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ENVIRONMENT

Subject:
Site Investigation and Soil Vapor Sampling Report
Former Atlantic Richfield Company Station No. 4931
731 West MacArthur Boulevard
Oakland, California 94609
ACEH Site No. RO0000076

Date:
December 16, 2016

Dear Mr. Detterman:

Arcadis U.S., Inc. (Arcadis) has prepared this report on behalf of the Atlantic Richfield Company, a BP affiliated company (ARCO), for the former ARCO service station listed below.

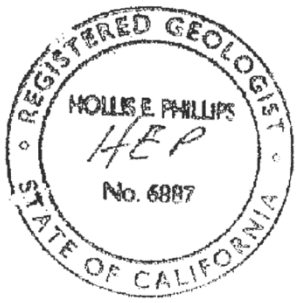
ARCO Facility No.	ACEH Site No.	Location
4931	RO0000076	731 West MacArthur Blvd., Oakland, CA

I declare, to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct. If you have any questions or comments regarding the content of this report, please contact Hollis Phillips by telephone at 415.432.6903 or by e-mail at hollis.phillips@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Hollis E. Phillips, P.G. (No. 6887)
Principal Geologist/Project Manager



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ARCADIS Design & Consultancy for natural and built assets

Atlantic Richfield Company,

a BP-affiliated company

SITE INVESTIGATION AND SOIL VAPOR SAMPLING REPORT

Former Atlantic Richfield Company Station No. 4931

731 West MacArthur Boulevard

Oakland, California 94609

ACEH Site No.: RO0000076

December 16, 2016

SITE INVESTIGATION AND SOIL VAPOR SAMPLING REPORT

Prepared for:

Former Atlantic Richfield Station No. 4931

731 West MacArthur Boulevard

Oakland, California 94609

ACEH Site No.: RO0000076

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ACRONYMS AND ABBREVIATIONS

1,2-DCA	1,2-dichloroethane
ACEH	Alameda County Environmental Health
ACPWA	Alameda County Public Works Agency
Arcadis	Arcadis U.S., Inc.
ARCO	Atlantic Richfield Company
bgs	below ground surface
BP	British Petroleum
BTEX	Benzene, toluene, ethylbenzene, and xylenes
COPC	constituent of potential concern
EDB	1,2-dibromoethane
ESL	Environmental Screening Level
GRO	Gasoline range organics (C6 - C12)
HASP	Health and Safety Plan
inHg	inches of Mercury
IWM	Integrated Wastestream Management, Inc.
IDW	Investigation-derived waste
LTC Policy	Low-Threat Underground Storage Tank Case Closure Policy
µg/m^3	micrograms per cubic meter
mg/kg	milligrams per kilogram
mL	milliliters
mL/min	milliliters per minute
MTBE	Methyl tert-butyl ether
%v	percent by volume
PID	Photo-ionization detector
SCM	Site Conceptual Model
SF-RWQCB	San Francisco Bay–Regional Water Quality Control Board
Site	Former ARCO Service Station No. 4931, located at 731 West MacArthur Boulevard, Oakland, California
SWRCB	State Water Resources Control Board
TAME	tert-amyl-methyl ether

TBA	Tert-butyl alcohol
TestAmerica	TestAmerica Laboratories, Inc.
TPH	Total petroleum hydrocarbons
USA-North	Underground Service Alert
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound

1 INTRODUCTION

Arcadis U.S., Inc. (Arcadis) has prepared this *Site Investigation and Soil Vapor Sampling Report* for the former ARCO service station No. 4931 located at 731 West MacArthur Boulevard in Oakland, California (the 'Site'; Figure 1). This report presents the results of soil and soil vapor sampling performed at the Site between October 31, 2016 and November 7, 2016. The recent sampling activities were performed to satisfy the Alameda County Environmental Health (ACEH) May 10, 2016 (ACEH 2016a) request for further site investigation to fill data gaps identified by ACEH that it requires necessary in order to close the Site under the State Water Resources Control Board (SWRCB) Low Threat Closure (LTC) Policy. The sampling activities for this work were proposed to ACEH in the *Site Investigation Work Plan* dated July 25, 2016 (Work Plan; Arcadis 2016). ACEH approved the Work Plan with comments in its letter dated September 8, 2016 (ACEH 2016b).

Based on the most recent soil and soil vapor analytical data collected along the site boundary, volatile petroleum hydrocarbon constituent concentrations are not expected to pose adverse health effects to current and future occupants of the residence adjacent to the Site located at 721 West MacArthur Boulevard. The following sections present the information evaluated to support this conclusion.

1.1 Site Background

The Site is located at the south-eastern corner of the intersection of West MacArthur Boulevard and West Street in Oakland, California. Currently, the Site is an active Westco Gasoline-branded retail fuel dispensing facility. Site features include a service station building, three fuel dispenser islands, and four 10,000-gallon doubled-wall fiberglass gasoline underground storage tanks (USTs; Figure 2). With the exception of landscaped planters along portions of the property boundary, the Site is covered with asphalt and/or concrete.

Commercial and residential properties are in the vicinity of the Site. The Site is bound by West MacArthur Boulevard to the north-northeast and West Street to the west-northwest. Residential dwellings are located adjacent to the Site along the south and east property boundaries. An automotive repair facility, Auto Mechs, and residential dwellings are located directly west and southwest of the Site beyond West Street. A Big-O Tires-branded service center is located on the northwest corner of the intersection of West MacArthur Boulevard and West Street. An oil change service center, Insta Lube, is located on the northeast corner of the intersection of West MacArthur Boulevard and West Street. Interstate 580 is

located approximately 600 feet south-southwest of the Site and Highway 24 is located approximately 1,000 feet east of the Site (Figure 1).

As shown on Figure 2, the Site and vicinity currently have 15 groundwater monitoring wells (A-2 through A-13 and AR-1 through AR-3), one soil vapor extraction well (AV-1), nine soil vapor probes (SV-1 through SV-9), and three sub-slab vapor probes (SS-SV-1 through SS-SV-3). Available records indicate that the groundwater monitoring wells are screened at depths ranging from 5 to 40 feet below ground surface (bgs).

1.2 Summary of Completed Activities

In its May 10, 2016 letter, ACEH identified several data gaps to be filled in order to provide a complete site conceptual model (SCM). The following information is required by ACEH to provide sufficient data that would allow the Site to be eligible for [Low-Threat Closure] LTC (ACEH 2016a):

- Potential receptor separation distance from contamination; and
- Potential vapor intrusion into the offsite residential home adjacent to the Site to the east.

To investigate the data gaps identified above, the following field activities were performed:

- Installed four soil borings (SB-08 through SB-11) along the Site property line with the adjacent residential property at 721 West MacArthur Boulevard and collected soil samples from each boring;
- Measured first groundwater depths at each soil boring;
- Installed one additional soil vapor probe (SV-9) at the property line with the adjacent residential property at 721 West MacArthur Boulevard;
- Collected soil vapor samples from the three soil vapor probes (SV-7, SV-8, and SV-9) located along the property line with the adjacent residential property at 721 West MacArthur Boulevard; and
- Inspected the crawl space and partial basement of 721 West MacArthur Boulevard.

Figure 2 shows the locations of the soil borings, soil vapor probes, and the crawl space/partial basement at 721 West MacArthur Boulevard.

1.3 Pre-Field Activities

Prior to initiating drilling activities, the site-specific Health and Safety Plan (HASP) was updated in accordance with state and federal requirements for use during the proposed field activities. All necessary permits and licenses were obtained prior to the initiation of subsurface investigations including subsurface

drilling permits W2016-0742 through W2016-0743 from the Alameda County Public Works Agency (ACPWA). Permits obtained for this project are included in Appendix A.

Underground utilities and other potential subsurface obstructions in the vicinity of the proposed sample locations were located and marked prior to initiation of subsurface activities. The utility survey included identifying the boring locations using white paint and obtaining an Underground Service Alert (USA-North) ticket number. A private utility locator was contracted to identify subsurface utilities prior to installing the proposed soil borings and soil vapor probe. Field personnel identified the location, direction, and depth of utilities at the Site using a ground penetrating radar device, electromagnetic survey equipment, and a radio frequency receiver.

2 SOIL BORING COMPLETIONS

Four direct push soil borings were advanced along the Site property line adjacent to residence located at 721 West MacArthur Boulevard. At the request of ACEH in its September 8, 2016 letter, one soil boring (SB-08) was located in the area of former soil sample SW6, which was a former UST pit excavation sidewall sample collected on November 22, 1991. Because SW6 contained relatively higher residual soil petroleum hydrocarbon concentrations than other sidewall samples collected at the time of the 1991 – 1992 UST excavation, ACEH requested a soil boring at SW6 to facilitate an understanding of the magnitude of the change in soil contaminant concentrations and the risk of vapor intrusion (ACEH 2016b).

The three other soil borings (SB-09, SB-10, and SB-11) were spaced approximately 20 feet apart from each other along the site property line between soil vapor probes SV-7 and SV-8. The purpose of these soil borings was to further assess soil conditions along the northeast property line and to delineate possible petroleum hydrocarbon mass adjacent to the residence at 721 West MacArthur Boulevard. In addition, the data from these borings may be used to support the understanding of hydrogeological conditions in the immediate area of the nearby residence to determine the separation distance between the ground surface and groundwater, and to evaluate a potential source of gasoline range organics (GRO) vapor concentrations previously detected at SV-8 in May 2015 (Arcadis 2016).

2.1 Soil Boring Advancement and Sampling

Prior to drilling, the soil boring locations were cleared to a minimum depth of 6.5 feet bgs with a hand auger. Once cleared, the soil borings were advanced further with a direct-push probing rig equipped for soil sample collection. Continuous soil samples were collected in acetate sample liners from below the

hand-cleared depth of 6.5 feet bgs to the total depth of each boring. Encountered subsurface materials were logged continuously for stratigraphic characteristics (such as, contacts, moisture, staining, and odors) under the supervision of a California Professional Geologist. Additional observations were noted in the field log regarding relative volatile organic compound (VOC) concentrations as measured with a photo-ionization detector (PID) from soil headspace screenings. Soil boring logs are included in Appendix B.

