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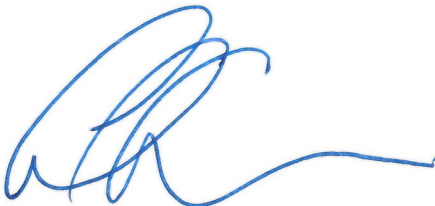
Mr. Keith Nowell, PG
Alameda County Health Care Services Agency
Environmental Health Department
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Work Plan for Additional Environmental Sampling
Fuel Case No. Ro0000247 and Geotracker ID T0600102220
3000 Broadway SPE LLC
260 30th Street
Oakland, California
Alameda County SCP Case No. RO0000247
Langan Project: 731635601

Dear Mr. Nowell:

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

Sincerely yours,



Alan Chamorro
3000 Broadway SPE LLC

WORK PLAN FOR ADDITIONAL ENVIRONMENTAL SAMPLING

260 30th Street
Oakland, California 94611

Prepared For:
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

Prepared By:
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Principal

5 January 2017
750635602

LANGAN

5 January 2017

Mr. Keith Nowell, PG
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

**Re: Work Plan for Additional Environmental Sampling
Fuel Leak Case No. RO000247 and GeoTracker ID T060010220
260 30th Street
Oakland, California
Langan Proposal No.: 750635602**

Dear Mr. Nowell,

Langan Engineering and Environmental Services, Inc. (Langan), on behalf of 3000 Broadway SPE LLC (Client), is pleased to submit this *Work Plan for Additional Environmental Sampling* (Work Plan) to further evaluate petroleum impacted soil discovered during a recent geotechnical investigation at 260 30th Street (Site) in Oakland, California.

If you have any questions or need any information clarified, please call Joshua Graber at (510) 874-7086.

Sincerely yours,

Langan Engineering and Environmental Services, Inc.



Karianne Staehlin
Senior Staff Scientist



Joshua Graber, CHMM
Associate



Dorinda Shipman, PG, CHG
Principal



cc: Alan Chamorro – Lowe Enterprises Real Estate Group

750635602.01 JDG_Final Work Plan Additional Subsurface Investigation_260 30th Street

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WORK PLAN FOR ADDITIONAL ENVIRONMENTAL SAMPLING
260 30th Street
Oakland, California

1.0 INTRODUCTION

On behalf of 3000 Broadway SPE LLC (Client), Langan Engineering and Environmental Services, Inc. (Langan) has prepared this *Work Plan for Additional Environmental Sampling* (Work Plan) for the property located at 260 30th Street, Oakland, California (Site, Figure 1). The Site and the surrounding area adjacent to the Site is proposed for redevelopment. The additional environmental sampling proposed is intended to further evaluate current conditions prior to redevelopment. The Work Plan is based on discussions with the Alameda County Department of Environmental Health (ACEH) and is intended to further evaluate petroleum hydrocarbon impacts recently encountered at the Site in boring B-16 during a geotechnical investigation.

The Site is currently in the Alameda County Local Oversight Program (LOP) and is associated with active fuel leak case number RO0000247. However, we do not believe the recently discovered petroleum impacts in boring B-16 are related to the former underground storage tank (UST) located in the sidewalk of 30th Street due to the upgradient location of the impacts relative to the former UST. We believe the impacts are likely related to a nearby floor drain system, which is proposed for removal during Site redevelopment.

The purpose of the additional environmental sampling proposed in this Work Plan is to:

- 1) Investigate subsurface conditions near floor drains located at 250 and 260 30th Street;
- 2) Evaluate the Site for vapor intrusion by collecting soil vapor samples beneath the proposed development excavation depth;
- 3) Further delineate the extent of petroleum impacted soil, confirm the source is related to the floor drains and determine if groundwater has been impacted; and
- 4) Characterize the Site soil planned for excavation and off-Site disposal.

A summary of our proposed additional environmental sampling, including sampling and analytical testing methods, are presented in this Work Plan.

Following the completion of the additional subsurface investigation, we will prepare a technical report summarizing our field activities, sampling methods, analytical results and recommendations. We will also share and discuss the results with ACEH.

1.1 Site Description and Proposed Redevelopment

The Site is part of a larger redevelopment plan consisting of four warehouse-like structures (250, 260, and 288 30th Streets and 3020 Broadway), including one former restaurant (3000 Broadway), and two private residential properties (3007 and 3009 Brook Street) in a fully developed mixed-use area of Oakland, commonly referred to as Auto Row. Until recently, the warehouse-like structures were utilized as automobile sales, repair and service shops, a restaurant, or were vacant. Currently, only the 288 30th Street address is an active business (XYZ Motors). The restaurant (3000 Broadway) recently closed; the former showroom (3020 Broadway) is vacant; and the two private residences (3007 and 3009 Brook Street) are vacant and planned for either relocation or demolition.

As show in Figure 2, the larger development area is bound by a commercial property and asphalt parking area to the north, Brook Street to the east, 30th Street to the south, and Broadway to the west. The Site and surrounding area generally slopes to the southeast. The larger development area has an approximate high elevation of 50 feet above mean sea level (MSL) at the northwest corner along Broadway, and an approximate low elevation of 30 feet above MSL at the southeast corner near the corner of 30th and Brook Streets.

Current development plans for the Site and surrounding area include the construction of a five-story, wood-frame apartment building, over a one- to two-story concrete podium with parking. The proposed development will have a single level basement along Broadway leveling out to the current grade at Brook Street, as the ground surface elevation drops. The entrance to the partial below grade parking will be along Brook Street. A cross section presented as Figure 3 illustrates the current approximate grade of the 30th Street sidewalk, the approximate elevations of the existing building slabs fronting 30th Street and the proposed excavation depths associated with the proposed development. A maximum excavation depth of 18 to 20 feet is expected along Broadway and a minimum excavation of seven to eight feet along Brook Street is expected. The data proposed for collection as part of this Work Plan is to evaluate soil to be excavated and also soil to be left in place as part of the redevelopment.

The Site is generally blanketed by medium dense clayey sand fill at depths up to ten feet, which is underlain by alternating layers of medium stiff to stiff clays and medium dense to very dense sands.

During our most recent geotechnical investigation, groundwater was measured at a depth of 28½ feet and 26½ feet below ground surface (bgs) in borings B-13 and B-14, respectively, along the eastern portion of the Site. Based on exterior elevations along the Broadway sidewalk, we estimate these groundwater elevations to both be at about 20½ feet. Along the western portion of the Site groundwater was measured at a depth of 32½ feet bgs in boring B-15 and a depth of 27 feet bgs in B-16, at elevations estimated to be 8½ and 10 feet. These groundwater measurements with the exception of the measurement recorded in B-15, represent stabilized groundwater within the boring for a period of at least 30 minutes. Groundwater flow at the Site is interpreted to be southeasterly.

During our previous investigations, groundwater was measured in boring B-12 at about 17 feet bgs which corresponds to Elevation 16 feet. During the environmental water sampling at borings B-11 and B-12 the groundwater was measured at depths of about 11 feet and 7 feet below street grade, respectively. These groundwater measurements represent only that of eastern portion of the Site as appreciable groundwater was not encountered during the drilling of environmental borings B-3 through B-6 on the western portion of the Site.

As a result of our field investigations we found that the highest measured groundwater varies from about Elevation 20½ to Elevation 25 feet. All previous boring/sampling locations are shown on Figure 2. A cross section depicting the general Site topography and Site subsurface conditions is presented in both Figures 2 and 3.

2.0 PREVIOUS INVESTIGATIONS

Langan reviewed previous environmental reports prepared for the 260 30th Street, the adjacent 3000 Broadway property, and the Hagstrom property located across 30th Street at 265 30th Street. The results of these investigations are summarized below and a summary of available groundwater analytical results for these properties are shown on Figure 4.

Langan Treadwell Rollo (currently Langan) previously prepared the following environmental reports for the Site and larger development area. The reports document previous soil and groundwater sampling at the Site and the analytical results, which are referenced as part of this Work Plan:

- Langan Treadwell Rollo, *Phase I Environmental Site Assessment, 3000 and 3020 Broadway; 3007 and 3009 Brook Street; and 250, 260, and 288 30th Street, Oakland, California* dated 25 April 2016; and

- Langan Treadwell Rollo, *Response to 4 November 2015 Letter and Request for No Further Action, Fuel Leak Case No. RO000247 and Geotracker ID T0600102220, Robert and Ruth Burrows Trust, 260 30th Street, Oakland, California* dated 24 October 2016.

2.1 Previous Environmental Documents by Others

Prior to Langan's involvement, various environmental activities, including the removal and/or abandonment of underground storage tanks (USTs), soil and groundwater investigations, and sensitive receptor surveys, were completed by others at both the Site and adjacent properties. These reports are summarized below.

DECON Environmental Services, Inc., Letter Re: Tank Removal Project, 3000 Broadway, Oakland, California dated 28 December 1992

In July 1992, DECON Environmental Services, Inc. (DECON) of Hayward, California was contracted to excavate and remove one 1,000-gallon diesel UST from beneath the 30th Street Site property sidewalk located in the vicinity of the 3000 Broadway and 288 30th Street properties in Oakland, California. At the time of the UST removal, the property was occupied by a Nissan dealership. Reportedly, the UST had not been in use for at least a decade, and was presumed to be empty.

Two soil samples labeled 721-823-01 and 721-823-02 were collected from the bottom of the excavation beneath the western and eastern portions of the former UST. The soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), lead, and benzene, toluene, ethylbenzene, and xylenes (BTEX). No TPH or BTEX compounds were detected at or above laboratory detection limits. A summary of the samples collected from beneath the UST are presented below.

Summary of TPH and BTEX Results in Soil Former UST Closure 3000 Broadway, Oakland, CA

Sample ID	Date	TPHg	TPHd	Benzene	Toluene	Ethylbenzene	Xylenes
721-823-01	7/21/1992	< 1	< 10	< 0.003	< 0.003	< 0.003	< 0.003
721-823-02	7/21/1992	< 1	< 10	< 0.003	< 0.003	< 0.003	< 0.003

Above results reported in milligrams per kilogram (mg/kg).

During the UST removal activities, a leaky sewer line, located near the northwest side of the excavation sidewall, was discovered. Reportedly, DECON applied for a sewer repair permit and made the necessary repairs. With the permission of the ACEH, DECON backfilled the UST

excavation with the previously stockpiled soil material and approximately 15 cubic yards of imported Class II base rock, and repaired the sidewalk. During the sidewalk repair, a fuel fill pipe was discovered, which was connected to a 350-gallon gasoline UST located to the west of the diesel UST, towards Broadway. With permission from both the ACEH and the Oakland Fire Department (OFD), the 350-gallon gasoline UST was also removed from beneath the 30th Street sidewalk.

Two soil samples were collected from beneath the 350-gallon gasoline UST and one sample was collected of the stockpiled soil material from the excavation pit. The analytical results of the bottom samples did not detect concentrations of purgeable hydrocarbons at or above the laboratory's reporting limit (one milligram per kilogram (mg/kg)). Of the BTEX compounds analyzed, xylenes were detected at a concentration of 0.007 mg/kg in one sample. No other BTEX compounds were detected in either the bottom samples or the stockpiled soil sample. With the permission of both the ACEH and the OFD, the excavation was backfilled with the stockpiled soil and approximately 12 cubic yards of imported Class II base rock.

In a City of Oakland letter dated 7 February 2000, additional analysis of soil and/or groundwater for methyl tertiary butyl ether (MTBE) was required before no further action (NFA) could be warranted for the removed USTs. According to DECON, a soil sample was collected from beneath the 30th Street sidewalk on 12 May 2000, and submitted for MTBE analysis. MTBE was not detected at or above the laboratory reporting limit (0.005 mg/kg). The 3000 Broadway Site property was granted UST case closure by the City of Oakland's Fire Services Agency, and NFA by OFD and the Hazardous Materials Management Program (HMMP) in a letter dated 7 June 2000. The approximate locations of the former USTs are shown on Figure 4.

Faultline Associates, Inc., Underground Storage Tank Closure Report, 260 30th Street, Oakland, California dated 22 September 1997

Based on the September 1997 *Underground Storage Tank Closure Report*, prepared by Faultline Associates, Inc. (Faultline) for the 260 30th Street Site property, one 1,000-gallon waste oil UST, was maintained for an unspecified period of time, before being abandoned-in-place in March 1997. The UST closure was recommended in-place to avoid potentially undermining the adjacent building. The UST was rinsed and inerted with dry ice, before being pressure grouted. The 30th Street sidewalk above the abandoned-in-place UST was finished with a concrete patch. Following the abandonment-in-place of the UST, a subsurface soil investigation was conducted by drilling four soil borings (SB-1 through SB-4) to a maximum depth of 20 feet bgs, directly adjacent to the abandoned in-place UST (Figure 2). In order to

characterize the soil underneath the abandoned-in-place UST, boring SB-3 was drilled at a 30° angle and soil was collected from beneath the former UST. Groundwater samples were not collected.

TPHg, TPHd, TPH as oil and grease (TPHog), and BTEX compounds were detected in the upper 15 feet of soil. However, none of these compounds were detected at a depth of 20 feet in borings SB-1, SB-3 or SB-4 or the bottom depth of 15 feet bgs in boring SB-2. Benzene and MTBE were not detected in any soil samples collected. With the exception of the soil sample collected from boring SB-1 at 15 feet bgs (labeled SB-1-15), only low levels of TPH and BTEX compounds were detected, if at all. Boring SB-1 was located adjacent to and immediately downgradient of the former UST. TPHg, TPHd, and TPHog were detected in sample SB-1-15 at maximum concentrations of 9,600 mg/kg, 4,500 mg/kg, and 18,000 mg/kg, respectively. Toluene, ethylbenzene, and xylene were detected at maximum concentrations of 21 mg/kg, 54 mg/kg, and 89 mg/kg, respectively. The soil sample collected from boring SB-1, at a depth of 20 feet bgs, did not contain any of the previous contaminants at or above laboratory reporting limits, which suggests the extent of contamination was vertically limited.

Due to the detected concentrations of TPH and BTEX compounds in soil near the former UST the ACEH required an additional subsurface investigation to determine if groundwater had been impacted. This requirement was documented in a letter from ACEH, addressed to Mr. Bruce Burrows dated 26 August 1999. A follow up investigation was conducted in 2014.

P&D Environmental, Inc., Soil and Groundwater Investigation Report, 260 30th Street, Oakland, California dated 15 October 2014

In a letter from ACEH to Mr. Bruce Burrows dated 25 April 2012, the ACEH requested a soil and groundwater investigation be conducted to determine the potential extent of impacts related to the abandoned-in-place UST. P&D Environmental (P&D) was retained to perform the investigation. P&D's investigation was conducted in September 2014 and consisted of drilling four borings (B1 through B4) for the collection of soil and groundwater samples (Figure 4). The purpose of this subsurface investigation and the resulting October 2014 report was to provide additional data to support administrative case closure through the State of California Regional Water Quality Control Board's (RWQCB) low threat closure policy (LTCP).

The soil analytical results collected from downgradient boring B4 indicated that petroleum hydrocarbons detected in the shallow soil samples analyzed (less than ten feet bgs) did not exceed residential or commercial RWQCB environmental screening levels (ESLs) for direct exposure (ESL Table S-1, February 2016). Furthermore, no soil samples collected at depths

greater than ten feet bgs had detected petroleum hydrocarbon concentrations in excess of the ESLs associated with leaching to groundwater (ESL Table S-2, February 2016). MTBE, BTEX, naphthalene, and semi-volatile organic compounds (SVOCs) (including polycyclic aromatic hydrocarbons (PAHs)) were not detected in any of the soil samples analyzed, with one exception. Ethylbenzene, xylenes, and naphthalene were detected in a single soil sample (B1-15.0) at concentrations below residential and commercial direct exposure ESLs.

Groundwater analytical results from P&D's investigation indicated the following concentrations of TPH and volatile organic compounds (VOCs) were present in groundwater:

- TPHg in samples B1-W and B4-W with concentrations of 2,400 micrograms per liter ($\mu\text{g/L}$) and 450 $\mu\text{g/L}$, respectively. TPHg was not detected above the laboratory's reporting limit (50 $\mu\text{g/L}$) in groundwater samples collected from borings B2 and B3, both of which are located downgradient of the former UST to the east-southeast.
- TPHd was detected in B1-W, B2-W, and B3-W at concentrations of 600 $\mu\text{g/L}$, 72 $\mu\text{g/L}$, and 450 $\mu\text{g/L}$, respectively. TPHd was not detected in the groundwater sample from boring B4.
- B2-W and B3-W with TPHmo concentrations of 350 $\mu\text{g/L}$ and 1,400 $\mu\text{g/L}$, respectively. TPHmo was not detected in the groundwater samples collected from borings B1 and B4.
- No BTEX compounds or MTBE were detected in groundwater samples collected from borings B2, B3, or B4. The groundwater sample from boring B1 (B1-W) had concentrations of ethylbenzene, xylenes, and naphthalene detected at 60 $\mu\text{g/L}$, 210 $\mu\text{g/L}$, and 9.1 $\mu\text{g/L}$, respectively.

Following investigation, P&D requested closure for the USTs at the Site. ACEH reviewed P&D's request for closure, and found the Site property did not successfully meet the criteria for closure under the LTCP. Technical comments were provided to Mr. Bruce Burrows by ACEH in their correspondence dated 4 November 2015 in which ACEH requested the preparation of an additional work plan and sensitive receptor survey.

P&D Well Survey Report

As requested in an ACEH letter dated 4 November 2015, P&D performed a well survey for wells not associated with groundwater contamination investigations in their *Well Survey Report*, dated 22 March 2016. The survey was conducted in a 2,000 foot radius circle from the Site properties. P&D identified six additional wells within the 2,000 foot radius of the Site, all of which were north to northwest (upgradient) of the Site. Based on the east-southeast

groundwater flow direction at the Site, no wells were identified within the known extent of petroleum hydrocarbon impacts at the Site or immediately downgradient of the Site. Accordingly, Langan does not expect supply wells to be impacted in the future by the petroleum hydrocarbon impacts associated with the former USTs.

2.2 2016 Phase I Environmental Site Assessment

In April 2016, Langan Treadwell Rollo (currently Langan) conducted a Phase I Environmental Site Assessment (ESA) for the Site, which also included the 3000 and 3020 Broadway and 250 and 288 30th Street properties. The following three recognized environmental conditions (RECs) were identified:

REC 1: Active Fuel Leak Site at 260 30th Street, Oakland, CA

The 260 30th Street on-Site property has a documented history of on-site contamination associated with a leaking underground storage tank (LUST), which has since been abandoned in-place and is presently located within the sidewalk in front of the 250 30th Street on-Site property. Based on the September 1997 *Underground Storage Tank Closure Report* conducted by Faultline, one 1,000-gallon waste oil UST was maintained for an unspecified period of time, before being abandoned in-place in March 1997, via pressure grouting.

