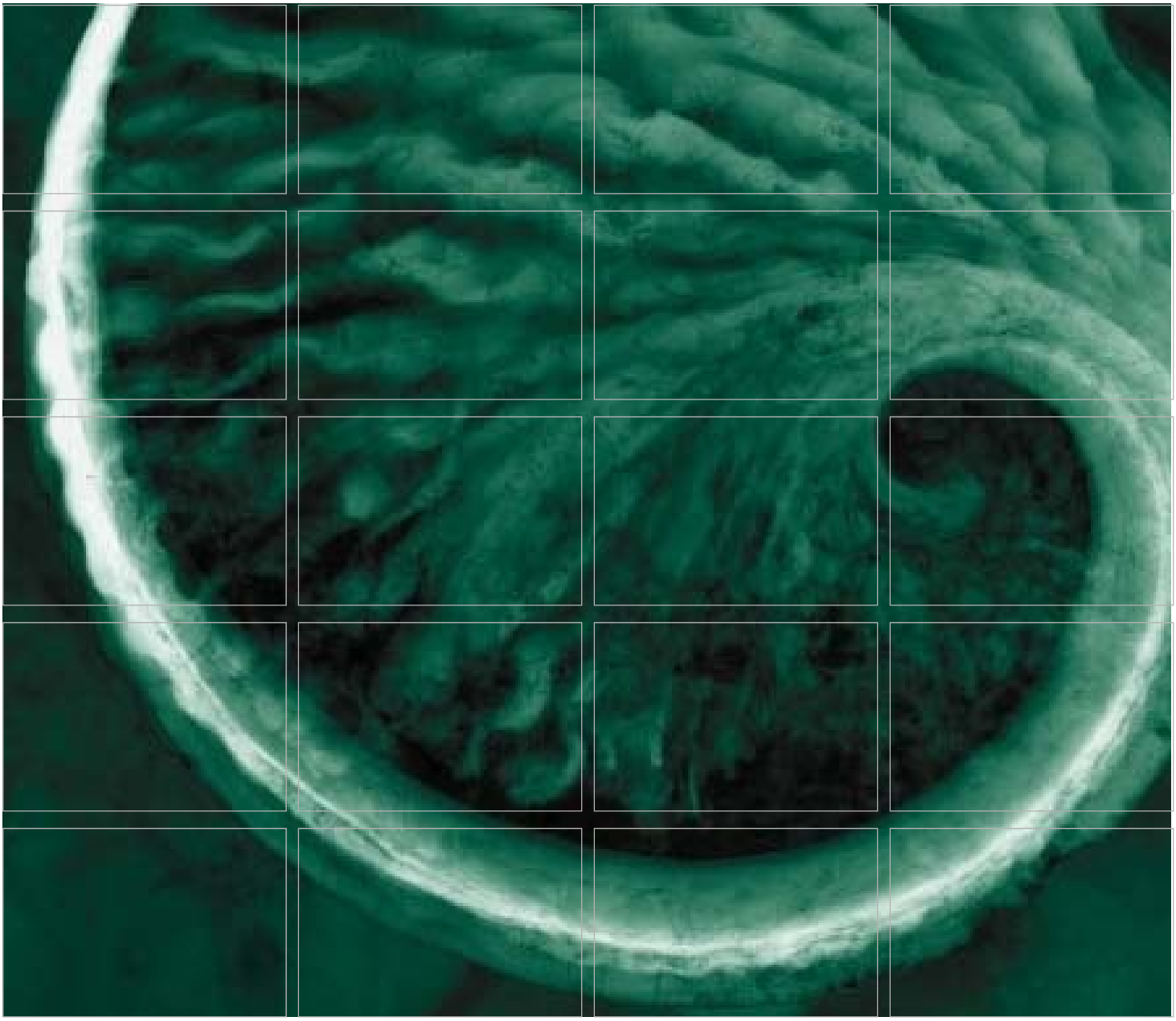
To whom it may concern:

As the legally authorized representative of PG&E, who contracted ERM-West, Inc. (ERM) to prepare the *Site Characterization Investigation Workplan*, I have reviewed the report and declare under the penalty of perjury, that the information and/or recommendations contained in this report are true and correct to the best of my knowledge.

Sincerely,

Ben A. LePage, Ph.D.

Manager, Remediation



Site Characterization Investigation Work Plan

Prepared for:
Pacific Gas and Electric Company

205 Brush Street
Oakland, California

November 2015

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The world's leading sustainability consultancy

Pacific Gas and Electric Company

Site Characterization Investigation Work Plan

205 Brush Street
Oakland, California

November 2015

Project No. 0231462

Jim Warner, P.G.
Principal-in-Charge

Arun Chemburkar, P.E.
Technical Director

John Lucio, P.G.
Project Manager

Environmental Resources Management
1277 Treat Blvd, Suite 500
Walnut Creek, California 94596
T: 925-946-0455
F: 925-946-9968

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LIST OF ACRONYMS

ACEH	Alameda County Environmental Health
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CNG	Compressed natural gas
COC	Compound of concern
CPT	Cone penetration test
DTSC	Department of Toxic Substances Control
EDR	Environmental Database Resources, Inc.
ERM	ERM-West, Inc.
ESA	Environmental Site Assessment
ESL	Environmental screening level
GPS	Global positioning system
HASP	Health and safety plan
Hg	Mercury
MTBE	Methyl tert-butyl ether
OFSA	Oakland Fire Services Agency
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PG&E	Pacific Gas and Electric Company
PID	Photo-ionization detector
PPDT	Pore pressure dissipation test
QA/QC	Quality assurance/quality control
RWQCB	San Francisco Bay Regional Water Quality Control Board
SLIC	Spills, Leaks, Investigations, and Cleanups
SWRCB	State Water Resources Control Board
TPH	Total petroleum hydrocarbons
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	Underground storage tank
VOC	Volatile organic compound

1.0 INTRODUCTION

ERM-West, Inc. (ERM) has been retained by Pacific Gas and Electric Company (PG&E) to complete a Site Characterization Investigation at the former Port of Oakland property located at 205 Brush Street in Oakland, Alameda County, California (the "site" or "subject property", Figure 1). This document serves as the Work Plan for activities planned to complete the characterization of impacted soil, soil vapor, and groundwater as identified in the 14 February 2014 *Phase II Environmental Site Investigation, 205-209 Brush Street, Oakland, California* (ERM 2014b). PG&E has acquired this property from the Port of Oakland for redevelopment as part of upgrading its natural gas distribution infrastructure. PG&E will perform timely characterization of the site prior to site redevelopment to fully assess any potential health risks to construction workers and expedite soil remediation to mitigate risks to site workers and eliminate any potential sources of impact to groundwater. The following sections present the site background and summarize a phased investigation to complete the site characterization.

2.0 SITE BACKGROUND

The subject property consists of an approximately 0.74-acre parcel of land that is improved with three vacant structures and concrete- and/or asphalt-paved areas. The subject property is identified as Alameda County Assessor's Parcel Number 001-0111-005-02. The subject property is situated in a primarily commercial and light industrial area in Oakland, Alameda County, California. Adjacent properties and surrounding areas include Market Street, with Sincere Home Décor and Sincere Hardware Supply beyond to the west; 3rd Street, with Extra Space Storage beyond to the north; Brush Street, with Digital Realty and 2nd Street beyond to the east; and a compressed natural gas (CNG) gas station and storage and parking lots to the south. A layout of the subject property is provided in Figure 2.

Based on an interview with personnel familiar with the subject property and a review of historical photographs and records, the subject property was occupied by residences in the late 1800s, followed by a blacksmith shop, carpenter shop, and hotel in the early 1900s. By the early 1950s, the subject property was occupied by a retail store, junk yard, machine shop, and restaurant, and by the late 1950s, a truck repair and cleaning facility was also located on site. By the late 1960s, a paint and varnish facility, including an exterior varnish tank, was located on the subject property. The Port of Oakland's Facilities Operations and Maintenance facility was first located on the site in the early 1970s. Former operations at this facility include hazardous waste storage, fueling of vehicles including underground storage tanks (USTs) and associated dispenser islands, vehicle maintenance and repair including a hydraulic lift, and painting shop.

The site is currently occupied by three commercial buildings located in the northern and eastern portions of the site, with a paved yard comprising the remainder of the 0.74-acre property. Building 2 (labeled as 2 on Figure 2) is in the northern portion of the site and consists of a single-story, plus mezzanine, approximately 6,096-square-foot office and warehouse building. The building was most recently occupied by construction offices and diver storage. Building 3 (labeled as 3 on Figure 2) adjoins the southeastern portion of Building 2. The single-story building consists of approximately 1,081 square feet and was most recently used as a vehicle maintenance facility. A covered vehicle wash area and associated sump (labeled as 4 on Figure 2) are adjacent to the east of Building 3. Building 1 (labeled as 6 on Figure 2) is in the southeastern portion of the subject property. The office/warehouse building consists of approximately 15,692

square feet within a single story and mezzanine. The building was most recently occupied by a paint shop, locker rooms, and offices. An overhang located adjacent to the northwestern exterior of Building 1 was previously used as a solvent drum storage area. The remainder of the site consists of an open, concrete-paved yard, with the exception of an asphalt-paved area at the western side of the subject property, where former USTs had been removed. The currently vacant portion of the subject property is surrounded by fencing, with an access gate along the western boundary at Market Street.