Direct push soil borings were terminated at the water table, based on the observation of saturated soils and/or groundwater flowing into the bottom of the borehole. Depth to first groundwater and subsequent total depths of each boring are as followed:

Table A. Depth to First Groundwater during Soil Boring Advancement

Soil Boring Location	Depth to First Groundwater (feet bgs)	Total Depth of Soil Boring (feet bgs)
SB-08	20.5	24
SB-09	20.5	24
SB-10	20.5	24
SB-11	22	24

2.1.1 Soil Sampling

Soil samples were collected from each soil boring for analytical testing. Generally, soil samples were collected from intervals that exhibited the most significant indications of petroleum hydrocarbon impacts based on odor, elevated PID readings, or staining. At soil borings SB-09 through SB-11, a minimum of one soil sample was collected from the interval between 0 to 5 feet bgs and one from the interval from 5 to 10 feet bgs based on specific depth interval criteria presented in the LTC Policy for direct contact and outdoor air exposure (SWRCB 2012). Additionally, one soil sample was collected from the bottom of each boring to assess the vertical extent of petroleum hydrocarbon constituent of potential concern (COPC)-impacted soils.

Additional soil samples were collected as necessary based on field observations. Soil sampling at SB-08 was generally conducted as described for the other three borings, however, a sample was specifically collected between 12 and 12.5 feet bgs to compare current soil conditions to the results from former soil sample SW6 collected on November 22, 1991. In 1991, SW6 was collected at the property boundary

between the Site and the residence at 721 West MacArthur Boulevard, and contained relatively higher concentrations of COPCs than other excavation UST pit sidewall samples collected in its vicinity.

Sampling for laboratory analytical testing was completed by United States Environmental Protection Agency (USEPA) Method 5035/5035A, which includes the placement of soil into EnCore samplers from each sampled location.

Soil samples were sealed, labelled, and placed in an ice-chilled cooler for delivery to TestAmerica Laboratories, Inc. (TestAmerica) of Pleasanton, California, a California Department of Public Health-certified analytical laboratory, under proper chain of custody procedures. Soil samples were analyzed for the following COPCs:

- Gasoline Range Organics (GRO C_6-C_{12}) using USEPA Method 8015 Modified;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) using USEPA Method 8260B;
- Methyl tert-butyl ether (MTBE), tert-butyl alcohol (TBA), tert-amyl-methyl ether (TAME), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol by USEPA Method 8260B; and
- Naphthalene by USEPA Method 8260B.

2.1.2 Soil Boring Abandonment

Upon completion of soil sampling activities, the borings were abandoned in accordance with the ACPWA requirements. The borings were grouted through a tremie pipe from the total depth to ground surface using neat cement (composed of two sacks [47 pounds] of Portland Cement and approximately 6 gallons of water), or as directed by the onsite ACPWA grout inspector. The ground surfaces at each location were restored with materials consistent with surrounding areas.

3 SOIL VAPOR ASSESSMENT

As directed in its letter dated September 8, 2016, ACEH requested the installation of an additional soil vapor probe in order to determine the potential for vapor intrusion to the residential house at 721 West MacArthur Boulevard (ACEH 2016b). The September 8, 2016 letter further directed the installation of a contingency soil vapor probe near former soil sample SW6. The contingency soil vapor probe was to be installed if concentrations of site COPCs in the soil samples collected from SB-08 exceed SWRCB LTC Policy screening criteria. As will be reported below in Section 6.2, the analyzed constituents in SB-08 soil samples were below laboratory reporting limits with the exception of one sample at 12 feet bgs which

contained a trace concentration of MTBE (0.015 milligrams per kilogram [mg/kg]). Therefore, the contingency soil vapor probe was not installed.

One permanent sampling point was installed so that repeated sampling can be conducted, as necessary, to evaluate seasonal variations. The installation and subsequent sampling was completed in accordance with the Advisory - Active Soil Gas Investigations guidance (Soil Gas Advisory; Department of Toxic Substances Control [DTSC] 2015). Soil vapor probe locations are shown on Figure 2.

3.1 Residential House Crawl Space and Partial-Basement Inspection

Prior to drilling activities, Arcadis personnel performed a reconnaissance of the crawl space and partial basement at the residential house located at 721 West MacArthur Boulevard on November 1, 2016. Permission was granted by the tenant to access the area beneath the residential house through the above ground crawl space doors along the western portion of the residence. The house is above grade and there is approximately three feet of crawl space between grade and the first-floor living space of the house. Arcadis personnel discovered that the above grade crawl space was present beneath the majority of the residence. The crawl space ground is earthen throughout. Arcadis noted three access doors and windows along the crawl space, along with crawl space vents. The ground surface of the crawl space was covered with loose debris and rubbish. Several utilities were observed entering the house through the crawl space.

An area in the southwest corner of the house is a partial basement. This feature is considered a partial basement as only part of the first-floor living space of the house is over this area and the remainder of it is over the crawl space. Furthermore, the partial basement is considered a ‘daylight’ basement as half of it is above ground and it contains windows and a doorway to the outside. Arcadis was not permitted to access the partial basement however, the tenant was willing to discuss the size and condition of this feature as well as allow Arcadis to inspect its exterior.

The tenant informed Arcadis that the partial basement is present in the rear of the residence and runs parallel to the gas station property. The floor area of the partial basement is approximately 12 feet by 10 feet, extending laterally from the back of the house (from the southwest corner of the residence) to 12 feet toward the street, and 10 feet from the southwest corner of the residence toward the centreline of the house. The tenant stated that the floor of the partial basement is at about 3 feet bgs and that the ground surface is paved with concrete. The upper 3 feet of the basement is above ground and at the height of the crawl space.

Besides the concrete flooring, the partial basement is unfinished. The partial basement was further described as a dug-out feature beneath the house, inferring that the concrete flooring is structurally not part of the foundation; only the walls of the crawl space and partial basement form the foundation of the house. An exterior door at the rear of the residence leads into the partial basement. The bottom of this door is approximately 3 feet below the surrounding grade and the tenant stated that the partial basement's floor is flush with the bottom of the door. As such, there is a 6-foot high ceiling in the partial basement, with 3 feet of space above grade and 3 feet of space below grade. The tenant further stated that no pumps or sumps are present partial basement.

Although Arcadis was not able to visually inspect the interior partial basement, the tenant's statements appear to be accurate based on the crawl space observations and what could be observed from the windows and door located along the exterior of the residence where the tenant described the partial basement. Figure 2 outlines the areas of the crawl space and partial basement at 721 West MacArthur Boulevard.

3.2 Soil Vapor Probe Installation

Soil vapor probe SV-9 was installed on November 1, 2016. The surface materials at the soil vapor probe location were cored with a concrete coring machine that removed an approximate 4-inch diameter cylinder of the pavement and aggregate material to expose the subsoil. Once the surface materials core was removed, the soil vapor probe was installed to 8 feet bgs with a hand auger. The total depth of the soil vapor probe (8 feet bgs) was selected based on the depth of the partial basement floor being at 3 feet bgs and direction from ACEH in its September 8, 2016 letter to place the new soil vapor probe 5 feet below the partial basement foundation.

During advancement of the probe's borehole, soil samples were collected continuously from ground surface to the total completion depth with the hand auger. Retrieved soil was logged as described above in Section 2.1. The soil boring log for SV-9 is included in Appendix B.

3.3 Soil Vapor Probe Construction

The soil vapor probe was constructed with a stainless-steel soil vapor screen implant 6 inches long and 0.5-inch in diameter, with a slot size of 0.01 inch. The soil vapor screen implant was connected to Teflon-lined polyethylene tubing to enable sampling at the ground surface. Valves were installed at the tube ends that can be closed when sampling is not being conducted. The vapor screen implant was set from approximately 7.25 to 7.75 feet bgs. Approximately three inches of #3 Sand were placed in the borehole

above and below the implant. A 1-foot interval of dry granular bentonite was placed above the sand pack. A limited amount (<2 inches) of hydrated granular bentonite was placed above the dry granular bentonite to secure the sand pack from the grout mixture. Following the thin layer of hydrated granular bentonite, a neat cement grout mixture was added. Near the surface, the probe was completed with approximately 6-inches of concrete and completed with a flush-mounted well box. A schematic drawing of the soil vapor probes is presented in Figure 3.

3.4 Soil Sampling at Vapor Probe Location

Soil samples from the probe location were collected for petroleum hydrocarbon assessment at the following depth intervals:

- 2.5 to 3 feet bgs;
- 4.5 to 5 feet bgs; and
- 7.5 to 8 feet bgs.

Sample intervals designated for laboratory analysis were collected with a hand auger and placed into appropriate laboratory supplied sample containers, labelled, and placed in an ice-chilled cooler for delivery to a TestAmerica, under proper chain-of-custody procedures. The selected soil samples were analyzed for the constituents stated above in Section 2.1.1.

3.5 Soil Vapor Sampling

All three soil vapor probes (SV-7, SV-8, and SV-9) located along the property boundary between the Site and the residential house at 721 West MacArthur Boulevard were sampled on November 7, 2016. Due to the introduction of atmospheric oxygen into the vadose zone during soil vapor probe installation, an equilibration time is required to allow the sand pack and tubing at SV-9 to equilibrate with the subsurface prior to sampling. A minimum of 72 hours was allowed for equilibration following soil vapor probe installation.

Soil vapor sampling was performed using laboratory-supplied 1-liter Summa canisters. Using small (1-liter, or similar) Summa canisters is desirable to minimize the potential for breakthrough of ambient air into the samples as described in Section 3.6 of the Soil Gas Advisory (DTSC 2015). The laboratory-supplied Summa canisters were batch certified by the laboratory prior to field receipt.

Soil gas assembly tests were conducted at each probe prior to sample collection as recommended in Section 4.2 of the Soil Gas Advisory. These pre-sampling tests included shut-in and leak tests that were completed before soil gas samples were collected (DTSC 2015).

3.6 Shut-In Tests

Prior to purging or sampling, a shut-in test was conducted to check for leaks in the above-ground sampling system using the guidelines from Section 4.2.1 of the Soil Gas Advisory (DTSC 2015) to determine the integrity of the sampling system. During the shut-in test, the above-ground valves, lines and fittings used to collect the sample were assembled and capped. The shut-in test was conducted while the sampling canister was attached with its valve in the closed position. The system was evacuated to a minimum measured vacuum of about 100 inches of water (7.35 inches of mercury [inHg]) using a syringe as measured via a vacuum gauge connected to the system with a T-fitting. The sample train was allowed to acclimate for approximately 10 minutes and no leaks were noted. Soil vapor sampling field notes are included in Appendix C.

After the shut-in test was completed and no leaks were found, a three-way valve (connecting the syringe and sorbent tube to the sample train) was placed outside of the shroud so that the shroud helium atmosphere could establish before purging began. The remaining valves, tubing, fittings, gauges, and Summa canister were left inside the shroud. The vapor probe caps were removed and the sample train tubing was connected to the sample probe using a short piece of new silicone tubing.

