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By Alameda County Environmental Health 1:05 pm, Sep 12, 2017

Mr. Jeremy Harris
1919 Crew LLC
Pier 54 Suite 202
San Francisco, CA 94158

Ms. Dilan Roe
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: 1919 Market Street – Acknowledgement Statement
Oakland, California 94805
ACEH Case# RO0003205
APNs 5-410-13-1, 5-410-14, 5-410-25

Dear Ms. Roe:

1919 Crew LLC has retained the environmental consultant referenced on the attached report for the project referenced above. The attached report is being submitted on behalf of 1919 Crew LLC.

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the State Water Resources Control Board's GeoTracker website.

Sincerely,

Jeremy Harris

September 8, 2017

Mr. Jeremy Harris
1919 Crew LLC
Pier 54 Suite 202
San Francisco, CA 94158

Re: **Remedial Action Plan**
1919 Market Street
Oakland, California 94607
ACDEH Site Cleanup Program RO3205

Dear Mr. Harris:

Pangea Environmental Services, Inc. (Pangea) prepared this *Remedial Action Plan* (RAP) for the subject property. This RAP was requested during the agency meeting on August 22, 2017. This RAP outlines procedures for remediating and/or mitigating subsurface chemicals of potential concern at the subject site. The RAP work scope proposes additional site assessment following implementation of the *Interim Remedial Action Plan* dated September 8, 2017 prior to selection of the final remediation and mitigation approaches for this site.

If you have any questions or comments, please call me at (510) 435-8664 or email briddell@pangeaenv.com.

Sincerely,
Pangea Environmental Services, Inc.

Bob Clark-Riddell, P.E.
Principal Engineer

Attachment: *Remedial Action Plan*

REMEDIAL ACTION PLAN

1919 Market Street
Oakland, California, 94607
ACDEH Site Cleanup Program RO3205

September 8, 2017

Prepared for:

Mr. Jeremy Harris
1919 Crew LLC
Pier 54 Suite 202
San Francisco, CA

Prepared by:

Pangea Environmental Services, Inc.
1710 Franklin Street, Suite 200
Oakland, California 94612

Written by:

REGISTERED PROFESSIONAL ENGINEER
ROBERT G. CLARK-RIDDELL
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Ron Scheele
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Principal Engineer

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ATTACHMENTS

1.0 INTRODUCTION

PANGEA Environmental Services, Inc. (PANGEA) prepared this *Remedial Action Plan* (IRAP) for the subject property located at 1919 Market Street, Oakland, California (Site). This RAP was requested during a meeting with Alameda County Department of Environmental Health (ACDEH) on August 22, 2017. This RAP outlines procedures for remediating and/or mitigating subsurface chemicals of potential concern at the subject site. The RAP work scope proposed additional site assessment following implementation of the *Interim Remedial Action Plan* dated September 8, 2017 prior to selection of the final remediation and mitigation approaches for this site. The Site background, chemical distribution, remedial objectives and cleanup goals, feasibility study, and proposed remedial action and schedule are presented below.

2.0 SITE BACKGROUND

The Site consists of three parcels of land comprising 1.457 acres located on the west side of Market Street and the east side of Myrtle Street within a mixed residential and commercial area of Alameda County, in Oakland, California (Figure 1). The Site's assessor parcel numbers (APN) are: 5-410-13-1, 5-410-14, and 5-410-25. The property is owned and being redeveloped by 1919 Crew LLC into live-work units. The Site is currently developed with one 70,000 square foot building constructed in 1923 that has been partially demolished. In addition to the structure, the Site is improved with asphalt-paved parking, perimeter fencing, and associated drainage features. The subject property is bound by residential housing to the north, Market Street to the east beyond which is residential housing, St. John Missionary Baptist Church and residential housing to the south, and Myrtle Street to the west beyond which is residential housing. An aerial site map showing Site features and surrounding properties is included as Figure 2.

2.1 Regulatory Cases at Site

Regulatory oversight is currently provided by the Alameda County Department of Environmental Health (ACDEH) under case #RO0003205 for Site redevelopment at 1919 Market Street. A LUST case under the name Scott Company of California for 1919 Market Street was closed in January 1999 pertaining to two former USTs located directly west of the Site beneath the sidewalk along Myrtle Street (ACDEH case# RO0002439).

2.2 Current and Historic Site Use

The Site has historically housed both residential and commercial tenants. The Site was formerly occupied by Greyhound Bus Lines and a plumbing contractor warehouse, which included onsite operations such as auto motive repair and painting. The property was formerly equipped with two 10,000-gallon underground storage tanks (USTs), located within the sidewalk to the southwest side of the building along Myrtle Street. The USTs were reportedly used by Greyhound Bus Lines to store diesel prior to the 1960s. The Site was occupied by Scott Company starting as early as 1957, who reportedly used the southwest UST to store gasoline. A former fuel dispenser was reportedly located on the southwest portion of the property, near the corner of the subject property building. The USTs and dispenser were removed in the early 1980s at a time when Myrtle Street was being repaved. On January 22, 1999, the Site received closure via Letter of No Further Action from the ACDEH for the Leaking UST case. According to a Phase I environmental site assessment (AEI, 2014), solvents were stored near the southwest and southeast corners of the Site and refrigerant oil was stored in the northeast corner of the Site. Historical use areas are shown on Figure 2.

2.3 Development Plans

The planned redevelopment of the Site will involve conversion of the existing warehouse to live/work units with communal courtyards. A site map showing the planned Site development is included as Figure 3. The existing street side facades and portions of the building that are structurally adequate will remain, while rebuilding the middle portion of the building to current structural standards from the ground up. The entire building floor slab will be removed to allow for construction of new structural elements, infrastructure, and utilities, except within the planned stacked parking area in the northeast corner of the Site.

2.4 Site Geology and Hydrogeology

The Site is situated within the Coast Range physiographic province of the State of California. The Coast Ranges are northwest-trending mountain ranges and narrow valleys, extending approximately 600 miles from the Oregon Border to the Santa Ynez River near Santa Barbara, sub-parallel to the Pacific coast and San Andreas Fault. Structural features including faults and synclinal folds largely control topography in the province and reflect both previous and existing regional tectonic regimes. The Coast Ranges are comprised of Mesozoic and Cenozoic aged sedimentary strata, dominated by the Franciscan Complex within the subject property vicinity.

The Site is located within the East Bay Plain subbasin, which is part of the larger Santa Clara Valley Groundwater Basin. The East Bay Plain subbasin is a northwest trending alluvial plain bounded to the north by San Pablo Bay, to the east by the contact with Franciscan Basement rock, and to the south by the Niles Cone Groundwater basin. The basin extends beneath San Francisco Bay to the west. Groundwater is generally found very near the surface throughout the basin. The East Bay Plain subbasin aquifer system consists of unconsolidated sediments of Quaternary age. The Early Holocene Temescal Formation is the most recently deposited and consists of primarily silts and clays with some gravel layers.

The relatively flat Site lies at an elevation of approximately 20 feet above mean sea level to the east of San Francisco Bay and to the north of the Oakland Inner Harbor (Figure 1). According to previous boring logs, soil beneath the Site consists of silty sand fill underlain by silty sand, clayey sand, and sandy clay to a total depth of 25 feet below grade surface (ft bgs). Potential shallow fill material consisting of sand, gravelly sand and/or silty sand is found at approximately 0 to 4 ft bgs. The Merritt Sand formation present in West Oakland consists of silty sand, making it difficult to differentiate this potential shallow fill material from the native soil. The shallow material is underlain by silt from 4 to 10 ft bgs, silty sand or clay from 10 to 21 ft bgs, sand from 21 to 24 ft bgs and clay from 24 to 25 ft bgs. In the former loading area in the northwest corner of the building, along the perimeter of the Site, and underneath Myrtle Street, a silty sand was observed from 13 to 21 ft bgs. During previous drilling, groundwater was encountered at approximately 13 to 16 ft bgs and with water levels rising several feet after drilling. Groundwater appears to be under semi-confined conditions. Based on historical well monitoring data from the Site and Site vicinity, groundwater flows to the northwest.

2.5 Chemicals of Potential Concern

The chemicals of potential concern (COPC) at this Site primarily include the following chlorinated VOCs and petroleum hydrocarbons: tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride, chloroform, benzene, ethylbenzene, and total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd).

The following chemicals have been detected in site media (soil, soil gas, subslab gas or groundwater) above conservative residential environmental screening levels (ESLs) established by the San Francisco Bay Region Water Quality Control Board (RWQCB): PCE, TCE, carbon tetrachloride, chloroform, benzene, ethylbenzene, and total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd). The following additional VOCs have been detected at the Site below ESLs: arsenic; 1,2-dichloroethane; naphthalene; 1,1,1-trichloroethane; toluene; xylenes; and TPH as motor oil (TPHmo).

No significant VOC impact has been detected in soil or groundwater based on data comparison to ESLs, with only limited benzene in groundwater above ESLs in the southeast corner (boring B-15). The primary impacted media of concern is soil gas and subslab gas.

2.6 Previous Site Assessment

A summary of previous environmental activities at the Site is provided below. Investigation drilling and sampling locations are shown on Figure 4.

- **November 19, 2014, Phase I Environmental Site Assessment, AEI:** A Phase I ESA revealed that the Site was formerly occupied by Greyhound Bus Lines and a plumbing contractor warehouse, which included on-site operations such as motor repair and painting. The property was formerly equipped with two 10,000-gallon USTs, located within the sidewalk to the southwest side of the building along Myrtle Street.

- **March 28, 2016, Phase II Subsurface Investigation Report, Partner Engineering & Science (Partner):** Three subslab samples (SS-3, SS-4 and SS-5) were collected on March 11, 2016. One of the subslab samples (SS-4) contained a detectable concentration of benzene which exceeded the residential Environmental Screening Level (ESL) established by the San Francisco Bay Regional Water Quality Control Board. No other VOCs were detected in excess of applicable ESLs. Based on the results of this investigation, the report concluded that there has been a release of VOCs to the subsurface in the vicinity of the former painting area.

- **May 2, 2016, Additional Subsurface Investigation Report, Partner:** Five soil borings (B-1 through B-5) were advanced to a depth of 15 to 20 ft bgs inside the building. Soil, groundwater, and shallow soil gas at 5 ft bgs were sampled to identify potential concerns related to the aforementioned historical operations. No VOCs were detected in soil samples above the applicable laboratory reporting limits (RL). Tetrachloroethene (PCE) was detected in one groundwater sample (B5-GW) at a concentration less than the applicable ESL. No other VOCs were detected in groundwater exceeding laboratory RLs and/or residential ESLs. One soil gas sample (B3-SG-5) contained PCE and trichloroethene (TCE) concentrations exceeding applicable ESLs. Two soil gas samples (B2-SG-5 and B4-SG-5) contained chloroform concentrations exceeding the applicable ESL.

- **October 6, 2016, Site Assessment Report, PANGEA:** Nineteen subslab gas probes and three soil gas wells were installed and sampled to delineate VOCs beneath the building. Two soil borings were also drilled and grab groundwater samples collected to assess groundwater conditions. The extent of PCE, TCE, benzene, carbon tetrachloride and chloroform were delineated in subslab gas/soil gas beneath the building. The extent of PCE in groundwater was also delineated.

- **May 17, 2017, Preliminary Offsite Assessment Results – 2006 Myrtle Street, PANGEA:** Two soil gas probes were installed and sampled to assess potential vapor intrusion at the residence located at 2006 Myrtle Street. Additionally, an indoor air sample was collected from the basement of the residence. Soil gas samples did not detect any VOCs above residential Environmental Screening Levels (ESLs). However, two contaminants of concern, benzene and carbon tetrachloride, were detected in the indoor air sample above residential ESLs. This Perimeter/Offsite Assessment Report documents additional soil gas and indoor air testing that showed that VOC concentrations in indoor air resembled VOC concentrations in ambient air.

- **July 17, 2017, Preliminary/Offsite Assessment Report and Site Assessment Workplan, PANGEA:** Soil, groundwater, subslab gas, shallow soil gas and indoor air samples were collected to further delineate the perimeter and offsite extent of known subsurface VOCs and possible VOCs near historical Site operations/chemical use. Soil sampling results showed that the shallow fill/soil within the proposed courtyard/landscaped areas had only trace levels of hydrocarbons and no VOCs, SVOCs or PCBs. No significant COC impact was detected in soil or groundwater during perimeter/offsite sampling except in the southeast corner in B-15. No VOCs were detected in the perimeter/offsite soil gas wells above applicable ESLs or LTCP criteria, except for low *chloroform* concentrations in one offsite soil gas well (SG-10) just above the conservative ESL. Only low VOC concentrations were detected in the basement air at 2006 Myrtle Street and levels appeared to be representative of ambient air conditions.

3.0 DISTRIBUTION OF CHEMICALS OF POTENTIAL CONCERN

The following chemicals have been detected in site media (soil, soil gas, subslab gas or groundwater) above conservative residential RWQCB environmental screening levels (ESLs) and are considered the primary chemicals of potential concern (COPCs): PCE, TCE, carbon tetrachloride, chloroform, benzene, ethylbenzene and total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd). Available information suggests several onsite releases from previous historical operations/storage areas are likely responsible for the VOCs and hydrocarbons discovered at the Site. This section describes COPC distribution by media, by chemical, and by location.