2.1 PREVIOUS SITE WORK – PHASE I ENVIRONMENTAL SITE ASSESSMENT

In 2013, ERM conducted a Phase I Environmental Site Assessment (ESA) for PG&E as part of the due diligence process for the potential acquisition of the site. Findings from the Phase I ESA identified the following recognized environmental conditions (RECs) at the subject property that are discussed in detail in the *Phase I Environmental Site Assessment, Former Port of Oakland Facilities Operations and Maintenance Property* (ERM 2013). The RECs are summarized below:

- One 1,000-gallon diesel UST and one 10,000-gallon gasoline UST, along with associated fuel dispensers, piping, concrete and soil overlying the USTs, were removed from the site under the oversight of the Oakland Fire Services Agency (OFSA) in 2003. During the removal of the tanks, soil beneath the tanks was observed to be stained and a strong hydrocarbon odor was reportedly noted. A limited excavation was conducted during the removal of the tank; however, sampling results indicate that impacted soil still remained within the former tank area and groundwater samples indicated the presence of total petroleum hydrocarbons (TPH) as gasoline (TPH-g) and diesel (TPH-d), as well as associated volatile organic compounds (VOCs) including benzene, toluene, ethylbenzene, total xylenes (BTEX), and methyl tert-butyl ether (MTBE) and lead. The site is considered an open case by the Alameda County Environmental Health (ACEH).
- The subject property address of 205 Brush Street is listed as Port of Oakland/Downtown Oakland CNG Station on the Alameda County Contaminated Sites and Spills, Leaks, Investigations, and Cleanups (SLIC) databases in the Environmental Database Resources, Inc. (EDR) report, on the State Water Resources Control Board (SWRCB) GeoTracker database, and on the ACEH database. According to the records reviewed, and a report titled *Removal Action Oversight and Documentation at Downtown Oakland CNG Station, 205/209 Brush Street,*

Oakland, CA (R&M Environmental 2007), stained, odiferous soil was encountered during soil excavation associated with construction of the CNG station on the Port of Oakland-owned property in 2007. Approximately 200 cubic yards of soil was excavated, and soil contaminated with TPH and VOCs reportedly remains in place. Based on the 2007 report, the soil contamination was considered to possibly be from a previous UST release at the Port of Oakland property adjacent to the north (the subject property). The case is listed as open – site assessment as of April 2007 on the GeoTracker and ACEH databases.

- Based on historical documents reviewed, the subject property has a history of commercial and industrial use since the early 1900s associated with potential environmental concerns. The long history of commercial and industrial activities at the site, and associated potential subsurface impacts, was identified as a REC for the subject property.

2.2 *PREVIOUS SITE WORK – PHASE II ENVIRONMENTAL SITE INVESTIGATION*

As part of the due diligence process to address the findings of the Phase I ESA, PG&E retained ERM to conduct a limited Phase II investigation. The scope of work completed and the results of this investigation were presented in the 16 January 2014 *Port of Oakland Phase II Environmental Site Investigation Work Plan, 205-209 Brush Street, Oakland, California* (ERM 2014a), and the investigation results were summarized in the 14 February 2014 *Phase II Environmental Site Investigation, 205-209 Brush Street, Oakland, California* (ERM 2014b). The scope of work included the following activities:

- The installation of 10 soil borings (SB-1 though SB-10; Figure 2) to collect soil and groundwater samples to address specific identified areas of concern.
- The completion of two soil vapor sampling points at locations SB-4 and SB-7 (SVP-4 and SVP-7) to assess the potential presence of VOCs at these locations.

The soil samples were analyzed for the following parameters:

- TPH-g, TPH-d, and TPH as motor oil (TPH-mo) by United States Environmental Protection Agency (USEPA) Method 8015B(M) with silica gel cleanup;

- VOCs plus fuel oxygenates by USEPA Method 8260B;
- Semivolatile organic compounds (SVOCs) by USEPA Method 8270C;
- California Title 22 Metals by USEPA Methods 6010/7000 series; and
- Organochlorine pesticides and polychlorinated biphenyls (PCBs) by USEPA Method 8081A/8082.

Deeper soil samples collected from all boring locations were placed on hold for organochlorine pesticides and PCBs analysis pending the results of shallow sample analysis. Based on shallow sample analytical results, deeper soil samples from SB-5 and SB-8 were analyzed for organochlorine pesticides and PCBs.

Temporary well points constructed of polyvinyl chloride blanks and screens were installed in soil borings SB-2 through SB-9 and grab groundwater samples were collected using a peristaltic pump. Samples were analyzed for the following parameters:

- TPH-g, TPH-d, and TPH-mo by USEPA Method 8015B(M) with silica gel cleanup;
- VOCs including fuel oxygenates by USEPA Method 8260B;
- SVOCs by USEPA Method 8270C;
- California Title 22 Metals by USEPA Methods 6010/7000 series; and
- Organochlorine pesticides and PCBs by USEPA Method 8081A/8082.

Temporary soil vapor points SVP-4 and SVP-7 were completed to a depth of 5.5 feet below ground surface (bgs). Soil vapor probe construction and sampling activities were performed in accordance with the *Final Active Soil Gas Advisory* (California Environmental Protection Agency [Cal/EPA] 2012). Soil vapor samples were collected and analyzed for VOCs including naphthalene by USEPA Method TO-15.

Figure 3 presents the soil analytical results that exceed their respective Environmental Screening Levels (ESLs), as established by the San Francisco Bay Regional Water Quality Control Board (RWQCB). As shown in the figure, concentrations of metals, TPH-d, TPH-mo, pesticides and PCBs exceeded their respective ESLs in samples from shallow soil (0.5 to 1 foot depth) at SB-4, -5, -7, and -8. These exceedances may be associated with the fill interval at these locations. Figure 3 also shows TPH and SVOC impact in deeper soil samples collected from borings SB-2 and SB-9.

Figure 4 presents the groundwater analytical results that exceed their respective ESLs. As shown in Figure 4, the following detected concentrations exceeded their respective ESLs:

- TPH in four samples (SB-2, -3, -5, and-9);
- VOCs and SVOCs in two samples (SB-2 and -9); and
- Metals in five samples (SB-2, -3, -6, -8, and -9).

Soil vapor analytical results in exceedance of their respective ESLs are summarized on Figure 5. As shown on Figure 5, only tetrachloroethene (PCE) was detected in the sample from SVP-7 at a concentration above its ESL.

The findings from the limited Phase II investigation at this site were provided to the Port and subsequently to the ACEH. As previously discussed, PG&E has acquired the site from the Port of Oakland and will take the lead in completing site characterization and ultimate remediation of the site proper. Per the purchase agreement, offsite impacts remain the responsibility of the Port of Oakland. This work plan presents the scope of work for a phased investigation designed to address the comprehensive delineation of the site soil, soil vapor, and groundwater.

3.0 PROPOSED SCOPE OF WORK

The findings from the limited Phase II investigation at this site indicate that further investigation activities are necessary to complete the delineation of media impacts from chemicals of concern (COCs) at the site. To accomplish this delineation, the following phased scope of work has been developed.

The goal of the initial phase is to complete the onsite delineation of COC impacts to soil, soil vapor, and shallow groundwater, as well as provide a baseline condition for offsite groundwater quality directly downgradient from the site. The scope of the initial phase is specifically defined by the following subsections.

The second phase will provide delineation of deeper site lithology and hydrostratigraphy, as well as groundwater quality within the deeper groundwater zone(s) to provide vertical delineation of groundwater impact from the identified COCs. A general scope for the second phase of the investigation is provided in this work plan; however, the scope of the second phase will be based on the results of the initial phase of investigation and will be provided to ACEH, along with the results of the initial phase, within a technical memorandum to obtain ACEH concurrence with the proposed scope.

The final phase will involve the installation of permanent monitoring points and will be based on the results of the previous two phases of investigation. Preliminary well locations are provided within this work plan; however, final well locations and construction details will be based on the results of the previous two phases of investigation and will be provided to ACEH in a technical memorandum for concurrence.

3.1 INITIAL PHASE

To complete the characterization of COCs within soil, soil vapor, and shallow groundwater, ERM proposes the installation of 14 soil borings and 4 SVPs. The results of the first phase should complete the delineation of COCs in soil and soil vapor and provide additional groundwater quality data to develop the scope of the second phase of the investigation. Prior to conducting the scope of work presented herein, the health and safety plan (HASP) will be reviewed and updated, if necessary, to cover the proposed scope of work. All work will be performed in accordance

with the HASP. The detailed task descriptions of the initial scope of work are described below.

3.1.1 Permitting and Utility Clearance

ERM will secure all appropriate permits to complete the proposed scope of work, including drilling and well installation permits from the Alameda County Public Works Agency.