3.7 Leak Tests

A leak test was used to evaluate whether ambient air was introduced into the soil gas sample during the collection process and to further determine the integrity of the sampling system. The well head and entire sampling train (valves, tubing, fittings, gauges, and Summa canister) were placed in the sampling shroud. Helium gas, as recommended by the guidelines from Subsection 4.2.2.2 of the Soil Gas Advisory (DTSC 2015), was used as a tracer compound for the leak test. The tracer compound was permitted into the shroud and monitored for concentration stability using a helium detector (model: Radio detection MGD-2002) with its port located near ground surface. Once the shroud atmosphere maintained a helium concentration between 10% to 20%, purging and sampling commenced at a soil vapor probe.

3.8 Purging

Purging consisted of removing approximately one volume of stagnant soil gas from the sampling system to ensure that samples are representative of subsurface conditions. A vacuum pump purged each probe

at a flow rate of approximately 150 to 200 milliliters per minute (mL/min). The purge volume was calculated by considering the internal volume of the sample tubing as well as the aboveground gauges and sampling equipment.

3.9 Soil Vapor Sample Collection

Following purging, the soil vapor samples were collected using evacuated 1-liter Summa canisters and TO-17 sorbent tubes with a laboratory-provided flow regulator (combined with a laboratory-provided soil vapor sampling manifold) set to collect a sample at approximately 100 mL/min. The valve on the sampling train was opened, allowing soil gas to flow into the Summa canisters until the vacuum gauge read approximately -5 inHg. Initial and final vacuum gauge readings were taken and recorded on the chain-of-custody form and on the laboratory-supplied sample labels included on each Summa canister. The TO-17 samples were collected by pulling approximately 75 milliliters (mL) of sample volume through the sorbent tubes via the syringe. Additionally, a shroud atmosphere sample was collected to verify an appropriate volume of helium (tracer gas) was present in the shroud during sample collection. Helium concentrations were maintained at approximately 6% to 21% in the shroud for the duration of purging and sampling (Appendix C).

Soil vapor samples in the sorbent tubes were placed in an ice-pack chilled cooler (Summa canisters were not placed in chilled coolers). The soil vapor samples were delivered under appropriate chain-of-custody protocols to a to Eurofins Calscience, Inc. (Calscience) of Garden Grove, California, a California Department of Public Health certified analytical laboratory, under proper chain-of-custody procedures. The soil vapor samples were analyzed for the presence of the following constituents:

- Fixed gases (methane, carbon dioxide, oxygen, and helium) using Modified ASTM Method D-1946;
- GRO using USEPA Method TO-3M;
- BTEX; MTBE, TBA; DIPE; ETBE, TAME; ethanol; 1,2-DCA; and EDB using USEPA Method TO-15; and
- Naphthalene by USEPA Method TO-17 (sorbent tubes only).

Please note that the shroud atmosphere sample was only tested for helium.

4 DECONTAMINATION

Down-hole drilling and sampling equipment was steam-cleaned prior to deployment and following the completion of each sampling location. Decontamination of non-dedicated or non-disposable field equipment was conducted using a Liquinox® solution and deionized water rinse before and after each sampling location to prevent cross-contamination.

5 INVESTIGATION-DERIVED WASTE DISPOSAL

Investigation-derived waste (IDW) generated during investigation activities included soil cuttings, decontamination fluids, purge/rinse water, personal protective equipment (PPE), and other disposable sampling materials. Soil cuttings derived from hand augering and direct push rig as well as wastewater from decontamination procedures were placed in 55-gallon steel drums. PPE, such as nitrile gloves, and disposable supplies, such as paper and plastic, was treated as municipal waste. Composite soil and aqueous samples of IDW were collected for waste profiling purposes. On November 30, 2016, drums were removed from the work area by Integrated Wastestream Management, Inc. (IWM). A copy of the certificates of disposal documenting proper off-site transport and disposal of the IDW is provided in Appendix D.

6 DISCUSSION OF RESULTS

A total of 19 soil samples and three soil vapor samples (plus a duplicate soil vapor sample) were collected during the recent investigation activities performed at the Site. Soil sample results are presented in Table 1 and presented on Figure 4. Soil vapor sample results are presented in Table 2 and presented on Figure 5. Laboratory analytical reports and chain of custody documentation are included in Appendix E. The results and evaluation of the analytical data are described below.

6.1 Screening Levels for Constituents of Potential Concern

6.1.1 Soil Screening Levels

Depth interval-specific soil concentrations of the primary toxic constituents of petroleum fuel releases including; benzene, ethylbenzene, and naphthalene, were compared to residential, commercial and utility worker soil screening levels presented in *Table 1 - Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health* of the SWRCB LTC Policy (SWRCB 2012). To support risk management decisions for the Site, concentrations of COPCs detected in soil samples (particularly for those COPCs without LTC Policy criteria) were also compared to San Francisco

Bay Regional Water Quality Control Board (SF-RWQCB) Environmental Screening Levels (ESLs) to assess potential direct contact exposure to commercial and construction workers at the Site (Soil Direct Exposure Human) Health Risk Screening Level – Table S-1) (SF-RWQCB 2016).

Table 1 provides soil sample results and screening levels (SF-RWQCB ESLs – Table S-1 and SWRCB LTC Policy – Table 1). Discussion of the soil sample results provided below compares COPC concentrations detected above respective laboratory reporting limits to SF-RWQCB commercial/industrial land use ESLs. SF-RWQCB construction worker ESLs and SWRCB LTC Policy screening levels are included in the corresponding data table (Table 1).

6.1.2 Soil Vapor Screening Levels

Benzene, ethylbenzene and naphthalene soil vapor concentrations were compared to applicable SWRCB LTC Policy soil gas screening criteria (SWRCB 2012). Concentrations of COPCs detected in soil vapor samples were also compared to SF-RWQCB ESLs presented in *Table SG-1: Subslab/Soil Gas Vapor Intrusion Human Health Risk Screening Levels (Volatile Chemicals Only)* to assess 'Residential Vapor Intrusion Human Health Risk' and 'Commercial/Industrial Vapor Intrusion Human Health Risk' (SF-RWQCB 2016).

6.2 Soil Sample Results

Generally, the analytical results indicate limited detected COPC concentrations in the soil samples collected, with the majority of COPCs not detected above laboratory reporting limits or at concentrations significantly below SWRCB LTC Policy criteria and SF-RWQCB ESLs. Below is a summary of the results at each sampled location:

SB-08: Soil samples were collected at 5 - 5.5 feet bgs, 8 - 8.5 feet bgs, 12 - 12.5 feet bgs, and 23.5 - 24 feet bgs. COPC concentrations were not detected above respective laboratory reporting limits in any of the soil samples collected from SB-08, with the exception of the sample collected at 12 -12.5 feet bgs, which contained a trace concentration of MTBE at 0.015 mg/kg.

SB-09: Soil samples were collected at 4 - 4.5 feet bgs, 8 - 8.5 feet bgs, 17 - 17.5 feet bgs, 19.5 - 20 feet bgs, and 23.5 - 24 feet bgs. In the sample collected at 8 - 8.5 feet bgs, GRO was detected at 87 mg/kg. This value is significantly below the SF-RWQCB soil direct contact screening level for commercial/industrial land use of 3,900 mg/kg. The remaining COPCs were not detected at concentrations above respective laboratory reporting limits.

In the sample collected at 17 - 17.5 feet bgs, GRO, benzene, ethylbenzene, xylenes, and naphthalene were detected above laboratory detection limits but at concentrations below soil screening levels. The remaining COPCs were not detected at concentrations above respective laboratory reporting limits.

In the sample collected at 19.5 - 20 feet bgs, GRO, ethylbenzene, xylenes, and naphthalene were detected above laboratory detection limits but at concentrations below soil screening levels. The remaining COPCs were not detected at concentrations above respective laboratory reporting limits.

COPC concentrations were not detected above respective laboratory reporting limits in any of the soil samples collected from SB-09 at 4 - 4.5 feet bgs and 23.5 - 24 feet bgs.

SB-10: Soil samples were collected at 1 - 1.5 feet bgs, 9 - 9.5 feet bgs, 20.5 - 21 feet bgs, and 23.5 - 24 feet bgs. GRO was detected at concentrations ranging from 0.440 mg/kg (23.5 – 24 feet bgs) to 990 mg/kg (20.5 - 21 feet bgs) in samples collected from SB-10. Ethylbenzene was detected at a concentration of 11 mg/kg in the sampled collected at 20.5 - 21 feet bgs. The detected concentrations of GRO and ethylbenzene are below their SF-RWQCB soil ESLs for commercial/industrial land use of 3,900 mg/kg and 22 mg/kg, respectively. All other tested constituents were not detected above respective laboratory reporting limits in any soil sample collected from SB-10.

SB-11: Soil samples were collected at 1.5 - 2 feet bgs, 6 - 6.5 feet bgs, and 23.5 - 24 feet bgs. Tested constituents were not detected above respective laboratory reporting limits in any of the soil samples collected from SB-11.

SV-9: Soil samples were collected at 2.5 - 3 feet bgs, 4.5 - 5 feet bgs, and 7.5 - 8 feet bgs. Tested constituents were not detected above respective laboratory reporting limits in any of the soil samples collected from SV-9.

6.3 Soil Vapor Sample Results

Generally, the analytical results indicated limited COPC concentrations in the soil vapor samples collected, with the majority of COPCs not detected above laboratory reporting limits or at concentrations below SWRCB LTC Policy soil gas screening criteria and SF-RWQCB ESLs. Below is a summary of the results at each sampled location.

SV-7: Benzene and toluene were detected at 1.6 micrograms per cubic meter ($\mu g/m^3$) and 2.0 $\mu g/m^3$, respectively. The benzene concentration is below the no bioattenuation zone and with bioattenuation zone SWRCB LTC Policy soil gas screening criteria for residential and commercial land uses. Both of the

detected concentrations are below SF-RWQCB soil gas ESLs for residential and commercial land uses. Fixed gases carbon dioxide and oxygen were detected at 1.56% volume (%v) and 18.8%v, respectively; supporting an active bioattenuation zone. The remaining COPCs were not detected in soil vapor at concentrations above respective laboratory reporting limits.

SV-8: GRO was detected at 2,200,000 µg/m^3. There are not established soil gas screening criteria for GRO under the SWRCB LTC Policy, because the LTC Policy focuses on the primary individual toxic constituents of petroleum fuel releases. The GRO soil vapor concentration exceeds the SF-RWQCB ESLs for residential land use of 300,000 µg/m^3 and is below the SF-RWQCB ESLs for commercial land use of 2,500,000 µg/m^3; both assuming that a bioattenuation is not present. Fixed gases carbon dioxide and oxygen were detected at 8.39%v and 5.25%v, respectively; supporting that an active bioattenuation zone is present. The remaining COPCs were not detected at concentrations in soil vapor above respective laboratory reporting limits.