Currently, the Site remains an open leak case identified as RWQCB and ACEH-LOP case numbers 01-2411 and RO0000247, respectively.

REC 2: Presence of Petroleum Hydrocarbons and Volatile Organic Compounds within Soil and Groundwater

A previous soil and groundwater investigation at the Site related to the former UST indicates that the Site's subsurface has been impacted by petroleum hydrocarbons and VOCs, likely associated with the on-site and nearby USTs. Additionally, multiple properties in the vicinity have operated as automotive facilities conducting sales, repairs, and services, all of which are commonly associated with petroleum hydrocarbon or fuel-related products.

Based on the analytical results of P&D Environmental Inc.'s October 2014 subsurface investigation, the highest concentrations of TPHg and VOCs were detected in boring B-1, which was located approximately 25 feet to the west (in the assumed upgradient flow direction) from the existing closed in-place UST location. The detected concentrations generally did not exceed RWQCB ESLs for commercial land use. However, concentrations of TPHg, TPHd, TPH as

motor oil (TPHmo), ethylbenzene, xylenes, and naphthalene were all detected in groundwater samples at concentrations exceeding their respective RWQCB ESLs.

REC 3: Historical Presence of Undocumented Underground Storage Tanks Containing Petroleum Product(s)

Two previously undocumented USTs were reportedly removed from the sidewalk of 30th Street near the 3000 Broadway and 288 30th Street Site buildings in July 1992. Regulatory documentation regarding these former USTs was limited, and only hard copies were located, with no known associated regulatory case numbers. Considering these findings, in addition to the concentrations of TPHg upgradient of the abandoned in-place waste oil UST discussed in REC 2 (above), this represents an REC for the site.

2.3 2016 Phase II Environmental Site Assessment

The purpose of Langan's Phase II ESA was to determine the downgradient extent of TPH impacts in groundwater and to assess the soil proposed for excavation during redevelopment. In April 2016, Langan conducted soil sampling at the Site from a total of 12 soil borings (B-1 through B-12). Grab groundwater samples were collected from two of the borings (B-11 and B-12), to evaluate potential petroleum impacts associated with the former closed-in-place UST located in front of 250 30th Street. All previous sampling locations are shown on Figure 2.

Based on the soil and groundwater sampling conducted in April 2016, and the corresponding analytical results, Langan's Phase II ESA report concluded that low levels of contaminants are present in the subsurface at the Site.

No TPHg, TPHd and TPHmo, VOCs, SVOCs, polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), or asbestos were detected above laboratory reporting limits in any of the soil samples analyzed. Of the metals analyzed only lead was detected in one composite sample from borings B-1 and B-2 (beneath the 3020 Broadway building) at elevated levels.

Groundwater samples collected in the area of the closed-in-place UST (B-11) indicate that residual concentrations of TPHg, TPHd, and TPHmo are present. TPHg, TPHd, or TPHmo were not detected in the groundwater sample (B-12) collected from the downgradient area, near 30th and Brook Streets, which suggests that the residual TPH is localized and has not migrated significantly away from the former UST location.

2.4 Request for No Further Action

Langan prepared a *Response to 4 November 2015 Letter and Request for No Further Action* letter for the Site dated 24 October 2016. This letter summarized previous environmental work and compared the existing conditions related to the former abandoned in-place UST to criteria required to achieve regulatory site closure under the RWQCB LTCP. Based on our evaluation, we recommended the 1,000-gallon, abandoned in-place UST be granted NFA.

2.5 November 2016 Geotechnical Investigation and Environmental Sampling

Langan previously prepared geotechnical reports for the Site related to the proposed redevelopment.

In order to obtain more subsurface data for design, Langan advanced four geotechnical borings (B-13 through B-16) in November 2016 to a maximum depth of 46.5 feet bgs. The borings were advanced into groundwater and a groundwater sample was collected from the upgradient portion of the Site from boring B-13. The groundwater sample from boring B-13 was collected to determine if concentration in groundwater were migrating onto the property near Broadway. The groundwater sample was analyzed for TPHg, TPHd, TPHmo and VOCs. No TPHg, TPHd or TPHmo were detected in the groundwater sample. Low levels of chloroform and trichloroethene (TCE) were detected at concentrations of 0.62 and 1.8 micrograms per liter ($\mu\text{g/L}$), respectively. No other VOCs were detected.

Additionally, a petroleum odor was noted and responses on a photoionization detector (PID) were detected in soil collected from boring B-16, starting at 6.0 feet bgs. Soil samples were collected from boring B-16 at depths of 6.0, 10, and 20.5 feet bgs and submitted for TPHg, TPHd, TPHmo, VOCs, and lead chemical analysis. All sampling locations are shown on Figure 2.

Elevated concentrations of TPHg, TPHd, and TPHmo were detected in soil samples from boring B-16 collected at depths of six and ten feet bgs. Significantly lower concentrations were detected in soil from 20.5 feet bgs, which is above the observed groundwater table. Low concentrations of tetrachloroethene (PCE), TCE and cis-1,2-dichloroethene were also detected in soil, with the highest concentrations in the six and ten foot samples. Analytical results associated with the soil samples from boring B-16 are included as Table 1.

Langan believes that the source of this contamination may be associated with a nearby floor drain and the long historical use as an automobile service facility. The floor drain located within the 260 30th Street Site property is likely connected to the same drain line as the adjacent 250

30th Street property. The approximate location of both floor drains within the 250 and 260 30th Street properties are shown on Figure 2. The laboratory reports associated with the groundwater and soil samples are included as Appendix A. Geotechnical boring logs associated with the above referenced drilling are included as Appendix B.

2.6 Floor Drain Exploration

On 14 November 2016, Langan oversaw exploration activities centered around the existing floor drain located within the northwest portion of the 260 30th Street Site property. Activities included removing portions of the concrete slab and ramp leading to 250 30th Street to reveal the cast iron piping leading away (north) from the floor drain toward the existing Site perimeter wall, and excavating the contents of the exposed drain and some of the surrounding soil material. The exposed drain piping was traced by a private utility locator and found to join the sanitary sewer and water cleanout conduits running east to west, which sloped to the east towards Brook Street. The drain piping was estimated to be about 1.5 feet below the slab by the private utility locator. The drain sump was found to be constructed of concrete walls and bottom and did not have any visible holes. During our exploratory activities, olfactory observations and PID readings of the material contained in the drain sump indicated low-level contamination. Approximate locations of the floor drain sumps and the drain lines are shown on Figure 2.

The proximity and orientation of the drain and associated piping support the conclusion that the impacts observed in boring B-16 are related to the drain and its associated piping.

3.0 ADDITIONAL ENVIRONMENTAL SAMPLING

Langan proposes to conduct additional subsurface sampling near boring B-16 and the floor drain system associated with both 250 and 260 30th Street Site properties. The additional environmental sampling is proposed to confirm that the petroleum impacts observed in boring B-16 are associated with the drain system and will help to evaluate the extent of the impacts. The sampling and analysis of soil vapor samples collected beneath the proposed development excavation depth will help to determine if vapor intrusion is a concern for the Site. Borings are proposed near the drains associated with both the 250 and 260 30th Street properties, along the drain piping, around former boring B-16, and downgradient of the buildings on Brook Street.

The additional sampling is proposed in up to three phases and will primarily focus on soil to be left in place post-construction. Phase two and three may not be completed if data indicate the soil, soil vapor and groundwater impacts are limited. The first two phases of the investigation (if

needed) will be conducted within the proposed building footprint of the Site and will include the collection of soil, soil vapor and groundwater samples from up to eight locations (B-17 through B-24). The first phase of work will include soil and groundwater sampling from borings B-17 through B-20 and the installation of three temporary soil vapor wells (B-18-SV, B-19-SV, and B-20-SV) for the collection of soil vapor samples.

If phase one analytical results indicate soil and/or groundwater concentrations above ESLs, it may be necessary to conduct additional soil and groundwater sampling within the building footprint to further delineate impacts. If required, phase two of our proposed environmental sampling will include the collection of additional soil and/or groundwater samples for chemical analyses from additional borings, B-21 through B-24 (Figure 2).

If analytical results of the first and second phase of our subsurface sampling indicate groundwater concentrations above ESLs, it may be necessary to conduct additional soil and groundwater sampling downgradient and off-Site within Brook Street. If required, this third phase of our proposed investigation will include the collection of soil and groundwater samples for chemical analyses from two additional off-Site locations, B-25 and B-26 (Figure 2).

The proposed sampling locations, shown on Figure 2, were chosen to delineate the petroleum impacts around boring B-16 and any potential contamination associated with the floor drains. Temporary soil vapor well locations are also proposed to assess the potential for vapor intrusion, if any, from the soil proposed to be left in place during development. Soil vapor samples will be collected from beneath the proposed slab elevation of the future development.

3.1 Site Specific Health and Safety Plan

A Site-specific *Health and Safety Plan* has been prepared by Langan as required by the Occupational Health and Safety Administration Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR 1910.120). The Health and Safety Plan will be reviewed and signed by Langan personnel and subcontractors performing work at the Site, prior to conducting field activities.

3.2 Pre-investigation Tasks

We will coordinate Site access with all appropriate parties prior to sampling. At least 72 hours prior to all field activities, we will visit the Site to mark out the sample locations and to notify the Underground Service Alert One-Call Notification Center (USA). In addition, we will engage the services of a private utility locator to clear the proposed sample locations for underground

utilities. Langan will also procure the required permits from Alameda County Public Works Agency-Water Resources Department (ACPWA) and/or ACEH for the completion of temporary soil gas monitoring wells and all drilling activities.

3.3 Phase One and Two Proposed Sampling Activities

This section outlines the proposed phase one and two soil, groundwater, and soil vapor sampling activities.

3.3.1 Soil and Groundwater Sampling

Up to eight borings (B-17 through B-24) will be advanced to facilitate soil and groundwater sample collection. Phase one will consist of borings B-17 through B-20 and phase two will consist of borings B-21 through B-24 (if necessary). Approximate boring locations are shown on Figure 2. If phase one borings do not indicate concentrations of petroleum hydrocarbons and/or related compounds in excess of applicable ESLs then phase two will not be performed.

Borings will be advanced using a limited access direct-push drill rig operated by Gregg Drilling & Testing, Inc. (Gregg Drilling) of Martinez, California. Borings will be advanced to five feet bgs with a hand auger to clear the location for buried utilities, if necessary, and will be drilled to a maximum depth of 32 feet bgs, depending on field conditions and the depth of groundwater.

Soil materials encountered during drilling activities will be logged in the field by a Langan geologist or engineer following the Unified Soil Classification System (USCS). Soils will be examined in the field for evidence of contamination (including visible staining, odors, and/or elevated readings on a PID). Soil samples will be collected at the following approximate depths: 8.0, 10, 15, 20, and 25 feet bgs. Discreet soil samples will be retained starting at eight feet bgs since this is the estimated excavation depth in this area.

Once the boring depth has been achieved, a temporary PVC casing will be placed in the boreholes to facilitate groundwater sampling. Groundwater levels will be measured within the temporary PVC at each location. One grab groundwater sample will be collected from each boring using either a peristaltic pump or a decontaminated or new, disposable bailer.

Soil samples will be collected into acetate liners and sealed with Teflon and plastic end caps. Grab groundwater samples will be collected into laboratory provided bottles and preservative. All samples will be placed on ice in a cooler following collection and shipped under chain-of-custody (COC) procedures to a State of California-certified analytical laboratory.

To avoid cross contamination, all sampling equipment used during the investigation activities will be thoroughly cleaned between sample locations. All borings will be backfilled with neat cement grout and the surface cover will be restored in accordance with ACPWA requirements.

3.3.2 Soil Vapor Sampling

The soil vapor sampling will be conducted in general accordance with the California Department of Toxic Substances Control's (DTSC) documents titled "Advisory – Active Soil Gas Investigation" dated July 2015 and "Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air" dated October 2011. Gregg Drilling will install up to three temporary soil vapor wells, adjacent to proposed borings B-18, B-19, and B-20. The step-out soil vapor borings and samples will be identified as B-18-SV, B-19-SV, and B-20-SV.

3.3.2.1 Temporary Soil Vapor Probe Installation

Temporary soil vapor wells will be installed at an approximate depth of ten feet below the existing slab surface, which corresponds to about one foot below the proposed excavation. To install the temporary soil vapor probe, 1/8-inch diameter disposable Teflon tubing will be threaded onto the top of a 1.5-inch long, 3/8-inch diameter nylon soil vapor screen implant. The assembly will then be placed into the boring. The soil vapor screen implant will be surrounded by approximately one-foot of sand filter pack. A three- to six-inch layer of dry bentonite chips will be placed above the sand filter pack. Hydrated bentonite chips will be placed above the dry bentonite to create a seal around the tubing to prevent ambient air intrusion into the soil vapor sample. The Teflon tubing attached to the soil vapor probe will extend at least two feet above the surface and will be fitted with a sealable sample valve or port at the end. The temporary soil vapor wells will be installed using direct push macrocore technology. The vapor probes will be allowed to equilibrate for a minimum of two hours before sampling. After the equilibration period, shut-in testing and leak testing (using a helium shroud) will be performed at each location prior to purging and sample collection.

Clean, laboratory-supplied one-liter summa canisters will be used for both purging and sample collection along with flow controllers set to a maximum rate of 200 milliliters per minute (mL/min). Following sample collection, summa canisters will be delivered to a State of California certified laboratory.

3.3.2.2 Sampling Train Assembly

The sampling train will be assembled using the following steps:

1. The initial vacuum of the summa canister (or equivalent) will be recorded prior to sampling. If the initial vacuum reading is less than 26 inches mercury (Hg), the canister will not be used. In addition, the canister will be inspected for damage and a canister that has visible damage will not be used.
2. Following the initial inspection, a dedicated flow controller and vacuum gauge will be attached to the summa canister and sealed with a compression fitting cap (e.g., Swagelok or equivalent).
3. The sample port and sampling manifold will be connected using ¼-inch outside diameter (OD) Teflon tubing and stainless steel compression fitting nut and ferrules. The sampling manifold consists of compression fittings with three valves and one pressure gauge to attach the probe tubing to the summa canister.
4. A syringe will also be connected to the sampling manifold using ¼-inch OD Teflon tubing and stainless steel compression fitting nut and ferrules.
5. The assembled summa canister, flow controller, and pressure gauge shall be connected to the sampling manifold using stainless steel compression fitting nut and ferrules.

3.3.2.3 Shut-in Test

Prior to soil vapor purging and sample collection, a shut-in test will be performed to check for leaks in the aboveground sampling train assembly:

1. The valve that connects the soil vapor probe to the sampling manifold will be closed and the valve that connects to the summa canister will be closed.
2. The syringe will then be pulled to empty air from the manifold.
3. A leak-free system will be evident by observing no loss of vacuum within the sampling manifold system. Noted leaks will be repaired prior to sample collection by checking and tightening the compression fittings on the manifold. The manifold will then be re-checked to make sure it passes the physical leak check before proceeding.

3.3.2.4 Leak Check

Helium will be used as a leak-check tracer gas around the Teflon tubing during sampling as a quality assurance/quality control (QA/QC) measure to confirm the sample integrity. The leak check will be conducted using the following steps:

1. The helium shroud is placed over the soil vapor probe at ground surface, along with the entire sampling train (sampling manifold, pump, and sampling canister).
2. A minimum helium atmosphere of ten percent will be induced within the shroud. The atmosphere within the shroud will be monitored using the Dielectric MGD 2002 instrument (or equivalent), inserted through a small aperture in the shroud. Following the three-volume purge, a small aliquot of soil vapor will be collected into the syringe for helium screening.
3. If helium is detected in the aliquot of purged soil vapor at a concentration less than five percent of the atmosphere induced under the shroud during the purge (e.g., if the helium concentration under the shroud is ten percent, the purged soil vapor should contain less than 0.5 percent helium), the sample flow train integrity will be considered adequate and within an acceptable range (DTSC, 2016).
4. The leak check test is performed during purging and sample collection at each soil vapor sampling location.

3.3.2.5 Sample Collection Methodology

Langan will collect one soil vapor sample from each temporary well. According to DTSC guidelines, if soil vapor wells are installed via hand augering then soil vapor samples will be collected after withdrawing three purge volumes and at least 48 hours after installation of the temporary soil vapor monitoring wells. If soil vapor wells are installed via direct push then soil vapor samples will be collected after withdrawing three purge volumes and at least two hours after installation of the temporary soil vapor monitoring wells. The samples will be collected in a one-liter Summa canister, following protocols:

1. Before collecting the sample, confirm that the sampling system valves are set as follows: 1) the syringe valve is confirmed to be closed, 2) the soil vapor probe valve is open, and 3) the summa canister valve is open.
2. Helium will be reintroduced into the shroud and be allowed to stabilize until at least a ten percent helium concentration has been reached.

3. Upon reaching a stable helium concentration, the summa canister inlet valve will be slowly opened (counter-clockwise) one full turn to begin sample collection at approximately 200 mL/min. During the sample collection, the helium concentration will be monitored using a Dielectric MGD 2002 helium detector and the approximate average concentration will be recorded on the sample field data sheet.
4. The start time and initial vacuum reading from the vacuum gauge will be recorded on the sample label, chain of custody records, and on the field log, along with the summa canister and flow controller identifications.
5. The valve will remain open until the final vacuum reading on the vacuum gauge on the summa canister is between two to four inches Hg. It is important to leave two to four inches of vacuum remaining in the summa canister so the receiving analytical laboratory can verify that the sample was not compromised during shipment.
6. The valve on the summa canister will be closed clockwise until it is finger-tight.
7. Turn off the helium and close the valve at the soil vapor probe tubing.
8. The stop time and final vacuum reading will be recorded on the sample label, chain of custody record, and on the field log. The sampling information on the chain of custody records will be completed and checked against the sample labels and field log.
9. The summa canister will be removed from the sampling manifold and placed in the laboratory-supplied cardboard boxes.

The soil vapor samples will be submitted under chain of custody protocol to a State of California-certified analytical laboratory.

3.3.2.6 Temporary Soil Gas Well Decommissioning

After soil vapor sampling is completed, the temporary soil vapor wells will be abandoned by removing the tubing assembly and sand pack from the temporary soil vapor well location and the borehole will be grouted.

3.4 Phase Three Proposed Sampling Activities (if necessary)

This section briefly outlines the proposed phase two soil and groundwater sampling activities, if necessary. The phase two investigation will be conducted if groundwater concentrations collected during phase one exceed applicable RWQCB ESLs.

3.4.1 Soil and Groundwater Sampling

Two additional off-Site borings (B-25 and B-26) will be advanced to facilitate soil and groundwater sample collection. The borings will be located within the Brook Street right-of-way, which is located off-Site and downgradient of the previous borings associated with phase one (Figure 2). The borings will be advanced using a truck-mounted direct-push drill rig operated by Gregg Drilling. Borings will be advanced to five feet bgs with a hand auger to clear the location for buried utilities, if necessary, and will be drilled to a maximum depth of 30 feet bgs, depending on the depth of groundwater.