Prior to initiating any subsurface field activities, all proposed drilling locations will be marked in the field and reviewed with site personnel and/or the property owner. Underground Service Alert, a notification service for marking underground utilities on public rights-of-way, will be notified at least 48 hours prior to advancing any borings. A private utility-locating contractor will also identify the locations of underground utilities near the proposed drilling locations. Drilling locations may be modified, as necessary, to avoid underground utilities. Visual clearance of utilities will be performed to a minimum depth of 5 feet bgs at all drilling locations via hand augering.

3.1.2 Soil Borings and Sampling

ERM will install 14 soil borings (SB-11 through -24) using hand augering and direct push techniques. The boring locations are provided on Figure 3. The rationale for each soil boring is provided in Table 1 and the targeted sampling intervals for each boring are provided in Table 2.

At each proposed soil boring location, borings will be hand-cleared using a hand auger to a minimum of 5 feet bgs, as required by ERM's internal subsurface utility clearance protocol. Direct-push technology will be used to advance the boring to the remainder of the total depth of the boring. During drilling activities, field personnel will:

- Continuously log the soil cores using the Unified Soil Classification System (USCS) and record the soil logging for each boring on separate boring logs;
- Make visual observations regarding the nature of the soil and evidence of impact, if any, based on continuous sampling; and
- Monitor the soil cores for the potential presence of VOCs using an organic vapor analyzer with a photo-ionization detector (PID) and note the results on the boring logs.

Soil samples will be collected in 6-inch (length) stainless steel sleeves or 6-inch acetate sleeves, capped on both ends, and sealed with Teflon tape. Collected sample containers will be labeled, placed in sealed plastic bags, stored in an iced cooler, and transported to Curtis & Tomkins Ltd., a California state-certified laboratory in Berkeley, California, for analysis as soon as possible after sample collection. All samples will be recorded on a chain-of-custody form that will accompany the samples to the laboratory.

Upon completion of soil and groundwater sampling, each of the borings will be backfilled with hydrated bentonite chips. For boring locations on concrete or asphalt, boreholes will be patched using like material at the surface. ERM will use a global positioning system (GPS) unit to locate the borings for figures and to document their location, if additional characterization is warranted based on analytical results.

3.1.3 Shallow Soil Borings

As shown in Tables 1 and 2, four borings (SB-11 -12, -17, and -18) are shallow and will be completed to approximately 5 feet bgs. The results from soil samples collected from these borings will address the COC concentrations in shallow (0.5 to 1 foot bgs) soil that exceeded their respective ESLs including TPH, metals, pesticides, and PCBs. Samples will be collected within the fill directly under the pavement (0.5 to 1 foot bgs), as well as a deeper sample within the native material under the fill anticipated to be encountered at approximately 2 to 3 feet bgs.

Soil samples collected from proposed soil borings SB-11, SB-12, SB-17 and SB-18 will be analyzed for Title 22 Metals using USEPA Methods 6010/7000 series. In addition, to address shallow occurrences of TPH-d and -mo, PCBs, and pesticides above their ESLs in the shallow soil sample from SB-5, the soil samples collected from proposed soil boring SB-18 will also be analyzed for the following parameters:

- TPH-D and -mo by USEPA Method 8015M with silica gel cleanup; and
- Organochlorine pesticides and PCBs by USEPA Methods 8081A/8082.

3.1.4 Soil and Groundwater Borings

To provide delineation of deeper soil impact, and additional characterization of groundwater, five soil borings (SB-14, -15, -16, -19, and -20) will be completed to first groundwater, which is anticipated to be encountered at approximately 15 feet bgs. As presented in Table 2, approximately four soil samples will be collected from the soil borings

based on previous sampling depths and/or field observations and screening. Each soil sample will be analyzed for the following parameters:

- TPH-g and VOCs by USEPA Method 8260B;
- TPH-d and -mo by USEPA Method 8015M with silica gel cleanup; and
- SVOCs by USEPA Method 8270C.

In addition, shallow soil samples (0.5 to 1 foot bgs and 2.5-3 feet bgs) collected from soil borings SB-14, SB-15, andSB-16 will be analyzed for organochlorine pesticides and PCBs (USEPA Methods 8081A/8082) and Title 22 metals to delineate the shallow pesticide, PCB, and metal exceedances of their respective ESLs that were observed in the shallow soil sample from previous boring SB-8.

Once groundwater is encountered, a temporary groundwater monitoring point consisting of dedicated PVC casing with a slotted-screen will be installed in each of the soil boings. A grab groundwater sample will be collected from each temporary groundwater monitoring point using dedicated polyethylene tubing and a low-flow peristaltic pump. Grab groundwater samples will be collected in laboratory-provided sample containers as specified below. Groundwater samples for metals will be field filtered prior to preservation to provide dissolved metals concentrations.

Collected sample containers will be labeled, placed in sealed plastic bags, stored in an iced cooler, and transported to the laboratory for analysis as soon as possible after sample collection. All samples will be recorded on a chain of custody form that will accompany the samples to the laboratory. In addition, one field duplicate groundwater sample and one trip blank will be collected for quality assurance/quality control (QA/QC) purposes.

Each groundwater sample will be analyzed by Curtis & Tomkins for the following parameters:

- TPH-g and VOCs by Agency USEPA Method 8260B;
- TPH-d and -mo by USEPA Method 8015M with silica gel cleanup;
- SVOCs by USEPA Method 8270C; and
- California Title 22 Metals by USEPA Methods 6010/7000 series.

3.1.5 Groundwater Borings

To provide additional information on upgradient and directly downgradient groundwater quality, five borings (SB-13, -21, 22, -23, and -24) will be installed to first encountered groundwater. The borings will be continuously cored for lithology and the cores will be field screened with a PID. Soil samples will not be collected unless visual or field screening indicate potential impact.

Once groundwater is encountered, a temporary groundwater monitoring point, consisting of dedicated PVC casing with a slotted-screen, will be installed in each of the soil boings. A grab groundwater sample will be collected from each temporary groundwater monitoring point using dedicated polyethylene tubing and a low-flow peristaltic pump. Grab groundwater samples will be collected in laboratory-provided sample containers as specified below. Groundwater samples for metals will be field filtered prior to preservation to provide dissolved metals concentrations.

Each groundwater sample will be analyzed by Curtis & Tomkins for the following parameters:

- TPH-g and VOCs by Agency USEPA Method 8260B;
- TPH-d and -mo by USEPA Method 8015M with silica gel cleanup;
- SVOCs by USEPA Method 8270C; and
- California Title 22 Metals by USEPA Methods 6010/7000 series.

3.1.6 Soil Vapor Sampling

Four temporary soil vapor probes (SVP-1, SVP-2, SVP-3, and SVP-5) will be installed to further delineate the soil vapor exceedance encountered in SVP-7. The locations of these probes are shown on Figure 5. The soil vapor probes will be installed by a C-57 (California Code of Regulations Title 16, Division 8, Article 3) licensed drilling contractor consistent with *Advisory – Active Soil Gas Investigations* (California Environmental Protection Agency, Department of Toxic Substances Control, Los Angeles Regional Water Quality Control Board, and San Francisco Regional Water Quality Control Board, 2015). At each proposed soil vapor probe location, a hand auger will be used to advance the boring to a depth of 5.5 feet bgs. Descriptions of the subsurface materials will be described by an ERM geologist from the soil cuttings and recorded on a boring log. Once the total depth of the boring is reached, the soil vapor probe construction materials will be immediately installed as follows:

- Each probe will consist of 0.125-inch inner-diameter Teflon tubing equipped with a stainless-steel coupler and vapor point. The vapor point will be lowered to a depth of 5 feet bgs.
- A 1-foot-thick annular filter pack will be installed around the vapor point. The filter pack will consist of clean, washed, well-graded, silica sand, and will extend approximately 0.5 feet below and 0.5 feet above the vapor point.
- Dry granular bentonite will then be added to the annular space to 1 foot above the sand pack.
- The remainder of annular space will consist of hydrated bentonite to ground surface.

Consistent with the DTSC Advisory, samples will not be collected for at least 48 hours to allow subsurface conditions to equilibrate. The temporary soil vapor sample borings will be drilled out and grouted on the same day that they are sampled.

3.1.6.1 Procedure for Soil Vapor Sampling

Soil vapor samples were collected consistent with the DTSC Advisory. Prior to arriving at the site for the soil vapor sampling event, the following activities will be completed:

- Each canister will be inspected for defects and/or physical damage. Any observed defects or damage will be documented in the project logbook. If necessary, the canister will not be used and will be replaced with a new canister.
- The volume of each canister will be measured and documented in the project logbook. Canisters containing less than 25 inch mercury (Hg) vacuum will be returned to the laboratory for a replacement canister.
- The receipt of all laboratory-supplied equipment (i.e., Summa canisters, flow controllers, particulate filters, chain-of-custody forms) was verified.

The following information was recorded on the sample form and/or field logbook prior to collecting soil vapor samples at each location:

- Serial numbers, or other unique identifier, of the Summa canister and flow controller;
- Initial vacuum on the Summa canister, as measured by the gauge on the flow controller, noting any discrepancies between the vacuum readings from the flow controller gauge and separate vacuum gauge;

- Sample date, outdoor temperature, and humidity; and
- Sample location and any comments, notes, or observations related to collecting the sample.