SV-9: GRO was detected at 68,000 µg/m^3; BTEX was detected at concentrations of 30 µg/m^3, 190 µg/m^3, 38 µg/m^3, and 130 µg/m^3 (total xylenes), respectively; and MTBE was detected at a concentration of 360 µg/m^3. The benzene and ethylbenzene concentrations are below the SWRCB LTC Policy soil gas screening criteria for residential and commercial land uses. In addition, all of the detected COPC soil vapor concentrations are below respective SF-RWQCB ESLs for residential and commercial land uses. Fixed gases helium, carbon dioxide, and oxygen were detected at 0.0312%v, 2.11%v and 14.1%v, respectively; supporting that an active bioattenuation zone is present. The remaining COPCs were not detected in soil vapor at concentrations above respective laboratory reporting limits.

6.4 Leakage Results

Helium was not detected above the laboratory reporting limit of 0.0100%v in samples SV-7 and SV-8. Trace levels of helium (leak check compound) were detected in SV-9 during the November 2016 event. Helium was detected in sample SV-9 at 0.0312%. The shroud atmosphere concentration was detected at 6.79%. The percent leakage was calculated using the following equation:

$$\%\ Leakage = \frac{Helium\ Concentration\ in\ Sample}{Helium\ Concentration\ in\ Shroud} \times 100$$

Therefore, the leakage value calculated for SV-9 was 0.46%. DTSC (2015) guidance allows up to 5% helium if quantitative tracer testing is performed. Therefore, this sample is deemed acceptable.

Helium and other fixed gas sample results from the November 7, 2016 sampling event are presented in Table 2 and in the laboratory-analytical report (Appendix E).

7 DATA EVALUATION

7.1 Soil Data Evaluation

Laboratory analysis of soil samples collected from soil borings SB-08 through SB-11 and from SV-9 indicate that soil along the property boundary between the Site and the residence at 721 West MacArthur Boulevard is not affected by site-related petroleum fuel COPCs. COPC concentrations were not detected above respective laboratory reporting limits in most all soil samples collected during the recent investigation. The limited number of detectable COPC concentrations are all significantly below their applicable SWRCB LTC Policy soil screening levels and respective SF-RWQCB ESLs. The soil sample results suggest that COPC-impacted soils are not present across the investigated area.

7.1.1 Separation Distance Evaluation

The recent soil boring investigation supports the understanding of hydrogeological conditions in the immediate area of the nearby residence by providing the data needed to determine the separation distance between 721 West MacArthur Boulevard's foundation and groundwater. Based on the depth-to-first-groundwater measurements recorded at the recent soil borings (SB-08 through SB-11) as presented above in Table A of Section 2.1, and based on the foundation details at 721 West MacArthur Boulevard, the receptor separation distance between groundwater and the residence's foundation ranges from approximately 17.5 feet bgs to 22 feet bgs. The minimum separation distance was calculated by subtracting the depth of the partial basement (3 feet bgs) from the shallowest depth-to-first-water measurement (20.5 feet bgs at SB-08 through SB-10). The maximum separation distance was calculated by subtracting the depth of the foundation at the crawl space (0 feet bgs) from the deepest depth-to-first-water measurement (22 feet bgs at SB-11).

Depths-to-first-groundwater data indicates a sizable separation distance between the 721 West MacArthur Boulevard residence's foundation and groundwater; providing a vadose zone available to support bioattenuation. Moreover, most of the residence sits 3 feet above the ground surface as it is constructed over a 3-foot-high crawl space, providing the receptor with even more separational distance between groundwater.

7.2 Soil Vapor Data Evaluation

Based on the current and expected future use of the Site, the detected soil vapor COPC concentrations were compared with human health risk-based screening levels protective of possible vapor migration concerns for residential exposures and indoor commercial workers. Most of the COPC soil vapor concentrations were either not detected above laboratory reporting limits or at concentrations below SWRCB LTC Policy soil gas screening criteria and SF-RWQCB ESLs.

7.2.1 Soil Vapor Data Evaluation – SF-RWQCB ESLs

As shown in Table 2, the only soil vapor concentration collected during the November 2016 event which exceeded a screening level was GRO at SV-8. The SV-8 soil vapor sample contained GRO concentrations above the SF-RWQCB residential vapor intrusion human health risk ESL based on no bioattenuation, however, this concentration is below the SF-RWQCB commercial/industrial vapor intrusion human health risk ESL. The recent GRO soil vapor result from SV-8 is generally consistent with its previous results. In May 2015, GRO was detected at SV-8 at a concentration that exceeded the residential vapor intrusion human health risk ESL, and was below the commercial/industrial vapor intrusion human health risk ESL. The primary individual toxic petroleum fuel constituents in the soil vapor sample collected from SV-8 were not detected above respective laboratory reporting limits.

Concentrations of COPCs in the soil vapor samples collected from SV-7 and SV-9 were below the respective SF-RWQCB residential and commercial/industrial vapor intrusion human health risk soil gas ESLs.

7.2.2 Soil Vapor Data Evaluation – SWRCB LTC Policy Screening Criteria

In order to evaluate applicable soil vapor sample results from SV-7, SV-8 and SV-9 to the SWRCB LTC Policy's Vapor Intrusion to Indoor Air Media-Specific Criteria, assessment to one of the four screening scenarios is required. Based on data collected during the recent investigation, site conditions meet the conditions of Scenario 4 – Direct Measurement of Soil Gas Concentrations (*Soil Gas Sampling – With Bioattenuation Zone*) as follows:

1. *There is a minimum of five vertical feet of soil between the soil vapor measurement and the foundation of an existing building or ground surface of future construction:*

As discussed above in Sections 3.1 and 3.2, the majority of the residence at 721 West MacArthur Boulevard is constructed over a 3-foot high crawl space. The partial basement encompasses a relatively

limited area below the residence in the rear of the house and extends to 3 feet bgs. Additionally, the walls of the crawl space (which are at surface grade) and walls of the partial basement form the foundation of the residence. A slab-on grade or other type of subsurface foundation is not present.

Given the construction of the crawl space and partial basement, there is at least 5 vertical feet of soil between the depth of the soil vapor sample with detected COPC concentrations and the residence's foundation within the footprint of the crawl spaces at all three soil vapor probes. SV-9 is set at 8 feet bgs, which is 5 feet below the bottom of the partial basement (3 feet below grade) therefore, at a minimum the soil vapor samples collected from SV-9 fulfil the criteria for collecting soil vapor samples at least 5 feet below the foundation of an existing building.

2. *TPH (TPHg + TPHd) is less than 100 mg/kg (measured in at least two depths within the five-foot zone.):*

Soil samples have been collected from two depths between 0 and 5 feet bgs from all three soil vapor probes (SV-7, SV-8, and SV-9) installed along the property boundary with the residence at 721 West MacArthur Boulevard. At each of these soil vapor probes, soil samples have been collected at 2.5 - 3 feet bgs and 4.5 - 5 feet bgs. As shown on Figure 4, GRO has not been detected above laboratory reporting limits (ranging from <0.200 mg/kg to <0.25 mg/kg) in the soil samples collected from SV-7, SV-8, and SV-9. These soil sample results fulfil the LTC Policy criterion that total petroleum hydrocarbons (TPH) are less than 100 mg/kg (measured in at least two depths within the five-foot zone).

3. *Oxygen is greater than or equal to four percent measured at the bottom of the five-foot zone:*

Oxygen concentrations in the soil vapor samples collected on November 7, 2016 were 18.8%v at SV-7, 5.25%v at SV-8, and 14.1%v at SV-9. These concentrations all exceed the LTC Policy criteria requirement of 4% and therefore support an active bioattenuation zone in the immediate area of the residence at 721 West MacArthur Boulevard.

7.2.2.1 Soil Vapor Data Evaluation to SWRCB LTC Policy Screening Levels

The recent soil vapor data indicate that site-specific conditions satisfy all the characteristics and criteria of the LTC Policy Scenario 4 (with a Bioattenuation Zone). Fulfillment of the three criteria above suggests the presence of an active bioattenuation zone beneath the Site that supports biodegradation of petroleum hydrocarbon vapors. Therefore, soil vapor concentrations of benzene, ethylbenzene, and naphthalene

may be compared to the soil vapor screening levels presented in the table *Soil Gas Criteria* within Scenario 4 - Soil Gas Sampling – With Bioattenuation Zone (SWRCB 2012).

Benzene, ethylbenzene, and naphthalene concentrations were not detected above respective SWRCB LTC Policy soil gas screening criteria based on an active bioattenuation zone for residential and commercial land use in any of the soil vapor samples collected from SV-7, SV-8, and SV-9. As noted above, GRO was detected at a concentration above the SF-RWQCB ESL (assuming no bioattenuation) for residential exposures at SV-8. However, the primary individual toxic COPCs at petroleum fuel releases are below SWRCB LTC Policy soil gas screening criteria.

As the recent soil vapor data and site conditions satisfy the SWRCB LTC Policy media-specific criteria for Petroleum Vapor Intrusion to Indoor Air, the Site can be considered low threat for the vapor-intrusion-to-indoor-air pathway. Exposure to petroleum vapors migrating from soil or groundwater to indoor air are not likely based on the recently collected soil vapor data and are not expected to pose unacceptable human health risks.

8 CONCLUSION AND RECOMMENDATIONS

A soil boring investigation and soil vapor assessment were completed at the Site in October and November 2016 to evaluate site conditions and potential vapor intrusion of site volatile COPCs into the adjacent upgradient residential property at 721 West MacArthur Boulevard. The analytical soil sample results suggest COPCs related to the Site are not expected to pose an impact to the Site or the adjacent residential property as the COPC concentrations in the soil samples collected from the recent soil borings were either not detected above respective laboratory reporting limits or were detected at concentrations below applicable SF-RWQCB ESLs and SWRCB LTC Policy soil screening levels. The soil sample results at SB-08 also indicate a reduction and likely natural attenuation of petroleum hydrocarbon concentrations beneath the Site when compared to data from the former soil sample SW6 (collected in November 1991). SW6 was a former UST pit sidewall sample collected at 12 feet bgs during the excavation of the former USTs and contained detectable concentrations of site COPCs, notably benzene at 1.0 mg/kg (Arcadis 2016). SB-08 was completed adjacent to SW6 and concentrations of site COPCs in SB-08 soil samples were nondetect except for a trace concentration of MTBE.