3.1 Chemical Distribution by Media

The chemical distribution in Site media (soil, groundwater, subslab gas/soil gas and indoor air) is summarized below. The COPC distribution in Site soil, groundwater, subslab gas/soil gas shown on Figures 5, 6, 7, 8, 9 and 10, respectively. No significant VOC impact has been detected in *soil* or *groundwater* based on data comparison to ESLs, with only limited benzene in groundwater above ESLs in the southeast corner (boring B-15). The primary impacted media of concern is soil gas and subslab gas.

3.1.1 Distribution of COPCs in Soil and Groundwater

Soil and groundwater analytical results are summarized on Figure 12 and Tables 1 and 2, respectively. These tables include a comparison to RWQCB ESLs for residential site use. Primary TPH impact in groundwater is present in the southeast historical solvent storage area (boring B-15) and also in the southwest former leaking UST area. No significant VOC impact has been detected in *soil* or *groundwater* based on data comparison to ESLs, with only limited benzene in groundwater above ESLs in the southeast corner (boring B-15). Since only petroleum hydrocarbons were detected in the southeast historical solvent storage area, a historic release of petroleum hydrocarbons likely occurred in this vicinity of the Site. Despite TPHg and TPHd in soil and groundwater being above residential ESLs, the hydrocarbon concentrations do not exceed the LTCP criteria shown on Tables 1 and 2. No groundwater monitoring wells exist at the Site.

3.1.2 Distribution of COPCs in Subslab Gas and Soil Gas

Subslab gas and soil gas analytical results are summarized on Figure 12 and Table 3. Table 3 also includes a comparison to soil vapor ESLs for residential site use. Subslab gas and shallow soil gas is impacted with concentrations of PCE, TCE, benzene, carbon tetrachloride and chloroform in excess respective residential ESLs for soil gas and/or subslab gas. The primary VOC impact above ESLs is present in soil gas about 5 ft below the concrete slab in the former loading dock and historical painting area within northwestern corner of the Site. The slab in the subgrade loading area (50 ft by 35 ft) is approximately 3.5 ft lower than the slab across the rest of the Site as shown on Figure 11. Some limited PCE (slightly below the ESL) was found in subslab gas in the northeast area.

Chloroform has been detected slightly above soil gas ESLs at three locations: northwest boring B-2, north central boring B-4 and offsite well SG-10 across Myrtle Street (Figure 9). These apparent isolated locations are near former or existing water service. Low chloroform concentrations are commonly detected in soil gas as a result of the chemical breakdown of chlorinated tap water.

While benzene was detected above the conservative ESL in select offsite soil gas wells, the benzene concentrations were well below the Low Threat UST Case Closure Policy (LTCP) criteria of 85,000 μg/m^3 for sites with a bioattentuation zone. The presence of oxygen above 4% for soil gas at 5 ft below building foundations and the lack of TPHg+TPHd concentrations greater than 100 mg/kg in shallow soil indicates the presence of a bioattenuation zone at the Site as based on the LTCP criteria.

3.1.3 Distribution of COPCs in Indoor Air

Indoor air analytical results from offsite sampling are summarized on Table 4. Table 4 also include a comparison to residential indoor air ESLs. Benzene and carbon tetrachloride were detected in indoor air basement samples slightly above the residential indoor air ESLs. No PCE or chloroform were detected in indoor air. A comparison of indoor air results to soil gas results yielded a poor correlation between the VOCs detected in the offsite basement air and underlying soil gas, suggesting that the VOCs detected in the offsite basement air sample were sourcing from materials inside the basement and ambient air, rather than from the subsurface.

3.2 Distribution by Chemical (Specific COPC)

As requested by ACDEH, the distribution of the following COPCs within all site media are summarized on chemical specific figures: PCE, TCE, carbon tetrachloride, chloroform, benzene, ethylbenzene and total petroleum hydrocarbons as gasoline and diesel (TPHg and TPHd). The chemical specific figures are presented as Figures 5 through 10.

3.3 Chemical Distribution by Location

The COPC distribution by Site location associated with historical uses is described below and summarized on Figure 12.

VOC Impact in Northwest Loading Area: Site data suggests that the northwest loading area is the primary source area of VOCs in soil gas. The primary chemicals of concern in this area are PCE, TCE and benzene, due to soil gas concentrations above residential ESLs in select wells. Chloroform slightly exceeds the residential soil gas ESL in this area within boring B-2. Low chloroform concentrations are commonly detected in soil gas as a result of the chemical breakdown of chlorinated tap water. No significant VOCs were detected in soil or groundwater in this area of the Site.

Petroleum Hydrocarbons in Former UST Area in Southwest Corner: The primary chemicals of concern in this area are TPHg, TPHd, benzene and ethylbenzene. TPHg and/or TPHd have been historically detected above the soil ESL in borings/former wells IB-1, IB-7, IB-8, B-14, MW-1 and MW-2 at concentrations ranging up to 560 mg/kg TPHg and 1,200 mg/kg TPHd. TPHg and TPHd have also been detected above the groundwater ESL in recent boring B-14-GW at 461 µg/L and 1,170 µg/L respectively. Benzene has been detected above the soil gas ESL in soil gas wells SG-12, SG-13 and SG-15 at concentrations ranging from 120 to 430 $\mu g/m^3$. Historical levels of ethylbenzene have been detected above the soil ESL in boring IB-8 at 1,100 mg/kg and above the groundwater ESL in former well MW-4 at 110 µg/L. Benzene concentrations in soil gas were well below the Low Threat UST Case Closure Policy (LTCP) criteria of 85,000 $\mu g/m^3$ for sites with a bioattentuation zone. The presence of oxygen above 4% for soil gas at 5 ft below building foundations and the lack of TPHg+TPHd concentrations greater than 100 mg/kg in shallow soil (B-14) indicates the presence of a bioattenuation zone at the Site as based on the LTCP criteria.

Northeastern Storage Area: PCE is a primary chemical of concern in this area due to 190 µg/m3 detected in subslab gas probe SS-21. The other COPC in this area is TPHd due to its detection above the groundwater ESL of 219 µg/L in boring B-11.

Southeast Solvent Storage Area: Benzene is a primary chemical of concern in this area due to 20 ug/L detected in grab groundwater in boring B-15. The other COPCs in this area are TPHg/TPHd due to their detection above groundwater ESLs in borings B-10 and B-15 at concentrations up to 6,650 µg/L TPHg and 4,460 µg/L TPHd.

4.0 REMEDIAL OBJECTIVES AND CLEANUP GOALS

The initial objective of site remediation and mitigation is to sufficiently safeguard human health to allow occupancy of planned live-work units at the subject site. The final remedial/mitigation objective is to help facilitate regulatory case closure within the relative near future.

The cleanup remediation goal for all media is the Tier 1 ESLs established by the RWQCB, except for select petroleum hydrocarbon compounds clarified herein. Currently, the primary media with VOC impact above Tier 1 ESLs is subslab gas and soil gas. No *soil* impact has been identified above Tier 1 ESLs, except for arsenic that likely represents background soil conditions and limited TPHg/TPHd in soil adjacent the former USTs. For *groundwater*, a benzene concentration of 20 ug/L in boring B-15 within the southeast corner exceeds the Tier 1 ESL of 1.0 ug/L. TPHg and TPHd at select locations also exceed Tier 1 ESLs. Despite these petroleum hydrocarbon concentrations in soil and/or groundwater above Tier 1 ESLs, the hydrocarbon concentrations do not exceed the LTCP criteria shown on Tables 1 and 2. PANGEA proposes using LTCP criteria for petroleum hydrocarbons associated with the former UST area (closed LUST case) and the oil storage areas.

If post-remediation conditions exceed Tier 1 ESLs, the goal of contingent mitigation will be safeguarding indoor air quality to below Tier 1 ESLs. Tier 1 ESLs generally correspond with a risk of <1 x 10^{-6} and a hazard index of <1.

5.0 FEASIBILITY STUDY

PANGEA prepared a feasibility study for addressing residual COPC impact at the site. To help select a cost-effective and appropriate alternative for meeting the remediation objectives, PANGEA evaluated several remediation techniques applicable to sites with chlorinated solvent impact. The evaluated remedial alternatives include:

- Excavation
- Insitu Bioremediation
- Insitu Bioremediation using BOS200®
- Soil Vapor Extraction (and Active Venting)
- Monitored Natural Attenuation (Soil Gas and Groundwater Monitoring)
- No Action

The evaluation of alternatives is discussed below.

5.1 Excavation

Excavation is a proven and effective technique for remediation of chlorinated and petroleum hydrocarbons. Excavation is most appropriate for shallow soils, and especially for low permeability materials where in-situ remedial techniques have very limited effectiveness. This method is also a cost-effective option for undeveloped sites where the excavation area is accessible and not beneath site facilities. Excavation can remove unsaturated soil, capillary fringe soil, and saturated soil. Soil is usually transported offsite for disposal, but soil can be treated and reused at the site in accordance with regulatory guidelines and approval.

Within PANGEA' *Interim Remedial Action Plan,* soil excavation was proposed to remove a primary VOC impact area in the northwest corner of the Site that poses a potential significant risk to adjacent properties. Planned future site assessment will further characterize the extent of known VOC and petroleum hydrocarbon impact. Soil excavation is a viable and cost-effective alternative for remediating any significant source material identified during future site assessment.

5.2 Insitu Bioremedation

Insitu bioremediation (ISB) can a cost-effective technique to remediate chlorinated and/or petroleum hydrocarbon impact within saturated soil. ISB may involve enhanced aerobic biodegradation or enhanced reductive dechlorination (anaerobic biodegradation) with or without bioaugmentation treatment.. ISB is typically implemented using injection technology or via material placement within trenches or excavation cavities. A typical example of amendments to treat chlorinated solvents may involve a combination of zero valent iron (ZVI) and lecithin-based microemulsion solution (ELS™) bioaugmented with dehalococcoides bacterium that would be injected into the subsurface via temporary direct push injection points. A typical example of amendments to treat hydrocarbons may involve the addition of an oxygen releasing material such as ORC™. The proposed amendments and distribution methodology would be based on Site data including the depth and concentrations of the contaminants of concern, lithology, and soil chemistry.

5.3 Insitu Bioremedation ("Trap and Treat") using BOS 200®

Another insitu bioremediation approach is the "Trap and Treat" process utilized by BOS 200®. BOS 200® utilizes two technologies to effectively remediate petroleum hydrocarbon sites. The two technologies first trap contaminants via carbon adsorption and then treat the subsurface via biological degradation within the BOS 200® matrix, as the product incorporates both aerobic and anaerobic biological processes. The "Trap" provides the immediate mass reduction and plume control, while the "Treat" provides the continued long term remedial degradation.

The product comes as a fine grained dry material which consists of: carbon, calcium sulfate, nitrate, phosphate, and ammonia in a proprietary blend. BOS 200® is 77% by weight carbon and up to 19% gypsum, the sulfate source. Gypsum is 79% by weight sulfate which translates to approximately 15% by weight sulfate in BOS 200®. The BOS 200® is mixed with water and a facultative blend of microbes (inoculation with aerobic and anaerobic microbes) to create a solids suspension. This is now an ideal environment for the biological process, where hydrocarbons are adsorbed on to BOS 200® particles made up of:

- Electron Acceptors: oxygen, nitrate, ammonia and sulfate (primary);
- Nutrients - phosphorus and nitrogen; and
- Aerobic and anaerobic blend of microbes (over 26 species of microbes);

BOS 200® is typically injected into the subsurface from 100 to 600 pounds per square inch gauge (psig) using injection pumps and direct-push tooling. BOS 200® can also be placed within excavation cavities.

5.4 Soil Vapor Extraction (and Active Venting)

Soil vapor extraction is a common approach for remediating unsaturated soil. This approach uses an aboveground vacuum blower to extract vapor-phase VOCs/hydrocarbons from the site subsurface. SVE also effectively removes VOCs/hydrocarbons adsorbed to unsaturated soil that could pose a risk to groundwater quality. Extracted vapors are typically treated aboveground with granular activated carbon, although emissions can be discharged to the atmosphere without treatment if acceptable to the air district.

Based on the shallow coarse-grained soil at this site, SVE would likely effectively remediate volatile compounds in shallow soil at the site. A shallow SVE system could also provide ‘active venting’ of the site subsurface using shallow site wells or horizontal vent piping. Therefore, Pangea considers SVE and Active Venting as a viable remediation measure for shallow soil, if merited by future site data.

Based on the fine-grained soil approximately 5 ft and deeper, SVE may have limited effectiveness in deeper soil due to low soil permeability, water upwelling and shallow groundwater (about 17 ft bgs). SVE also does not effectively target residual groundwater impact within fine-grained materials. Therefore, Pangea estimates limited effectiveness for SVE in deeper soil.

5.5 Monitored Natural Attenuation (Soil Gas and Indoor Air Monitoring)

This alternative involves no active remediation, and assumes that residual contaminants will attenuate naturally. To be selected as an appropriate alternative, residual contaminants are often required to attenuate (or are projected to attenuate) to water quality objectives or other applicable cleanup standards within a reasonable timeframe. In addition, subslab/soil gas are required to attenuate (or are projected to attenuate) to applicable cleanup standards within a reasonable timeframe.

Given the planned interim remediation of source removal via excavation (which will target key source material), residual VOCs/hydrocarbons in subslab/soil gas groundwater will likely attenuate naturally. Depending on site conditions following additional assessment and IRAP implementation, this alternative may be appropriate.