The soil gas sampling equipment will generally be placed in this order, although the actual sampling equipment chain will be determined based on the soil gas sampling container:

1. Below ground soil gas inlet;
2. Tubing from below ground to above ground surface;
3. Manifold with flow controller set to approximately 170 milliliters (mL) per minute;
4. Sample container; and
5. Purge canister/vacuum pump.

Any changes to the sample chain will be noted on the sampling forms.

Once all tubing and sample containers are in place, a purge volume will be calculated. This includes the pore space of the annulus and the internal volume of the below-ground and above-ground tubing. The purge volume will be documented on the *Soil Vapor Probe Purge Calculations* form. For this sampling event, a default of three purge volumes will be used prior to sample collection. The following steps outline the procedure used to calculate the purge time for three purge volumes:

1. Calculate the appropriate purge volume in mL.

   <u>For 0.188-inch inner diameter tubing</u>:
   1 Purge Volume (mL) = length of tubing (in feet, include tubing above and below ground surface) x 5.45 mL

   <u>For other size tubing</u>:
   1 Purge Volume (mL) = (length of tubing) x (πr_t^2) x (16.38 mL/ inch^3) x N

   Where:

   Length of tubing = length of tubing above and below ground surface, in inches. The length of the tubing that is below ground can be found on each soil vapor probe completion form;

   r_t = the inner radius of the tubing, in inches; and

N = the number of purge volumes required.

Calculate the purge volume within the sand filter pack void space in mL using the following equation:

$$V_p = \pi \times r_p^2 \times h_p \times 16.38 \text{ mL/inch}^3 \times P_p \times N$$

Where:

V_p = Volume of void space in the sand filter pack in mL.

r_p = Radius of the sand filter pack in inches.

h_p = Height if the filter pack in inches.

P_p = Porosity of the sand filter pack (0.30).

N = number of purge volumes required.

Calculate the purge volume within the dry bentonite void space in mL using the following equation:

$$V_b = \pi \times r_b^2 \times h_b \times 16.38 \text{ mL/ inch}^3 \times P_b \times N$$

Where:

V_b = Volume of void space in the dry bentonite in mL

R_b = Radius of the sand filter pack in inches

H_b = Height if the filter pack in inches

P_b = Porosity of the granular bentonite (0.36)

N = number of purge volumes required

2. Calculate the purge time for the appropriate purge volume.

$$\text{Purge time (min)} = \frac{\text{purge volume (mL)}}{\text{Flow controller purge rate (mL/min)}}$$

Flow controller purge rate = 170 mL/minute

3. Sample apparatus pressure test

Prior to purging and sampling, a sample apparatus pressure test is conducted. The pressure test confirms that there is no leak in the sample apparatus, from the well head to the sample container, and therefore the apparatus can be used to collect a representative soil vapor sample. The pressure test procedure is as follows:

- To perform the pressure test, all equipment is connected as described in the sample train. The sample train may be connected to the probe, but the valve to the probe must remain closed.
- The valves to the Summa canister and the probe/sampling point are closed, and the valve to the purge/vacuum pump is opened.
- The vacuum pump is started to evacuate air from the sample train to a minimum vacuum of 7.4 inches of mercury. Once a vacuum equal or greater has been applied, the valve to the purge/vacuum pump will be closed so that the vacuum is held and the vacuum pump is shut off.
- The initial vacuum readings on the flow controller are recorded and the sample train is allowed to sit for at least 1 minute.
- The applied vacuum should hold (within 0.37 inch-Hg) in the line for at least 1 minute.
- If there is any observable loss of vacuum, the fittings are tightened and the pressure test is repeated until the vacuum in the sample train does not noticeably dissipate.

4. Purging

To purge the soil vapor probe, follow these procedures:

- Confirm that the valve on the sample collection Summa canister is still closed.
- Open the two-way shut-off valve.
- Open the purge Summa canister or turn on battery powered pump.
- Run battery powered pump for the length of time calculated in Step 2.
- If using a battery powered pump, monitor the flow rate on the flow meter. If flow is less than 200 mL/min, adjust purge time accordingly.
- Monitor probe pressure during purging. If the formation pressure exceeds -100 inches of water (-7.4 inches Hg) and flow rates below 100 mL/min are observed, stop purge and follow low follow purge and sample techniques as described in the *Advisory – Active Soil Gas Investigations*.

- A PID reading is collected from effluent stream during purging and recorded on the field form.
- After purge volume is achieved close the valve connected to the purge summa or battery powered pump.

5. Leak Detection Test

Isopropyl alcohol will be used as the leak check compound. It is extremely important to prevent cross-contamination while handling the isopropyl alcohol and sampling equipment. One person will be designated as the person to handle the leak detection compound at all locations ("dirty hands") and the other person be designated as the person to handle the sampling equipment for all locations ("clean hands"). While the soil vapor sample is being collected, the leak detection test is conducted by fanning the leak detection compound near each tubing fitting/connection. The used leak detection materials will be discarded in a sealed plastic bag away from the sampling equipment/supplies.

3.1.6.2 Sample Collection

Soil vapor samples will be collected after the soil vapor probe is purged. Soil vapor sample collection procedures are as follows:

- The two-way shut-off valve on the manifold is confirmed to be open.
- The valve on the sample collection Summa canister is opened, recording the sample start time and the vacuum reading on the flow controller, which should be between 25- and 30-inch Hg.
- The vacuum being pulled on the probe, which is measured by the vacuum gauge on the probe-side of the flow controller, will be recorded on the field form.
- While the soil vapor sample is being collected, the leak detection test will be conducted.
- The sample collection Summa canister will be left open until the vacuum reading is approximately 4-inch of mercury. Because we are using 1-L Summa canisters, this should take less than 10 minutes. If the vacuum does not decrease to 4-inch Hg within 20 minutes, the Project Manager will be notified.
- Monitor probe pressure during purging. If the formation pressure exceeds -100 inches of water (-7.4 inches Hg) and flow rates below 100 mL/min are observed, stop purge and follow low follow purge and

sample techniques as described in the *Advisory – Active Soil Gas Investigations*.

- Once the vacuum reading on the sample canister reaches approximately 4-inch Hg, the final vacuum readings on the manifold will be documented, the valve on the sample canister will be closed, and sample end time will be recorded. The canister and manifold will be disconnected, labeled, and documented on the chain of custody.

Each soil vapor sample will be analyzed by a California state-certified laboratory for VOCs by USEPA Method TO-15. The soil vapor samples will be analyzed on a standard turn-around-time of 1 week.

3.2 PHASE TWO – CONE PENETRATION TEST INVESTIGATION

As part of the second phase of investigation, ERM proposes the completion of cone penetration test (CPT) borings and depth-discrete grab groundwater sampling to provide lithologic and hydrostratigraphic information beneath the initial water-bearing interval. The results of this phase of the investigation will help delineate deeper groundwater zones and provide vertical characterization of potential groundwater impact by COCs. The exact number and locations of the CPT borings will be based on the results of the initial phase described above. At this point, we have assumed that a minimum of three borings will be completed (one upgradient and two downgradient) at the approximate locations shown on Figure 4. These borings will be installed following the first phase of investigation to complete the shallow groundwater characterization and place the deeper borings in locations that will not present a potential vertical migration issue.

As the cone penetrometer tool is advanced at each location, the following soil parameters will be measured at 5-centimeter intervals:

- Cone bearing pressure;
- Sleeve friction;
- Friction ratio; and
- Pore water pressure.

The data will be processed in real time in the field and a report including graphical interpretations of each CPT boring will be generated. Upon reaching the water table, a pore pressure dissipation test (PPDT) will be conducted. The PPDT measures hydrostatic water pressure and provides an estimate of the depth of the groundwater table and verifies the presence of

water in the formation to assist in determining appropriate intervals for groundwater sampling. PPDTs will also be performed in appropriate deeper hydrostratigraphic units. The purpose of the CPT investigation is to delineate the occurrence of the next deeper water-bearing interval below the shallow impacted water-bearing zone to determine if vertical migration of the COCs has occurred.

Following completion of the CPT borings, the graphical interpretations and PPDT data will be reviewed to determine the appropriate groundwater sampling depths. Depth-discrete groundwater sampling will be completed using HydroPunch® samplers or, where necessary, temporary wells.

Temporary wells are installed by advancing the sampling rods with a disposable tip to the targeted groundwater sampling interval, retracting the rods approximately 3 to 5 feet to allow for the appropriate screen interval, and leaving the rods in the ground while groundwater is allowed to infiltrate into the temporary well. Following the setting of a temporary well, the CPT rig can be moved to the next sampling location to continue sampling. The temporary well points are secured with traffic delineators to minimize interaction with vehicular traffic. The well points are periodically checked for groundwater infiltration and once a sufficient quantity of groundwater is detected, a groundwater sample is collected using a clean stainless steel bailer. After collection of the groundwater sample, the rods are removed and the borehole is grouted to the surface using a bentonite-cement mixture. This work plan assumes that temporary wells may be required for some locations.