Soil vapor samples were collected on November 7, 2016 from three locations at the Site to evaluate vapor measurements and the potential for vapor migration of subsurface petroleum hydrocarbon constituents. This recent event was directed by ACEH in their letter dated September 8, 2016 (ACEH

2016b). Previous soil vapor sampling was completed at the Site on May 15, 2015 (Arcadis 2015). Based on the most recent analytical data collected along the Site boundary, volatile petroleum hydrocarbon constituent concentrations are not expected to pose adverse health effects to occupants of the residence adjacent to the Site located at 721 West MacArthur Boulevard. This conclusion is supported by:

- Most of the residential dwelling is constructed over a 3-foot-high crawl space (with a small partial basement area in the southwestern corner). Potential vapor intrusion of VOCs from the subsurface into this residential dwelling is unlikely due to its elevated location of the living space and dilution by atmospheric factors;

- There is a sizable bioattenuation vadose zone separation distance between the residential receptor and groundwater considering the maximum depth of the residence's foundation and depth to first groundwater;

- Site COPCs in soil vapor samples collected along the property line between the Site and the residential dwelling are either non-detect above laboratory reporting limits or below applicable SWRCB LTC Policy soil gas screening criteria for residential and commercial land uses and respective SF-RWQCB ESLs for residential and commercial land uses. It should also be noted that of all 3 soil vapor probes sampled during the recent investigation, SV-8, which contained a detection of GRO above its residential SF-RWQCB ESL, is located furthest away from the residential dwelling at 721 West MacArthur Boulevard; and

- The recent soil vapor sampling data fulfils the requirements within the LTC Policy Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air.

As directed by ACEH in their letter dated September 8, 2016 (ACEH 2016b), another soil vapor sampling event will be performed to evaluate seasonal and temporal variations in vapor concentrations at the Site. As the first two soil vapor sampling events were completed during calendar months that are diametrically opposite, the next soil vapor sampling event is proposed in May 2017 to continue with the seasonal record of soil vapor data.

9 REFERENCES

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TABLES

Table 1
Soil Analytical Results
Former Atlantic Richfield Company Station No. CA-4931
731 West MacArthur Boulevard
Oakland, California 94609
ACEH Site No.: RO0000076

ARCADIS Design & Consultancy for natural and built assets

Sample Location/ I.D.	Date Sampled	Sample Depth (feet bgs)	GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (total) (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	Ethanol (mg/kg)	Naphthalene (mg/kg)	EDB (mg/kg)	1,2-DCA (mg/kg)
Low-Threat Closure Policy Residential [0 to 5 feet bgs][1]			--	1.9	--	21	--	--	--	--	--	--	--	9.7	--	--
Low-Threat Closure Policy Residential [5 to 10 feet bgs][1]			--	2.8	--	32	--	--	--	--	--	--	--	9.7	--	--
Low-Threat Closure Policy Commercial/Industrial [0 to 5 feet bgs][1]			--	8.2	--	89	--	--	--	--	--	--	--	45	--	--
Low-Threat Closure Policy Commercial/Industrial [5 to 10 feet bgs][1]			--	12	--	134	--	--	--	--	--	--	--	45	--	--
Low-Threat Closure Policy Utility Worker [0 to 10 feet bgs][1]			--	14	--	314	--	--	--	--	--	--	--	219	--	--
Commercial Direct Exposure Screening Level[2]			3,900	1.0	4,600	22	2,400	180	--	--	--	--	--	14	0.16	1.6
Construction Worker Direct Exposure Soil Screening Level[2]			2,800	24	4,100	480	2,400	3,700	--	--	--	--	--	350	3.2	37
SB-08	10/31/2016	5.0 - 5.5	<0.230	<0.0046	<0.0046	<0.0046	<0.0093	<0.0046	<0.093	<0.0046	<0.0046	<0.0046	<0.930	<0.0093	<0.0046	<0.0046
		8.0 - 8.5	<0.210	<0.0042	<0.0042	<0.0042	<0.0085	<0.0042	<0.085	<0.0042	<0.0042	<0.0042	<0.850	<0.0085	<0.0042	<0.0042
		12.0 - 12.5	<0.200	<0.0040	<0.0040	<0.0040	<0.0079	0.015	<0.079	<0.0040	<0.0040	<0.0040	<0.790	<0.0079	<0.0040	<0.0040
		23.5 - 24.0	<0.210	<0.0043	<0.0043	<0.0043	<0.0085	<0.0043	<0.085	<0.0043	<0.0043	<0.0043	<0.850	<0.0085	<0.0043	<0.0043
SB-09	10/31/2016	4.0 - 4.5	<0.200	<0.0040	<0.0040	<0.0040	<0.0079	<0.0040	<0.079	<0.0040	<0.0040	<0.0040	<0.790	<0.0079	<0.0040	<0.0040
		8.0 - 8.5	87.0	<0.0042	<0.0042	<0.450	<0.900	<0.0042	<0.084	<0.0042	<0.0042	<0.0042	<0.840	<0.900	<0.0042	<0.0042
		17.0 - 17.5	84.0	0.410	<0.390	1.70	2.40	<0.390	<0.770	<0.390	<0.390	<0.390	<39.0*	0.930	<0.390	<0.390
		19.5 - 20.0	140	<0.380	<0.380	1.70	7.20	<0.380	<0.760	<0.380	<0.380	<0.380	<38.0*	1.40	<0.380	<0.380
		23.5 - 24.0	<0.180	<0.0036	<0.0036	<0.0036	<0.0072	<0.0036	<0.072	<0.0036	<0.0036	<0.0036	<0.720	<0.0072	<0.0036	<0.0036
SB-10	10/31/2016	1.0 - 1.5	<0.180	<0.0036	<0.0036	<0.0036	<0.0071	<0.0036	<0.071	<0.0036	<0.0036	<0.0036	<0.710	<0.0071	<0.0036	<0.0036
		9.0 - 9.5	4.50	<0.0038	<0.0038	<0.0038	<0.0076	<0.0038	<0.076	<0.0038	<0.0038	<0.0038	<0.760	<0.0076	<0.0038	<0.0038
		20.5 - 21.0	990	<3.60	<3.60	11.0	<7.20	<3.60	<7.20	<3.60	<3.60	<3.60	<360	<7.20	<3.60	<3.60
		23.5 - 24.5	0.440	<0.0039	<0.0039	<0.0039	<0.0077	<0.0039	<0.077	<0.0039	<0.0039	<0.0039	<0.770	<0.0077	<0.0039	<0.0039
SB-11	11/1/2016	1.5 - 2.0	<0.200	<0.0039	<0.0039	<0.0039	<0.0078	<0.0039	<0.078	<0.0039	<0.0039	<0.0039	<0.780	<0.0078	<0.0039	<0.0039
		6.0 - 6.5	<0.200	<0.0040	<0.0040	<0.0040	<0.0080	<0.0040	<0.080	<0.0040	<0.0040	<0.0040	<0.800	<0.0080	<0.0040	<0.0040
		23.5 - 24.0	<0.170	<0.0035	<0.0035	<0.0035	<0.0070	<0.0035	<0.070	<0.0035	<0.0035	<0.0035	<0.700	<0.0070	<0.0035	<0.0035
SV-9	11/1/2016	2.5 - 3.0	<0.200	<0.0040	<0.0040	<0.0040	<0.0079	<0.0040	<0.079	<0.0040	<0.0040	<0.0040	<0.790	<0.0079	<0.0040	<0.0040
		4.5 - 5.0	<0.210	<0.0042	<0.0042	<0.0042	<0.0084	<0.0042	<0.084	<0.0042	<0.0042	<0.0042	<0.840	<0.0084	<0.0042	<0.0042
		7.5 - 8.0	<0.210	<0.0042	<0.0042	<0.0042	<0.0085	<0.0042	<0.085	<0.0042	<0.0042	<0.0042	<0.850	<0.0085	<0.0042	<0.0042

Notes:

[1] State Water Resources Control Board LTC Policy, Table 1 - Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health.

[2] Direct exposure soil screening level (Table S-1 Soil Direct Exposure Human Health Risk Screening Levels, SF-RWQCB [Interim Final – February 2016]).

bgs = below ground surface
mg/kg = milligrams per kilogram
GRO = total petroleum hydrocarbons as gasoline range organics
MTBE = Methyl-t-Butyl Ether
TBA = Tert-Butyl Alcohol
DIPE = Diisopropyl Ether
ETBE = Ethyl-t-Butyl Ether
TAME = Tert-Amyl-Methyl Ether
EDB = 1,2-Dibromoethane
1,2-DCA = 1,2-Dichloroethane
* = Lab Control Sample or Lab Control Sample Duplicate is outside acceptance limits.

Table 2
Soil Vapor Analytical Results
Former Atlantic Richfield Company Station No. CA-4931
731 West MacArthur Boulevard
Oakland, California 94609
ACEH Site No.: RO0000076

ARCADIS Design & Consultancy for natural and built assets

Sample ID	Depth (ft bgs)	Date Sampled	GRO (µg/m^3)	Benzene (µg/m^3)	Toluene (µg/m^3)	Ethylbenzene (µg/m^3)	m,p-Xylenes (µg/m^3)	o-Xylenes (µg/m^3)	MTBE (µg/m^3)	TBA (µg/m^3)	Naphthalene (µg/m^3)	Helium (%v)	Carbon Dioxide (%v)	Oxygen (%v)	Methane (%v)
SWRCB LTC Policy Soil Vapor Screening Levels															
LTC No Bioattenuation Zone Soil Gas Criteria (µg/m^3) Residential[1]			--	85	--	1,100	--	--	--	--	93	--	--	--	--
LTC No Bioattenuation Zone Soil Gas Criteria (µg/m^3) Commercial[1]			--	280	--	3,600	--	--	--	--	310	--	--	--	--
LTC with Bioattenuation Zone Soil Gas Criteria (µg/m^3) Residential[1]			--	85,000	--	1,100,000	--	--	--	--	93,000	--	--	--	--
LTC with Bioattenuation Zone Soil Gas Criteria (µg/m^3) Commercial[1]			--	280,000	--	3,600,000	--	--	--	--	310,000	--	--	--	--
SF-RWQCB Soil Vapor ESLs															
SF-RWQCB ESL (Res)[2] (µg/m^3)			300,000	48	160,000	560	52,000	52,000	5,400	--	41	--	--	--	--
SF-RWQCB ESL (C/I) [3] (µg/m^3)			2,500,000	420	1,300,000	4,900	440,000	440,000	47,000	--	360	--	--	--	--
Analytical Method			**TO-3**	**TO-15**	**TO-15**	**TO-15**	**TO-15**	**TO-15**	**TO-15**	**TO-15**	**TO-17**	**D1946**			
SV-7	5	5/15/2015	460	13	9.7	1.6 J	6.1	2.5 J	<0.67	ND (TIC)	<17	<0.19	0.25	11	<0.19
	5	11/7/2016	<3,800	1.6	2.0	<2.2	<8.7	<2.2	<7.2	<6.1	<27	<0.0100	1.56	18.8	<0.500
SV-7 (DUP)	5	11/7/2016	<3,800	4.7	3.7	<3.0	<12	<3.0	<10	<8.4	<27	<0.0100	2.84	16.2	<0.500
SV-8	5	5/15/2015	490,000	<7.8	37 J	21 J	19 J	8.8 J	<40	ND (TIC)	<17	<0.19	3.4	1.3	1.4
	5	11/7/2016[a]	2,200,000	<32	<38	<43	<170	<43	<150	<120	<27	<0.0100	8.39	5.25	<0.500
SV-9	8	11/7/2016	68,000	30	190	38	97	33	360	<7.5	<27	0.0312	2.11	14.1	<0.500

Notes:

1.SWRCB LTC Policy screening criteria for soil gas samples, residential and commercial land uses (Appendix 4).