5.6 No Action

This alternative involves no further action. Given the presence of VOCs/hydrocarbons above the proposed cleanup and mitigation goals, this alternative is not appropriate.

6.0 REMEDIAL ACTION PLAN

The following RAP is consistent with our meeting with ACDEH on August 22, 2017.

6.1 RAP Objectives

The specific objectives of the RAP are to investigate, remediate, and mitigate VOCs/petroleum hydrocarbons to sufficiently safeguard human health to allow occupancy of planned live-work units at the subject Site. The final remedial/mitigation objective is to help facilitate regulatory case closure within the relative near future.

The cleanup remediation goal for all media is the Tier 1 ESLs established by the RWQCB, except for select petroleum hydrocarbon compounds that shall meet LTCP criteria. The goal of contingent mitigation is to safeguarding indoor air quality to below Tier 1 ESLs.

6.2 RAP Work Scope

The RAP work scope first involves additional assessment during and after IRAP implementation. The subsequent RAP work scope involves remediation and/or mitigation based on additional assessment data and post-IRAP conditions. To achieve the RAP objectives, the proposed work scope includes the following specific tasks:

- Task 1 – Additional Site Assessment;
- Task 2 – Contingent Site Remediation; and
- Task 3 – Contingent Vapor Intrusion Mitigation.
- Task 4 – Post Remediation/Mitigation Monitoring

Task 1 – Additional Site Assessment

PANGEA will implement the site assessment work scope outlined in the *Perimeter/Offsite Assessment Report and Revised Site Assessment Workplan* dated September 8, 2017. This assess will further characterize extent of COPCs are several areas at the Site and offsite. The assessment will also evaluate conditions beneath the planned elevators and within shallow soil of the courtyards. PANGEA will also perform soil gas sampling in the northwest corner for at least 2 events following implementation of the *Interim Remedial Action Plan* dated September 8, 2017.

Task 2 – Contingent Site Remediation

As merited based on results of site assessment described in Task 1, PANGEA may implement contingent site remediation. The remediation could consist of one or more of the viable remedial techniques described in the above feasibility study. Possible contingent remediation could involve some of the following:

- Additional excavation within the IRAP area;
- Excavation or insitu bioremediation within TPH impact in the southeastern area or adjacent the former USTs (southwestern area);
- Excavation of impact identified in the northern central area or the northeastern former oil storage/loading area;
- Excavation of shallow lead-impacted soil beneath the planned courtyards; and/or
- Soil vapor extraction of shallow soil.

Any required soil excavation would be conducted following procedures described in the *Interim Remedial Action Plan*. If insitu bioremediation is proposed, implementation procedures can be provided separately.

Task 3 – Contingent Vapor Intrusion Mitigation

As merited based on results of site assessment and remediation described in Tasks 1 and 2, PANGEA may implement contingent mitigation of vapor intrusion. Vapor intrusion mitigation could consist of one or more of the following viable mitigation techniques beneath some or all the site buildings:

- A ‘full blown’ engineered vapor mitigation system (VMS);
- Active or passive ventilation;
- A post-slab engineered vapor barrier; and
- Utility conduit trench plugs (i.e., soil gas barriers in utility trenches).

Specific procedures for vapor intrusion mitigation would be provided in a subsequent document.

Contingent ‘Full blown’ Engineered Vapor Mitigation System (VMS)

A ‘full blown’ VMS includes a venting system and an engineered sub-slab vapor barrier system. The VMS would be installed within the applicable residential buildings during construction and before occupancy of these buildings. The venting system would provide a route for the VOC-affected soil gas that would otherwise collect beneath the building slab and barrier system to vent directly to the atmosphere outside the building by providing a slight negative pressure beneath the building. The barrier system is intended to sufficiently retard the migration of VOC-affected soil gas into the onsite building such that VOCs in soil gas do not represent an unacceptable risk to future residential users of the Site. The sub-slab venting system would be designed for conversion to an active sub-slab depressurization/venting system, if performance monitoring results indicate the passive venting system is not providing sufficient mitigation of VOC vapors.

The VMS includes the following elements:

- Installation of a sub-slab ventilation (SSV) system beneath each building slab;
- Installation of a sub-slab engineered vapor barrier above the SSV system (e.g., GeoSeal™ by Land Science®);
- Sealing of slab penetrations and cracks using Retro-Coat™ Caulk and Retro-Coat™ Gel or comparable polyurethane material;
- Closure of potential preferential pathways (e.g., trench plugs for utilities);
- Sub-slab gas monitoring after slab construction and before occupancy; and
- SSV system design for conversion from passive to active operation, if merited by gas monitoring.

Contingent Active or Passive Subslab Ventilation

In conjunction with a VMS system, active subslab ventilation/subslab depressurization or soil vapor extraction (SVE) could be implemented. The SSV system is intended to be passive and long lasting, and to require minimal operations and maintenance activities. The SSV system consists of a trench, a layer of permeable material, horizontal vapor collection piping within the permeable material layer, vent risers attached to the vapor collection pipes that run to the roof, with the potential for a wind-driven turbine fans installed at the top of the vent risers. The purpose of the SSV is to provide protection by extracting soil vapor that may accumulate in the subsurface.

For the SSV piping area, a permeable base layer will be installed. The permeable base layer would consist of a minimum of 4 inches of gravel or crushed rock placed continuously around the SSV piping below grade. The permeable material would surround the vapor mitigation piping. The permeable base would provide a continuous, highly permeable zone that allows advective flow of soil vapor to the collection piping.

The vapor collection piping would be 3-inch diameter perforated Schedule 40 PVC pipe. The 3-inch piping is chosen to be large enough to allow vapor flow. The slotted pipe would connect to a 3-inch diameter cast-iron pipe (CIP) prior to grade.

The horizontal vapor collection piping would be connected to vertical vent riser piping, 3-inch diameter CIP. The 3 inches diameter CIP will be mounted to the building or routed inside the building. The riser vents would continue past the roof and terminate approximately 1 foot above the roof. The piping will be installed at a minimum of 10 ft from the property line and 25 ft from HVAC inlets. Vent risers would be labeled “CONTAINS VAPORS: DO NOT BREAK OR CUT.”

The selected 3-inch vent piping is capable of conveying in excess of 650 cubic ft per minute of air with minimal pressure drop and has more than sufficient capacity to convey the design flow rate using a wind-driven turbine fan.

A single 3-inch vent is capable of servicing a vapor mitigation membrane that covers an area ranging from 4,000 to 6,000 square feet (ft^2)(LADBS). SSV piping and risers would be provided as necessary.

A wind-driven turbine fan would be installed at the top of the riser vent to provide wind siphoning flow from the vent. The selected wind-driven turbine fan would create a vacuum that draws air out from the VMS. The fan requires no power to operate. Performance monitoring will determine if the fan flow rate requires reduction, or if fan removal is required to allow passive ventilation without a fan. Calculations would be performed to estimate the maximum allowable vapor flow rate per riser to remain below BAAQMD limitations.

The passive subslab venting system would be designed for possible conversion to an active subslab depressurization/venting system. System piping or valving would be provided to facilitate future conversion. Active venting would be conducted if performance monitoring results indicate the passive venting system is not providing sufficient mitigation of VOC.

The venting system could be converted to an active system with the addition of a blower connected to the VMS riser piping. The blower would mechanically move VOC-affected soil gas through the venting system and provide active sub-slab depressurization. A fan (RP 140 Radon Fan or equivalent) could be installed at each riser location. Alternatively, a larger SVE blower could be used for higher applied vacuum to vent the Site subsurface.

Contingent Trench Plug Installation

Trench plugs would be installed at various points along the subsurface sanitary sewer trench and other utilities transversing areas with VOC impact of concern. These trench plugs would help prevent VOC migration away from the apparent VOC source area along the utility or sanitary sewer backfill material. The utility line backfill will be sealed using a sand/cement slurry or controlled density fill (CDF) plug to limit vapor migration within the utility trench. A map showing tentative trench plug locations and a cross sectional illustration of the trench plugs are provided in Appendix B.

Contingent Post-Slab Engineered Vapor Barrier

This section describes installation of the engineered post-slab vapor barrier and slab penetration sealing.

Engineered Vapor Barrier System: The engineered barrier system would be a minimum 20-mils dry thickness, post-slab, very low permeability vapor barrier, such as Retro-Coat™ by Land Science®, applied on top of the structural floor slab across the building footprint. To help avoid damage, the vapor barrier would be applied just prior to the floor finishes. Potential preferential pathways such as cracks, annular spaces, pipe penetrations, or other imperfections would be sealed as described above. The engineered barrier system would be installed in accordance with the applicable manufacturer recommendations and specifications.

Slab Penetration Sealing: As an added precaution, potential preferential pathways would be sealed using Retro-Coat™ Caulk and Retro-Coat™ Gel or comparable polyurethane material, as appropriate, within the entirety of Building B South. Potential preferential pathways include cracks, imperfection to the slab, or other penetrations that would not be readily accessible after vapor barrier installation. Mechanical, electrical or other conduits originating from beneath the building floor slabs would also be sealed with a conduit seal to prevent migration of VOC-affected soil gas into the building. Typical details for conduit seals would be provided. A Site plan showing locations of conduit penetration seals would be included in the completion report record drawing set. Unused Site utilities, if any, would be abandoned and sealed where appropriate.

Contingent Subslab Gas Probe Installation

If required to monitor subslab gas conditions after VMS installation, PANGEA would install subslab gas probes or monitor the VMS riser gas. The probes would be constructed of PVC or stainless steel, with ¼" diameter Teflon tubing connecting the probe to sampling ports within a manifold enclosure mounted on the wall. The Teflon tubing would be contained within a secondary conduit such as PVC or non-metallic conduit to safeguard integrity of the Teflon tubing.

6.3 Reporting

Results from the post-IRAP soil gas sampling and additional site assessment will be used to select the final remedial action approach. The final remediation and vapor intrusion mitigation approaches will be presented a *Remedial Design and Implementation Plan* (RDIP) for the Site.

7.0 SCHEDULE

The responsible party, 1919 Crew LLC, will provide ACDEH with a project schedule. The overall schedule goal is to prepare a final remediation and mitigation plan at the earliest opportunity following completion of the IRAP and additional Site characterization activities. RDIP preparation is tentatively anticipated in early 2018 following ACDEH review of the IRAP implementation and site assessment reports.

8.0 REFERENCES

The regulatory record for this Site can be found on the State of California GeoTracker Website at https://geotracker.waterboards.ca.gov/profile_report?global_id=T10000009433

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SFRWQCB, 2016. San Francisco Bay Regional Water Quality Control Board, *Environmental Screening Levels*, February 22, (Revision 3, May)

Figure
1

1919 Market Street
Oakland, California

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Vicinity Map

1919 Market Street
Oakland, California

Site Map and Historical Use Areas

Figure 3

1919 Market Street
Oakland, California

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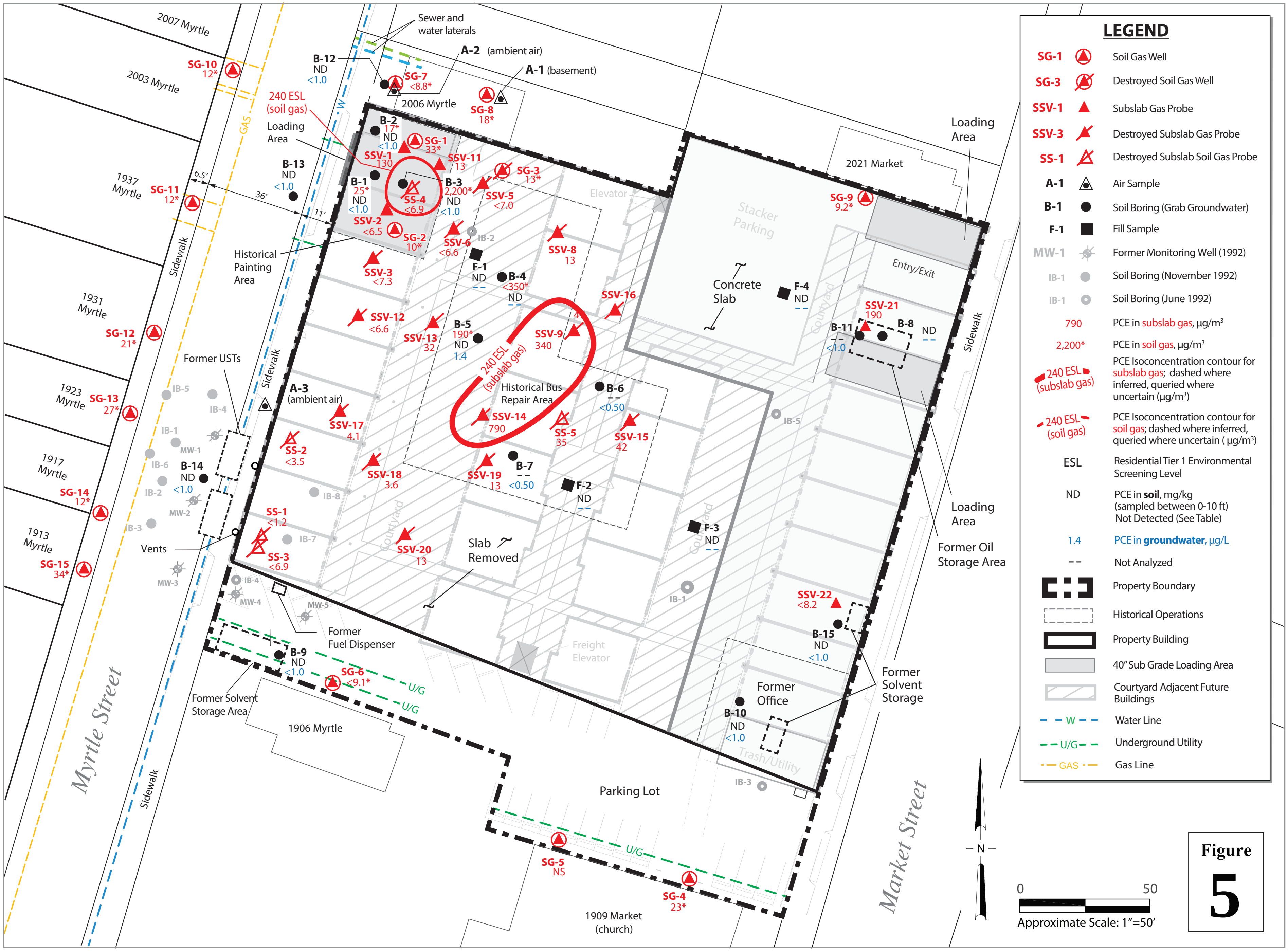
Site Map with
Planned Site Development