The groundwater sampling plan includes collecting a sample at the top of the water table and at approximately 10-foot intervals or in units that are potentially water-bearing, based on the CPT results. Decontamination of CPT and groundwater sampling equipment (rods and sampling devices) will be conducted between individual sampling points. All rods and sampling equipment will be sprayed with pressurized hot water and detergent by a steam cleaner, and then rinsed with clear potable water.

Following sample collection, groundwater sample containers will be labeled, placed in zip-top-style plastic bags, packed in ice, and transported under standard chain-of-custody documentation to Curtis & Tomkins. Each groundwater sample will be analyzed by Curtis & Tomkins for the following parameters:

- TPH-g and VOCs by Agency USEPA Method 8260B;
- TPH-d and -mo by USEPA Method 8015M with silica gel cleanup;

- SVOCs by USEPA Method 8270C; and
- California Title 22 Metals by USEPA Methods 6010/7000 series.

3.3 PHASE THREE – INSTALLATION OF PERMANENT MONITORING WELLS

The third phase of the investigation involves the installation of permanent monitoring wells to provide information on plume stability and seasonal fluctuations. For the purpose of this work plan, we have assumed the installation of a minimum of four monitoring wells at the locations provided on Figure 4. The locations and specific construction details will be based on the results of the first two phases of the investigation described above. In addition, the timing of the well installation may be dictated by the site redevelopment plan and schedule. It may be necessary to delay the installation of the permanent monitoring wells until completion of the site redevelopment to ensure that the monitoring wells are not damaged during the site redevelopment activities. The installation schedule will be provided within the technical memorandum provided to ACEH presenting the results of the second phase of the investigation and the proposed locations of the monitoring wells.

The new monitoring wells will be installed using a drill rig equipped with hollow-stem augers. Soil samples will be collected continuously using 18- and 24-inch, California-modified, split-spoon samplers. An ERM geologist will describe the soils in accordance with the USCS and prepare the associated well logs. Soil cores will be screened with a PID and the results of the field-screening will be recorded on the well log. If visual observation or PID screening indicates potential impact to soil, soil samples will be collected to determine the potential presence of an ongoing soil source to groundwater. In addition, soil samples may be collected from selected well locations for geotechnical testing, such as vertical permeability, grain size distribution, porosity, bulk density, and total organic carbon.

The monitoring wells will be constructed of PVC well screen (0.010 or 0.020-inch, machine-slotted screens) and blank riser pipe. Screen intervals will be determined based on the CPT data. An appropriate filter pack will be emplaced in the annular space to approximately 2 feet above the top of the screen interval. The transition seal will consist of approximately 2 to 3 feet of bentonite chips with the remainder of the annular space backfilled with neat cement. Monitoring wells installed will be completed at the surface with a flush-mounted, steel, protective road box. The monitoring

wells will be completed with a watertight expansion cap and secured with a lock.

3.3.1 Monitoring Well Development

Following installation, the new monitoring wells will be developed no sooner than 72 hours following placement of the grout seal. The wells will be developed by pumping or bailing a minimum of 10 well casing volumes of water. The wells will also be surged during development to remove any sediment that may have entered during installation. Stabilization parameters (pH, specific conductance, turbidity, and temperature) will be monitored during development.

3.3.2 Monitoring Well Sampling

A groundwater sample will be collected from each new monitoring well no sooner than 24 hours after development activities have been completed. Three casing volumes of water will be purged from the wells with a disposable bailer and stabilization parameters will be monitored. The groundwater sample will then be collected into laboratory-supplied containers, properly preserved and labeled, and placed in an iced cooler. The sample will be submitted under proper chain-of-custody procedures to Curtis & Tomkins for laboratory analysis of the following parameters:

- TPH-g and VOCs by Agency USEPA Method 8260B;
- TPH-d and -mo by USEPA Method 8015M with silica gel cleanup;
- SVOCs by USEPA Method 8270C; and
- California Title 22 Metals by USEPA Methods 6010/7000 series.

3.3.3 Surveying

Horizontal coordinates, ground surface elevation, and top of casing elevation for the new monitoring wells will be completed under the direction of a civil Professional Engineer. Northing and easting coordinates will be surveyed relative to the NAD 83 with an accuracy of ± 1.0 foot horizontal. Elevations will be surveyed relative to the NGVD 88 with an accuracy of ± 0.01 foot vertical.

4.0 QUALITY ASSURANCE/QUALITY CONTROL MEASURES

4.1 SAMPLE DUPLICATES, RINSATE BLANKS, AND TRIP BLANKS

ERM will collect one duplicate sample for every 10 groundwater samples collected for Quality Assurance/Quality Control (QA/QC) purposes. One Rinsate Blank, collected by pouring deionized water through field-cleaned, non-disposable field equipment, will also be collected during each day of sample collection to confirm no cross-contamination occurred between sample collections. Lastly, a Trip Blank consisting of a laboratory provided container filled with deionized water will accompany all samples packaged in ice coolers to identify any contamination that may have occurred while transporting samples.

4.2 SAMPLE DOCUMENTATION

As discussed in previous sections, all samples collected will be reported on a laboratory chain-of-custody and transported under proper protocol to a California-certified laboratory for analysis.

4.3 EQUIPMENT DECONTAMINATION

All non-disposable equipment will be decontaminated prior to use. Equipment decontamination will be limited to drilling equipment (hand augers, drill rods, and other downhole equipment) that will be decontaminated after each soil boring and each soil vapor probe is installed. Vapor probe construction material will be single use and will be provided as factory clean and hermetically sealed. Other sampling equipment will either be single use or cleaned by the analytical laboratory and will not require decontamination.

Decontamination procedures will generally consist of:

- Washing the equipment with a cleaning agent suitable for environmental equipment, such as Alconox or Liquinox;
- Rinsing the equipment with water;
- A final rinse with deionized water; and
- Drying the equipment with paper towels.

Typical equipment for decontamination:

- High pressure steam cleaner (provided by drilling contractor);
- Brushes;
- Wash/rinse tubs;
- Alconox detergent (or equivalent); and
- Deionized water.

4.4 INVESTIGATION DERIVED WASTE

All waste soil generated during the sampling work will remain on site in one 55-gallon drum pending analysis prior to disposal. ERM will collect one composite sample of the drummed soil and the decontamination water to be submitted to Curtis & Tomkins and analyzed for TPH-g, VOCs, TPH-d and -mo, SVOCs, pesticides, PCBs, and metals. The soil and decontamination water will be properly disposed of at a licensed disposal facility in accordance with local, state, and federal regulations based on the analytical results.