Soil materials encountered during drilling activities will be logged in the field by a Langan geologist or engineer following the USCS. Soils will be examined in the field for evidence of contamination (including visible staining, odors, and/or elevated readings on a PID). Soil samples will be collected at the following approximate depths: 5, 10, 15, 20, and 25 feet bgs. Once the boring depth has been achieved, a temporary PVC casing will be placed in the boreholes to facilitate grab groundwater sampling. Groundwater levels will be measured within the temporary PVC at each location. One grab groundwater sample will be collected from each boring using either a peristaltic pump or a decontaminated stainless steel bailer.

Soil samples will be collected into acetate liners and sealed with Teflon and plastic end caps. Grab groundwater samples will be collected into laboratory provided bottles and preservative. All samples will be placed on ice in a cooler following collection and shipped under COC procedures to a State of California-certified analytical laboratory in Pittsburgh, California.

To avoid cross contamination, all sampling equipment used during the investigation activities will be thoroughly cleaned between sample locations. All borings will be backfilled with neat cement grout and the surface cover will be restored in accordance with ACPWA requirements.

3.5 Laboratory Analyses

We anticipate analyzing up to three soil samples per boring, based on field observations. The soil samples will be submitted for the following analyses on a standard turnaround time.

- TPHg, TPHd, and TPHmo by EPA Method 8015;
- VOCs by EPA Method 8260; and
- PAHs by EPA Method 8270.

Additionally, no more than one soil sample from each of the proposed borings will be submitted for the following analysis, for waste characterization purposes:

- California Assessment Manual (CAM) 17 Metals by EPA Method 6020.

The groundwater samples will be submitted for the following analyses on a standard turnaround time.

- TPHg, TPHd, and TPHmo by EPA Method 8015;
- VOCs by EPA Method 8260; and
- PAHs by EPA Method 8270.

The soil vapor samples will be submitted for the following analyses on a standard turnaround time.

- VOCs by EPA Method TO-15;
- Methane by ASTM D-1946; and
- Helium by ASTM D-1946.

3.6 Sample Identification

Sample nomenclature shall be assigned, as follows:

- Soil samples shall be identified by boring location and bottom depth of sample (i.e. a sample collected at boring location B-17 at a depth of 7.0 to 7.5 feet bgs will be labeled as B-17-7.5).
- Groundwater samples shall be identified by boring location (i.e. B-17-GW).
- Soil vapor samples shall be sequentially identified by step out boring/temporary soil vapor well location (i.e. B-19-SV).

3.7 Field Documentation

Field activity logs will be completed for each Site visit. Field activity logs shall identify the following: Site name and address, date and time on-Site, on-Site field personnel, general

weather conditions, purpose of Site visit, a summary of field activities, and any other important details.

3.8 Chain of Custody

Samples will be collected and transported to the analytical laboratory following chain of custody (COC) procedures. The COC documents the identity and integrity of the sample from the time of collection through receipt at the laboratory. The COC will be completed as samples are collected, and will include the following information: sample ID, date of sample collection, time of sample collection, sample type, and sampler name(s). Additionally, the starting and ending pressures for the summa canisters will be noted on the COC form for the soil vapor samples.

3.9 Sample Packing and Shipping

Samples will be packed in boxes and transported, by shipment or courier, to the respective certified analytical laboratories. Each sample will be individually labeled and will be accompanied by the COC. All samples will be transported to the respective analytical laboratories after sample collection. The COC will be signed by the sampler and relinquished to the sample custodian.

3.10 Investigation Derived Waste

Investigation derived waste including soil cuttings, used sampling equipment and decontamination rinsate will be placed in 55-gallon drums, sealed and labeled. The drums will be stored on-Site, pending analytical profiling and proper disposal.

4.0 DATA EVALUATION AND REPORTING

Upon the completion of the field activities and analytical testing, Langan will prepare a technical report summarizing our field activities, sampling methods, analytical results and recommendations. The report will compare the analytical results to ESLs and describe the nature and extent of petroleum compounds. Based on the results of our environmental sampling and the proposed redevelopment plan, we will determine if any additional environmental mitigation measures are needed.

5.0 PROJECT SCHEDULE

We are requesting your review and approval of this Work Plan for completion of field activities that are anticipated to require up to four days. The phase one is expected to take two days and is scheduled to begin on 25 January 2016. If required, the phase two is expected to take an

additional day to complete, but would be conducted subsequent to the completed phase one, including the assessment of the analytical data, and only if deemed necessary. Phase three would be conducted following a review of phase two data and is expected to take one day of field work. Laboratory analyses are expected to be completed within one week after sample collection. The complete technical report is anticipated to be complete within four weeks of receipt of all laboratory analytical data.

REFERENCES

Department of Toxic Substances Control (DTSC), *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)* dated October 2011.

DTSC, *Advisory – Active Soil Gas Investigations* dated July 2015.

Faultline Associates, Inc., *Underground Storage Tank Closure Report, 260 30th Street, Oakland, California* dated 22 September 1997.

P & D Environmental, Inc., *Soil and Groundwater Investigation Report, 260 30th Street, Oakland, California* dated 15 October 2014.

Langan Treadwell Rollo, *Phase I Environmental Site Assessment, 3000 and 3020 Broadway; 3007 and 3009 Brook Street; and 250, 260, and 288 30th Street, Oakland, California* dated 25 April 2016.

Langan Treadwell Rollo, *Phase II Environmental Site Assessment, 3000 and 3020 Broadway, and 250, 260 and 288 30th Street, Oakland, California* dated 27 April 2016.

TABLE

Table 1
Boring B-16 Soil Analytical Results
260 30th Street
Oakland, California

Boring	Depth	Date Sampled	TPHg	TPHd	TPHmo	VOCs ¹			Lead
						PCE	TCE	cis-1,2-DCE	
(mg/kg)									
B-16	6	11/7/16	810	2900	6100	2	< 0.2	< 0.2	6.9
B-16	10	11/7/16	460	1600	3600	0.059	0.29	0.29	5.4
B-16	20.5	11/7/16	15	46	100	0.013	0.017	< 0.005	7.3
Tier 1 ESL			100	230	5,100	0.42	0.46	0.19	80
Residential ESL (Direct Shallow Soil Exposure)			740	230	11,000	0.6	1.2	19	80
Commercial ESL (Direct Shallow Soil Exposure)			3,900	1100	140,000	2.7	8	90	320
Commercial ESL (Construction Worker Exposure)			2,800	880	32,000	33	23	82	160
Leaching to Groundwater ESL (Drinking Water)			770	570	--	0.42	0.46	0.19	--

Notes:

1 - Low concentrations (less than 1.5 mg/kg) of n-butyl benzene, sec-butyl benzene, 1,2-dichlorobenzene, naphthalene, n-propyl benzene, 1,1,1,2-tetrachloroethane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and xylenes were also detected for complete listing of detected VOCs refer to lab report.

mg/kg - Milligrams per kilogram

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B

TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

VOCs - Volatile Organic Compounds, EPA Method 8260

< 1.0 - Analyte was not detected above the laboratory reporting limit (1.0 mg/kg)

ND - Not detected at or above the laboratory reporting limit

-- - Not Applicable or criteria not established

ESL - San Francisco Bay Regional Water Quality Control Board, Environmental Screening Level

**Table 2
Sampling Plan
260 30th Street**

Boring ID	Rationale	Approximate Sample Depth ¹ (ft below top of slab)	Sample ID	Media	Analytical Suite
Phase One					
B-17	To evaluate impacts, if any, from floor drain at 250 30th street	8	B-17-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-17-10		
		15	B-17-15		
		20	B-17-20		
		25	B-17-25		
		26-36	B-17-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
B-18	To evaluate impacts, if any, from floor drain at 260 30th street	8	B-18-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-18-10		
		15	B-18-15		
		20	B-18-20		
		25	B-18-25		
				26-36	B-18-GW
		10	B-18-SV	Soil Vapor	VOCs, Methane, and Helium
B-19	To evaluate impacts, if any, from floor drain piping along property boundary	8	B-19-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-19-10		
		15	B-19-15		
		20	B-19-20		
		25	B-19-25		
				26-36	B-19-GW
		10	B-19-SV	Soil Vapor	VOCs, Methane, and Helium
B-20	To evaluate the extent of impacts documented previously at B-16	8	B-20-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-20-10		
		15	B-20-15		
		20	B-20-20		
		25	B-20-25		
				26-36	B-20-GW
		10	B-20-SV	Soil Vapor	VOCs, Methane, and Helium
Phase Two (if necessary)					
B-21	To evaluate impacts, if any, from floor drain piping along property boundary	8	B-21-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-21-10		
		15	B-21-15		
		20	B-21-20		
		25	B-21-25		
		26-36	B-21-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
B-22	To evaluate the extent of impacts documented previously at B-16	8	B-22-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-22-10		
		15	B-22-15		
		20	B-22-20		
		25	B-22-25		
		26-36	B-22-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
B-23	To evaluate the extent of impacts documented previously at B-16	8	B-23-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-23-10		
		15	B-23-15		
		20	B-23-20		
		25	B-23-25		
		26-36	B-23-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
B-24	To evaluate the extent of impacts documented previously at B-16	8	B-24-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-24-10		
		15	B-24-15		
		20	B-24-20		
		25	B-24-25		
		26-36	B-24-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
Phase Three (if necessary)					
B-25	To evaluate off-site impacts to groundwater, if any	8	B-25-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-25-10		
		15	B-25-15		
		20	B-25-20		
		25	B-25-25		
		26-36	B-25-GW	Water	TPH-g, -d, -mo, VOCs, PAHs
B-26	To evaluate off-site impacts to groundwater, if any	8	B-26-8	Soil	TPH-g, -d, and -mo, VOCs, and PAHs
		10	B-26-10		
		15	B-26-15		
		20	B-26-20		
		25	B-26-25		
		26-36	B-26-GW	Water	TPH-g, -d, -mo, VOCs, PAHs

Notes:

1 - Sample depths and number are approximate and will be determined in the field based on observations. Up to three soil samples will be analyzed at each boring location.

Laboratory methods for each analysis are listed in the Section 3.5 of the report.

An additional composite sample will be collected for waste disposal purposes, which is not listed on this table.

Acronyms

TPHg - Total Petroleum Hydrocarbons as Gasoline, EPA Method 8015B

TPHd - Total Petroleum Hydrocarbons as Diesel Range, EPA Method 8015B

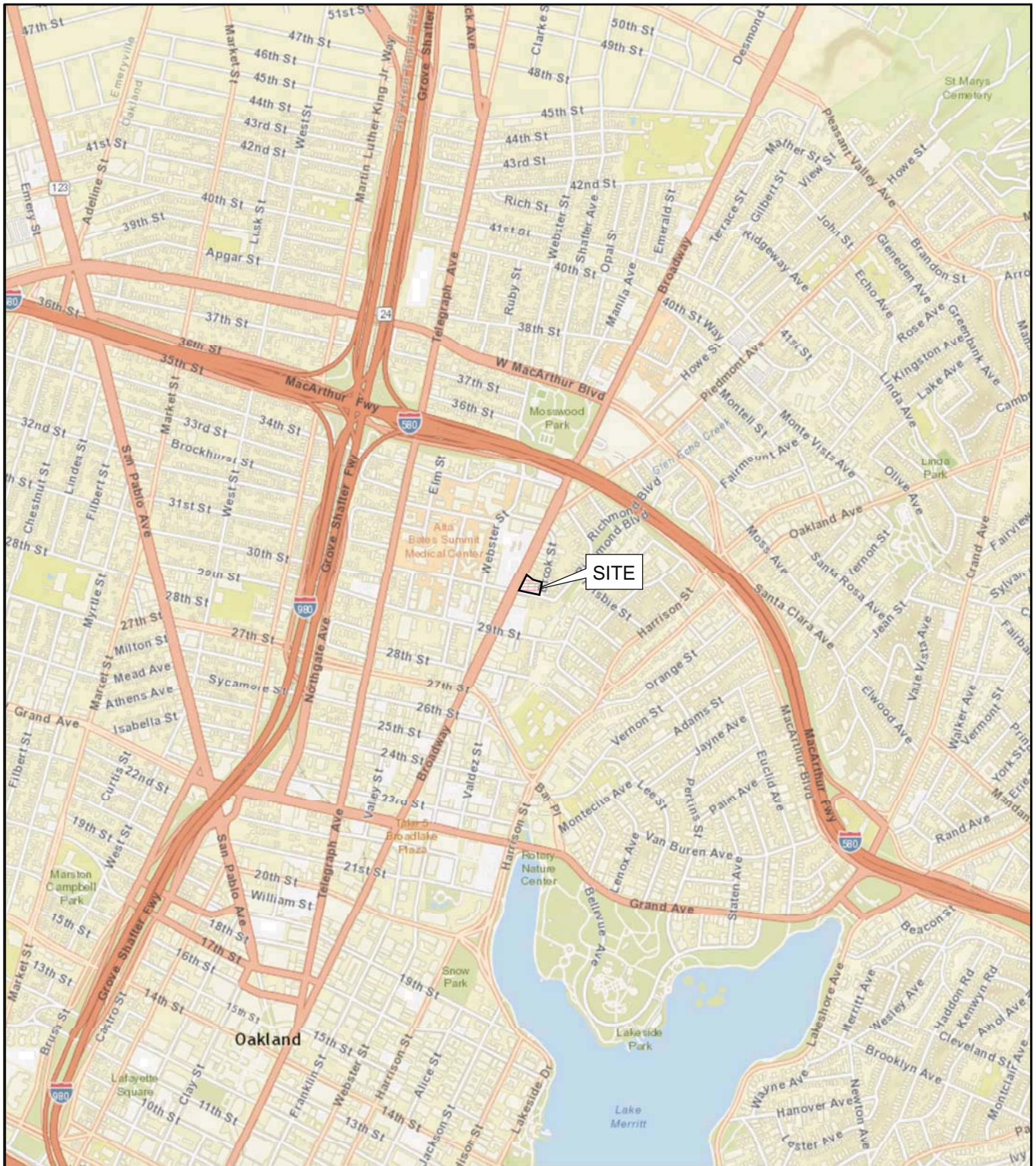
TPHmo - Total Petroleum Hydrocarbons as Motor Oil, EPA Method 8015B

VOCs - Volatile Organic Compounds, EPA Method 8260 for soil and groundwater and EPA Method TO-15 for soil vapor

PAHs - Polycyclic Aromatic Hydrocarbons, EPA Method 8270

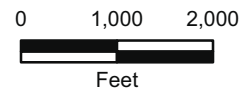
CAM 17 - California Assessment Manual 17 Metals, EPA Method 6020

FIGURES



NOTES:

World street basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online.
 Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, IPC, NRCAN.



**3000 AND 3020 BROADWAY;
 250, 260, AND 288 30TH STREET**
 Oakland, California

SITE LOCATION MAP

LANGAN

Date 12/28/16






Project No. 750635602

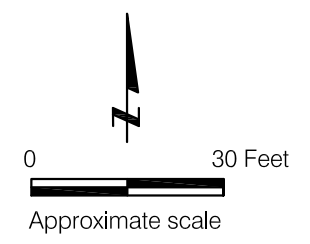
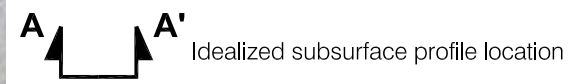
Figure 1

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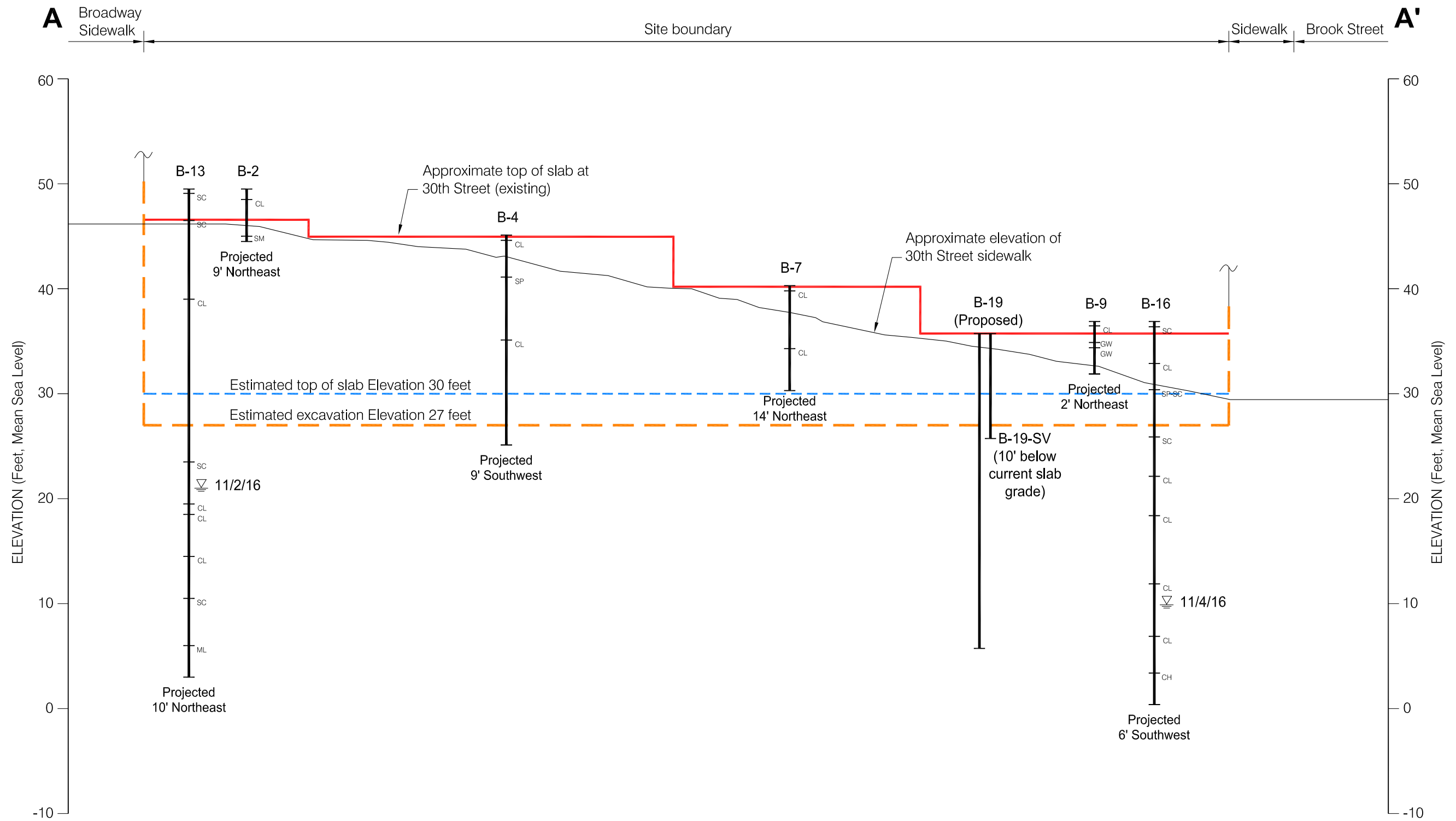
EXPLANATION