2. Residential Vapor Intrusion Human Health Risk ESL - (Table SG-1: Subslab/Soil Gas Vapor Intrusion Human Health Risk Screening Levels (Volatile Chemicals Only), SF-RWQCB [February 2016]).

3. Commercial/Industrial Vapor Intrusion Human Health Risk ESL - (Table SG-1: Subslab/Soil Gas Vapor Intrusion Human Health Risk Screening Levels (Volatile Chemicals Only), SF-RWQCB [February 2016]).

[a] Reporting limit is elevated due to high levels of non-target hydrocarbons during the November 7, 2016 sampling event at SV-8.

All soil vapor sample concentrations and ESLs given in micrograms per cubic meter (µg/m^3) with the exception of fixed gases (helium, carbon dioxide, oxygen, nitrogen, and methane), which are given in percent by volume (%v).

SWRCB LTC Policy = State Water Resources Control Board Low Threat Closure Policy

SF-RWQCB = San Francisco Bay Regional Water Quality Control Board

ESL = Environmental Screening Level

µg/m^3 = micrograms per cubic meter

%v = percent by volume

< = Analyte was not detected above the specified method detection limit

-- = Not applicable or not available

ft bgs= Feet below ground surface

J = Estimated value

SV = Soil vapor

GRO = Gasoline range organics (C6-C12)

MTBE = Methyl tertiary-butyl ether

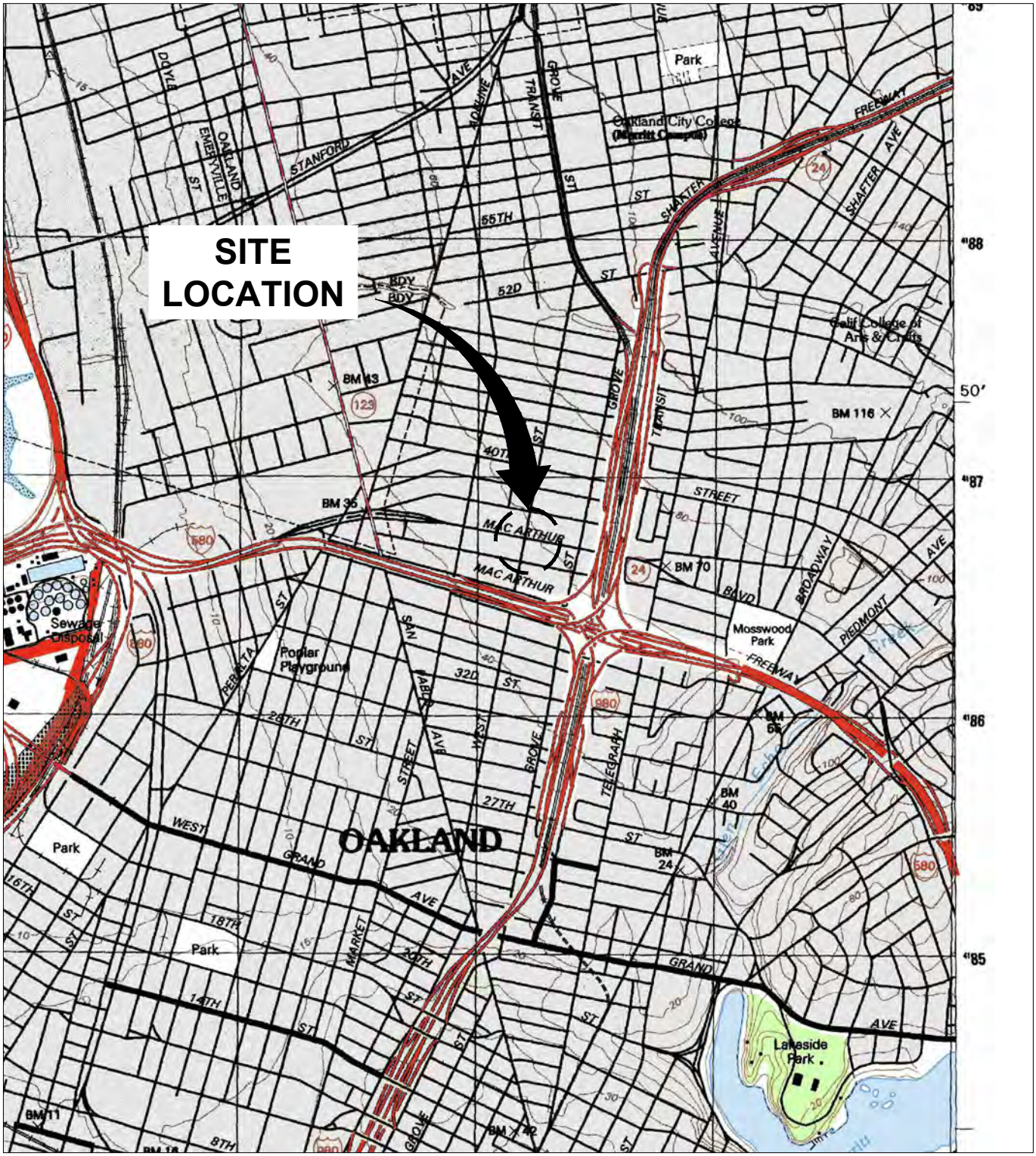
TBA = Tertiary-butyl alcohol

DUP = Duplicate sample

ESLs for xylenes applied to m,p-Xylenes and o-Xylene.

ND (TIC)= Non Detect as a Tentatively Identified Compounds

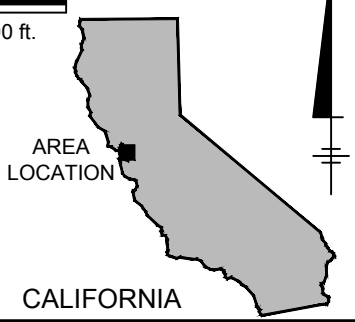
FIGURES



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND WEST, CALIFORNIA, 1993.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



FORMER ARCO STATION 4931
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\RETURN-TO\EMERYVILLE, CA\GP09BPNAIC110N000003Q12\DWG\GP09BPNAC110-N01.dwg LAYOUT: 1 SAVED: 10/1/2012 11:40 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 10/1/2012 11:59 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: ---
Oakland West.jpg

RESIDENTIAL

SB-07

WEST STREET

A-12

A-11

DRIVEWAY

SIDEWALK

DRIVEWAY

D.I.

IRR.

PLANTER

D.I.

SB-3

C.B.

A-9

SV-1

A-8

A-5

SB-6

PRODUCT ISLAND

L13

L12

L1

L11

L10

L9

L2

L8

L3

A-7

L7

S12

S11

S10

S9

SV-3

A-10

SV-2

SS-SV-1

A-4

SB-5

SS-SV-3

BUILDING

BUILDING

EXISTING UNDERGROUND FUEL STORAGE

AR-3

AR-1

A-6

PRODUCT ISLANDS

S8

L4

L6

S7

L5

PRODUCT ISLANDS

S4

L3A

S3

L5

L3

KIOSK

SS-SV-2

SB-1A

SV-5

S6

L4

S2

L1

SIDEWALK

A-3

SW7

SW8

SW9

S5

L2

L11

L7

SV-4

SW20

S1

L6/L9/L10

IRR.

SW1

SV-6

L8/L12

SW21

AV-1

AR-2

ST-A

SW18

FT-A

SW17

SB-2

A-13

SW2

SW10

SW11

SW15

D.I.

FORMER USTs

T1A

FORMER UST

T1B

SW12

SW16

SW19

ST-B

SW14

SW3

SW5

SV-8

SB-09

SW13

SB-10

SV-9

SB-11

SV-7

SW4

A-2

SB-08

SW6

BLOCKWALL

TREATMENT ENCLOSURE

BUILDING GARAGE

BUILDING

BASEMENT AREA BENEATH HOUSE
(3 FEET BELOW GROUND SURFACE)

721 WEST MACARTHUR BLVD

CRAWL SPACE (3 FEET
ABOVE GROUND SURFACE)

37TH STREET

WEST MACARTHUR BOULEVARD

LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE
- SOIL BORING PROBE

NOTES:

1. SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

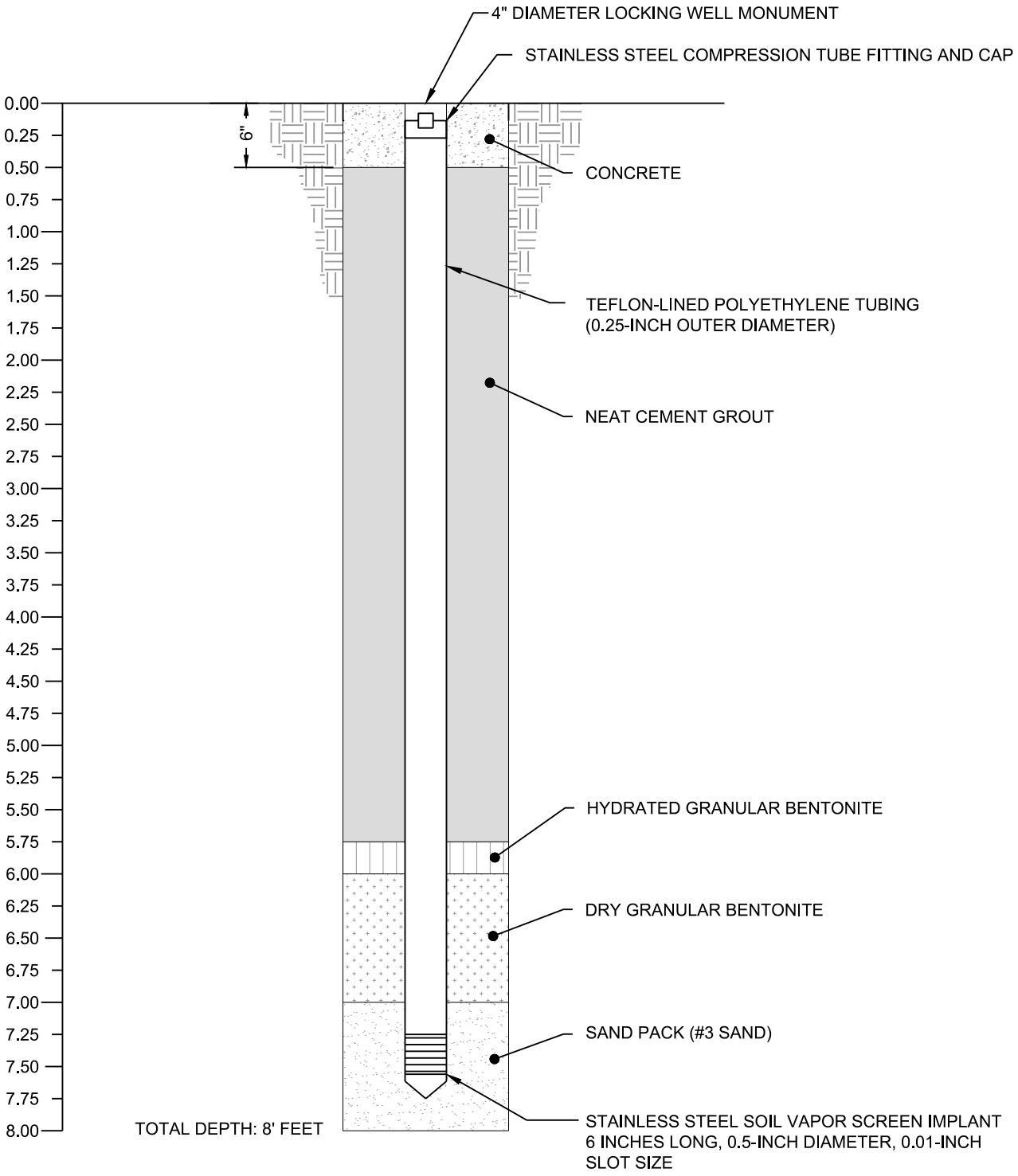
FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SITE PLAN

ARCADIS Design & Consultancy for natural and built assets

FIGURE 2

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACT\GP09BPNAC110\N0000\SoilResults 2016\DWG\GP09BPNAC110 B02.dwg LAYOUT: 2 SAVED: 11/18/2016 12:41 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/18/2016 3:55 PM BY: REYES, ALEC
PROJECTNAME: ---
XREFS:
GP09BPNAC110-X01



NOT TO SCALE

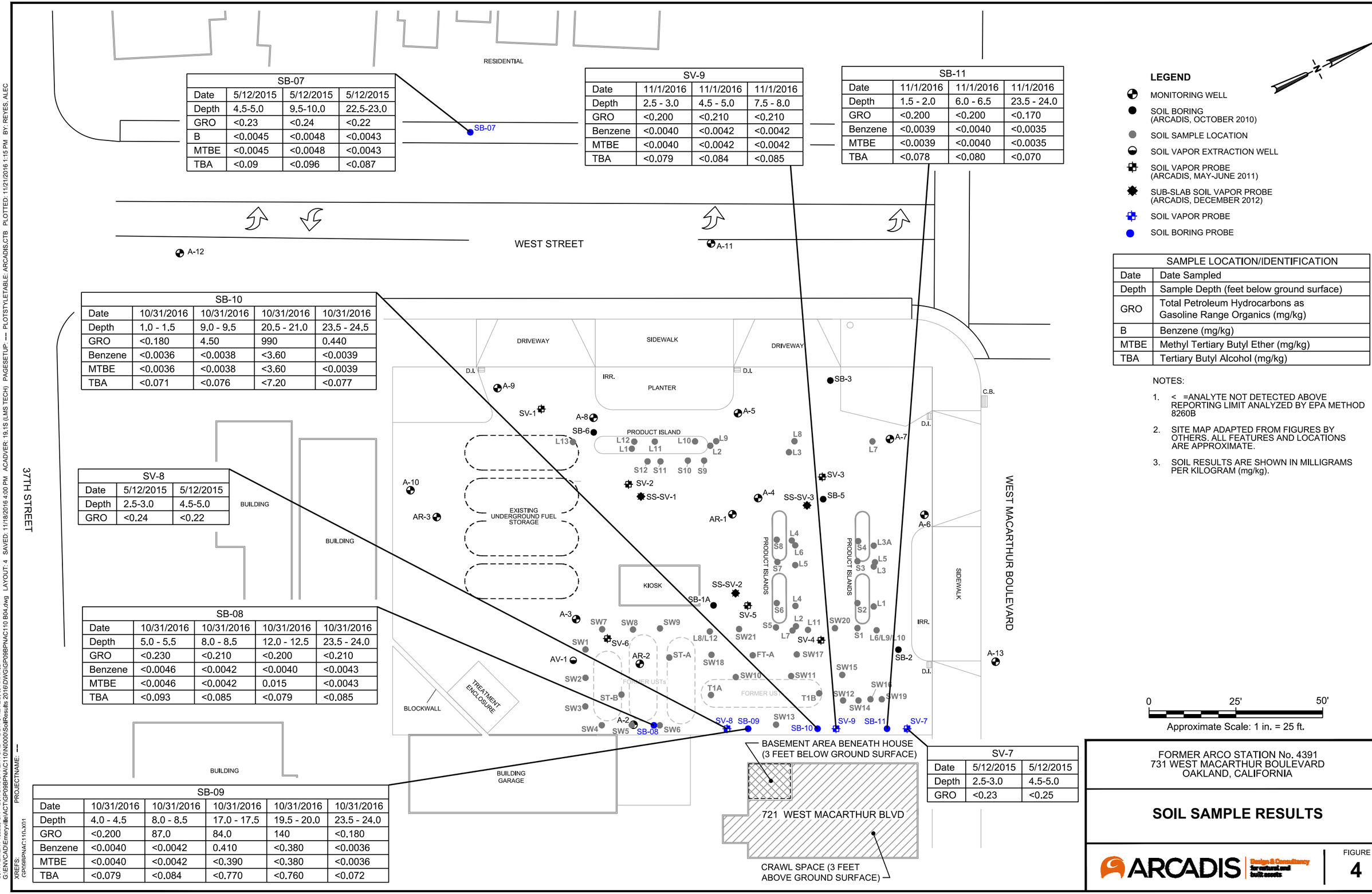
FORMER BP STATION. 4931
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

VAPOR PROBE SCHEMATIC DIAGRAM

ARCADIS Design & Consultancy for natural and built assets

FIGURE
3

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: J. HARRIS
G:\ENVCAD\Emeryville\ACT\GP09BPNA\C110\N0000\SoilResults 2016\DWG\GP09BPNAC110 T01.dwg LAYOUT: 3 SAVED: 11/18/2016 4:11 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/21/2016 1:21 PM BY: REYES, ALEC
XREFS: IMAGES: PROJECTNAME: ---



SB-07			
Date	5/12/2015	5/12/2015	5/12/2015
Depth	4.5-5.0	9.5-10.0	22.5-23.0
GRO	<0.23	<0.24	<0.22
B	<0.0045	<0.0048	<0.0043
MTBE	<0.0045	<0.0048	<0.0043
TBA	<0.09	<0.096	<0.087

SV-9			
Date	11/1/2016	11/1/2016	11/1/2016
Depth	2.5 - 3.0	4.5 - 5.0	7.5 - 8.0
GRO	<0.200	<0.210	<0.210
Benzene	<0.0040	<0.0042	<0.0042
MTBE	<0.0040	<0.0042	<0.0042
TBA	<0.079	<0.084	<0.085

SB-11			
Date	11/1/2016	11/1/2016	11/1/2016
Depth	1.5 - 2.0	6.0 - 6.5	23.5 - 24.0
GRO	<0.200	<0.200	<0.170
Benzene	<0.0039	<0.0040	<0.0035
MTBE	<0.0039	<0.0040	<0.0035
TBA	<0.078	<0.080	<0.070

SB-10				
Date	10/31/2016	10/31/2016	10/31/2016	10/31/2016
Depth	1.0 - 1.5	9.0 - 9.5	20.5 - 21.0	23.5 - 24.5
GRO	<0.180	4.50	990	0.440
Benzene	<0.0036	<0.0038	<3.60	<0.0039
MTBE	<0.0036	<0.0038	<3.60	<0.0039
TBA	<0.071	<0.076	<7.20	<0.077

SV-8		
Date	5/12/2015	5/12/2015
Depth	2.5-3.0	4.5-5.0
GRO	<0.24	<0.22

SB-08				
Date	10/31/2016	10/31/2016	10/31/2016	10/31/2016
Depth	5.0 - 5.5	8.0 - 8.5	12.0 - 12.5	23.5 - 24.0
GRO	<0.230	<0.210	<0.200	<0.210
Benzene	<0.0046	<0.0042	<0.0040	<0.0043
MTBE	<0.0046	<0.0042	0.015	<0.0043
TBA	<0.093	<0.085	<0.079	<0.085

SB-09					
Date	10/31/2016	10/31/2016	10/31/2016	10/31/2016	10/31/2016
Depth	4.0 - 4.5	8.0 - 8.5	17.0 - 17.5	19.5 - 20.0	23.5 - 24.0
GRO	<0.200	87.0	84.0	140	<0.180
Benzene	<0.0040	<0.0042	0.410	<0.380	<0.0036
MTBE	<0.0040	<0.0042	<0.390	<0.380	<0.0036
TBA	<0.079	<0.084	<0.770	<0.760	<0.072

SV-7		
Date	5/12/2015	5/12/2015
Depth	2.5-3.0	4.5-5.0
GRO	<0.23	<0.25

LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE
- SOIL BORING PROBE

SAMPLE LOCATION/IDENTIFICATION	
Date	Date Sampled
Depth	Sample Depth (feet below ground surface)
GRO	Total Petroleum Hydrocarbons as Gasoline Range Organics (mg/kg)
B	Benzene (mg/kg)
MTBE	Methyl Tertiary Butyl Ether (mg/kg)
TBA	Tertiary Butyl Alcohol (mg/kg)

NOTES:

1. < =ANALYTE NOT DETECTED ABOVE REPORTING LIMIT ANALYZED BY EPA METHOD 8260B
2. SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.
3. SOIL RESULTS ARE SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg).