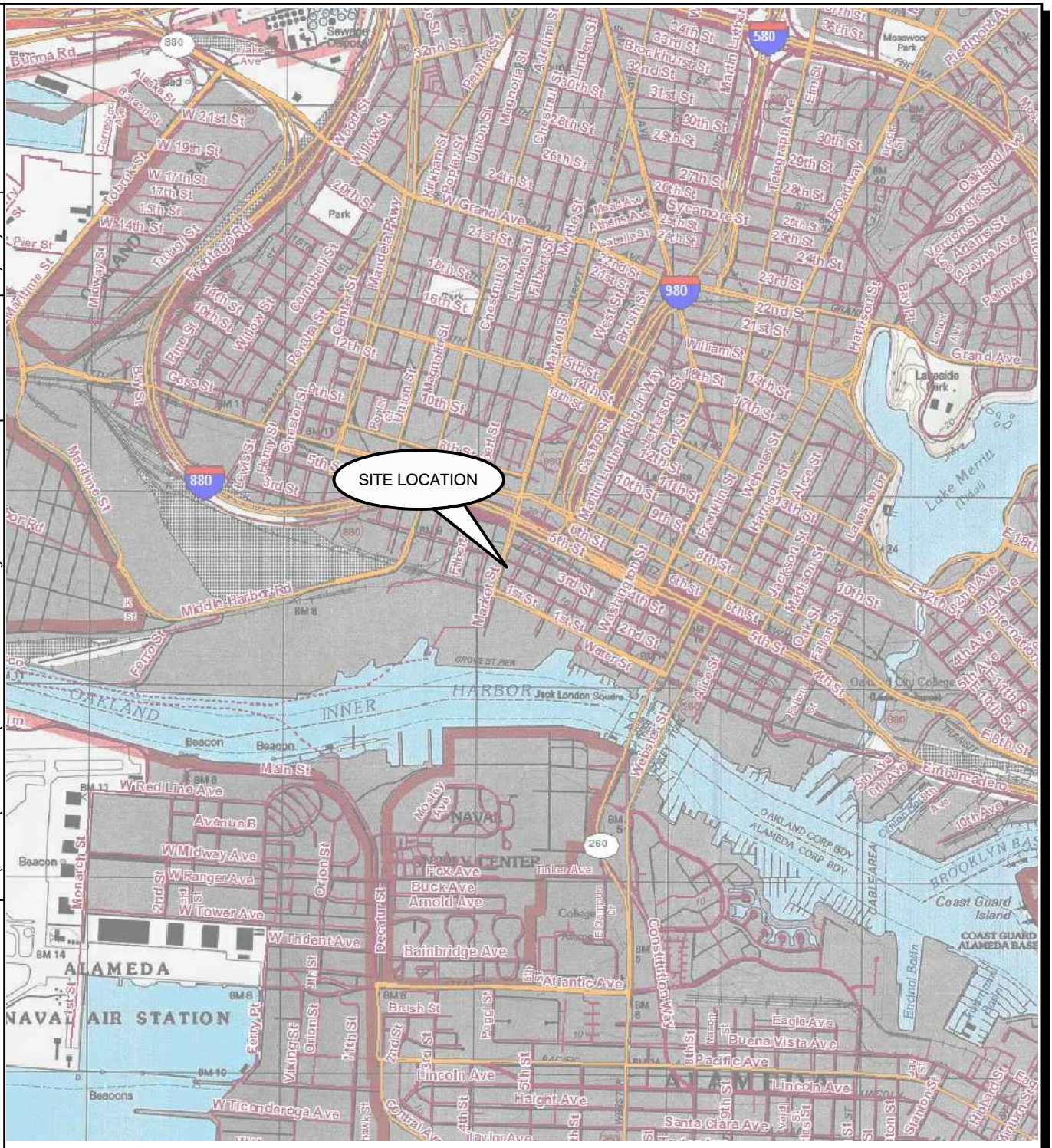
5.0 SCHEDULE AND REPORTING

PG&E is prepared to implement the initial phase of investigation as described above upon approval of this work plan by ACEH. It is anticipated that the initial phase of work can be completed within four weeks of the work plan approval. As previously discussed, technical memorandums will be prepared at the completion of the initial and second phases of investigation. The technical memorandums will summarize the results of each phase of work and the scope of work for the subsequent phase. The memorandums will be submitted to ACEH for concurrence prior to implementation of the next phase of work. It is anticipated that the initial technical memorandum will be submitted to ACEH within four weeks of the receipt of all of the analytical results.

An investigation summary report will be prepared following the completion of the third phase and will document the results of the entire three phases of the investigation. In addition, the report will include the laboratory analytical reports, the completed boring logs from each soil boring, CPT boring, soil vapor probe and monitoring wells, as well as the field sampling forms.

Figures

Project No. 0231462.00
Date: 11/19/15
Drawn By: J. Estrada
CAD File: G:\DWGS\0231462\0231462006-06.dwg



SCALE 1: 24,000

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1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

N

References:
TOPO!® Software
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle,
Oakland West, California
Dated: 1997

Figure 1
Sample Locations
205 Brush Street
Oakland, California

ERM 11/15

Aerial Photo Source: © 2012 Google Earth Pro Ver 7.0.2.8415

CAD File: G:\DWGS\0231462\023146200-07.dwg
Drawn By: R. Olson
Date: 11/19/15
Project No. 0231462.00

LEGEND

1. Former UST Location
2. Former Diver's Boat and Equipment Storage
3. Former Vehicle Maintenance
4. Former Vehicle Wash Area
5. Former Solvent Storage Area
6. Storage, Former Offices and Paint Shop

Site Boundary

Previous Soil Sampling Location

Previous Soil and Grab Groundwater Sampling Location

Previous Soil Vapor Sampling Point

N

0 40

Approx. Scale (feet)

Figure 2

Site Detail Map
205 Brush Street
Oakland, California

ERM 11/15

CAD File:	Drawn By:	Date:	Project No.
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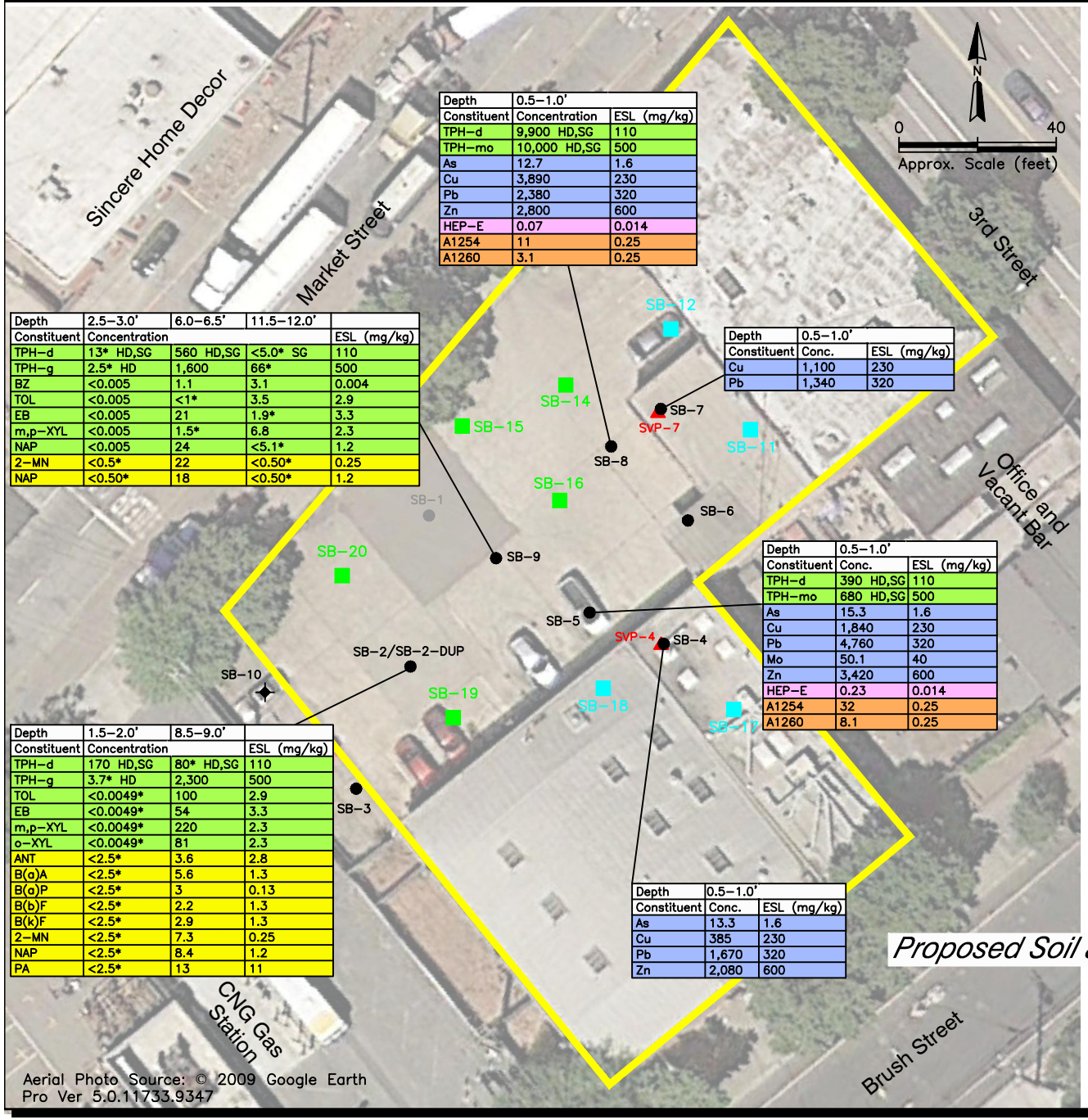

Depth	0.5–1.0'	
Constituent	Concentration	ESL (mg/kg)
TPH–d	9,900 HD,SG	110
TPH–mo	10,000 HD,SG	500
As	12.7	1.6
Cu	3,890	230
Pb	2,380	320
Zn	2,800	600
HEP–E	0.07	0.014
A1254	11	0.25
A1260	3.1	0.25

Depth	2.5–3.0'	6.0–6.5'	11.5–12.0'	
Constituent	Concentration			ESL (mg/kg)
TPH–d	13* HD,SG	560 HD,SG	<5.0* SG	110
TPH–g	2.5* HD	1,600	66*	500
BZ	<0.005	1.1	3.1	0.004
TOL	<0.005	<1*	3.5	2.9
EB	<0.005	21	1.9*	3.3
m,p–XYL	<0.005	1.5*	6.8	2.3
NAP	<0.005	24	<5.1*	1.2
2–MN	<0.5*	22	<0.50*	0.25
NAP	<0.50*	18	<0.50*	1.2

Depth	0.5–1.0'	
Constituent	Conc.	ESL (mg/kg)
Cu	1,100	230
Pb	1,340	320

Depth	0.5–1.0'	
Constituent	Conc.	ESL (mg/kg)
TPH–d	390 HD,SG	110
TPH–mo	680 HD,SG	500
As	15.3	1.6
Cu	1,840	230
Pb	4,760	320
Mo	50.1	40
Zn	3,420	600
HEP–E	0.23	0.014
A1254	32	0.25
A1260	8.1	0.25