1919 Market Street
Oakland, California

PANGEA

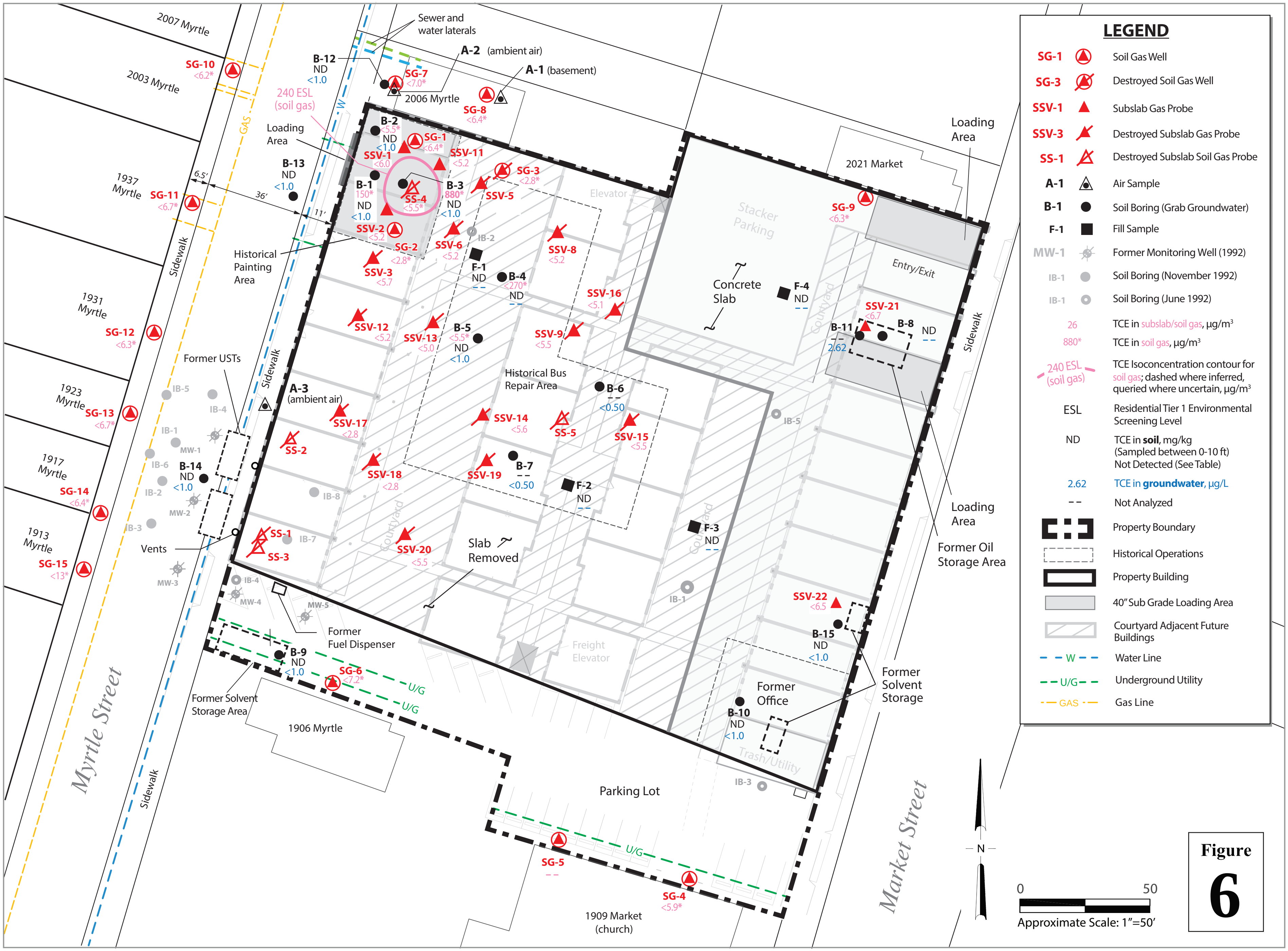
Site Map with Investigation Locations



1919 Market Street
Oakland, California

PANGEA

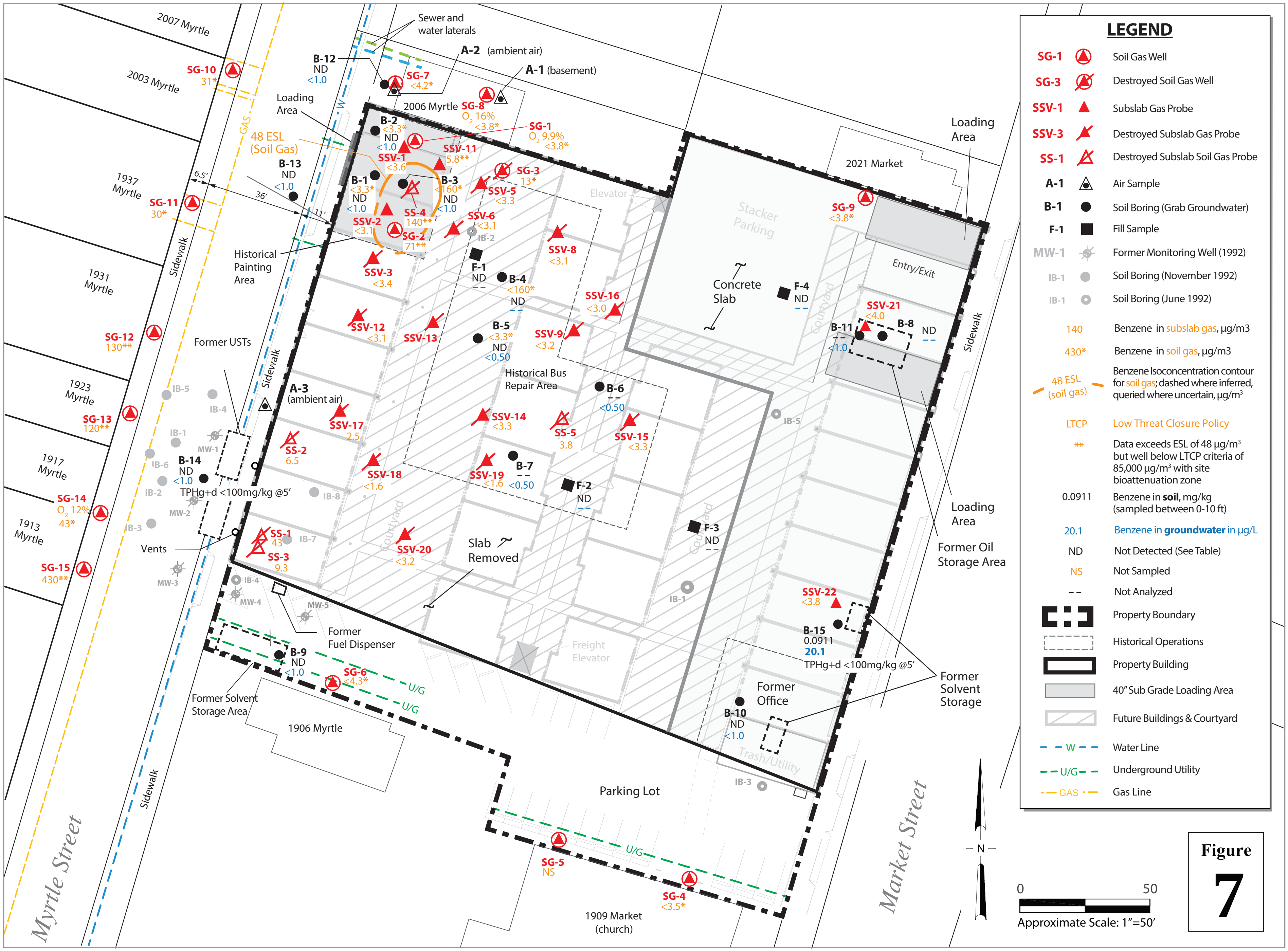
PCE in Soil, Groundwater and Subslab/Soil Gas



1919 Market Street
Oakland, California

PANGEA

TCE in Soil, Groundwater and Subslab/Soil Gas



1919 Market Street
Oakland, California

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Benzene in Soil, Groundwater and Subslab/Soil Gas

1919 Market Street
Oakland, California

PANGEA

Carbon Tetrachloride in Soil, Groundwater and Subslab/Soil Gas

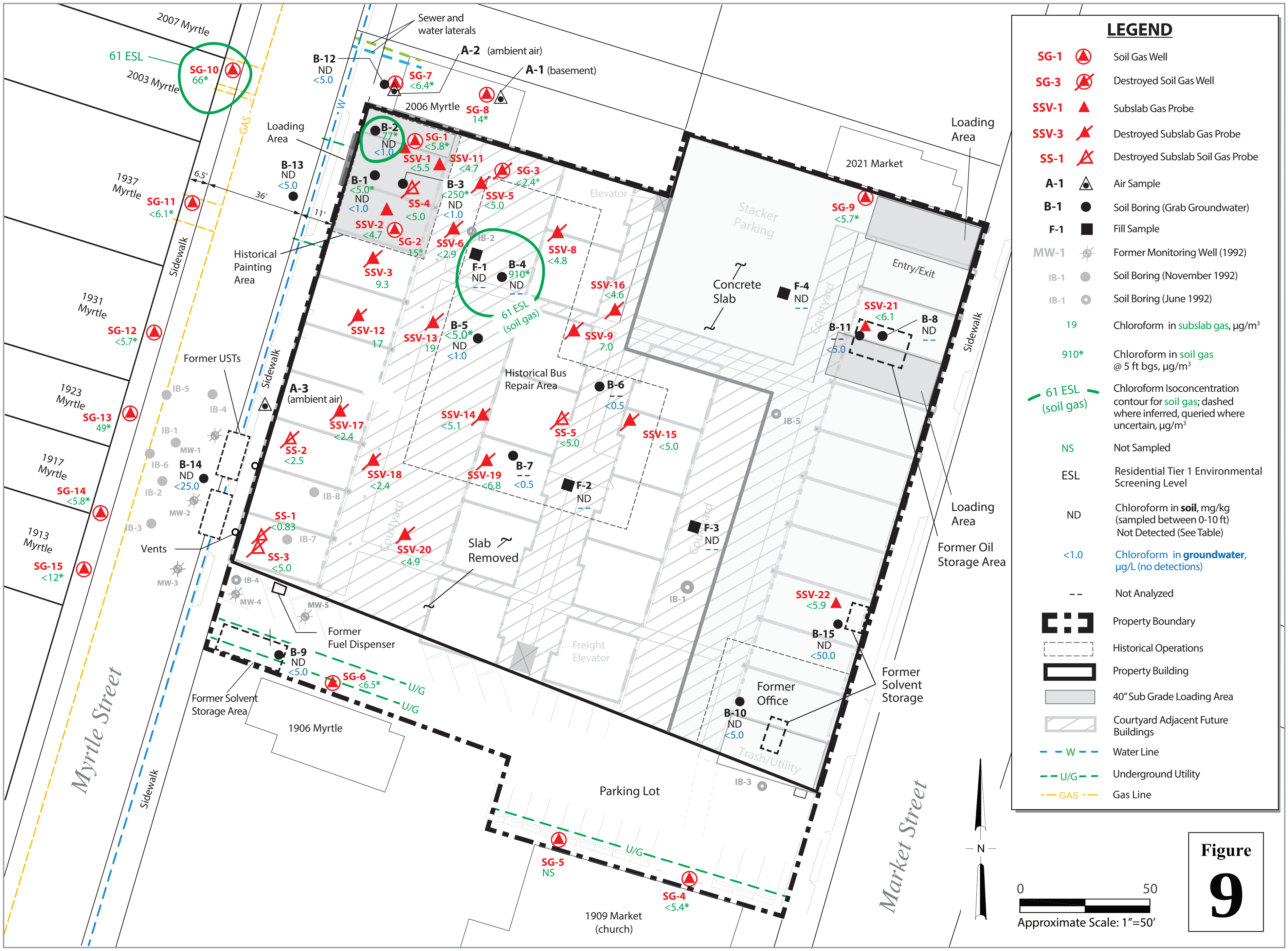

Figure 9

1919 Market Street
Oakland, California

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Chloroform in Soil, Groundwater and Subslab/Soil Gas