- B-18** ● Approximate location of proposed 30-foot environmental boring by Langan
- B-13** ⊕ Approximate location of geotechnical boring by Langan, November 2016
- B-1** ● Approximate location of 5-foot boring by Langan Treadwell Rollo, April 2016
- B-3** ⊕ Approximate location of 20-foot boring by Langan Treadwell Rollo, April 2016
- B-5** ⊕ Approximate location of 15-foot boring by Langan Treadwell Rollo, April 2016
- B-7** ⊕ Approximate location of 10-foot boring by Langan Treadwell Rollo, April 2016
- B1** ⊕ Approximate location of boring by P&D Environmental, Inc., September 2014
- SB-1** ● Approximate location of boring by Faultline Associates, Inc., March 1997
-  Approximate location of abandoned in-place 1,000-gallon waste oil UST, March 1997
-  Approximate location of former USTs (350-gallon gasoline and 1,000-gallon diesel), removed in July 1992
-  Approximate location of floor drain
-  Site Boundary
-  Approximate location of drain line piping

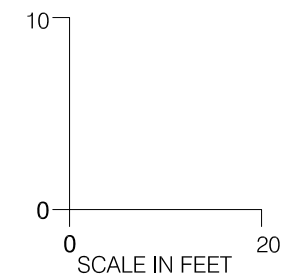


3000 AND 3020 BROADWAY; AND 250, 260, AND 288 30TH STREET Oakland, California		
SITE PLAN AND CROSS SECTION		
Date 12/21/16	Project No. 750635602	Figure 2
		

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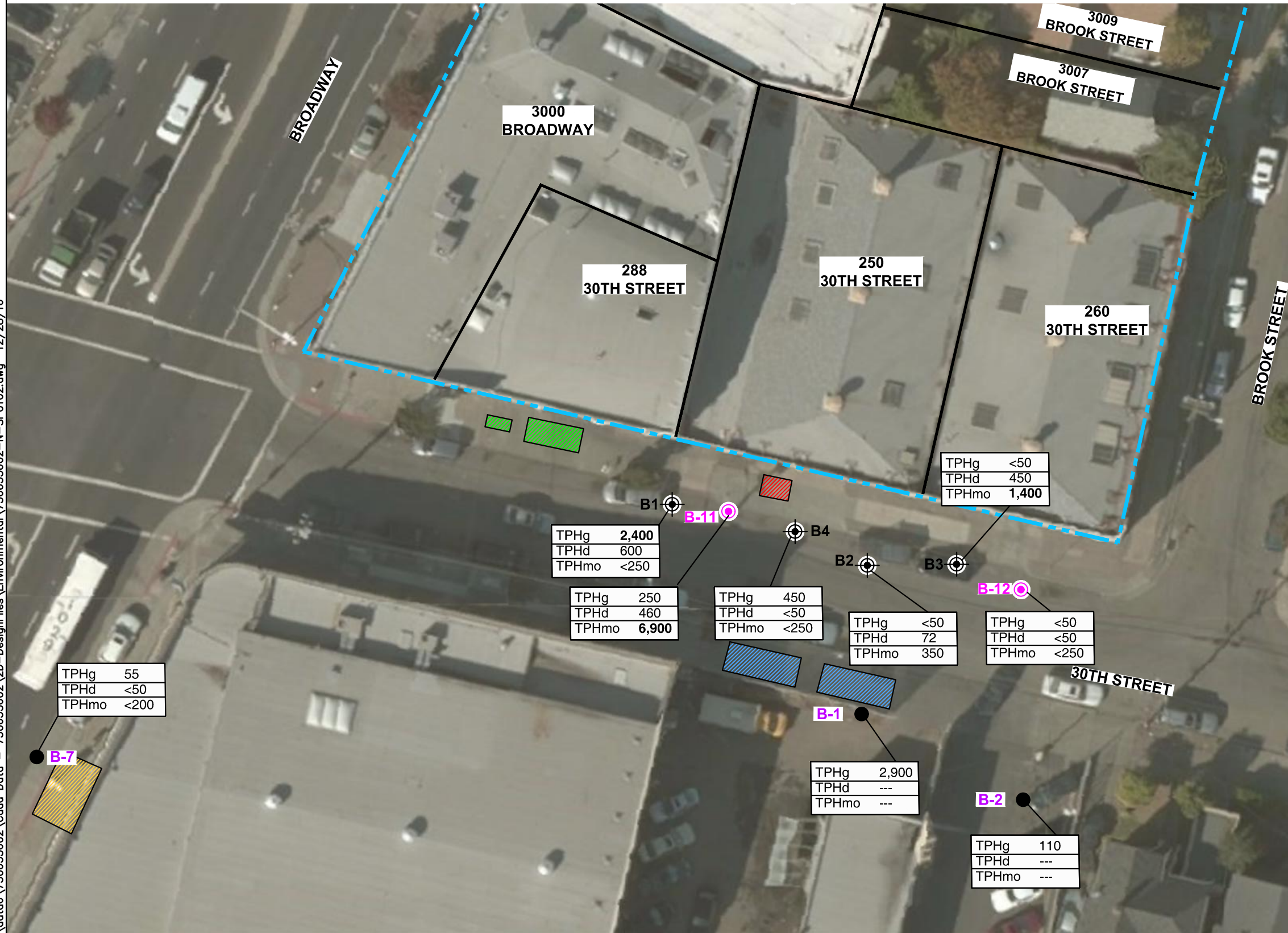


Notes:
 1. The above profile represents a generalized soil cross section interpreted from widely spaced borings. Soil deposits may vary in type, strength, and other important properties between points of exploration. All elevations are approximate.



3000 AND 3020 BROADWAY; AND 250, 260, AND 288 30TH STREET Oakland, California		
IDEALIZED SUBSURFACE PROFILE A-A'		
Date 12/28/16	Project No. 750635602	Figure 3
LANGAN		

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- ### EXPLANATION
- B-11** (pink circle with dot) Approximate location of boring by Langan Treadwell Rollo, April 2016
 - B1** (black circle with crosshair) Approximate location of boring by P&D Environmental, Inc., September 2014
 - B-1** (black circle) Approximate location of boring by Trinity, 1999 and 2006
 - (Red hatched box) Approximate location of abandoned in-place 1,000-gallon waste oil UST, March 1997
 - (Green hatched box) Approximate location of former USTs (350-gallon gasoline and 1,000-gallon diesel), removed in July 1992
 - (Yellow hatched box) Approximate location of former 1,500-gallon heating oil UST, removed in August 1997
 - (Blue hatched box) Approximate location of former 8,000-gallon gasoline USTs, removed in December 1995
 - (Blue dashed line) Site Boundary

Notes:

- Concentrations in micrograms per liter ($\mu\text{g/L}$)
- Total Petroleum Hydrocarbons as gasoline, diesel and motor oil (TPH-g, -d, -mo).
- San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels, (February 2016)

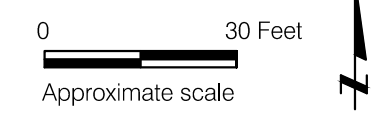
Compound	Human Health Risk Based Only	Fresh Water Ecotox	Gross Contamination Levels (GW-4)	Odor Nuisance Levels (Table GW-5)	
				Drinking Water	Non-Drinking Water
TPH gasoline	221	443	50,000	100	5,000
TPH diesel	147	640	2,500	100	5,000
TPH motor oil	147 1	-	50,000	100 1	5000 1

1 - TPH motor oil is not soluble. TPH motor oil detections in water most likely are petroleum degradates or less likely NAPL. If the detections are degradates, add TPH motor oil and TPH diesel results and compare to TPH diesel criterion. See User's Guide Chapter 9 for further information.

3000 AND 3020 BROADWAY; AND 250, 260, AND 288 30TH STREET
Oakland, California

SITE PLAN WITH BORING LOCATIONS AND TPH ANALYTICAL RESULTS IN GROUNDWATER

Date 12/28/16 | Project No. 750635602 | Figure 4



Reference: Aerial by nearmap.

APPENDIX A
LABORATORY ANALYTICAL REPORTS



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1611295

Report Created for: Langan

501 14th Street, 3rd Floor
Oakland, CA 94612

Project Contact: Josh Graber

Project P.O.:

Project Name: 750635601; 3000 Broadway

Project Received: 11/07/2016

Analytical Report reviewed & approved for release on 11/10/2016 by:

Angela Rydelius,
Laboratory Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.





Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635601; 3000 Broadway
WorkOrder: 1611295

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)



Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635601; 3000 Broadway
WorkOrder: 1611295

Analytical Qualifiers

S surrogate spike recovery outside accepted recovery limits
c2 surrogate recovery outside of the control limits due to matrix interference.
d7 strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram
e2 diesel range compounds are significant; no recognizable pattern
e4 gasoline range compounds are significant.
e7 oil range compounds are significant
e11 stoddard solvent/mineral spirit (?)

Quality Control Qualifiers

F10 MS/MSD outside control limits. Physical or chemical interferences exist due to sample matrix.



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	4.0	40	11/08/2016 17:37
tert-Amyl methyl ether (TAME)	ND	0.20	40	11/08/2016 17:37
Benzene	ND	0.20	40	11/08/2016 17:37
Bromobenzene	ND	0.20	40	11/08/2016 17:37
Bromochloromethane	ND	0.20	40	11/08/2016 17:37
Bromodichloromethane	ND	0.20	40	11/08/2016 17:37
Bromoform	ND	0.20	40	11/08/2016 17:37
Bromomethane	ND	0.20	40	11/08/2016 17:37
2-Butanone (MEK)	ND	0.80	40	11/08/2016 17:37
t-Butyl alcohol (TBA)	ND	2.0	40	11/08/2016 17:37
n-Butyl benzene	0.35	0.20	40	11/08/2016 17:37
sec-Butyl benzene	ND	0.20	40	11/08/2016 17:37
tert-Butyl benzene	ND	0.20	40	11/08/2016 17:37
Carbon Disulfide	ND	0.20	40	11/08/2016 17:37
Carbon Tetrachloride	ND	0.20	40	11/08/2016 17:37
Chlorobenzene	ND	0.20	40	11/08/2016 17:37
Chloroethane	ND	0.20	40	11/08/2016 17:37
Chloroform	ND	0.20	40	11/08/2016 17:37
Chloromethane	ND	0.20	40	11/08/2016 17:37
2-Chlorotoluene	ND	0.20	40	11/08/2016 17:37
4-Chlorotoluene	ND	0.20	40	11/08/2016 17:37
Dibromochloromethane	ND	0.20	40	11/08/2016 17:37
1,2-Dibromo-3-chloropropane	ND	0.16	40	11/08/2016 17:37
1,2-Dibromoethane (EDB)	ND	0.16	40	11/08/2016 17:37
Dibromomethane	ND	0.20	40	11/08/2016 17:37
1,2-Dichlorobenzene	0.53	0.20	40	11/08/2016 17:37
1,3-Dichlorobenzene	ND	0.20	40	11/08/2016 17:37
1,4-Dichlorobenzene	ND	0.20	40	11/08/2016 17:37
Dichlorodifluoromethane	ND	0.20	40	11/08/2016 17:37
1,1-Dichloroethane	ND	0.20	40	11/08/2016 17:37
1,2-Dichloroethane (1,2-DCA)	ND	0.16	40	11/08/2016 17:37
1,1-Dichloroethene	ND	0.20	40	11/08/2016 17:37
cis-1,2-Dichloroethene	ND	0.20	40	11/08/2016 17:37
trans-1,2-Dichloroethene	ND	0.20	40	11/08/2016 17:37
1,2-Dichloropropane	ND	0.20	40	11/08/2016 17:37
1,3-Dichloropropane	ND	0.20	40	11/08/2016 17:37
2,2-Dichloropropane	ND	0.20	40	11/08/2016 17:37

(Cont.)



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.20	40	11/08/2016 17:37
cis-1,3-Dichloropropene	ND	0.20	40	11/08/2016 17:37
trans-1,3-Dichloropropene	ND	0.20	40	11/08/2016 17:37
Diisopropyl ether (DIPE)	ND	0.20	40	11/08/2016 17:37
Ethylbenzene	ND	0.20	40	11/08/2016 17:37
Ethyl tert-butyl ether (ETBE)	ND	0.20	40	11/08/2016 17:37
Freon 113	ND	0.20	40	11/08/2016 17:37
Hexachlorobutadiene	ND	0.20	40	11/08/2016 17:37
Hexachloroethane	ND	0.20	40	11/08/2016 17:37
2-Hexanone	ND	0.20	40	11/08/2016 17:37
Isopropylbenzene	ND	0.20	40	11/08/2016 17:37
4-Isopropyl toluene	ND	0.20	40	11/08/2016 17:37
Methyl-t-butyl ether (MTBE)	ND	0.20	40	11/08/2016 17:37
Methylene chloride	ND	0.20	40	11/08/2016 17:37
4-Methyl-2-pentanone (MIBK)	ND	0.20	40	11/08/2016 17:37
Naphthalene	ND	0.20	40	11/08/2016 17:37
n-Propyl benzene	ND	0.20	40	11/08/2016 17:37
Styrene	ND	0.20	40	11/08/2016 17:37
1,1,1,2-Tetrachloroethane	ND	0.20	40	11/08/2016 17:37
1,1,2,2-Tetrachloroethane	0.35	0.20	40	11/08/2016 17:37
Tetrachloroethene	2.0	0.20	40	11/08/2016 17:37
Toluene	ND	0.20	40	11/08/2016 17:37
1,2,3-Trichlorobenzene	ND	0.20	40	11/08/2016 17:37
1,2,4-Trichlorobenzene	ND	0.20	40	11/08/2016 17:37
1,1,1-Trichloroethane	ND	0.20	40	11/08/2016 17:37
1,1,2-Trichloroethane	ND	0.20	40	11/08/2016 17:37
Trichloroethene	ND	0.20	40	11/08/2016 17:37
Trichlorofluoromethane	ND	0.20	40	11/08/2016 17:37
1,2,3-Trichloropropane	ND	0.20	40	11/08/2016 17:37
1,2,4-Trimethylbenzene	1.4	0.20	40	11/08/2016 17:37
1,3,5-Trimethylbenzene	0.44	0.20	40	11/08/2016 17:37
Vinyl Chloride	ND	0.20	40	11/08/2016 17:37
Xylenes, Total	ND	0.20	40	11/08/2016 17:37

(Cont.)



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	115	70-130		11/08/2016 17:37
Toluene-d8	85	70-130		11/08/2016 17:37
4-BFB	113	70-130		11/08/2016 17:37
Benzene-d6	74	60-140		11/08/2016 17:37
Ethylbenzene-d10	76	60-140		11/08/2016 17:37
1,2-DCB-d4	136	60-140		11/08/2016 17:37

Analyst(s): MW



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.67	6.7	11/08/2016 21:33
tert-Amyl methyl ether (TAME)	ND	0.033	6.7	11/08/2016 21:33
Benzene	ND	0.033	6.7	11/08/2016 21:33
Bromobenzene	ND	0.033	6.7	11/08/2016 21:33
Bromochloromethane	ND	0.033	6.7	11/08/2016 21:33
Bromodichloromethane	ND	0.033	6.7	11/08/2016 21:33
Bromoform	ND	0.033	6.7	11/08/2016 21:33
Bromomethane	ND	0.033	6.7	11/08/2016 21:33
2-Butanone (MEK)	ND	0.13	6.7	11/08/2016 21:33
t-Butyl alcohol (TBA)	ND	0.33	6.7	11/08/2016 21:33
n-Butyl benzene	0.17	0.033	6.7	11/08/2016 21:33
sec-Butyl benzene	0.072	0.033	6.7	11/08/2016 21:33
tert-Butyl benzene	ND	0.033	6.7	11/08/2016 21:33
Carbon Disulfide	ND	0.033	6.7	11/08/2016 21:33
Carbon Tetrachloride	ND	0.033	6.7	11/08/2016 21:33
Chlorobenzene	ND	0.033	6.7	11/08/2016 21:33
Chloroethane	ND	0.033	6.7	11/08/2016 21:33
Chloroform	ND	0.033	6.7	11/08/2016 21:33
Chloromethane	ND	0.033	6.7	11/08/2016 21:33
2-Chlorotoluene	ND	0.033	6.7	11/08/2016 21:33
4-Chlorotoluene	ND	0.033	6.7	11/08/2016 21:33
Dibromochloromethane	ND	0.033	6.7	11/08/2016 21:33
1,2-Dibromo-3-chloropropane	ND	0.027	6.7	11/08/2016 21:33
1,2-Dibromoethane (EDB)	ND	0.027	6.7	11/08/2016 21:33
Dibromomethane	ND	0.033	6.7	11/08/2016 21:33
1,2-Dichlorobenzene	0.37	0.033	6.7	11/08/2016 21:33
1,3-Dichlorobenzene	ND	0.033	6.7	11/08/2016 21:33
1,4-Dichlorobenzene	ND	0.033	6.7	11/08/2016 21:33
Dichlorodifluoromethane	ND	0.033	6.7	11/08/2016 21:33
1,1-Dichloroethane	ND	0.033	6.7	11/08/2016 21:33
1,2-Dichloroethane (1,2-DCA)	ND	0.027	6.7	11/08/2016 21:33
1,1-Dichloroethene	ND	0.033	6.7	11/08/2016 21:33
cis-1,2-Dichloroethene	0.29	0.033	6.7	11/08/2016 21:33
trans-1,2-Dichloroethene	ND	0.033	6.7	11/08/2016 21:33
1,2-Dichloropropane	ND	0.033	6.7	11/08/2016 21:33
1,3-Dichloropropane	ND	0.033	6.7	11/08/2016 21:33
2,2-Dichloropropane	ND	0.033	6.7	11/08/2016 21:33