Depth	1.5–2.0'	8.5–9.0'	
Constituent	Concentration		ESL (mg/kg)
TPH–d	170 HD,SG	80* HD,SG	110
TPH–g	3.7* HD	2,300	500
TOL	<0.0049*	100	2.9
EB	<0.0049*	54	3.3
m,p–XYL	<0.0049*	220	2.3
o–XYL	<0.0049*	81	2.3
ANT	<2.5*	3.6	2.8
B(a)A	<2.5*	5.6	1.3
B(a)P	<2.5*	3	0.13
B(b)F	<2.5*	2.2	1.3
B(k)F	<2.5*	2.9	1.3
2–MN	<2.5*	7.3	0.25
NAP	<2.5*	8.4	1.2
PA	<2.5*	13	11

Depth	0.5–1.0'	
Constituent	Conc.	ESL (mg/kg)
As	13.3	1.6
Cu	385	230
Pb	1,670	320
Zn	2,080	600

LEGEND

- Site Boundary
- Proposed Soil and Groundwater Sampling Location
- Proposed Shallow Soil Sampling Location
- Soil Sampling Location
- Soil and Grab Groundwater Sampling Location
- Soil Vapor Sampling Point

Depth	0.5–1.0'	
Constituent	Conc.	ESL
Cu	1,100	230
Pb	1,340	320

Sample Depth (ft. bgs)
ESL for Soil in mg/kg
Concentration in mg/kg
Chemical Constituent

ESL: Commercial/Industrial Environmental Screening Level for Shallow Soils (≤3 meters bgs) Groundwater Is Current or Potential Drinking Water Resource

- TPH or VOCs
- Metals
- Pesticide
- PCBs
- SVOCs

* = Concentration Does Not Exceed ESL

HD – The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
SG – The sample extract was subjected to Silica Gel treatment prior to analysis.
TPH–g – Total Petroleum Hydrocarbons as Gasoline
TPH–d – Total Petroleum Hydrocarbons as Diesel
TPH–mo – Total Petroleum Hydrocarbons as Motor Oil
BZ – Benzene
TOL – Toluene
EB – Ethylbenzene
m,p–XYL – m,p–Xylene
o–XYL – o–Xylene
NAP – Naphthalene
As – Arsenic
Cu – Copper
Mo – Molybdenum
Pb – Lead
Zn – Zinc
ANT – Anthracene
B(a)A – Benzo(a)Anthracene
B(a)P – Benzo(a)Pyrene
B(b)F – Benzo(b)Fluoranthene
B(k)F – Benzo(k)Fluoranthene
2–MN – 2–Methylnaphthalene
PA – Phenanthrene
HEP–E – Heptachlor Epoxide
A1254 – Aroclor 1254
A1260 – Aroclor 1260

Figure 3

Proposed Soil and Groundwater Sampling Locations
Site Characterization Work Plan
205 Brush Street
Oakland, California

ERM 11/15

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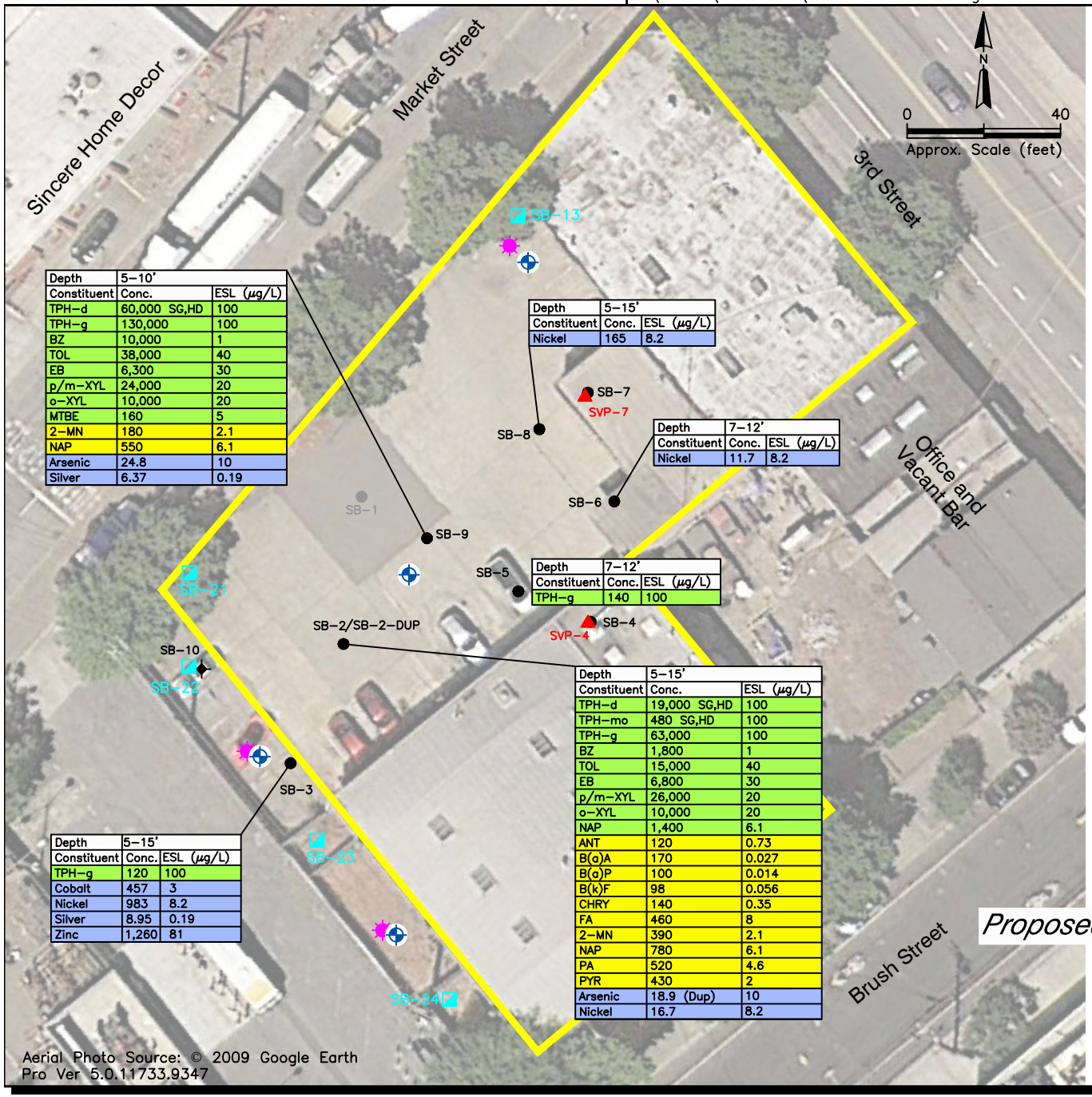

Depth	5-10'	
Constituent	Conc.	ESL (µg/L)
TPH-d	60,000 SG,HD	100
TPH-g	130,000	100
BZ	10,000	1
TOL	38,000	40
EB	6,300	30
p/m-XYL	24,000	20
o-XYL	10,000	20
MTBE	160	5
2-MN	180	2.1
NAP	550	6.1
Arsenic	24.8	10
Silver	6.37	0.19

Depth	5-15'	
Constituent	Conc.	ESL (µg/L)
Nickel	165	8.2

Depth	7-12'	
Constituent	Conc.	ESL (µg/L)
Nickel	11.7	8.2

Depth	7-12'	
Constituent	Conc.	ESL (µg/L)
TPH-g	140	100

Depth	5-15'	
Constituent	Conc.	ESL (µg/L)
TPH-d	19,000 SG,HD	100
TPH-mo	480 SG,HD	100
TPH-g	63,000	100
BZ	1,800	1
TOL	15,000	40
EB	6,800	30
p/m-XYL	26,000	20
o-XYL	10,000	20
NAP	1,400	6.1
ANT	120	0.73
B(a)A	170	0.027
B(a)P	100	0.014
B(k)F	98	0.056
CHRY	140	0.35
FA	460	8
2-MN	390	2.1
NAP	780	6.1
PA	520	4.6
PYR	430	2
Arsenic	18.9 (Dup)	10
Nickel	16.7	8.2

Depth	5-15'	
Constituent	Conc.	ESL (µg/L)
TPH-g	120	100
Cobalt	457	3
Nickel	983	8.2
Silver	8.95	0.19
Zinc	1,260	81

LEGEND

- Site Boundary
- Proposed Phase 3 Monitoring Well Location
- Proposed Phase 2 CPT Location
- Proposed Grab Groundwater Sampling Location
- Soil Sampling Location
- Soil and Grab Groundwater Sampling Location
- Soil Vapor Sampling Point

Depth	7-12'	
Constituent	Conc.	ESL
TPH-g	140	100

- Sample Depth (ft. bgs)
- ESL for Groundwater in µg/L
- Concentration in µg/L
- Chemical Constituent

ESL: Commercial/Industrial Environmental Screening Level where Groundwater Is Current or Potential Drinking Water Resource

TPH or VOCs | SVOCs | METALS

HD – The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
SG – The sample extract was subjected to Silica Gel treatment prior to analysis.