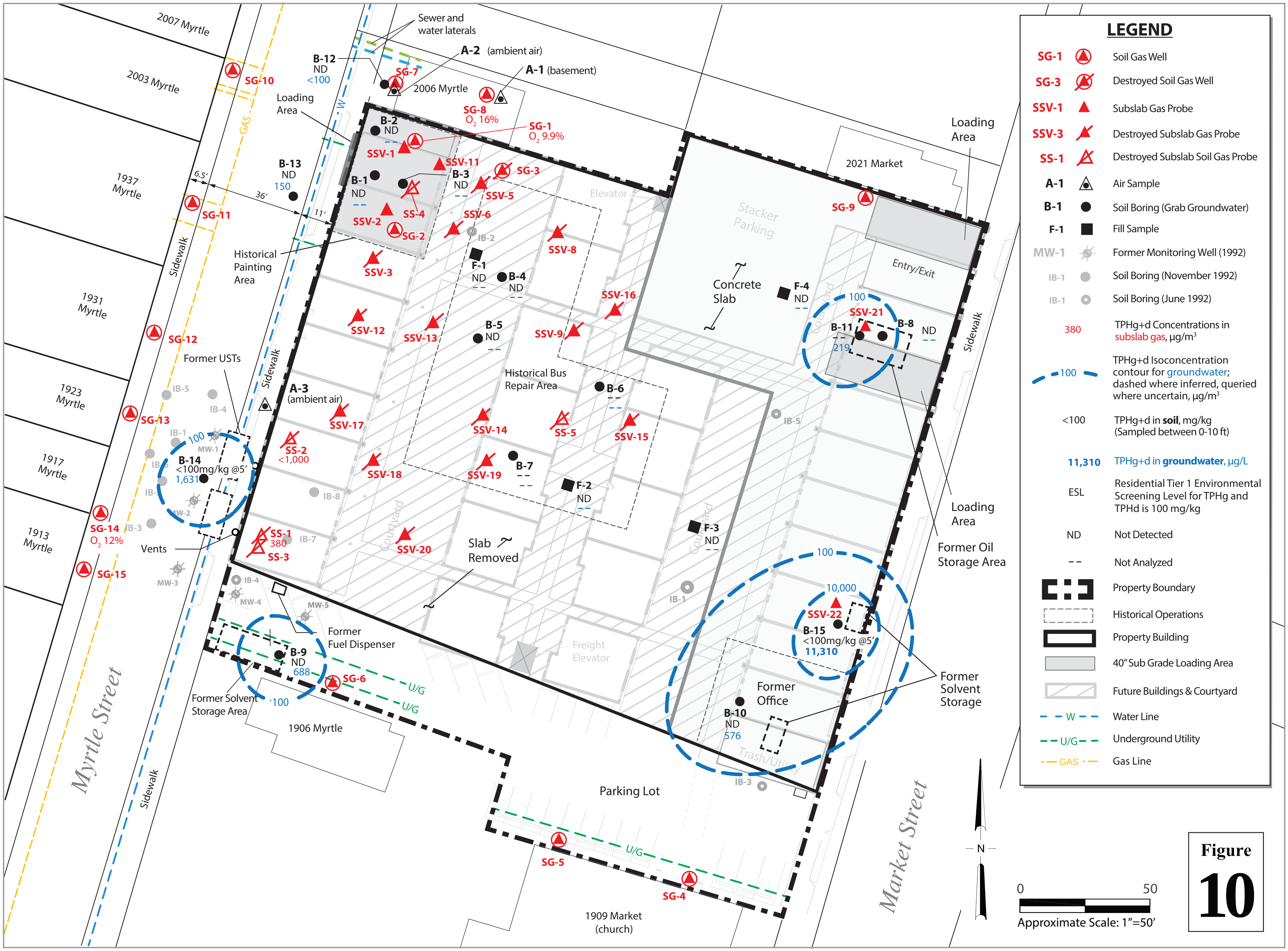

Figure 10

1919 Market Street
Oakland, California

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TPH in Soil, Groundwater and Subslab/Soil Gas

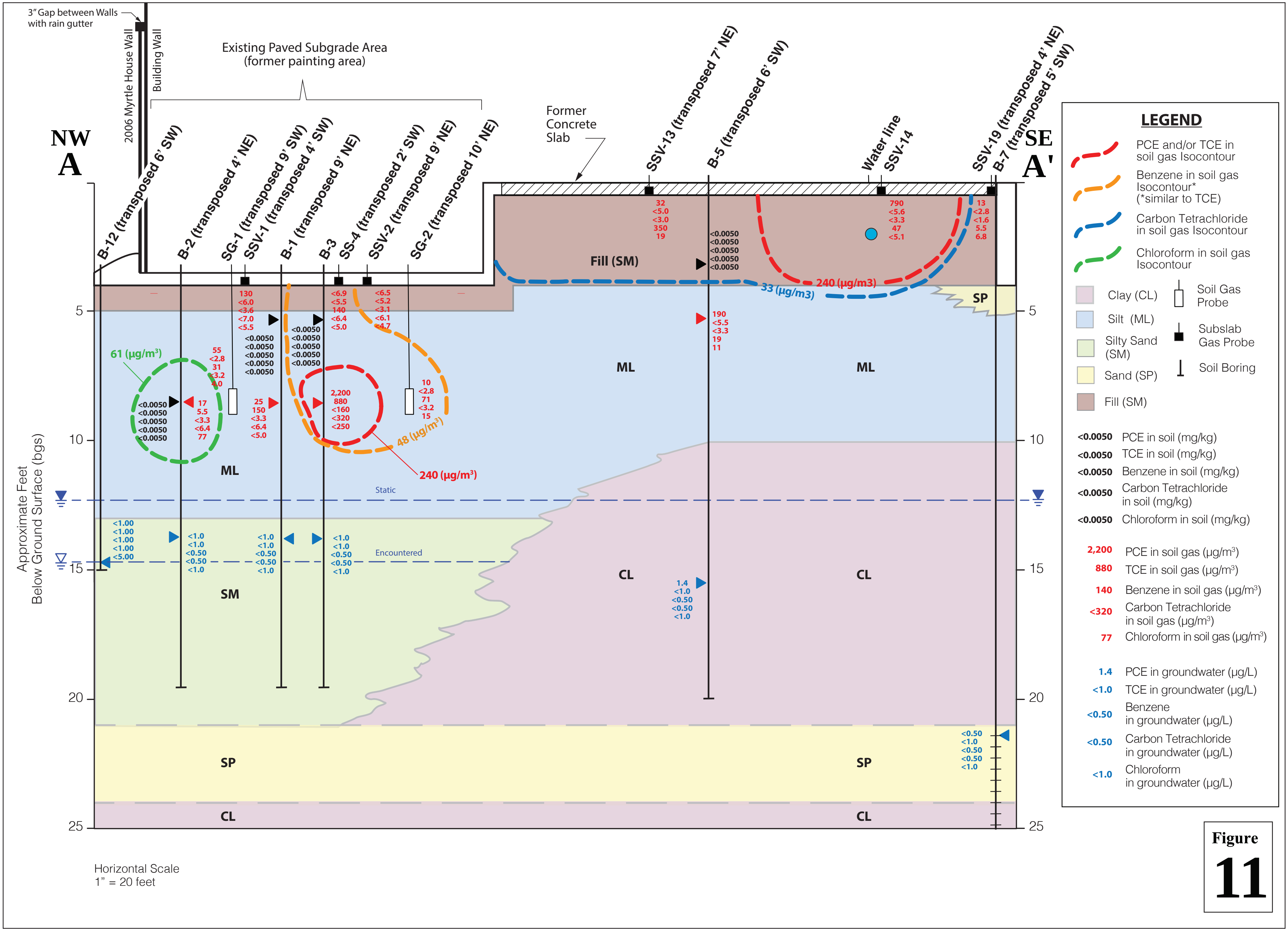

Figure 11

1919 Market Street
Oakland, California

PANGEA

Cross Section A-A'