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC18	129370
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
1,1-Dichloropropene	ND		0.033	6.7	11/08/2016 21:33
cis-1,3-Dichloropropene	ND		0.033	6.7	11/08/2016 21:33
trans-1,3-Dichloropropene	ND		0.033	6.7	11/08/2016 21:33
Diisopropyl ether (DIPE)	ND		0.033	6.7	11/08/2016 21:33
Ethylbenzene	ND		0.033	6.7	11/08/2016 21:33
Ethyl tert-butyl ether (ETBE)	ND		0.033	6.7	11/08/2016 21:33
Freon 113	ND		0.033	6.7	11/08/2016 21:33
Hexachlorobutadiene	ND		0.033	6.7	11/08/2016 21:33
Hexachloroethane	ND		0.033	6.7	11/08/2016 21:33
2-Hexanone	ND		0.033	6.7	11/08/2016 21:33
Isopropylbenzene	ND		0.033	6.7	11/08/2016 21:33
4-Isopropyl toluene	ND		0.033	6.7	11/08/2016 21:33
Methyl-t-butyl ether (MTBE)	ND		0.033	6.7	11/08/2016 21:33
Methylene chloride	ND		0.033	6.7	11/08/2016 21:33
4-Methyl-2-pentanone (MIBK)	ND		0.033	6.7	11/08/2016 21:33
Naphthalene	0.15		0.033	6.7	11/08/2016 21:33
n-Propyl benzene	0.068		0.033	6.7	11/08/2016 21:33
Styrene	ND		0.033	6.7	11/08/2016 21:33
1,1,1,2-Tetrachloroethane	ND		0.033	6.7	11/08/2016 21:33
1,1,2,2-Tetrachloroethane	ND		0.033	6.7	11/08/2016 21:33
Tetrachloroethene	0.059		0.033	6.7	11/08/2016 21:33
Toluene	ND		0.033	6.7	11/08/2016 21:33
1,2,3-Trichlorobenzene	ND		0.033	6.7	11/08/2016 21:33
1,2,4-Trichlorobenzene	ND		0.033	6.7	11/08/2016 21:33
1,1,1-Trichloroethane	ND		0.033	6.7	11/08/2016 21:33
1,1,2-Trichloroethane	ND		0.033	6.7	11/08/2016 21:33
Trichloroethene	0.29		0.033	6.7	11/08/2016 21:33
Trichlorofluoromethane	ND		0.033	6.7	11/08/2016 21:33
1,2,3-Trichloropropane	ND		0.033	6.7	11/08/2016 21:33
1,2,4-Trimethylbenzene	0.77		0.033	6.7	11/08/2016 21:33
1,3,5-Trimethylbenzene	0.26		0.033	6.7	11/08/2016 21:33
Vinyl Chloride	ND		0.033	6.7	11/08/2016 21:33
Xylenes, Total	0.15		0.033	6.7	11/08/2016 21:33

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	112		70-130	11/08/2016 21:33
Toluene-d8	91		70-130	11/08/2016 21:33
4-BFB	101		70-130	11/08/2016 21:33
Benzene-d6	75		60-140	11/08/2016 21:33
Ethylbenzene-d10	79		60-140	11/08/2016 21:33
1,2-DCB-d4	123		60-140	11/08/2016 21:33

Analyst(s): MW



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	0.10	1	11/08/2016 20:54
tert-Amyl methyl ether (TAME)	ND	0.0050	1	11/08/2016 20:54
Benzene	ND	0.0050	1	11/08/2016 20:54
Bromobenzene	ND	0.0050	1	11/08/2016 20:54
Bromochloromethane	ND	0.0050	1	11/08/2016 20:54
Bromodichloromethane	ND	0.0050	1	11/08/2016 20:54
Bromoform	ND	0.0050	1	11/08/2016 20:54
Bromomethane	ND	0.0050	1	11/08/2016 20:54
2-Butanone (MEK)	ND	0.020	1	11/08/2016 20:54
t-Butyl alcohol (TBA)	ND	0.050	1	11/08/2016 20:54
n-Butyl benzene	ND	0.0050	1	11/08/2016 20:54
sec-Butyl benzene	ND	0.0050	1	11/08/2016 20:54
tert-Butyl benzene	ND	0.0050	1	11/08/2016 20:54
Carbon Disulfide	ND	0.0050	1	11/08/2016 20:54
Carbon Tetrachloride	ND	0.0050	1	11/08/2016 20:54
Chlorobenzene	ND	0.0050	1	11/08/2016 20:54
Chloroethane	ND	0.0050	1	11/08/2016 20:54
Chloroform	ND	0.0050	1	11/08/2016 20:54
Chloromethane	ND	0.0050	1	11/08/2016 20:54
2-Chlorotoluene	ND	0.0050	1	11/08/2016 20:54
4-Chlorotoluene	ND	0.0050	1	11/08/2016 20:54
Dibromochloromethane	ND	0.0050	1	11/08/2016 20:54
1,2-Dibromo-3-chloropropane	ND	0.0040	1	11/08/2016 20:54
1,2-Dibromoethane (EDB)	ND	0.0040	1	11/08/2016 20:54
Dibromomethane	ND	0.0050	1	11/08/2016 20:54
1,2-Dichlorobenzene	ND	0.0050	1	11/08/2016 20:54
1,3-Dichlorobenzene	ND	0.0050	1	11/08/2016 20:54
1,4-Dichlorobenzene	ND	0.0050	1	11/08/2016 20:54
Dichlorodifluoromethane	ND	0.0050	1	11/08/2016 20:54
1,1-Dichloroethane	ND	0.0050	1	11/08/2016 20:54
1,2-Dichloroethane (1,2-DCA)	ND	0.0040	1	11/08/2016 20:54
1,1-Dichloroethene	ND	0.0050	1	11/08/2016 20:54
cis-1,2-Dichloroethene	ND	0.0050	1	11/08/2016 20:54
trans-1,2-Dichloroethene	ND	0.0050	1	11/08/2016 20:54
1,2-Dichloropropane	ND	0.0050	1	11/08/2016 20:54
1,3-Dichloropropane	ND	0.0050	1	11/08/2016 20:54
2,2-Dichloropropane	ND	0.0050	1	11/08/2016 20:54

(Cont.)



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.0050	1	11/08/2016 20:54
cis-1,3-Dichloropropene	ND	0.0050	1	11/08/2016 20:54
trans-1,3-Dichloropropene	ND	0.0050	1	11/08/2016 20:54
Diisopropyl ether (DIPE)	ND	0.0050	1	11/08/2016 20:54
Ethylbenzene	ND	0.0050	1	11/08/2016 20:54
Ethyl tert-butyl ether (ETBE)	ND	0.0050	1	11/08/2016 20:54
Freon 113	ND	0.0050	1	11/08/2016 20:54
Hexachlorobutadiene	ND	0.0050	1	11/08/2016 20:54
Hexachloroethane	ND	0.0050	1	11/08/2016 20:54
2-Hexanone	ND	0.0050	1	11/08/2016 20:54
Isopropylbenzene	ND	0.0050	1	11/08/2016 20:54
4-Isopropyl toluene	ND	0.0050	1	11/08/2016 20:54
Methyl-t-butyl ether (MTBE)	ND	0.0050	1	11/08/2016 20:54
Methylene chloride	ND	0.0050	1	11/08/2016 20:54
4-Methyl-2-pentanone (MIBK)	ND	0.0050	1	11/08/2016 20:54
Naphthalene	ND	0.0050	1	11/08/2016 20:54
n-Propyl benzene	ND	0.0050	1	11/08/2016 20:54
Styrene	ND	0.0050	1	11/08/2016 20:54
1,1,1,2-Tetrachloroethane	ND	0.0050	1	11/08/2016 20:54
1,1,2,2-Tetrachloroethane	ND	0.0050	1	11/08/2016 20:54
Tetrachloroethene	0.013	0.0050	1	11/08/2016 20:54
Toluene	ND	0.0050	1	11/08/2016 20:54
1,2,3-Trichlorobenzene	ND	0.0050	1	11/08/2016 20:54
1,2,4-Trichlorobenzene	ND	0.0050	1	11/08/2016 20:54
1,1,1-Trichloroethane	ND	0.0050	1	11/08/2016 20:54
1,1,2-Trichloroethane	ND	0.0050	1	11/08/2016 20:54
Trichloroethene	0.017	0.0050	1	11/08/2016 20:54
Trichlorofluoromethane	ND	0.0050	1	11/08/2016 20:54
1,2,3-Trichloropropane	ND	0.0050	1	11/08/2016 20:54
1,2,4-Trimethylbenzene	0.012	0.0050	1	11/08/2016 20:54
1,3,5-Trimethylbenzene	ND	0.0050	1	11/08/2016 20:54
Vinyl Chloride	ND	0.0050	1	11/08/2016 20:54
Xylenes, Total	ND	0.0050	1	11/08/2016 20:54

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC18	129370

Analytes	Result	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>	
Dibromofluoromethane	110		70-130	11/08/2016 20:54
Toluene-d8	94		70-130	11/08/2016 20:54
4-BFB	118		70-130	11/08/2016 20:54
Benzene-d6	76		60-140	11/08/2016 20:54
Ethylbenzene-d10	91		60-140	11/08/2016 20:54
1,2-DCB-d4	76		60-140	11/08/2016 20:54

Analyst(s): MW



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/8/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW3550B
Analytical Method: SW8270C-SIM
Unit: mg/kg

Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) using SIM Mode

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC35	129457

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.10	10	11/10/2016 12:27
Acenaphthylene	ND	0.10	10	11/10/2016 12:27
Anthracene	ND	0.10	10	11/10/2016 12:27
Benzo (a) anthracene	0.13	0.10	10	11/10/2016 12:27
Benzo (a) pyrene	ND	0.10	10	11/10/2016 12:27
Benzo (b) fluoranthene	ND	0.10	10	11/10/2016 12:27
Benzo (g,h,i) perylene	ND	0.10	10	11/10/2016 12:27
Benzo (k) fluoranthene	ND	0.10	10	11/10/2016 12:27
Chrysene	ND	0.10	10	11/10/2016 12:27
Dibenzo (a,h) anthracene	ND	0.10	10	11/10/2016 12:27
Fluoranthene	ND	0.10	10	11/10/2016 12:27
Fluorene	0.13	0.10	10	11/10/2016 12:27
Indeno (1,2,3-cd) pyrene	ND	0.10	10	11/10/2016 12:27
1-Methylnaphthalene	0.21	0.10	10	11/10/2016 12:27
2-Methylnaphthalene	0.26	0.10	10	11/10/2016 12:27
Naphthalene	0.22	0.10	10	11/10/2016 12:27
Phenanthrene	0.38	0.10	10	11/10/2016 12:27
Pyrene	0.14	0.10	10	11/10/2016 12:27
Surrogates	REC (%)	Limits		
1-Fluoronaphthalene	110	30-130		11/10/2016 12:27
2-Fluorobiphenyl	86	30-130		11/10/2016 12:27

Analyst(s): REB



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/8/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW3550B
Analytical Method: SW8270C-SIM
Unit: mg/kg

Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) using SIM Mode

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC35	129457

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.10	10	11/09/2016 17:37
Acenaphthylene	ND	0.10	10	11/09/2016 17:37
Anthracene	ND	0.10	10	11/09/2016 17:37
Benzo (a) anthracene	0.10	0.10	10	11/09/2016 17:37
Benzo (a) pyrene	ND	0.10	10	11/09/2016 17:37
Benzo (b) fluoranthene	ND	0.10	10	11/09/2016 17:37
Benzo (g,h,i) perylene	ND	0.10	10	11/09/2016 17:37
Benzo (k) fluoranthene	ND	0.10	10	11/09/2016 17:37
Chrysene	ND	0.10	10	11/09/2016 17:37
Dibenzo (a,h) anthracene	ND	0.10	10	11/09/2016 17:37
Fluoranthene	ND	0.10	10	11/09/2016 17:37
Fluorene	ND	0.10	10	11/09/2016 17:37
Indeno (1,2,3-cd) pyrene	ND	0.10	10	11/09/2016 17:37
1-Methylnaphthalene	0.13	0.10	10	11/09/2016 17:37
2-Methylnaphthalene	0.19	0.10	10	11/09/2016 17:37
Naphthalene	ND	0.10	10	11/09/2016 17:37
Phenanthrene	0.16	0.10	10	11/09/2016 17:37
Pyrene	ND	0.10	10	11/09/2016 17:37
Surrogates	REC (%)	Limits		
1-Fluoronaphthalene	93	30-130		11/09/2016 17:37
2-Fluorobiphenyl	90	30-130		11/09/2016 17:37

Analyst(s): REB



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/8/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW3550B
Analytical Method: SW8270C-SIM
Unit: mg/kg

Polynuclear Aromatic Hydrocarbons (PAHs / PNAs) using SIM Mode

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC35	129457

Analytes	Result	RL	DF	Date Analyzed
Acenaphthene	ND	0.010	1	11/09/2016 18:02
Acenaphthylene	ND	0.010	1	11/09/2016 18:02
Anthracene	ND	0.010	1	11/09/2016 18:02
Benzo (a) anthracene	ND	0.010	1	11/09/2016 18:02
Benzo (a) pyrene	ND	0.010	1	11/09/2016 18:02
Benzo (b) fluoranthene	ND	0.010	1	11/09/2016 18:02
Benzo (g,h,i) perylene	ND	0.010	1	11/09/2016 18:02
Benzo (k) fluoranthene	ND	0.010	1	11/09/2016 18:02
Chrysene	ND	0.010	1	11/09/2016 18:02
Dibenzo (a,h) anthracene	ND	0.010	1	11/09/2016 18:02
Fluoranthene	ND	0.010	1	11/09/2016 18:02
Fluorene	ND	0.010	1	11/09/2016 18:02
Indeno (1,2,3-cd) pyrene	ND	0.010	1	11/09/2016 18:02
1-Methylnaphthalene	ND	0.010	1	11/09/2016 18:02
2-Methylnaphthalene	ND	0.010	1	11/09/2016 18:02
Naphthalene	ND	0.010	1	11/09/2016 18:02
Phenanthrene	ND	0.010	1	11/09/2016 18:02
Pyrene	ND	0.010	1	11/09/2016 18:02
Surrogates	REC (%)	Limits		
1-Fluoronaphthalene	89	30-130		11/09/2016 18:02
2-Fluorobiphenyl	88	30-130		11/09/2016 18:02

Analyst(s): REB



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC7	129401

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	810	50	50	11/08/2016 01:05
MTBE	---	2.5	50	11/08/2016 01:05
Benzene	---	0.25	50	11/08/2016 01:05
Toluene	---	0.25	50	11/08/2016 01:05
Ethylbenzene	---	0.25	50	11/08/2016 01:05
Xylenes	---	0.75	50	11/08/2016 01:05

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorotoluene	87	69-117	11/08/2016 01:05

Analyst(s): IA Analytical Comments: d7

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC7	129401

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	460	50	50	11/08/2016 01:35
MTBE	---	2.5	50	11/08/2016 01:35
Benzene	---	0.25	50	11/08/2016 01:35
Toluene	---	0.25	50	11/08/2016 01:35
Ethylbenzene	---	0.25	50	11/08/2016 01:35
Xylenes	---	0.75	50	11/08/2016 01:35

Surrogates	REC (%)	Limits	Date Analyzed
2-Fluorotoluene	82	69-117	11/08/2016 01:35

Analyst(s): IA Analytical Comments: d7



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC7	129401

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	15	1.0	1	11/08/2016 03:34
MTBE	---	0.050	1	11/08/2016 03:34
Benzene	---	0.0050	1	11/08/2016 03:34
Toluene	---	0.0050	1	11/08/2016 03:34
Ethylbenzene	---	0.0050	1	11/08/2016 03:34
Xylenes	---	0.015	1	11/08/2016 03:34

Surrogates	REC (%)	Limits	
2-Fluorotoluene	95	69-117	11/08/2016 03:34

Analyst(s): IA

Analytical Comments: d7



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg

LUFT 5 Metals

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	ICP-MS3	129385
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Cadmium	ND		0.25	1	11/08/2016 17:41
Chromium	42		0.50	1	11/08/2016 17:41
Lead	6.9		0.50	1	11/08/2016 17:41
Nickel	50		0.50	1	11/08/2016 17:41
Zinc	39		5.0	1	11/08/2016 17:41
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Terbium	107		70-130		11/08/2016 17:41

Analyst(s): MIG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	ICP-MS3	129406
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Cadmium	ND		0.25	1	11/08/2016 17:47
Chromium	31		0.50	1	11/08/2016 17:47
Lead	5.4		0.50	1	11/08/2016 17:47
Nickel	37		0.50	1	11/08/2016 17:47
Zinc	37		5.0	1	11/08/2016 17:47
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Terbium	103		70-130		11/08/2016 17:47

Analyst(s): MIG

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	ICP-MS3	129406
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Cadmium	ND		0.25	1	11/08/2016 17:53
Chromium	46		0.50	1	11/08/2016 17:53
Lead	7.3		0.50	1	11/08/2016 17:53
Nickel	46		0.50	1	11/08/2016 17:53
Zinc	48		5.0	1	11/08/2016 17:53
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Terbium	102		70-130		11/08/2016 17:53

Analyst(s): MIG



Analytical Report

Client: Langan
Date Received: 11/7/16 15:00
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-6	1611295-001A	Soil	11/03/2016	GC11A	129400

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	2900	200	200	11/08/2016 14:02
TPH-Motor Oil (C18-C36)	6100	1000	200	11/08/2016 14:02

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
C9	173	S	72-114	11/08/2016 14:02

Analyst(s): TK **Analytical Comments:** e7,e2,e11,c2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-10	1611295-002A	Soil	11/03/2016	GC11A	129400

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	1600	200	200	11/08/2016 15:21
TPH-Motor Oil (C18-C36)	3600	1000	200	11/08/2016 15:21

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
C9	136	S	72-114	11/08/2016 15:21

Analyst(s): TK **Analytical Comments:** e7,e2,e11,c2

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-16-20.5	1611295-003A	Soil	11/03/2016	GC11A	129400

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	46	10	10	11/08/2016 16:39
TPH-Motor Oil (C18-C36)	100	50	10	11/08/2016 16:39

Surrogates	REC (%)	Limits	Date Analyzed
C9	101	72-114	11/08/2016 16:39

Analyst(s): TK **Analytical Comments:** e7,e2,e4



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC10
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129370
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-129370
 1611280-003AMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	0.10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.0422	0.0050	0.050	-	84	53-116
Benzene	ND	0.0496	0.0050	0.050	-	99	63-137
Bromobenzene	ND	-	0.0050	-	-	-	-
Bromochloromethane	ND	-	0.0050	-	-	-	-
Bromodichloromethane	ND	-	0.0050	-	-	-	-
Bromoform	ND	-	0.0050	-	-	-	-
Bromomethane	ND	-	0.0050	-	-	-	-
2-Butanone (MEK)	ND	-	0.020	-	-	-	-
t-Butyl alcohol (TBA)	ND	0.180	0.050	0.20	-	90	41-135
n-Butyl benzene	ND	-	0.0050	-	-	-	-
sec-Butyl benzene	ND	-	0.0050	-	-	-	-
tert-Butyl benzene	ND	-	0.0050	-	-	-	-
Carbon Disulfide	ND	-	0.0050	-	-	-	-
Carbon Tetrachloride	ND	-	0.0050	-	-	-	-
Chlorobenzene	ND	0.0473	0.0050	0.050	-	95	77-121
Chloroethane	ND	-	0.0050	-	-	-	-
Chloroform	ND	-	0.0050	-	-	-	-
Chloromethane	ND	-	0.0050	-	-	-	-
2-Chlorotoluene	ND	-	0.0050	-	-	-	-
4-Chlorotoluene	ND	-	0.0050	-	-	-	-
Dibromochloromethane	ND	-	0.0050	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.0040	-	-	-	-
1,2-Dibromoethane (EDB)	ND	0.0438	0.0040	0.050	-	88	67-119
Dibromomethane	ND	-	0.0050	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.0050	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.0050	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.0050	-	-	-	-
Dichlorodifluoromethane	ND	-	0.0050	-	-	-	-
1,1-Dichloroethane	ND	-	0.0050	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.0454	0.0040	0.050	-	91	58-135
1,1-Dichloroethene	ND	0.0480	0.0050	0.050	-	96	42-145
cis-1,2-Dichloroethene	ND	-	0.0050	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.0050	-	-	-	-
1,2-Dichloropropane	ND	-	0.0050	-	-	-	-
1,3-Dichloropropane	ND	-	0.0050	-	-	-	-
2,2-Dichloropropane	ND	-	0.0050	-	-	-	-

(Cont.)