TPH-g – Total Petroleum Hydrocarbons as Gasoline
TPH-d – Total Petroleum Hydrocarbons as Diesel
TPH-mo – Total Petroleum Hydrocarbons as Motor Oil
BZ – Benzene
TOL – Toluene
EB – Ethylbenzene
m,p-XYL – m,p-Xylene
o-XYL – o-Xylene
MTBE – Methyl tert-butyl ether
NAP – Naphthalene
ANT – Anthracene
B(a)A – Benzo(a)Anthracene
B(a)P – Benzo(a)Pyrene
B(k)F – Benzo(a)Fluoranthene
CHRY – Chrysene
FA – Fluoranthene
2-MN – 2-Methylnaphthalene
PA – Phenanthrene
PYR – Pyrene

Figure 4

Proposed Groundwater Sampling Locations
Site Characterization Work Plan
205 Brush Street
Oakland, California

ERM 11/15

CAD File:	Drawn By:	Date:	Project No.
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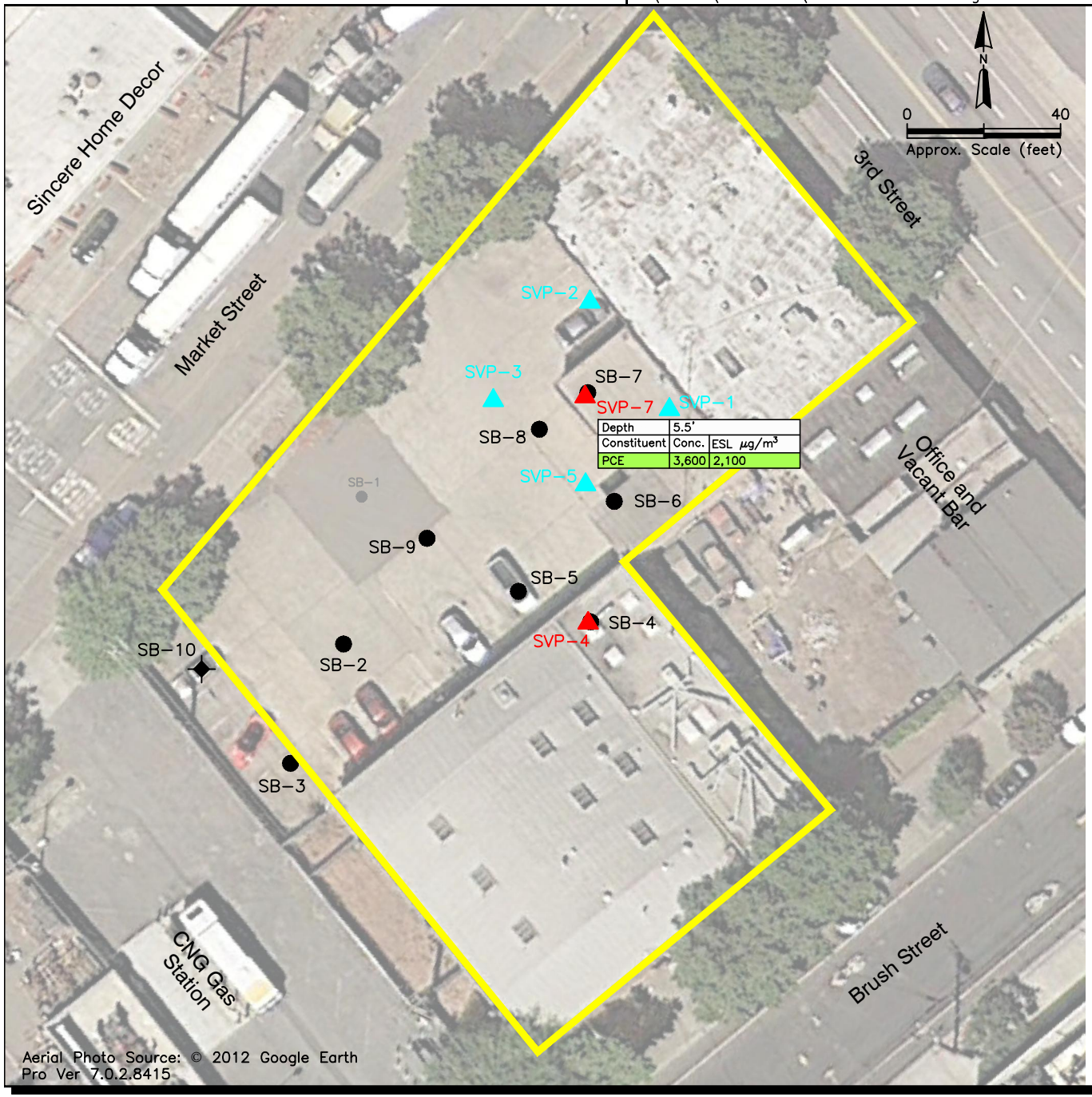

LEGEND

- Site Boundary
- Proposed Soil Vapor Location
- Soil Sampling Location
- Soil and Grab Groundwater Sampling Location
- Soil Vapor Sampling Point

Depth	5.5'	
PCE	Conc.	ESL
Constituent	3,600	2,100

- Sample Depth (ft. bgs)
- ESL for Soil Vapor in $\mu g/m^3$
- Concentration in $\mu g/m^3$
- Chemical Constituent

VOCs in Soil Vapor

ESL: Commercial/Industrial Environmental Screening Level for Soil Gas Screening Levels for Evaluation of Potential Vapor Intrusion (volatile chemicals only)

PCE – Tetrachloroethene

Figure 5

Proposed Soil Vapor Locations
Site Characterization Work Plan
205 Brush Street
Oakland, California

ERM 11/15

Tables

Table 1
Rationale for Boring Location Selection
Site Characterization Investigation Work Plan
205 Brush Street
Oakland, California

Sampling Location	Rationale for Selection
SB-11	Delineate extent of metals in shallow soil identified at SB-7.
SB-12	Delineate extent of metals in shallow soil identified at SB-7.
SB-13	Provide groundwater quality data for groundwater flowing onto site.
SB-14	Delineate extent of metals, TPH, pesticides, and PCBs in shallow soil identified at SB-8, as well as metals in shallow soil at SB-7. Also, provide additional delineation of metals in groundwater above ESLs as identified in SB-7.
SB-15	Delineate extent of metals, TPH, pesticides, and PCBs in shallow soil identified at SB-8, TPH exceedances in soil identified at SB-9, and provide delineation of TPH and metals exceedances in groundwater identified at SB-9.
SB-16	Delineate extent of metals, TPH, pesticides, and PCBs in shallow soil identified at SB-8, TPH exceedances in soil identified at SB-9, and provide delineation of TPH and metals exceedances in groundwater identified at SB-9.
SB-17	Delineate extent of metals in shallow soil identified at SB-4.
SB-18	Delineate extent of metals, TPH, pesticides, and PCBs in shallow soil identified at SB-5, as well as metals in shallow soil at SB-4.
SB-19	Provide delineation on the extent of TPH, VOCs, and SVOC exceedances in soil identified at SB-2 and exceedances of TPH, VOCs, SVOCs, and metals identified in the groundwater sample from SB-2.
SB-20	Provide delineation on the extent of TPH, VOCs, and SVOC exceedances in soil identified at SB-2 and exceedances of TPH, VOCs, SVOCs, and metals identified in the groundwater sample from SB-2.
SB-21	Provide delineation on the extent of TPH, VOCs, and SVOC exceedances in soil identified at SB-2 and exceedances of TPH, VOCs, SVOCs, and metals identified in the groundwater sample from SB-2.
SB-22	Document the condition of groundwater quality directly downgradient and offsite to establish baseline conditions that the Port of Oakland will be responsible for.
SB-23	Document the condition of groundwater quality directly downgradient and offsite to establish baseline conditions that the Port of Oakland will be responsible for.
SB-24	Document the condition of groundwater quality directly downgradient and offsite to establish baseline conditions that the Port of Oakland will be responsible for.

Table 2
Projected Soil Sampling Intervals
Site Characterization Investigation Work Plan
205 Brush Street
Oakland, California

Sampling Location	Anticipated Total Depth (ft bgs)	Approximate Sampling Depths (ft bgs)	Groundwater Samples
SB-11	5	0.5 to 1.0, 2.5 to 3	No
SB-12	5	0.5 to 1.0, 2.5 to 3	No
SB-13	15	None proposed	Yes
SB-14	15	0.5 to 1.0, 2.5 to 3, 6 to 6.5, 10 to 10.5	Yes
SB-15	15	0.5 to 1.0, 2.5 to 3, 6 to 6.5, 10 to 10.5	Yes
SB-16	15	0.5 to 1.0, 2.5 to 3, 6 to 6.5, 10 to 10.5	Yes
SB-17	5	0.5 to 1.0, 2.5 to 3	No
SB-18	5	0.5 to 1.0, 2.5 to 3	No
SB-19	15	0.5 to 1.0, 2.5 to 3, 6 to 6.5, 10 to 10.5	Yes
SB-20	15	0.5 to 1.0, 2.5 to 3, 6 to 6.5, 10 to 10.5	Yes
SB-21	15	None proposed	Yes
SB-22	15	None proposed	Yes
SB-23	15	None proposed	Yes
SB-24	15	None proposed	Yes

Notes:
ft bgs = feet below ground surface