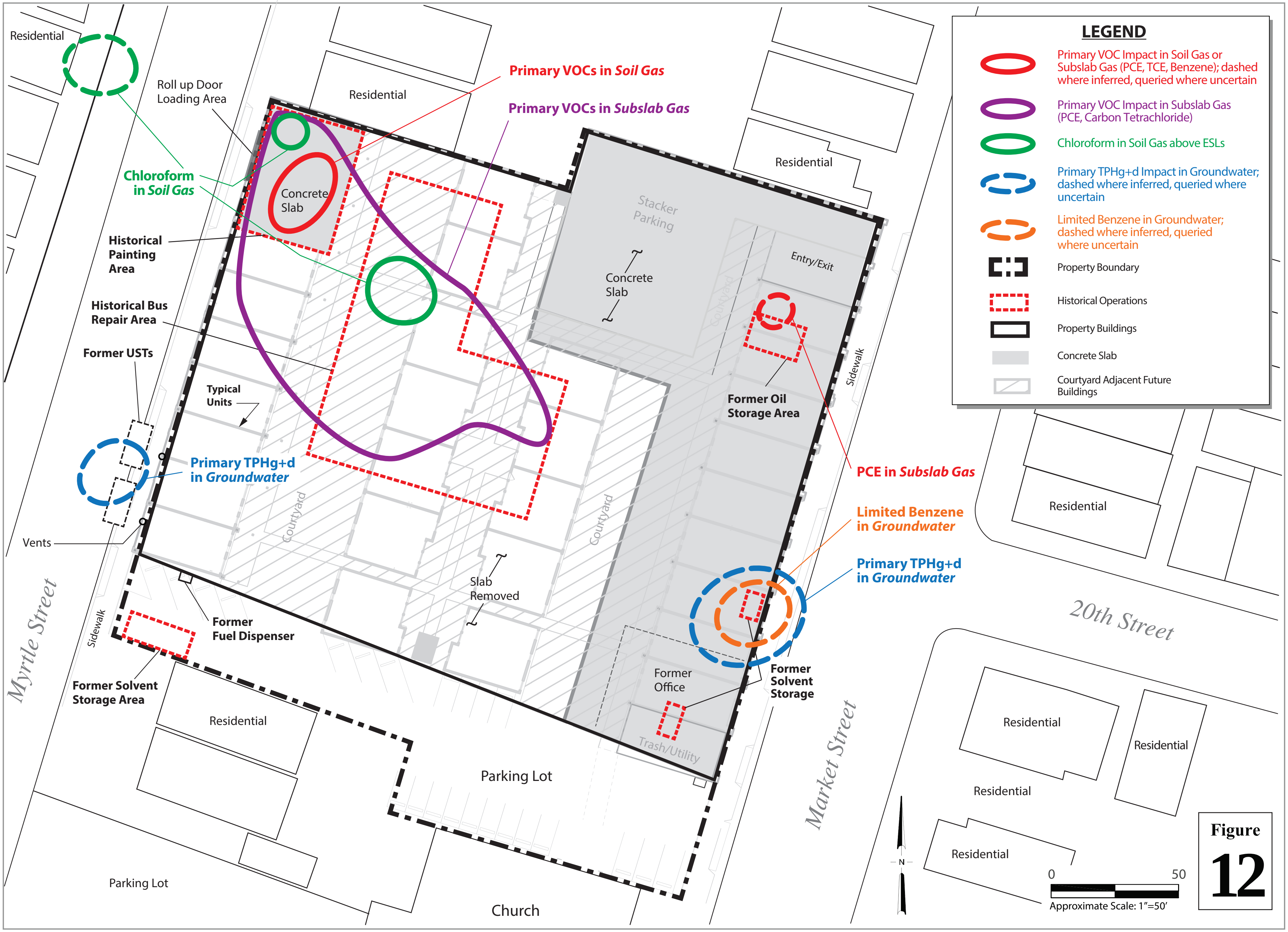

Figure 12

1919 Market Street
Oakland, California

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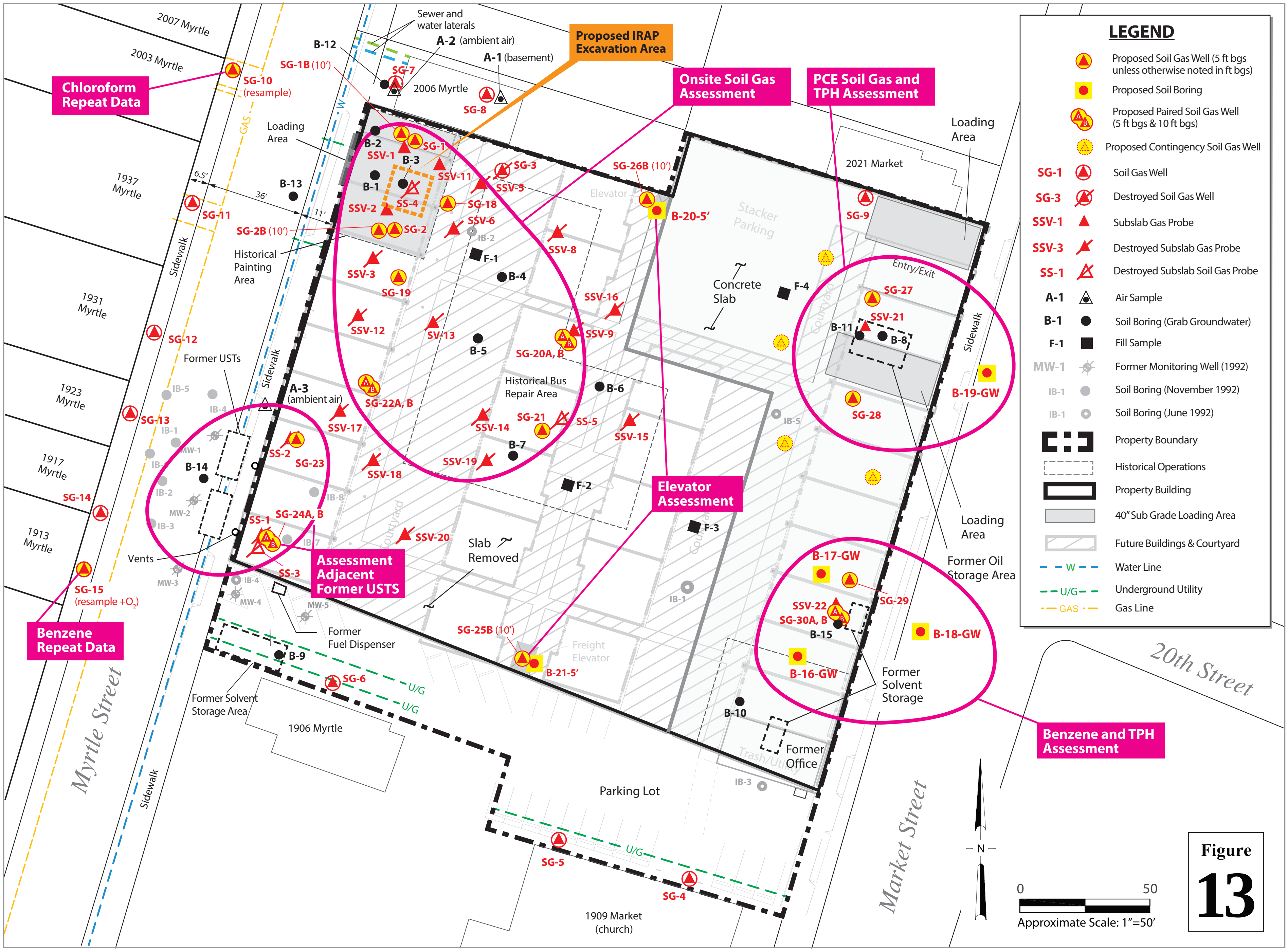
VOC and TPH Impact Summary



1919 Market Street
Oakland, California

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Proposed Sampling Locations

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Table 1. Soil Analytical Data - 1919 Market Street, Oakland, California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	SVOCs	PCBs	Metals	NOTES
			mg/kg																	
		Soil - Tier 1 ESL:	100	230	5,100	0.044	2.9	1.4	2.3	0.033	0.0045	0.42	0.46	7.8	0.048	0.068	Varies	0.25	Varies	
		Residential 0-5 ft - LTCP Criteria:	<100		NA	1.9	NA	21	NA	9.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	
June 1992 Soil Sampling																				
IB-1	June 1992	5.0	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		10.5	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
IB-2	June 1992	5.0	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		10.5	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
IB-3	June 1992	5.0	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		10.5	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
IB-4	June 1992	5.0	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		10.5	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		15.0	**2.5**	--	--	ND	**0.016**	**0.030**	**0.10**	--	--	--	--	--	--	--	--	--	--	
IB-5	June 1992	5.0	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
		10.5	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	
November 1992 Soil Sampling																				
IB-1	11/25/1992	6.0	**2.8**	<10	**<10 / 14[a]**	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		11.0	**87**	**300**	<20	<0.005	<0.005	<0.005	0.030	--	--	--	--	--	--	--	--	--	--	
IB-2	11/25/1992	6.0	<0.50	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		11.0	**23**	**<10 / 12[a]**	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
IB-3	11/25/1992	6.0	<0.5	<10	**13 / <10[a]**	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		11.0	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
IB-4	11/25/1992	6.0	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		11.5	**13**	**170**	**27**	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--	--	
IB-5	11/25/1992	7.0	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
		11.5	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
IB-6	11/25/1992	7.0	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
		11.5	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
IB-7	11/25/1992	5.0	<1	<1	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
		10.0	**560**	**44**	<10	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
IB-8	11/25/1992	5.0	<1	<1	**11**	<0.0025	<0.0025	<0.0025	<0.0025	--	--	--	--	--	--	--	--	--	--	
		10.0	**160**	**76**	<10	<0.0025	<0.0025	**1,100**	<0.0025	--	--	--	--	--	--	--	--	--	--	

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Table 1. Soil Analytical Data - 1919 Market Street, Oakland, California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	SVOCs	PCBs	Metals	NOTES
			mg/kg																	
		Soil - Tier 1 ESL:	100	230	5,100	0.044	2.9	1.4	2.3	0.033	0.0045	0.42	0.46	7.8	0.048	0.068	Varies	0.25	Varies	
MW-1	1992	5.0	**40**	**140**	<10	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--	--	
		10.5	**430**	**1,100**	**61**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
		13.0	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
MW-2	1992	5.5	**120**	**180**	<10	<0.05	<0.05	<0.05	<0.05	--	--	--	--	--	--	--	--	--	--	
		10.5	**310**	**1,200**	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
		15.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
MW-3	1992	5.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		10.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		15.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005											
MW-4	1992	8.0	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		12.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
MW-5	1992	8.0	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
		14.5	<0.5	<10	<10	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--	--	--	--	--	
2016-2017 Soil Sampling																				
B-1	04/15/2016	2.0[1]	--	--	--	<0.0050	<0.0050	<0.0050	<0.015	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	
B-2	04/15/2016	5.0[1]	--	--	--	<0.0050	<0.0050	<0.0050	<0.015	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	
B-3	04/15/2016	2.0[1]	--	--	--	<0.0050	<0.0050	<0.0050	<0.015	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	
B-4	04/15/2016	3.0	--	--	--	<0.0050	<0.0050	<0.0050	<0.015	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	
B-5	04/15/2016	3.0	--	--	--	<0.0050	<0.0050	<0.0050	<0.015	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	--	--	--	
B-8-5	11/14/2016	5.0	<0.15	<0.99	<5.0	<0.0038	<0.0038	<0.0038	<0.015	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	<0.0038	--	--	--	
B-9-5	5/26/2017	5.0	<0.116	<4.63	<4.63	<0.00116	<0.00578	<0.00116	<0.00347	<0.00578	<0.00116	<0.00116	<0.00116	<0.00116	<0.00116	<0.00578	--	--	--	
B-10-5	5/26/2017	5.0	<0.113	<4.52	<4.52	<0.00113	<0.00566	<0.00113	<0.00339	<0.00566	<0.00113	<0.00113	<0.00113	<0.00113	<0.00113	<0.00566	--	--	--	
B-12-5	5/26/2017	5.0	<0.116	<4.65	<4.65	<0.00116	<0.00581	<0.00116	<0.00349	<0.00581	<0.00116	<0.00116	<0.00116	<0.00116	<0.00116	<0.00581	--	--	--	
B-13-5	5/26/2017	5.0	<0.116	<232	**1,914**	<0.00116	<0.00580	<0.00116	<0.00348	<0.00580	<0.00116	<0.00116	<0.00116	<0.00116	<0.00116	<0.00580	--	--	--	
B-14-5	5/26/2017	5.0	**3.34**	**22.8**	<4.67	<0.00117	<0.00583	<0.00117	<0.00350	<0.00583	<0.00117	<0.00117	<0.00117	<0.00117	<0.00117	<0.00583	--	--	--	
B-14-10	5/26/2017	10.0	**65.1**	**252**	**16.2**	<0.0196	<0.0979	<0.0196	<0.0587	<0.0979	<0.0196	<0.0196	<0.0196	<0.0196	<0.0196	<0.0979	--	--	--	b
B-15-5	5/26/2017	5.0	**5.50**	<4.51	<4.51	<0.0194	<0.0972	<0.0194	<0.0583	<0.0972	<0.0194	<0.0194	<0.0194	<0.0194	<0.0194	<0.0972	--	--	--	
B-15-10	5/26/2017	10.0	**101**	<5.32	<5.32	**0.0911**	<0.110	<0.0220	<0.0659	<0.110	<0.0220	<0.0220	<0.0220	<0.0220	<0.0220	<0.110	--	--	--	b

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Table 1. Soil Analytical Data - 1919 Market Street, Oakland, California

Boring / Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	SVOCs	PCBs	Metals	NOTES
			mg/kg																	
		Soil - Tier 1 ESL:	100	230	5,100	0.044	2.9	1.4	2.3	0.033	0.0045	0.42	0.46	7.8	0.048	0.068	Varies	0.25	Varies	
F-1	11/14/2016	2.0	<0.14	**12**	**30**	<0.0034	<0.0034	<0.0034	<0.0068	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<1,700	<0.096	c	
F-2	11/14/2016	2.0	<0.14	<1.0	<5.0	<0.0033	<0.0033	<0.0033	<0.0066	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<0.0033	<1,700	<0.096	c,d	d =lead detected at 84.4 mg/kg
F-3	11/14/2016	2.0	<0.15	<1.0	<5.0	<0.0039	<0.0039	<0.0039	<0.0078	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<0.0039	<1,700	<0.096	c	
F-4	11/14/2016	2.0	<0.19	1.0	<5.0	<0.0048	<0.0048	<0.0048	<0.0096	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<1,700	<0.096	c	

Legend:

TPHg,d,mo = Total Petroleum Hydrocarbons as gasoline (TPHg), diesel(TPHd), and motor oil(TPHmo) by EPA Method 8015C.

VOCs = Volatile Organic Compounds by EPA Method 8260B.

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

1,1,1-TCA = 1,1,1-Trichloroethane

SVOCs = Semi-Volatile Organic Compounds

mg/Kg = milligrams per kilogram

ft bgs = Depth below ground surface in feet.

ND = analyte(s) not detected, detection limit unkowwn

< n = Chemical not present at a concentration in excess of detection limit shown.

-- = Not analyzed, not applicable

ESL = Environmental Screening Level, from California Regional Water Quality Control Board - San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Revised February 2016 (Revision 3).

a = duplicate sample taken

b = sample analyzed outside of laboratory method hold time. See lab report for details

c = all metals detected below Tier 1 ESLs, except for arsenic which was detected above its Tier 1 ESL, but within background range for the area.

(1) = Grade elevation is 40" below rest of building so sample depth is approximately 3.3 ft lower than samples collected outside of Loading Area

Concentrations exceed environmental screening levels

Bold = contaminant detected above reporting limit

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Table 2. Groundwater Analytical Data - 1919 Market St, Oakland, CA

Well ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	Carbon Tetrachloride	Chloroform	NOTES
			µg/L																	
		Groundwater - Tier 1 ESL:	100	100	50,000	1.0	40	13	20.0	0.170	0.50	3.0	5.0	6.0	10	0.061	62	0.22	2.3	
		LTCP Criteria:	NA	NA	NA	3,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Historical Monitoring Well Data																				
MW-1	8/7/1992	--	<0.050	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	12/3/1992	--	<0.050	<0.050	<0.050	<0.5	**14**	**1.8**	**2.5**	--	--	--	--	--	--	--	--	--	--	
	6/11/1993	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/28/1994	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/10/1995	--	<0.050	**0.06**	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	6/12/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	10/22/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	5/7/1998	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-2	8/7/1992	--	<0.050	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	12/3/1992	--	<0.050	<0.050	<0.050	<0.5	**14**	**1.9**	**2.5**	--	--	--	--	--	--	--	--	--	--	
	6/11/1993	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/13/1994	--	<0.050	**0.11**	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/10/1995	--	<0.050	**0.06**	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	6/12/1997	--	<0.050	<0.050	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	10/22/1997	--	<0.050	<0.050	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	5/7/1998	--	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
MW-3	8/7/1992	--	<0.050	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	12/3/1992	--	<0.050	<0.050	<0.050	<0.5	**16**	**2.4**	**3.5**	--	--	--	--	--	--	--	--	--	--	
	6/11/1993	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/13/1994	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/10/1995	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	6/12/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	10/22/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	5/7/1998	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-4	8/7/1992	--	**2.8**	<0.050	<0.050	**20**	**150**	**7.5**	**340**	--	--	--	--	--	--	--	--	--	--	
	12/3/1992	--	**0.22**	<0.050	<0.050	**13**	**36**	**8.2**	**31**	--	--	--	--	--	--	--	--	--	--	
	6/11/1993	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	1/13/1994	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	1/10/1995	--	**3.0**	**0.75**	<0.5	**25**	**52**	**43**	**230**	--	--	--	--	--	--	--	--	--	--	
	6/12/1997	--	**5.4**	**0.39**	--	**5.2**	**5.2**	**30**	**130**	--	--	--	--	--	--	--	--	--	--	
	10/22/1997	--	**7.7**	<0.30	--	**17**	**18**	**110**	**300**	--	--	--	--	--	--	--	--	--	--	
	5/7/1998	--	**17**	<0.30	--	**8.8**	<0.5	**9.9**	**22**	--	--	--	--	--	--	--	--	--	--	
MW-5	8/7/1992	--	<0.050	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	12/3/1992	--	**0.072**	<0.050	<0.050	<0.5	**33**	**3.5**	**4.2**	--	--	--	--	--	--	--	--	--	--	
	6/11/1993	--	<0.050	**0.10**	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
MW-5 cont.	1/13/1994	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	1/10/1995	--	<0.050	<0.050	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--	--	--	--	
	6/12/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	10/22/1997	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	5/7/1998	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