NELAP 4033ORELAP

 QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC10
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129370
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-129370
 1611280-003AMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
1,1-Dichloropropene	ND	-	0.0050	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.0050	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.0050	-	-	-	-
Diisopropyl ether (DIPE)	ND	0.0455	0.0050	0.050	-	91	52-129
Ethylbenzene	ND	-	0.0050	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.0461	0.0050	0.050	-	92	53-125
Freon 113	ND	-	0.0050	-	-	-	-
Hexachlorobutadiene	ND	-	0.0050	-	-	-	-
Hexachloroethane	ND	-	0.0050	-	-	-	-
2-Hexanone	ND	-	0.0050	-	-	-	-
Isopropylbenzene	ND	-	0.0050	-	-	-	-
4-Isopropyl toluene	ND	-	0.0050	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.0450	0.0050	0.050	-	90	58-122
Methylene chloride	ND	-	0.0050	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.0050	-	-	-	-
Naphthalene	ND	-	0.0050	-	-	-	-
n-Propyl benzene	ND	-	0.0050	-	-	-	-
Styrene	ND	-	0.0050	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.0050	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.0050	-	-	-	-
Tetrachloroethene	ND	-	0.0050	-	-	-	-
Toluene	ND	0.0515	0.0050	0.050	-	103	76-130
1,2,3-Trichlorobenzene	ND	-	0.0050	-	-	-	-
1,2,4-Trichlorobenzene	ND	-	0.0050	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.0050	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.0050	-	-	-	-
Trichloroethene	ND	0.0483	0.0050	0.050	-	97	72-132
Trichlorofluoromethane	ND	-	0.0050	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.0050	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.0050	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.0050	-	-	-	-
Vinyl Chloride	ND	-	0.0050	-	-	-	-
Xylenes, Total	ND	-	0.0050	-	-	-	-



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC10
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129370
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: mg/kg
Sample ID: MB/LCS-129370
 1611280-003AMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Surrogate Recovery							
Dibromofluoromethane	0.135	0.133		0.12	108	107	70-130
Toluene-d8	0.145	0.149		0.12	116	119	70-130
4-BFB	0.0127	0.0136		0.012	102	109	70-130
Benzene-d6	0.0821	0.103		0.10	82	103	60-140
Ethylbenzene-d10	0.0930	0.121		0.10	93	121	60-140
1,2-DCB-d4	0.0806	0.0932		0.10	81	93	60-140

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	0.0419	0.0412	0.050	ND	84	82	53-116	1.58	20
Benzene	0.0476	0.0475	0.050	ND	95	95	63-137	0	20
t-Butyl alcohol (TBA)	0.169	0.164	0.20	ND	84	82	41-135	2.72	20
Chlorobenzene	0.0451	0.0451	0.050	ND	90	90	77-121	0	20
1,2-Dibromoethane (EDB)	0.0412	0.0407	0.050	ND	82	81	67-119	1.27	20
1,2-Dichloroethane (1,2-DCA)	0.0440	0.0430	0.050	ND	88	86	58-135	2.14	20
1,1-Dichloroethene	0.0449	0.0453	0.050	ND	90	91	42-145	0.902	20
Diisopropyl ether (DIPE)	0.0439	0.0435	0.050	ND	88	87	52-129	0.900	20
Ethyl tert-butyl ether (ETBE)	0.0449	0.0445	0.050	ND	90	89	53-125	0.963	20
Methyl-t-butyl ether (MTBE)	0.0440	0.0432	0.050	ND	88	86	58-122	1.74	20
Toluene	0.0486	0.0486	0.050	ND	97	97	76-130	0	20
Trichloroethene	0.0460	0.0458	0.050	ND	92	92	72-132	0	20
Surrogate Recovery									
Dibromofluoromethane	0.135	0.135	0.12		108	108	70-130	0	20
Toluene-d8	0.147	0.147	0.12		117	118	70-130	0.101	20
4-BFB	0.0135	0.0139	0.012		108	111	70-130	3.21	20
Benzene-d6	0.0994	0.0992	0.10		99	99	60-140	0	20
Ethylbenzene-d10	0.111	0.111	0.10		111	111	60-140	0	20
1,2-DCB-d4	0.0898	0.0887	0.10		90	89	60-140	1.19	20



Quality Control Report

Client: Langan
Date Prepared: 11/8/16
Date Analyzed: 11/8/16 - 11/9/16
Instrument: GC35
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129457
Extraction Method: SW3550B
Analytical Method: SW8270C-SIM
Unit: mg/kg
Sample ID: MB/LCS-129457
 1611287-029AMS/MSD

QC Summary Report for SW8270C

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acenaphthene	ND	-	0.010	-	-	-	-
Acenaphthylene	ND	-	0.010	-	-	-	-
Anthracene	ND	-	0.010	-	-	-	-
Benzo (a) anthracene	ND	-	0.010	-	-	-	-
Benzo (a) pyrene	ND	0.129	0.010	0.20	-	65	23-129
Benzo (b) fluoranthene	ND	-	0.010	-	-	-	-
Benzo (g,h,i) perylene	ND	-	0.010	-	-	-	-
Benzo (k) fluoranthene	ND	-	0.010	-	-	-	-
Chrysene	ND	0.148	0.010	0.20	-	74	38-104
Dibenzo (a,h) anthracene	ND	-	0.010	-	-	-	-
Fluoranthene	ND	-	0.010	-	-	-	-
Fluorene	ND	-	0.010	-	-	-	-
Indeno (1,2,3-cd) pyrene	ND	-	0.010	-	-	-	-
1-Methylnaphthalene	ND	0.183	0.010	0.20	-	91	59-106
2-Methylnaphthalene	ND	0.164	0.010	0.20	-	82	54-108
Naphthalene	ND	-	0.010	-	-	-	-
Phenanthrene	ND	0.156	0.010	0.20	-	78	48-107
Pyrene	ND	0.145	0.010	0.20	-	73	40-104
Surrogate Recovery							
1-Fluoronaphthalene	0.428	0.422		0.50	86	84	63-123
2-Fluorobiphenyl	0.425	0.414		0.50	85	83	55-127

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Benzo (a) pyrene	NR	NR		ND<0.05	NR	NR	-	NR	
Chrysene	NR	NR		ND<0.05	NR	NR	-	NR	
1-Methylnaphthalene	NR	NR		ND<0.05	NR	NR	-	NR	
2-Methylnaphthalene	NR	NR		ND<0.05	NR	NR	-	NR	
Phenanthrene	NR	NR		ND<0.05	NR	NR	-	NR	
Pyrene	NR	NR		ND<0.05	NR	NR	-	NR	
Surrogate Recovery									
1-Fluoronaphthalene	NR	NR			NR	NR	-	NR	
2-Fluorobiphenyl	NR	NR			NR	NR	-	NR	



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/8/16
Instrument: GC19
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129401
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: mg/Kg
Sample ID: MB/LCS-129401
 1611295-001AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	0.576	0.40	0.60	-	96	89-118
MTBE	ND	0.0930	0.050	0.10	-	93	68-116
Benzene	ND	0.112	0.0050	0.10	-	112	85-118
Toluene	ND	0.116	0.0050	0.10	-	115	87-121
Ethylbenzene	ND	0.116	0.0050	0.10	-	116	91-124
Xylenes	ND	0.348	0.015	0.30	-	116	92-126
Surrogate Recovery							
2-Fluorotoluene	0.104	0.119		0.10	104	119	88-119

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	NR	NR		21	NR	NR	-	NR	
MTBE	NR	NR		ND<2.5	NR	NR	-	NR	
Benzene	NR	NR		ND<0.25	NR	NR	-	NR	
Toluene	NR	NR		ND<0.25	NR	NR	-	NR	
Ethylbenzene	NR	NR		ND<0.25	NR	NR	-	NR	
Xylenes	NR	NR		1.2	NR	NR	-	NR	
Surrogate Recovery									
2-Fluorotoluene	NR	NR			NR	NR	-	NR	



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16 - 11/8/16
Instrument: ICP-MS2
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129385
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg
Sample ID: MB/LCS-129385
 1611272-055AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Cadmium	ND	48.4	0.25	50	-	97	75-125
Chromium	ND	48.8	0.50	50	-	98	75-125
Lead	ND	48.0	0.50	50	-	96	75-125
Nickel	ND	47.9	0.50	50	-	96	75-125
Zinc	ND	483	5.0	500	-	97	75-125
Surrogate Recovery							
Terbium	525	517		500	105	103	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Cadmium	53.8	51.8	50	1.8	104	100	75-125	3.96	20
Chromium	91.6	92.5	50	37	109	111	75-125	1.03	20
Lead	211	276	50	200	20,F10	150,F10	75-125	26.7,F10	20
Nickel	81.8	79.3	50	25	114	109	75-125	2.99	20
Zinc	1360	1390	500	820	108	114	75-125	2.18	20
Surrogate Recovery									
Terbium	528	515	500		106	103	70-130	2.44	20



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/8/16
Instrument: ICP-MS2
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129406
Extraction Method: SW3050B
Analytical Method: SW6020
Unit: mg/Kg
Sample ID: MB/LCS-129406
 1611288-002AMS/MSD

QC Summary Report for Metals

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Cadmium	ND	53.1	0.25	50	-	106	75-125
Chromium	ND	54.0	0.50	50	-	108	75-125
Lead	ND	52.0	0.50	50	-	104	75-125
Nickel	ND	51.8	0.50	50	-	104	75-125
Zinc	ND	524	5.0	500	-	105	75-125
Surrogate Recovery							
Terbium	524	504		500	105	101	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
Cadmium	52.4	52.9	50	ND	104	106	75-125	1.03	20
Chromium	79.8	78.5	50	25.34	109	106	75-125	1.59	20
Lead	68.3	68.4	50	15.85	105	105	75-125	0	20
Nickel	93.7	90.4	50	40.54	106	100	75-125	3.52	20
Zinc	597	610	500	88.45	102	104	75-125	2.12	20
Surrogate Recovery									
Terbium	532	558	500		106	112	70-130	4.77	20

Analyte	DLT Result	DLTRef Val	%D	%D Limit
Cadmium	ND<1.2	ND	-	-
Chromium	26.6	25.34	4.97	20
Lead	16.6	15.85	4.73	20
Nickel	41.2	40.54	1.63	20
Zinc	92.4	88.45	4.47	-

%D Control Limit applied to analytes with concentrations greater than 25 times the reporting limits.



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/8/16
Instrument: GC11B
Matrix: Soil
Project: 750635601; 3000 Broadway

WorkOrder: 1611295
BatchID: 129400
Extraction Method: SW3550B
Analytical Method: SW8015B
Unit: mg/Kg
Sample ID: MB/LCS-129400
 1611287-026AMS/MSD

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	37.6	1.0	40	-	94	91-127
TPH-Motor Oil (C18-C36)	ND	-	5.0	-	-	-	-
Surrogate Recovery							
C9	21.7	22.1		25	87	88	74-110

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	NR	NR		2.1	NR	NR	-	NR	
Surrogate Recovery									
C9	NR	NR			NR	NR	-	NR	



1534 Willow Pass Rd
 Pittsburg, CA 94565-1701
 (925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1611295

ClientCode: TWRK

WaterTrax
 WriteOn
 EDF
 Excel
 EQulS
 Email
 HardCopy
 ThirdParty
 J-flag

Report to:

Josh Graber
 Langan
 501 14th Street, 3rd Floor
 Oakland, CA 94612
 (415) 955-9040 FAX: (415) 955-9041

Email: jdgraber@treadwellrollo.com
 cc/3rd Party:
 PO:
 ProjectNo: 750635601; 3000 Broadway

Bill to:

Accounts Payable
 Langan
 555 Montgomery St., Suite 1300
 San Francisco, CA 94111
 Langan_InvoiceCapture@concur.soluio

Requested TAT: 2 days;

Date Received: 11/07/2016

Date Logged: 11/07/2016

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1611295-001	B-16-6	Soil	11/3/2016 00:00	<input type="checkbox"/>	A	A	A	A	A							
1611295-002	B-16-10	Soil	11/3/2016 00:00	<input type="checkbox"/>	A	A	A	A	A							
1611295-003	B-16-20.5	Soil	11/3/2016 00:00	<input type="checkbox"/>	A	A	A	A	A							

Test Legend:

1	8260B_S	2	8270_PNA_S	3	G-MBTEx_S	4	LUFTMS_6020_TTLC_S
5	TPH(DMO)_S	6		7		8	
9		10		11		12	

Prepared by: Agustina Venegas

The following SamplIDs: 001A, 002A, 003A contain testgroup Multi Range_S.

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.



WORK ORDER SUMMARY

Client Name: LANGAN
Client Contact: Josh Graber
Contact's Email: jdgraber@treadwellrollo.com

Project: 750635601; 3000 Broadway

Comments:

Work Order: 1611295
QC Level: LEVEL 2
Date Logged: 11/7/2016

WaterTrax WriteOn EDF Excel Fax Email HardCopy ThirdParty J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1611295-001A	B-16-6	Soil	SW6020 (LUFT)	1	Stainless Steel tube 2 1/2"x6"	<input type="checkbox"/>	11/3/2016	2 days		<input type="checkbox"/>	
			Multi-Range TPH(g,d,mo) by EPA 8015Bm			<input type="checkbox"/>		2 days			
			SW8270C (PAHs/PNAs)			<input type="checkbox"/>		2 days			
			SW8260B (VOCs)			<input type="checkbox"/>		2 days			
1611295-002A	B-16-10	Soil	SW6020 (LUFT)	1	Stainless Steel tube 2 1/2"x6"	<input type="checkbox"/>	11/3/2016	2 days		<input type="checkbox"/>	
			Multi-Range TPH(g,d,mo) by EPA 8015Bm			<input type="checkbox"/>		2 days			
			SW8270C (PAHs/PNAs)			<input type="checkbox"/>		2 days			
			SW8260B (VOCs)			<input type="checkbox"/>		2 days			
1611295-003A	B-16-20.5	Soil	SW6020 (LUFT)	1	Stainless Steel tube 2 1/2"x6"	<input type="checkbox"/>	11/3/2016	2 days		<input type="checkbox"/>	
			Multi-Range TPH(g,d,mo) by EPA 8015Bm			<input type="checkbox"/>		2 days			
			SW8270C (PAHs/PNAs)			<input type="checkbox"/>		2 days			
			SW8260B (VOCs)			<input type="checkbox"/>		2 days			
1611295-004A	B-13-5	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	11/2/2016			<input checked="" type="checkbox"/>	
1611295-005A	B-13-10	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	11/2/2016			<input checked="" type="checkbox"/>	
1611295-006A	B-13-15	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	11/2/2016			<input checked="" type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).

- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



WORK ORDER SUMMARY

Client Name: LANGAN
Client Contact: Josh Graber
Contact's Email: jdgraber@treadwellrollo.com

Project: 750635601; 3000 Broadway

Work Order: 1611295
QC Level: LEVEL 2
Date Logged: 11/7/2016

Comments:

WaterTrax WriteOn EDF Excel Fax Email HardCopy ThirdParty J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1611295-007A	B-13-20	Soil		1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	11/2/2016				<input checked="" type="checkbox"/>

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).
- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



Sample Receipt Checklist

Client Name: **Langan**
 Project Name: **750635601; 3000 Broadway**
 WorkOrder No: **1611295** Matrix: Soil
 Carrier: Bernie Cummins (MAI Courier)

Date and Time Received: **11/7/2016 15:00**
 Date Logged: **11/7/2016**
 Received by: **Agustina Venegas**
 Logged by: **Agustina Venegas**

Chain of Custody (COC) Information

Chain of custody present? Yes No
 Chain of custody signed when relinquished and received? Yes No
 Chain of custody agrees with sample labels? Yes No
 Sample IDs noted by Client on COC? Yes No
 Date and Time of collection noted by Client on COC? Yes No
 Sampler's name noted on COC? Yes No

Sample Receipt Information

Custody seals intact on shipping container/cooler? Yes No NA
 Shipping container/cooler in good condition? Yes No
 Samples in proper containers/bottles? Yes No
 Sample containers intact? Yes No
 Sufficient sample volume for indicated test? Yes No

Sample Preservation and Hold Time (HT) Information

All samples received within holding time? Yes No NA
 Sample/Temp Blank temperature Temp: 7.4°C NA
 Water - VOA vials have zero headspace / no bubbles? Yes No NA
 Sample labels checked for correct preservation? Yes No
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes No NA
 Samples Received on Ice? Yes No
 (Ice Type: WET ICE)

UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes No NA
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes No NA

Comments:



McC Campbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1611262

Report Created for: Langan

501 14th Street, 3rd Floor
Oakland, CA 94612

Project Contact: Josh Graber

Project P.O.:

Project Name: 750635601; 3000 Broadway

Project Received: 11/04/2016

Analytical Report reviewed & approved for release on 11/10/2016 by:

Angela Rydelius,
Laboratory Manager

The report shall not be reproduced except in full, without the written approval of the laboratory. The analytical results relate only to the items tested. Results reported conform to the most current NELAP standards, where applicable, unless otherwise stated in the case narrative.