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Table 2. Groundwater Analytical Data - 1919 Market St, Oakland, CA

Well ID	Date Sampled	Sample Depth (ft bgs)	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	1,2-DCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	Carbon Tetrachloride	Chloroform	NOTES
			µg/L																	
		Groundwater - Tier 1 ESL:	100	100	50,000	1.0	40	13	20.0	0.170	0.50	3.0	5.0	6.0	10	0.061	62	0.22	2.3	
		LTCP Criteria:	NA	NA	NA	3,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Groundwater Data																				
B-1-GW	4/11/2016	16*	--	--	--	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	
B-2-GW	4/11/2016	16*	--	--	--	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	
B-3-GW	4/11/2016	16*	--	--	--	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	
B-5-GW	4/11/2016	20	--	--	--	<0.50	<0.50	<0.50	<1.0	<1.0	<0.50	**1.4**	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<1.0	
B-6-GW	9/1/2016	21	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
B-7-GW	9/1/2016	21	--	--	--	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
B-9-GW	5/26/2017	15	<100	**688**	**304**	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	
B-10-GW	5/26/2017	16	<100	**576**	**706**	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	
B-11-GW	5/26/2017	15	<100	**219**	**381**	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	**2.62**	<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	
B-12-GW	5/26/2017	15	<100	<100	<100	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	
B-13-GW	5/26/2017	14	<100	**150**	**315**	<1.00	<1.00	<1.00	<3.00	<5.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	<5.00	
B-14-GW	5/26/2017	12.5	**461**	**1,170**	**938**	<5.00	<5.00	<5.00	<15.0	<25.0	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<5.00	<25.0	
B-15-GW	5/26/2017	13	**6,650**	**4,660**	**3,830**	**20.1**	<10.0	<10.0	<30.0	<50.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<50.0	

Legend:

TPHg = Total Petroleum Hydrocarbons as gasoline by EPA Method 8015.

TPHd = Total Petroleum Hydrocarbons as diesel by EPA Method 8015. ESE Carbon Range of C12-C22.

TPHmo = Total Petroleum Hydrocarbons as motor oil by EPA Method 8015. ESE Carbon Range of C22-C32.

1,2-DCA = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

1,1,1-TCA = 1,1,1-Trichloroethane

µg/L = Micrograms per Liter

ft bgs = feet below ground surface in feet

< n = Chemical not present at a concentration in excess of detection limit shown.

-- = Not analyzed

ESL = Environmental Screening Level, from California Regional Water Quality Control Board - San Francisco Bay Region, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim Revised February 2016 (Revision 3).

* = Surface elevation approximately 3.3 ft below other borings

Concentrations exceed environmental screening levels

Bold = contaminant detected above reporting limit

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Table 3. Soil Gas Analytical Data - 1919 Market Street, Oakland, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Oxygen	Methane [1]	Carbon Dioxide	Notes
			$\mu g/m^3$														%	%	%	
Subslab Gas /Soil Gas - Residential ESL:			300,000	48	160,000	560	52,000	41	54	240	240	520,000	33	61	Varies	NA	NA	NA	NA	
Soil Gas @ 5 ft with Bio Zone - LTCP Criteria:			NA	<85,000	NA	<1,100,000	NA	<93,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Subslab Soil Gas Samples																				
SS-1	02/05/16	0.5	**380**	**43**	**27**	**1.3**	**9.0**	**1.9**	<0.70	<1.2	<0.93	**2.3**	<1.1	<0.83	*	**12**	**17**	<0.20	--	
SS-2	02/05/16	0.5	<1,000	**6.5**	**16**	<2.2	<6.6	**5.3**	<2.1	<3.5	<2.8	<2.8	<3.2	<2.5	--	**16**	**17**	<0.19	--	
SS-3[2]	03/11/16	0.5	--	**9.3**	**140**	**19**	**100**	--	<4.1	<6.9	<5.5	<5.6	<6.4	<5.0	--	--	--	--	--	
SS-4[2]	03/11/16	0.5	--	**140**	**35**	**6.9**	**46**	--	<4.1	<6.9	<5.5	<5.6	<6.4	<5.0	--	--	--	--	--	
SS-5	03/11/16	0.5	--	**3.8**	**19**	<4.4	**26**	--	<4.1	**35**	**26**	**67**	<6.4	<5.0	--	--	--	--	--	
SSV-1	08/01/16	0.5	--	<3.6	**8.2**	<4.9	**9.7**	<23	<4.5	**130**	<6.0	<6.1	<7.0	<5.5	*	**14**	--	--	--	
SSV-2	08/01/16	0.5	--	<3.1	**8.1**	<4.2	**6.3**	<20	<3.9	<6.5	<5.2	<5.3	<6.1	<4.7	--	--	--	--	--	
SSV-3	08/01/16	0.5	--	<3.4	**4.2**	<4.6	**5.6**	<22	<4.3	<7.3	<5.7	**10**	**260**	**9.3**	--	**38**	--	--	--	
SSV-5	08/01/16	0.5	--	<3.3	**5.9**	<4.5	**7.5**	<21	<4.1	<7.0	<5.5	<5.6	**15**	<5.0	--	**21**	--	--	--	
SSV-6	08/01/16	0.5	--	<3.1	**4.5**	<4.2	**6.2**	<20	<3.9	<6.6	<5.2	**18**	**61**	<4.8	*	**13**	--	--	--	
SSV-8	08/01/16	0.5	--	<3.1	<3.7	<4.2	<8.4	<20	<3.9	**13**	<5.2	**80**	<6.1	<4.8	*	--	--	--	--	
SSV-9	08/01/16	0.5	--	<3.2	<3.8	<4.4	<8.4	<21	<4.1	**340**	<5.5	**220**	**33**	**7.0**	*	--	--	--	--	
SSV-10	--	--				---probe destroyed before sampling could occur---														
SSV-11	08/17/16	0.5	--	**5.8**	**34**	<4.2	**15.3**	<20	<3.9	**13**	<5.2	<5.3	<6.1	<4.7	--	**10**	--	--	--	
SSV-12	08/17/16	0.5	--	<3.1	<3.7	**17**	**168**	<20	<3.9	<6.6	<5.2	**17**	**390**	**17**	--	**21**	--	--	--	
SSV-13	08/17/16	0.5	--	<3.0	<3.5	<4.0	<8.0	<19	<3.7	**32**	<5.0	**79**	**350**	**19**	--	<9.1	--	--	--	
SSV-14	08/17/16	0.5	--	<3.3	<3.9	<4.5	<9.0	<22	<4.2	**790**	<5.6	**240**	**47**	<5.1	--	**13**	--	--	--	
SSV-15	08/17/16	0.5	--	<3.3	<3.9	<4.5	<9.0	<22	<4.2	**42**	<5.5	**260**	**35**	<5.0	--	**15**	--	--	--	
SSV-16	08/17/16	0.5	--	<3.0	<3.6	<4.1	<8.2	<20	<3.8	**47**	<5.1	**52**	<6.0	<4.6	--	**20**	--	--	--	
SSV-17	09/01/16	0.5	--	**2.5**	**5.9**	<2.2	<6.6	<5.3	<2.0	**4.1**	<2.8	**5.3**	**11**	<2.4	*	**320**	--	--	--	
SSV-18	09/01/16	0.5	--	<1.6	**4.5**	<2.2	<6.6	<5.3	<.20	**3.6**	<2.8	**12**	**4.4**	<2.4	*	**150**	--	--	--	
SSV-19	09/01/16	0.5	--	<1.6	**3.1**	<2.2	<6.6	<5.3	**11**	**13**	<2.8	**160**	**5.5**	**6.8**	*	**110**	--	--	--	
SSV-20	09/01/16	0.5	--	<3.2	**6.4**	<4.4	<13	**13**	<4.1	**13**	<5.5	**13**	<6.4	<4.9	*	<100	--	--	--	

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Table 3. Soil Gas Analytical Data - 1919 Market Street, Oakland, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Oxygen	Methane [(1)]	Carbon Dioxide	Notes
			ug/m³														%	%	%	
Subslab Gas /Soil Gas - Residential ESL:			300,000	48	160,000	560	52,000	41	54	240	240	520,000	33	61	Varies	NA	NA	NA	NA	
Soil Gas @ 5 ft with Bio Zone - LTCP Criteria:			NA	<85,000	NA	<1,100,000	NA	<93,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SSV-21	05/31/17	0.5		<4.0	<4.7	<5.4	<10.8	<13	<5.0	**190**	<6.7	<6.8	<7.8	<6.1	--	**14**	--	--	--	
SSV-22	05/31/17	0.5	--	<3.8	<4.5	<5.2	<10.4	<13	<4.9	<8.2	<6.5	<6.6	<7.6	<5.9	--	<12	--	--	--	
Soil Gas Samples																				
B-1[2]	04/29/16	5.0[3]	--	<3.3	<3.8	<4.4	<8.8	--	<4.1	**25**	**150**	<5.6	<6.4	<5.0	--	--	--	--	--	
B-2[2]	04/29/16	5.0[3]	--	<3.3	<3.8	**66**	**400**	--	<4.1	**17**	**5.5**	<5.6	<6.4	**77**	--	--	--	--	--	
B-3[2]	04/29/16	5.0[3]	--	<160	<190	<220	<220	--	<210	**2,200**	**880**	<280	<320	<250	--	--	--	--	--	
B-4[2]	04/29/16	5.0	--	<160	<190	<220	<220	--	<210	<350	<270	<280	<320	**910**	--	--	--	--	--	
B-5[2]	04/29/16	5.0	--	<3.3	<3.8	<4.4	<8.8	--	<4.1	**190**	<5.5	**46**	**19**	**11**	--	--	--	--	--	
SG-1	09/06/16	5.0[3]	--	**31**	**24**	**2.6**	**14**	<5.3	<2.0	**55**	<2.8	<2.8	<3.2	**4.0**	*	<50	--	--	--	
	05/24/17	5.0[3]	--	<3.8	<4.5	<5.2	<10.4	<12	<4.8	**33**	<6.4	<6.5	<7.6	<5.8	--	<12	**9.9**	<0.00032	**2.3**	
SG-2	09/06/16	5.0[3]	--	**71**	**120**	**17**	**80**	<5.3	<2.0	**10**	<2.8	<2.8	<3.2	**15**	*	<50	--	--	--	
SG-3	09/06/16	5.0	--	**13**	**38**	**8.3**	**53**	<5.3	<2.0	**13**	<2.8	**3.4**	<3.2	<2.4	*	<50	--	--	--	
SG-4	05/23/17	5.0	--	<3.5	<4.2	<4.8	<9.6	<12	<4.5	**23**	<5.9	<6.0	<7.0	<5.4	--	**760**	--	--	--	
SG-5	05/23/17	5.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	not sampled, water in well
SG-6	05/24/17	5.0	--	<4.3	<5.0	<5.8	<11.6	<14	<5.4	<9.1	<7.2	<7.3	<8.4	<6.5	--	<13	--	--	--	
SG-7	04/14/17	5.0	--	<4.0	<4.7	<5.4	<10.8	<26	<5.1	**16**	<6.7	<6.8	<7.9	<6.1	*	**68**	--	--	--	
	05/24/17	5.0	--	<4.2	<4.9	<5.7	<11.4	<14	<5.3	<8.8	<7.0	<7.1	<8.2	<6.4	--	<13	--	--	--	
SG-8	04/14/17	5.0	--	**11**	**27**	<6.5	**15**	<31	<6.0	**22**	<8.0	<8.1	<9.4	**9.5**	*	**15**	--	--	--	
	05/24/17	5.0	--	<3.8	<4.4	<5.1	<10.2	<12	<4.8	**18**	<6.3	<6.4	<7.4	14	--	<12	**16**	<0.00024	**1.6**	
	05/24/17	5.0	--	<3.8	<4.5	<5.1	<10.2	<12	<4.8	**20**	<6.4	<6.5	<7.4	14	--	<12	--	--	--	duplicate sample
SG-9	05/24/17	8.0	--	<3.8	<4.4	<5.1	<10.2	<12	<4.8	**9.2**	<6.3	<6.4	<7.4	<5.7	--	<12	--	--	--	
SG-10	05/31/17	8.0	--	**31**	**44**	**5.1**	**22**	<12	<4.6	**12**	<6.2	<6.3	<7.2	**66**	--	<11	--	--	--	
SG-11	05/31/17	5.0	--	**30**	**42**	**5.9**	**16**	<13	<5.0	**12**	<6.7	<6.8	<7.9	<6.1	--	**12**	--	--	--	
SG-12	05/31/17	5.0	--	**130**	**110**	**10**	**46**	<12	<4.7	**21**	<6.3	<6.4	<7.4	<5.7	--	<12	--	--	--	
SG-13	05/31/17	5.0	--	**120**	**150**	**18**	**79**	<13	<5.0	**27**	<6.7	<6.8	<7.8	**49**	--	**21**	--	--	--	

Pangea

Table 3. Soil Gas Analytical Data - 1919 Market Street, Oakland, California

Boring/ Sample ID	Date Sampled	Sample Depth (ft bgs)	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	Other VOCs	Isopropyl Alcohol (Leak Check Compound)	Oxygen	Methane [1]	Carbon Dioxide	Notes
			ug/m^3														%	%	%	
Subslab Gas /Soil Gas - Residential ESL:			300,000	48	160,000	560	52,000	41	54	240	240	520,000	33	61	Varies	NA	NA	NA	NA	
Soil Gas @ 5 ft with Bio Zone - LTCP Criteria:			NA	<85,000	NA	<1,100,000	NA	<93,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
SG-14	05/31/17	5.0	--	**43**	**100**	**28**	**109**	<12	<4.8	**12**	<6.4	<6.5	<7.5	<5.8	--	<12	**12**	<0.00024	**3.0**	
SG-15	05/31/17	5.0	--	**430**	**1,600**	**300**	**1,140**	<25	<9.8	**34**	<13	<13	<15	<12	--	<24	--	--	--	
Shroud Samples																				
Shroud (SG-8)	04/14/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**110,000**	--	--	--	
Shroud (SG-1)	05/24/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**180,000**	--	--	--	
Shroud (SG-1)	05/31/17	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**180,000**	--	--	--	

Legend:

VOC = Volatile Organic Compounds

TPHg = Total Petroleum Hydrocarbons as gasoline

1,2-DCA = 1,2-dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

1,1,1-TCA = 1,1,1-trichloroethane

VOCs analyzed by EPA Method TO-15

ug/m^3 = Micrograms per cubic meter of air.

ft bgs = Depth interval below ground surface in feet.

< n = Chemical not present at a concentration in excess of detection limit shown.

-- = not analyzed

NA = not applicable

* = trace levels of other VOCs detected well below screening level thresholds. See lab report for details.

ESL = Environmental Screening Level for Shallow Soil Gas for Evaluation of Potential Vapor Intrusion (Table E-2). Established by the SFBRWQCB, Interim Final - November 2007 (Revised February 2016).

(1) = The lower explosion limit for methane is 4.4 to 5%.

(2) = Samples collected by Partner Engineering and Science, Inc. as part of seperate investigation

(3) = Grade elevation is 40 inces below rest of building so sample depth is at approximately 8.3 ft relative to samples collected outside of Loading Area

Concentrations exceed environmental screening levels

Bold = contaminant detected above reporting limit

Table 4. Indoor Air Analytical Data - 1919 Market Street, Oakland, CA

Sample Location / ID	Sample Date	Benzene	Toluene	Ethylbenzene	Total Xylenes	Napthalene	1,2-DCA	PCE	TCE	1,1,1-TCA	Carbon Tetrachloride	Chloroform	Notes
		µg/m³											
Indoor Air ESL, Commercial Land Use:		0.42	1,300	4.9	440	0.36	0.47	2.1	3.0	4,400	0.29	0.53	
Indoor Air ESL, Residential Land Use:		0.097	310	1.1	100	0.083	0.11	0.48	0.48	1,000	0.067	0.12	
2006 Myrtle Street													
A-1 (Basement Air)	4/8/2017	**0.60**	**0.82**	<0.21	**0.98**	--	<0.20	<0.33	<0.26	<0.27	**0.36**	<0.24	
	5/24/2017	<0.25	**0.66**	**0.14**	**0.61**	<0.41	<0.13	<0.21	<0.17	<0.17	**0.66**	**0.15**	
A-2 (Ambient Air)	5/24/2017	<0.26	**0.56**	<0.14	**0.53**	<0.43	<0.13	<0.22	<0.18	<0.18	**0.97**	<0.16	
1919 Market Street													
A-3 (Ambient Air)	5/24/2017	**0.30**	**1.4**	**0.34**	**1.14**	<0.42	<0.13	<0.22	<0.17	<0.17	**0.81**	<0.16	

Notes:

Samples analyzed for VOCs by USEPA Method TO-15 SIM.

DCA = Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

TCA = Trichloroethane

µg/m3 = micrograms per cubic meter

San Francisco Bay Region.

< n = Compound not detected at or above the laboratory method detection limit of n

Concentrations exceed shown environmental screening levels

Bold = contaminant detected above reporting limit

APPENDIX A

Standard Operating Procedures

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Pangea Environmental Services' standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality, and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist, scientist or engineer working under the supervision of a California Registered Engineer, California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic-push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. With hollow-stem drilling, samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. With hydraulic-push drilling, samples are typically collected using acetate liners. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler or the acetate tube. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes or cut acetate liners chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

Soil samples collected during drilling will be analyzed in the field for ionizable organic compounds using a photo-ionization detector (PID) with a 10.2 eV lamp. The screening procedure will involve placing an undisturbed soil sample in a sealed container (either a zip-lock bag, glass jar, or a capped soil tube). The container will be set aside, preferably in the sun or warm location. After approximately fifteen minutes, the head space within the container will be tested for total organic vapor, measured in parts per million on a volume to volume basis (ppmv) by the PID. The PID instrument will be calibrated prior to boring using hexane or isobutylene. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples collected from borings are either collected from the open borehole, from within screened PVC inserted into the borehole, or from a driven Hydropunch-type sampler. Groundwater is typically extracted using a bailer, check valve and/or a peristaltic pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Pangea often performs electrical conductivity (EC) logging and/or continuous coring to identify potential water-bearing zones. Hydropunch-type sampling is then performed to provide discrete-depth grab groundwater sampling within potential water-bearing zones for vertical contaminant delineation. Hydropunch-type sampling typically involves driving a cylindrical sheath of hardened steel with an expendable drive point to the desired depth within undisturbed soil. The sheath is retracted to expose a stainless steel or PVC screen that is sealed inside the sheath with Neoprene O-rings to prevent infiltration of formation fluids until the desired depth is attained. The groundwater is extracted using tubing inserted down the center of the rods into the screened sampler.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

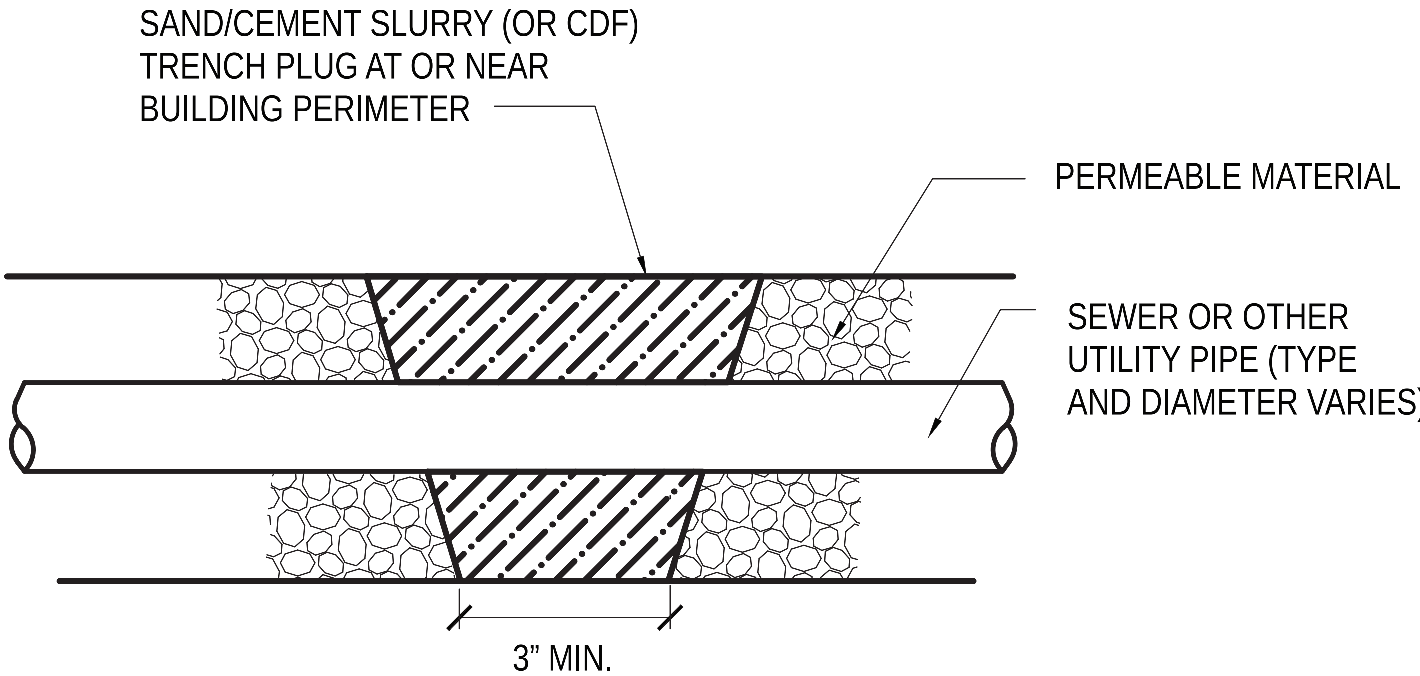
Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

APPENDIX B

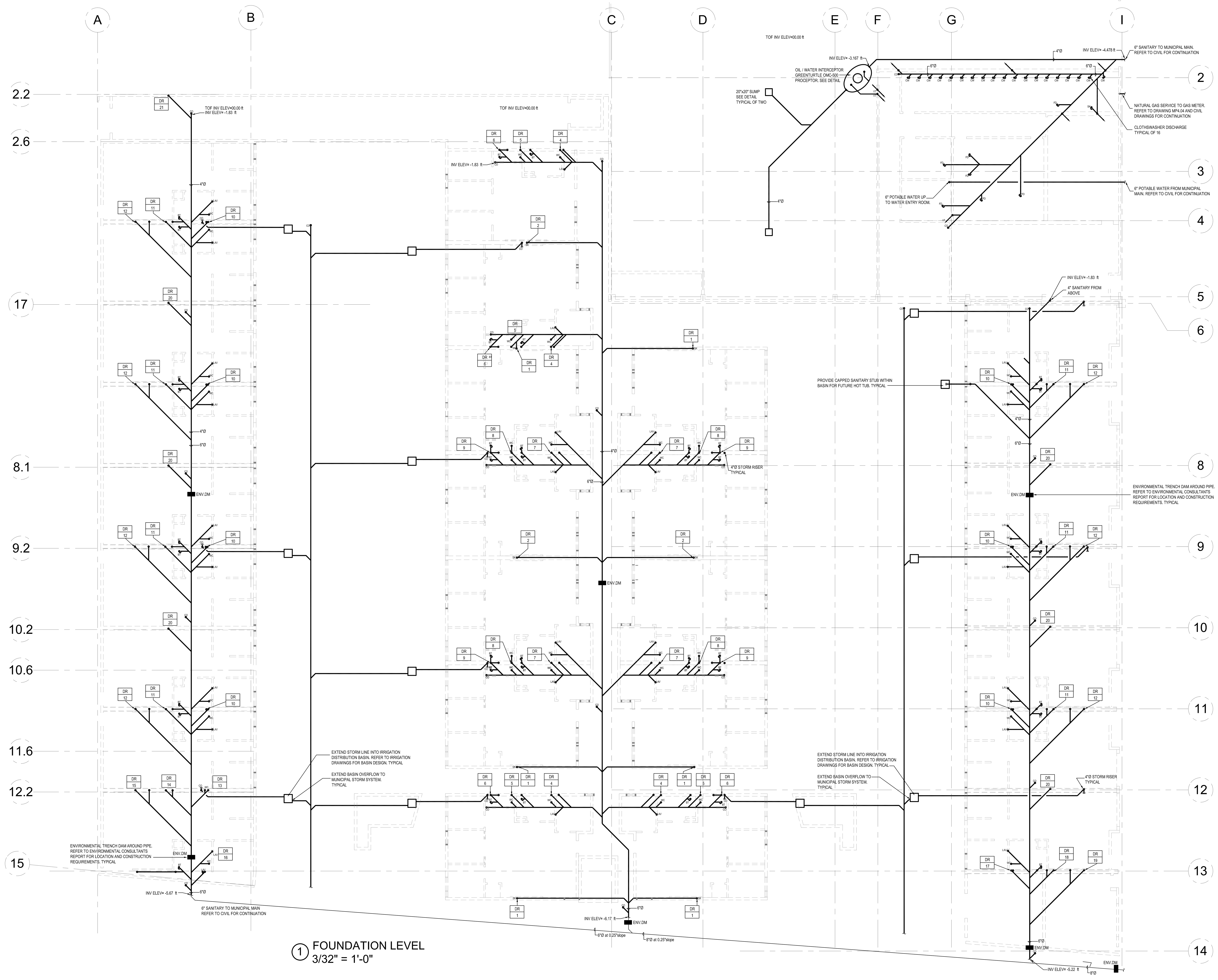
Trench Plugs



TYPICAL SOIL GAS CUT-OFF BARRIER IN UTILITY TRENCH

Not to Scale

Figure
1



1 FOUNDATION LEVEL
3/32" = 1'-0"

NOT FOR CONSTRUCTION
AUGUST 7, 2017

Aug 07, 2017 2:00PM

1919 MARKET

1919 Market Crew, LLC

1919 MARKET STREET, OAKLAND, CA

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MEP ENGINEER
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#	DATE	ISSUES & REVISIONS	BY
1	AUG 07, 2017	ISSUED FOR OWNER REVIEW	MM

SCHEMATIC DESIGN

FOUNDATION PLAN MECHANICAL AND PLUMBING

PROJECT NUMBER: 17-200215

SHEET NUMBER MP2.00