Glossary of Terms & Qualifier Definitions

Client: Langan
Project: 750635601; 3000 Broadway
WorkOrder: 1611262

Glossary Abbreviation

%D	Serial Dilution Percent Difference
95% Interval	95% Confident Interval
DF	Dilution Factor
DI WET	(DISTLC) Waste Extraction Test using DI water
DISS	Dissolved (direct analysis of 0.45 µm filtered and acidified water sample)
DLT	Dilution Test (Serial Dilution)
DUP	Duplicate
EDL	Estimated Detection Limit
ITEF	International Toxicity Equivalence Factor
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
ML	Minimum Level of Quantitation
MS	Matrix Spike
MSD	Matrix Spike Duplicate
N/A	Not Applicable
ND	Not detected at or above the indicated MDL or RL
NR	Data Not Reported due to matrix interference or insufficient sample amount.
PDS	Post Digestion Spike
PDSD	Post Digestion Spike Duplicate
PF	Prep Factor
RD	Relative Difference
RL	Reporting Limit (The RL is the lowest calibration standard in a multipoint calibration.)
RPD	Relative Percent Deviation
RRT	Relative Retention Time
SPK Val	Spike Value
SPKRef Val	Spike Reference Value
SPLP	Synthetic Precipitation Leachate Procedure
ST	Sorbent Tube
TCLP	Toxicity Characteristic Leachate Procedure
TEQ	Toxicity Equivalents
WET (STLC)	Waste Extraction Test (Soluble Threshold Limit Concentration)



Analytical Report

Client: Langan
Date Received: 11/4/16 16:45
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-13-GW	1611262-001A	Water	11/03/2016 09:55	GC18	129443

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	11/07/2016 17:04
tert-Amyl methyl ether (TAME)	ND	0.50	1	11/07/2016 17:04
Benzene	ND	0.50	1	11/07/2016 17:04
Bromobenzene	ND	0.50	1	11/07/2016 17:04
Bromochloromethane	ND	0.50	1	11/07/2016 17:04
Bromodichloromethane	ND	0.50	1	11/07/2016 17:04
Bromoform	ND	0.50	1	11/07/2016 17:04
Bromomethane	ND	0.50	1	11/07/2016 17:04
2-Butanone (MEK)	ND	2.0	1	11/07/2016 17:04
t-Butyl alcohol (TBA)	ND	2.0	1	11/07/2016 17:04
n-Butyl benzene	ND	0.50	1	11/07/2016 17:04
sec-Butyl benzene	ND	0.50	1	11/07/2016 17:04
tert-Butyl benzene	ND	0.50	1	11/07/2016 17:04
Carbon Disulfide	ND	0.50	1	11/07/2016 17:04
Carbon Tetrachloride	ND	0.50	1	11/07/2016 17:04
Chlorobenzene	ND	0.50	1	11/07/2016 17:04
Chloroethane	ND	0.50	1	11/07/2016 17:04
Chloroform	0.62	0.50	1	11/07/2016 17:04
Chloromethane	ND	0.50	1	11/07/2016 17:04
2-Chlorotoluene	ND	0.50	1	11/07/2016 17:04
4-Chlorotoluene	ND	0.50	1	11/07/2016 17:04
Dibromochloromethane	ND	0.50	1	11/07/2016 17:04
1,2-Dibromo-3-chloropropane	ND	0.20	1	11/07/2016 17:04
1,2-Dibromoethane (EDB)	ND	0.50	1	11/07/2016 17:04
Dibromomethane	ND	0.50	1	11/07/2016 17:04
1,2-Dichlorobenzene	ND	0.50	1	11/07/2016 17:04
1,3-Dichlorobenzene	ND	0.50	1	11/07/2016 17:04
1,4-Dichlorobenzene	ND	0.50	1	11/07/2016 17:04
Dichlorodifluoromethane	ND	0.50	1	11/07/2016 17:04
1,1-Dichloroethane	ND	0.50	1	11/07/2016 17:04
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	11/07/2016 17:04
1,1-Dichloroethene	ND	0.50	1	11/07/2016 17:04
cis-1,2-Dichloroethene	ND	0.50	1	11/07/2016 17:04
trans-1,2-Dichloroethene	ND	0.50	1	11/07/2016 17:04
1,2-Dichloropropane	ND	0.50	1	11/07/2016 17:04
1,3-Dichloropropane	ND	0.50	1	11/07/2016 17:04
2,2-Dichloropropane	ND	0.50	1	11/07/2016 17:04

(Cont.)



Analytical Report

Client: Langan
Date Received: 11/4/16 16:45
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-13-GW	1611262-001A	Water	11/03/2016 09:55	GC18	129443

Analytes	Result	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.50	1	11/07/2016 17:04
cis-1,3-Dichloropropene	ND	0.50	1	11/07/2016 17:04
trans-1,3-Dichloropropene	ND	0.50	1	11/07/2016 17:04
Diisopropyl ether (DIPE)	ND	0.50	1	11/07/2016 17:04
Ethylbenzene	ND	0.50	1	11/07/2016 17:04
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	11/07/2016 17:04
Freon 113	ND	0.50	1	11/07/2016 17:04
Hexachlorobutadiene	ND	0.50	1	11/07/2016 17:04
Hexachloroethane	ND	0.50	1	11/07/2016 17:04
2-Hexanone	ND	0.50	1	11/07/2016 17:04
Isopropylbenzene	ND	0.50	1	11/07/2016 17:04
4-Isopropyl toluene	ND	0.50	1	11/07/2016 17:04
Methyl-t-butyl ether (MTBE)	ND	0.50	1	11/07/2016 17:04
Methylene chloride	ND	0.50	1	11/07/2016 17:04
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	11/07/2016 17:04
Naphthalene	ND	0.50	1	11/07/2016 17:04
n-Propyl benzene	ND	0.50	1	11/07/2016 17:04
Styrene	ND	0.50	1	11/07/2016 17:04
1,1,1,2-Tetrachloroethane	ND	0.50	1	11/07/2016 17:04
1,1,2,2-Tetrachloroethane	ND	0.50	1	11/07/2016 17:04
Tetrachloroethene	ND	0.50	1	11/07/2016 17:04
Toluene	ND	0.50	1	11/07/2016 17:04
1,2,3-Trichlorobenzene	ND	0.50	1	11/07/2016 17:04
1,2,4-Trichlorobenzene	ND	0.50	1	11/07/2016 17:04
1,1,1-Trichloroethane	ND	0.50	1	11/07/2016 17:04
1,1,2-Trichloroethane	ND	0.50	1	11/07/2016 17:04
Trichloroethene	1.8	0.50	1	11/07/2016 17:04
Trichlorofluoromethane	ND	0.50	1	11/07/2016 17:04
1,2,3-Trichloropropane	ND	0.50	1	11/07/2016 17:04
1,2,4-Trimethylbenzene	ND	0.50	1	11/07/2016 17:04
1,3,5-Trimethylbenzene	ND	0.50	1	11/07/2016 17:04
Vinyl Chloride	ND	0.50	1	11/07/2016 17:04
Xylenes, Total	ND	0.50	1	11/07/2016 17:04

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



Analytical Report

Client: Langan
Date Received: 11/4/16 16:45
Date Prepared: 11/7/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L

Volatile Organics

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-13-GW	1611262-001A	Water	11/03/2016 09:55	GC18	129443

Analytes	Result	RL	DF	Date Analyzed
Surrogates	REC (%)	Limits		
Dibromofluoromethane	118	70-130		11/07/2016 17:04
Toluene-d8	84	70-130		11/07/2016 17:04
4-BFB	123	70-130		11/07/2016 17:04

Analyst(s): MW



Analytical Report

Client: Langan
Date Received: 11/4/16 16:45
Date Prepared: 11/6/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: µg/L

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-13-GW	1611262-001B	Water	11/03/2016 09:55	GC7	129395

Analytes	Result	RL	DF	Date Analyzed
TPH(g) (C6-C12)	ND	50	1	11/06/2016 18:09
MTBE	---	5.0	1	11/06/2016 18:09
Benzene	---	0.50	1	11/06/2016 18:09
Toluene	---	0.50	1	11/06/2016 18:09
Ethylbenzene	---	0.50	1	11/06/2016 18:09
Xylenes	---	1.5	1	11/06/2016 18:09

Surrogates	REC (%)	Limits	Date Analyzed
aaa-TFT	103	70-130	11/06/2016 18:09

Analyst(s): IA



Analytical Report

Client: Langan
Date Received: 11/4/16 16:45
Date Prepared: 11/4/16
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
Extraction Method: SW3510C
Analytical Method: SW8015B
Unit: µg/L

Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
B-13-GW	1611262-001B	Water	11/03/2016 09:55	GC11B	129329
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH-Diesel (C10-C23)	ND		50	1	11/07/2016 13:30
TPH-Motor Oil (C18-C36)	ND		250	1	11/07/2016 13:30
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
C9	89		72-117		11/07/2016 13:30
<u>Analyst(s):</u> TK					



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC18
Matrix: Water
Project: 750635601; 3000 Broadway


WorkOrder: 1611262
BatchID: 129443
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS-129443
 1611208-001CMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	10.7	0.50	10	-	107	54-140
Benzene	ND	9.48	0.50	10	-	95	47-158
Bromobenzene	ND	-	0.50	-	-	-	-
Bromochloromethane	ND	-	0.50	-	-	-	-
Bromodichloromethane	ND	-	0.50	-	-	-	-
Bromoform	ND	-	0.50	-	-	-	-
Bromomethane	ND	-	0.50	-	-	-	-
2-Butanone (MEK)	ND	-	2.0	-	-	-	-
t-Butyl alcohol (TBA)	ND	42.8	2.0	40	-	107	42-140
n-Butyl benzene	ND	-	0.50	-	-	-	-
sec-Butyl benzene	ND	-	0.50	-	-	-	-
tert-Butyl benzene	ND	-	0.50	-	-	-	-
Carbon Disulfide	ND	-	0.50	-	-	-	-
Carbon Tetrachloride	ND	-	0.50	-	-	-	-
Chlorobenzene	ND	10.4	0.50	10	-	104	43-157
Chloroethane	ND	-	0.50	-	-	-	-
Chloroform	ND	-	0.50	-	-	-	-
Chloromethane	ND	-	0.50	-	-	-	-
2-Chlorotoluene	ND	-	0.50	-	-	-	-
4-Chlorotoluene	ND	-	0.50	-	-	-	-
Dibromochloromethane	ND	-	0.50	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.20	-	-	-	-
1,2-Dibromoethane (EDB)	ND	10.1	0.50	10	-	101	44-155
Dibromomethane	ND	-	0.50	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.50	-	-	-	-
Dichlorodifluoromethane	ND	-	0.50	-	-	-	-
1,1-Dichloroethane	ND	-	0.50	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	12.4	0.50	10	-	123	66-125
1,1-Dichloroethene	ND	9.56	0.50	10	-	96	47-149
cis-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
1,2-Dichloropropane	ND	-	0.50	-	-	-	-
1,3-Dichloropropane	ND	-	0.50	-	-	-	-
2,2-Dichloropropane	ND	-	0.50	-	-	-	-

(Cont.)

NELAP 4033ORELAP

 QA/QC Officer



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC18
Matrix: Water
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
BatchID: 129443
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS-129443
 1611208-001CMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
1,1-Dichloropropene	ND	-	0.50	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
Diisopropyl ether (DIPE)	ND	7.63	0.50	10	-	76	57-136
Ethylbenzene	ND	-	0.50	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	10.1	0.50	10	-	101	55-137
Freon 113	ND	-	0.50	-	-	-	-
Hexachlorobutadiene	ND	-	0.50	-	-	-	-
Hexachloroethane	ND	-	0.50	-	-	-	-
2-Hexanone	ND	-	0.50	-	-	-	-
Isopropylbenzene	ND	-	0.50	-	-	-	-
4-Isopropyl toluene	ND	-	0.50	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	10.6	0.50	10	-	105	53-139
Methylene chloride	ND	-	0.50	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.50	-	-	-	-
Naphthalene	ND	-	0.50	-	-	-	-
n-Propyl benzene	ND	-	0.50	-	-	-	-
Styrene	ND	-	0.50	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
Tetrachloroethene	ND	-	0.50	-	-	-	-
Toluene	ND	8.58	0.50	10	-	86	52-137
1,2,3-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,2,4-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.50	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.50	-	-	-	-
Trichloroethene	ND	11.3	0.50	10	-	113	43-157
Trichlorofluoromethane	ND	-	0.50	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.50	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.50	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.50	-	-	-	-
Vinyl Chloride	ND	-	0.50	-	-	-	-
Xylenes, Total	ND	-	0.50	-	-	-	-



Quality Control Report

Client: Langan
Date Prepared: 11/7/16
Date Analyzed: 11/7/16
Instrument: GC18
Matrix: Water
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
BatchID: 129443
Extraction Method: SW5030B
Analytical Method: SW8260B
Unit: µg/L
Sample ID: MB/LCS-129443
 1611208-001CMS/MSD

QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Surrogate Recovery							
Dibromofluoromethane	29.4	28.7		25	118	115	70-130
Toluene-d8	21.6	22.1		25	86	88	70-130
4-BFB	2.92	2.78		2.5	117	111	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	10.7	10.6	10	ND	107	106	69-139	0.493	20
Benzene	9.08	9.15	10	ND	91	91	69-141	0	20
t-Butyl alcohol (TBA)	43.4	42.3	40	ND	109	106	41-152	2.64	20
Chlorobenzene	9.63	9.83	10	ND	96	98	77-120	2.10	20
1,2-Dibromoethane (EDB)	10.2	10.0	10	ND	102	101	76-135	1.29	20
1,2-Dichloroethane (1,2-DCA)	12.1	11.9	10	ND	121	119	73-139	1.66	20
1,1-Dichloroethene	9.08	9.26	10	ND	91	93	59-140	1.95	20
Diisopropyl ether (DIPE)	7.65	7.66	10	ND	77	77	72-140	0	20
Ethyl tert-butyl ether (ETBE)	10.0	10.0	10	ND	101	100	71-140	0.288	20
Methyl-t-butyl ether (MTBE)	11.1	11.0	10	ND	111	110	73-139	0.915	20
Toluene	7.90	7.90	10	ND	79	79	71-128	0	20
Trichloroethene	10.6	10.8	10	ND	106	108	64-132	1.21	20
Surrogate Recovery									
Dibromofluoromethane	29.2	29.0	25		117	116	73-131	0.768	20
Toluene-d8	21.7	21.4	25		87	85	72-117	1.57	20
4-BFB	2.86	3.12	2.5		115	125	74-116	8.46	20



Quality Control Report

Client: Langan
Date Prepared: 11/6/16
Date Analyzed: 11/6/16
Instrument: GC7
Matrix: Water
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
BatchID: 129395
Extraction Method: SW5030B
Analytical Method: SW8021B/8015Bm
Unit: µg/L
Sample ID: MB/LCS-129395
 1611123-001AMS/MSD

QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	55.9	40	60	-	93	85-112
MTBE	ND	9.35	5.0	10	-	93	74-127
Benzene	ND	10.8	0.50	10	-	108	81-124
Toluene	ND	11.6	0.50	10	-	117	79-131
Ethylbenzene	ND	11.1	0.50	10	-	111	86-127
Xylenes	ND	32.6	1.5	30	-	109	87-133
Surrogate Recovery							
aaa-TFT	10.7	10.6		10	107	106	87-117

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	NR	NR		ND<800	NR	NR	-	NR	
MTBE	NR	NR		ND<100	NR	NR	-	NR	
Benzene	NR	NR		14	NR	NR	-	NR	
Toluene	NR	NR		55	NR	NR	-	NR	
Ethylbenzene	NR	NR		ND<10	NR	NR	-	NR	
Xylenes	NR	NR		190	NR	NR	-	NR	
Surrogate Recovery									
aaa-TFT	NR	NR			NR	NR	-	NR	



Quality Control Report

Client: Langan
Date Prepared: 11/4/16
Date Analyzed: 11/7/16
Instrument: GC9a
Matrix: Water
Project: 750635601; 3000 Broadway

WorkOrder: 1611262
BatchID: 129329
Extraction Method: SW3510C
Analytical Method: SW8015B
Unit: µg/L
Sample ID: MB/LCS/LCSD-129329

QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	RL	SPK Val	MB SS %REC	MB SS Limits
TPH-Diesel (C10-C23)	ND	50	-	-	-
TPH-Motor Oil (C18-C36)	ND	250	-	-	-
Surrogate Recovery					
C9	553		625	88	74-107

Analyte	LCS Result	LCSD Result	SPK Val	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	1080	1080	1000	108	108	95-136	0	30
Surrogate Recovery								
C9	587	582	625	94	93	74-107	0.881	30



1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1611262

ClientCode: TWRK

WaterTrax
 WriteOn
 EDF
 Excel
 EQulS
 Email
 HardCopy
 ThirdParty
 J-flag

Report to:

Josh Graber
 Langan
 501 14th Street, 3rd Floor
 Oakland, CA 94612
 (415) 955-9040 FAX: (415) 955-9041

Email: jdgraber@treadwellrollo.com
 cc/3rd Party:
 PO:
 ProjectNo: 750635601; 3000 Broadway

Bill to:

Accounts Payable
 Langan
 555 Montgomery St., Suite 1300
 San Francisco, CA 94111
 Langan_InvoiceCapture@concursoft.com

Requested TAT: 5 days;

Date Received: 11/04/2016

Date Logged: 11/04/2016

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1611262-001	B-13-GW	Water	11/3/2016 09:55	<input type="checkbox"/>	A	B	B										

Test Legend:

1	8260B_W	2	G-MBTX_W	3	TPH(DMO)_W	4	
5		6		7		8	
9		10		11		12	

Prepared by: Briana Cutino

The following SampID: 001B contains testgroup Multi Range_W.

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days). Hazardous samples will be returned to client or disposed of at client expense.



WORK ORDER SUMMARY

Client Name: LANGAN
Client Contact: Josh Graber
Contact's Email: jdgraber@treadwellrollo.com

Project: 750635601; 3000 Broadway

Work Order: 1611262
QC Level: LEVEL 2
Date Logged: 11/4/2016

Comments:

WaterTrax WriteOn EDF Excel Fax Email HardCopy ThirdParty J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1611262-001A	B-13-GW	Water	SW8260B (VOCs)	2	VOA w/ HCl	<input type="checkbox"/>	11/3/2016 9:55	5 days	Trace	<input type="checkbox"/>	
1611262-001B	B-13-GW	Water	Multi-Range TPH by EPA 8015Bm	4	VOA w/ HCl	<input type="checkbox"/>	11/3/2016 9:55	5 days	Trace	<input type="checkbox"/>	

NOTES: - STLC and TCLP extractions require 2 days to complete; therefore, all TATs begin after the extraction is completed (i.e., One-day TAT yields results in 3 days from sample submission).
- MAI assumes that all material present in the provided sampling container is considered part of the sample - MAI does not exclude any material from the sample prior to sample preparation unless requested in writing by the client.



Sample Receipt Checklist

Client Name: **Langan**
 Project Name: **750635601; 3000 Broadway**
 WorkOrder No: **1611262** Matrix: Water
 Carrier: Bernie Cummins (MAI Courier)

Date and Time Received: **11/4/2016 16:45**
 Date Logged: **11/4/2016**
 Received by: **Briana Cutino**
 Logged by: **Briana Cutino**

Chain of Custody (COC) Information

Chain of custody present? Yes No
 Chain of custody signed when relinquished and received? Yes No
 Chain of custody agrees with sample labels? Yes No
 Sample IDs noted by Client on COC? Yes No
 Date and Time of collection noted by Client on COC? Yes No
 Sampler's name noted on COC? Yes No

Sample Receipt Information

Custody seals intact on shipping container/cooler? Yes No NA
 Shipping container/cooler in good condition? Yes No
 Samples in proper containers/bottles? Yes No
 Sample containers intact? Yes No
 Sufficient sample volume for indicated test? Yes No

Sample Preservation and Hold Time (HT) Information

All samples received within holding time? Yes No NA
 Sample/Temp Blank temperature Temp: 3.6°C NA
 Water - VOA vials have zero headspace / no bubbles? Yes No NA
 Sample labels checked for correct preservation? Yes No
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes No NA
 Samples Received on Ice? Yes No
 (Ice Type: WET ICE)

UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522? Yes No NA
 Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539? Yes No NA

Comments:

APPENDIX B
GEOTECHNICAL BORING LOGS

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-12

PAGE 1 OF 2

Boring location: See Figure 2

Logged by: Abraham Eng
Drilled by: Exploration Geoservices, Inc.

Date started: 4/16/16

Date finished: 4/16/16

Drilling method: Hollow Stem Auger

Hammer weight/drop: 140 lbs./30 inches

Hammer type: Downhole

Samplers: Standard Penetration Test (SPT), Shelby Tube (ST)

LABORATORY TEST DATA

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
	Sampler Type	Sample	Blows/ 6"	SPT N-Value ¹								
Ground Surface Elevation: 32 feet ²												
1						2.5 inches asphalt concrete (AC)						
2						4 inches aggregate base (AB)						
3						CLAYEY SAND (SC) light brown, medium dense, moist, fine-grained, pockets of SANDY CLAY (CL), olive-brown, very stiff, moist, fine-grained sand						
4												
5												
6												
7					SC							
8												
9												
10												
11	SPT		7 10 14	24		LL = 34, PI = 16, see Figure C-1					23.6	
12												
13												
14												
15						CLAY with SAND (CL) dark brown, very stiff to hard, moist, fine-grained sand LL = 40, PI = 23, see Figure C-1					23.1	
16	SPT		7 10 20	30								
17						▽ (4/16/16, 11:20 A.M.)						
18												
19						SANDY CLAY (CL) green-gray, hard, wet, fine-grained sand						
20												
21	SPT		9 13 20	33		LL = 37, PI = 18, see Figure C-1					22.1	
22												
23												
24						CLAY with SAND (CL) green-gray, hard, wet, fine-grained sand						
25												
26	SPT		9 13 21	34		LL = 38, PI = 17, see Figure C-1					26.4	
27												
28												
29												
30												

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

LANGAN



Project No.:
750635601

Figure:
B-1a

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-12

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA					
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	SPT		7 11 15	26	CL	CLAY with SAND (CL) (continued) very stiff						
32												
33						CLAY (CL) green-gray, hard, wet						
34												
35												
36	SPT		11 17 24	41	CL	LL = 46, PI = 25, see Figure C-1				29.5		
37												
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TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

Boring terminated at a depth of 36.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater stabilized at 17 feet at time of drilling.

¹ SPT blow counts for the last two increments were converted to SPT N-Values using a factor of 1.0 to account for sampler type and hammer energy.

² Elevations based on Oakland City Datum. Elevations referenced were obtained from the ALTA Survey performed by Luk and Associates, dated 20 April 2016.



Project No.:
750635601

Figure:
B-1b

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-13

Boring location: See Figure 2

Logged by: J. Sanglerat
Drilled by: Gregg Drilling

Date started: 11/2/16

Date finished: 11/2/16

Drilling method: Hollow Stem Auger

Hammer weight/drop: 140 lbs./30 inches

Hammer type: Safety Auto

Samplers: Sprague & Herwood (S&H), Standard Penetration Test (SPT), Shelby Tube (ST)

LABORATORY TEST DATA

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹								
1						1 inch tile						
2					SC	4 inches concrete slab						
3						CLAYEY SAND with GRAVEL (SC) dark brown, moist, fine- to medium-grained sand, fine subangular gravel						
4						CLAYEY SAND with GRAVEL (SC) light brown to yellow-brown, medium dense, moist, fine- to medium-grained, fine subangular gravel						
5						FILL						
6	SPT		8 11 9	24	SC							
7					SC							
8												
9												
10												
11	S&H		13 12 12	17		CLAY (CL) light brown to yellow-brown mottling, very stiff, moist, fine-grained, with trace sand						
12												
13												
14												
15												
16	ST		800 psi			trace silt Consolidation Test, see Figure C-4					22.9	100
17							PP	3,500				
18					CL							
19												
20						olive-gray with gray mottling, medium stiff, trace sand	PP	3,500				
21	S&H		3 4 5	6		Triaxial Test, see Figure C-6	TxUU	2,100	2,850	25.4	100	
22												
23												
24												
25												
26	S&H		12 18 25	30		very stiff, with orange-brown mottling, and trace organic rootlets	PP	3,500		22.8	103	
27						CLAYEY SAND (SC) yellow-brown, medium dense to dense, moist, fine-grained						
28					SC	(11/2/16, 9:45 a.m.)						
29												
30												

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

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Project No.: 750635601

Figure: B-2a

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-13

PAGE 2 OF 2

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA					
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	S&H		5	20	CL	CLAY (CL) olive-gray with dark gray mottling, very stiff, wet CLAY with SAND (CL) gray-brown, very stiff, wet, fine-grained sand LL = 41, PI = 23, see Figure C-2	PP	4,000		22.1	105	
32			12		CL							
33			17									
34												
35	S&H		10	32	CL	CLAY (CL) olive-gray with trace gray mottling, hard, wet						
36			20		CL							
37			26									
38												
39												
40	S&H		20	45	SC	CLAYEY SAND with trace GRAVEL (SC) gray-brown, dense, wet, fine- to medium-grained, fine subangular gravel	PP	3,500		15.8	117	
41			31		SC							
42			33									
43												
44												
45	S&H		9	37	ML	SILT (ML) olive-gray to brown, hard, wet			43.1	21.5	106	
46			18		ML							
47			35									
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

Boring terminated at a depth of 46.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater stabilized at 28.5 feet at time of drilling.
PP = pocket penetrometer.

¹ S&H and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.7 and 1.2, respectively to account for sampler type and hammer energy.
² Elevations based on Oakland City Datum. Elevations referenced were obtained from the ALTA Survey performed by Luk and Associates, dated 20 April 2016.



Project No.:
750635601

Figure:
B-2b

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-14

Boring location: See Figure 2

Logged by: J. Sanglerat
Drilled by: Gregg Drilling

Date started: 11/3/16

Date finished: 11/4/16

Drilling method: Hollow Stem Auger

Hammer weight/drop: 140 lbs./30 inches

Hammer type: Safety Auto

Samplers: Sprague & Herwood (S&H), Standard Penetration Test (SPT), Shelby Tube (ST)

LABORATORY TEST DATA

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
	Sampler Type	Sample	Blows/ 6"	SPT N-Value ¹								
1						4 inches concrete slab						
2						CLAYEY SAND with GRAVEL (SC) dark brown, moist, fine- to medium-grained, fine subangular gravel						
3					SC							
4												
5												
6	SPT		7 5 6	13		SANDY CLAY (CL) yellow-brown with black mottling, stiff, moist, fine-grained sand						
7						CLAY (CL) yellow-brown, very stiff, mist, trace fine-grained sand						
8					CL							
9						CLAY (CL) yellow-brown, very stiff, mist, trace fine-grained sand						
10												
11	S&H		10 14 20	24								
12						olive-brown with trace black mottling						
13												
14												
15						CLAY (CL) yellow-brown, very stiff, mist, trace fine-grained sand						
16	S&H		11 17 20	26							25.9	100
17						CLAY (CL) yellow-brown, very stiff, mist, trace fine-grained sand						
18					CL							
19												
20						Triaxial Test, see Figure C-6						
21	ST		250 psi					TxUU PP	2,000 3,600 4,500		25.7	96
22						SANDY CLAY (CL) yellow-brown, very stiff, wet, fine-grained sand LL = 33, PI = 17, see Figure C-2 (11/3/16, 3:15 p.m.)						
23												
24												
25						SANDY CLAY (CL) yellow-brown, very stiff, wet, fine-grained sand LL = 33, PI = 17, see Figure C-2 (11/3/16, 3:15 p.m.)						
26	S&H		6 12 21	23				PP	3,000		57.9	
27												
28												
29												
30												

FILL

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

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Project No.: 750635601

Figure: B-3a

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-14

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA						
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft	
31	S&H		5 13 20	23	CL	CLAY with SAND (CL) olive-gray, very stiff, wet, fine-grained sand	PP		3,500				
32													
33													
34													
35													
36	S&H		6 11 25	31		olive-gray to gray, hard	PP		>4,500				
37													
38													
39													
40													
41													
42													
43													
44													
45													
46													
47													
48													
49													
50													
51													
52													
53													
54													
55													
56													
57													
58													
59													
60													

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

Boring terminated at a depth of 36.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater stabilized at 26.5 feet at time of drilling.
PP = pocket penetrometer.

¹ S&H and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.7 and 1.2, respectively to account for sampler type and hammer energy.
² Elevations based on Oakland City Datum. Elevations referenced were obtained from the ALTA Survey performed by Luk and Associates, dated 20 April 2016.



Project No.:
750635601

Figure:
B-3b

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-15

Boring location: See Figure 2

Logged by: J. Sanglerat
Drilled by: Gregg Drilling

Date started: 11/4/16

Date finished: 11/4/16

Drilling method: Hollow Stem Auger

Hammer weight/drop: 140 lbs./30 inches

Hammer type: Safety Auto

Samplers: Sprague & Herwood (S&H), Standard Penetration Test (SPT), Shelby Tube (ST)

LABORATORY TEST DATA

DEPTH (feet)	SAMPLES					LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
	Sampler Type	Sample	Blows/ 6"	SPT N-value ¹									
1							4 inches of concrete slab						
2							CLAYEY SAND with GRAVEL (SC) yellow-brown, moist, fine-grained, fine subangular gravel						
3						SC							
4													
5													
6	S&H		9 11 12	16			SANDY CLAY (CL) yellow-brown with trace black inclusions, very stiff, moist, medium-grained Consolidation Test, see Figure C-5	PP		1,250			
7												30.8	89
8													
9													
10													
11	S&H		3 5 9	10		CL	olive-gray with trace black mottling, stiff, moist, fine- to medium-grained sand	PP		2,500 to 3,000			
12													
13													
14													
15													
16	ST		200 psi				SANDY CLAY (CL) olive-gray, moist, medium-grained sand, fine subangular gravel Particle Size Analysis, see Figure C-3	PP		1,500			
17						CL					59.9	22.9	104
18													
19													
20													
21	S&H		8 33 31	45		SC	lense of CLAYEY SAND (SC) olive-gray, medium-grained, dense, moist	PP		4,000			
22						CL	CLAY with trace SAND (CL) olive-gray, hard, mist, fine- to medium-grained sand						
23													
24													
25													
26	S&H		4 8 15	16		CL	CLAY with trace SAND and SILT (CL) olive-gray to dark gray, very stiff, moist, fine-grained sand						
27													
28													
29						SP-SC	SAND with CLAY (SP-SC) olive-gray, medium dense, moist, fine-grained						
30													

FILL

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

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Project No.: 750635601

Figure: B-4a

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-15

PAGE 2 OF 2

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA								
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft			
31	S&H		8	26		SAND with CLAY (SP-SC) (continued)									
32			19			CLAYEY SAND (SC)				45.6	20.4	108			
33			18		SC	olive-gray with yellow-brown mottling, very stiff, moist, fine-grained LL = 36, PI = 17, see Figure C-2									
34															
35															
36	S&H		6	27	CL	CLAY (CL)									
37			15			olive-gray with brown mottling, wet, very stiff, trace fine-grained sand									
38			23												
39															
40															
41															
42															
43															
44															
45															
46															
47															
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57															
58															
59															
60															

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

Boring terminated at a depth of 36.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at 32.5 feet (not stabilized).
PP = pocket penetrometer.

¹ S&H and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.7 and 1.2, respectively to account for sampler type and hammer energy.
² Elevations based on Oakland City Datum. Elevations referenced were obtained from the ALTA Survey performed by Luk and Associates, dated 20 April 2016.

LANGAN

Project No.:
750635601

Figure:
B-4b

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-16

PAGE 1 OF 2

Boring location: See Figure 2

Logged by: J. Sanglerat
Drilled by: Gregg Drilling

Date started: 11/4/16

Date finished: 11/4/16

Drilling method: Hollow Stem Auger

Hammer weight/drop: 140 lbs./30 inches

Hammer type: Safety Auto

Samplers: Sprague & Herwood (S&H), Standard Penetration Test (SPT), Shelby Tube (ST)

LABORATORY TEST DATA

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
	Sampler Type	Sample	Blows/ 6"	SPT N-Value ¹								
1						6 inches of concrete slab						
2					SC	CLAYEY SAND with GRAVEL (SC) yellow-brown, moist, fine- to medium-grained						
3												
4												
5	S&H		8	18	CL	CLAY with SAND (CL) yellow-brown, very stiff, moist, fine-grained sand LL = 45, PI = 25, see Figure C-2 strong hydrocarbon odor at 6.5 feet	PP		>4,500		23.9	102
6			9									
7												
8					SP- SC	SAND with CLAY (SP-SC) yellow-brown, medium dense, moist, fine-grained						
9												
10	S&H		8	28							24.5	99
11			15									
12					SC	CLAYEY SAND (SC) yellow-brown, medium dense, mist, fine-grained reduced hydrocarbon odor at 12 feet LL = 30, PI = 11, see Figure C-2						
13												
14												
15	S&H		4	27	CL	SANDY CLAY (CL) yellow-brown to olive-gray trace orange-brown and black inclusions, very stiff, fine- to coarse-grained sand color change to gray at 18 feet, strong hydrocarbon odor LL = 40, PI = 23, see Figure C-2				58.2		
16			13									
17												
18												
19												
20	S&H		4	21	CL	CLAY (CL) gray, very stiff, wet, fine-grained sand strong hydrocarbon odor Triaxial Test, see Figure C-6	PP TxUU	2,100	>4,500 5,700		22.3	105
21			9									
22												
23												
24												
25	S&H		6	26	CL	no hydrocarbon odor at 24 feet, color chage to yellow-brown SANDY CLAY (CL) yellow-brown, very stiff, moist to wet, fine- to medium-grained sand (11/4/16. 12:33 p.m.)	PP		2,500			
26			15									
27												
28												
29												
30												

LANGANProject No.:
750635601Figure:
B-5a

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

PROJECT:

3000 BROADWAY
Oakland, California

Log of Boring B-16

DEPTH (feet)	SAMPLES				LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA					
	Sampler Type	Sample	Blows/6"	SPT N-Value ¹			Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	S&H		8	28	CL	CLAY (CL) olive-brown, very stiff, wet, with hard silty nodules	PP	4,000				
32			14									
33			17									
34				21	CH	CLAY (CH) brown with trace black specks, very stiff, wet LL = 63, PI = 41, see Figure C-2	PP	3,000		30.2	94	
35	S&H		7									
36			14									
37			16									
38												
39												
40												
41												
42												
43												
44												
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56												
57												
58												
59												
60												

TEST GEOTECH LOG 750635601-GEOTECH - 3000-BROADWAY.GPJ TR.GDT 12/20/16

Boring terminated at a depth of 36.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater stabilized at 27 feet at time of drilling.
PP = pocket penetrometer.

¹S&H and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.7 and 1.2, respectively to account for sampler type and hammer energy.
²Elevations based on Oakland City Datum. Elevations referenced were obtained from the ALTA Survey performed by Luk and Associates, dated 20 April 2016.



Project No.:
750635601









Figure:
B-5b

UNIFIED SOIL CLASSIFICATION SYSTEM


Major Divisions	Symbols	Typical Names
Coarse-Grained Soils (more than half of soil > no. 200 sieve size)	Gravels (More than half of coarse fraction > no. 4 sieve size)	GW Well-graded gravels or gravel-sand mixtures, little or no fines
		GP Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM Silty gravels, gravel-sand-silt mixtures
		GC Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW Well-graded sands or gravelly sands, little or no fines
		SP Poorly-graded sands or gravelly sands, little or no fines
		SM Silty sands, sand-silt mixtures
Fine -Grained Soils (more than half of soil < no. 200 sieve size)	Silts and Clays LL = < 50	ML Inorganic silts and clayey silts of low plasticity, sandy silts, gravelly silts
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL Organic silts and organic silt-clays of low plasticity
	Silts and Clays LL = > 50	MH Inorganic silts of high plasticity
		CH Inorganic clays of high plasticity, fat clays
		OH Organic silts and clays of high plasticity
Highly Organic Soils	PT Peat and other highly organic soils	

SAMPLE DESIGNATIONS/SYMBOLS

GRAIN SIZE CHART		
Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel coarse fine	3" to No. 4	76.2 to 4.76
	3" to 3/4" 3/4" to No. 4	76.2 to 19.1 19.1 to 4.76
Sand coarse medium fine	No. 4 to No. 200	4.76 to 0.075
	No. 4 to No. 10	4.76 to 2.00
	No. 10 to No. 40 No. 40 to No. 200	2.00 to 0.420 0.420 to 0.075
Silt and Clay	Below No. 200	Below 0.075

-  Sample taken with Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter. Darkened area indicates soil recovered
-  Classification sample taken with Standard Penetration Test sampler
-  Undisturbed sample taken with thin-walled tube
-  Disturbed sample
-  Sampling attempted with no recovery
-  Core sample
-  Analytical laboratory sample
-  Sample taken with Direct Push or Drive sampler

 Unstabilized groundwater level

 Stabilized groundwater level

SAMPLER TYPE

- | | |
|--|---|
| <p>C Core barrel</p> <p>CA California split-barrel sampler with 2.5-inch outside diameter and a 1.93-inch inside diameter</p> <p>D&M Dames & Moore piston sampler using 2.5-inch outside diameter, thin-walled tube</p> <p>O Osterberg piston sampler using 3.0-inch outside diameter, thin-walled Shelby tube</p> | <p>PT Pitcher tube sampler using 3.0-inch outside diameter, thin-walled Shelby tube</p> <p>S&H Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter</p> <p>SPT Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside diameter and a 1.5-inch inside diameter</p> <p>ST Shelby Tube (3.0-inch outside diameter, thin-walled tube) advanced with hydraulic pressure</p> |
|--|---|

3000 BROADWAY
Oakland, California

CLASSIFICATION CHART

LANGAN

Date 12/7/16	Project No. 750635601	Figure B-6
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