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

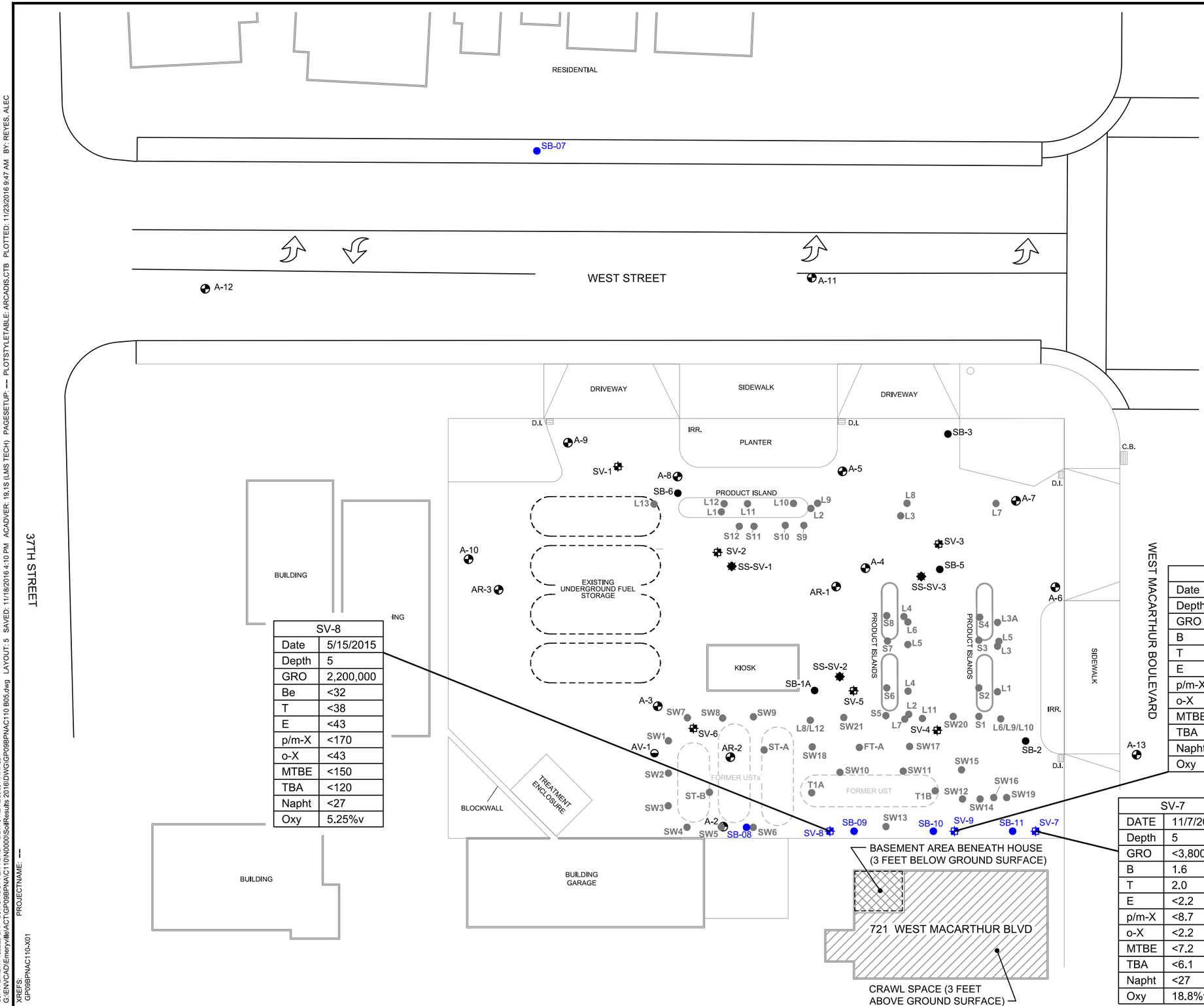
FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SOIL SAMPLE RESULTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
G:\ENVCAD\Emeryville\ACT\GP09BPNA\C110\N0000\SoilResults 2016\DWG\GP09BPNAC110 B04.dwg LAYOUT: 4 SAVED: 11/18/2016 4:00 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/21/2016 1:15 PM BY: REYES, ALEC
XREFS:
GP09BPNAC110-XR1
PROJECTNAME: ---



LEGEND

- MONITORING WELL
- SOIL BORING (ARCADIS, OCTOBER 2010)
- SOIL SAMPLE LOCATION
- SOIL VAPOR EXTRACTION WELL
- SOIL VAPOR PROBE (ARCADIS, MAY-JUNE 2011)
- SUB-SLAB SOIL VAPOR PROBE (ARCADIS, DECEMBER 2012)
- SOIL VAPOR PROBE
- SOIL BORING PROBE

SAMPLE LOCATION/IDENTIFICATION	
Date	Date Sampled
Depth	Sample Depth (feet below ground surface)
GRO	Total Petroleum Hydrocarbons as Gasoline Range Organics (C6-C12) (µg/m³)
B	Benzene (µg/m³)
T	Toluene (µg/m³)
E	Ethylbenzene (µg/m³)
p/m-X	p/m-Xylenes (µg/m³)
o-X	o-Xylenes (µg/m³)
MTBE	Methyl Tertiary Butyl Ether (µg/m³)
TBA	Tertiary Butyl Alcohol (µg/m³)
Napht	Napthalene (µg/m3)
Oxy	Oxygen (v%)

NOTES:

1. < =ANALYTE NOT DETECTED ABOVE REPORTING LIMIT.
2. ANALYTICAL METHOD: TO-15, T0-3, T0-17, D1946.
3. SITE MAP ADAPTED FROM FIGURES BY OTHERS. ALL FEATURES AND LOCATIONS ARE APPROXIMATE.
4. SOIL VAPOR ANALYTICAL RESULTS ARE SHOWN IN MICROGRAMS PER METER CUBED (µg/m³).
5. OXYGEN RESULTS ARE SHOWN IN PERCENT BY VOLUME (%v)

SV-8	
Date	5/15/2015
Depth	5
GRO	2,200,000
Be	<32
T	<38
E	<43
p/m-X	<170
o-X	<43
MTBE	<150
TBA	<120
Napht	<27
Oxy	5.25%v

SV-9	
Date	11/7/2016
Depth	5
GRO	68,000
B	30
T	190
E	38
p/m-X	97
o-X	33
MTBE	360
TBA	<7.5
Napht	<27
Oxy	14.1%v

SV-7	
DATE	11/7/2016
Depth	5
GRO	<3,800
B	1.6
T	2.0
E	<2.2
p/m-X	<8.7
o-X	<2.2
MTBE	<7.2
TBA	<6.1
Napht	<27
Oxy	18.8%v

0 25' 50'

Approximate Scale: 1 in. = 25 ft.

FORMER ARCO STATION No. 4391
731 WEST MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

SOIL VAPOR ANALYTICAL RESULTS NOVEMBER 7, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A.REYES, J.HARRIS
G:\ENVCAD\Emeryville\ACTIVE\GP09BPNAC110\N0000\SoilResults 2016\DWG\GP09BPNAC110 B05.dwg LAYOUT: 5 SAVED: 11/18/2016 4:10 PM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/23/2016 9:47 AM BY: REYES, ALEC
XREFS:
GP09BPNAC110-X01
PROJECTNAME: ---

APPENDIX A

ACPWA Drilling Permit

Alameda County Public Works Agency - Water Resources Well Permit

Public Works Agency
Alameda County

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 10/05/2016 By jamesy

Permit Numbers: W2016-0742 to W2016-0743
Permits Valid from 10/31/2016 to 11/03/2016

Application Id:	1475171755893	**City of Project Site:**	Oakland
Site Location:	731 W MacArthur Blvd, Oakland, CA		
Project Start Date:	10/31/2016	**Completion Date:**	10/31/2016
Assigned Inspector:	Contact Lindsay Furuyama at (925) 956-2311 or Lfuruyama@groundzonees.com		
Extension Start Date:	10/31/2016	**Extension End Date:**	11/03/2016
Extension Count:	1	**Extended By:**	jamesy

Applicant:	Arcadis - Jennifer Granborg 100 Smith Ranch Rd #329, San Rafael, CA 94903	**Phone:** 415-491-4530 x10
Property Owner:	Abdul Rahim Alazani 27081 Call Ave, Hayward, CA 94542	**Phone:** 510-394-7728
Client:	BP West Coast Products 501 Westlake Park Bl, Houston, TX 77079	**Phone:** 281-366-2000

	Total Due:	$530.00
Receipt Number: WR2016-0506	**Total Amount Paid:**	$530.00
Payer Name : Arcadis	Paid By: CHECK	**PAID IN FULL**

Works Requesting Permits:

Borehole(s) for Investigation-Environmental/Monitorinig Study - 4 Boreholes
Driller: Cascade - Lic #: 938110 - Method: DP **Work Total: $265.00**

Specifications

Permit Number	Issued Dt	Expire Dt	# Boreholes	Hole Diam	Max Depth
W2016-0742	10/05/2016	01/29/2017	4	2.00 in.	25.00 ft

Specific Work Permit Conditions

1. Backfill bore hole by tremie with cement grout or cement grout/sand mixture. Upper two-three feet replaced in kind or with compacted cuttings. All cuttings remaining or unused shall be containerized and hauled off site. The containers shall be clearly labeled to the ownership of the container and labeled hazardous or non-hazardous.

2. Boreholes shall not be left open for a period of more than 24 hours. All boreholes left open more than 24 hours will need approval from Alameda County Public Works Agency, Water Resources Section. All boreholes shall be backfilled according to permit destruction requirements and all concrete material and asphalt material shall be to Caltrans Spec or County/City Codes. No borehole(s) shall be left in a manner to act as a conduit at any time.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

5. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

6. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

7. NOTE:
Under California laws, the owner/operator are responsible for reporting the contamination to the governmental regulatory agencies under Section 25295(a). The owner/operator is liable for civil penalties under Section 25299(a)(4) and criminal penalties under Section 25299(d) for failure to report a leak. The owner/operator is liable for civil penalties under Section 25299(b)(4) for knowing failure to ensure compliance with the law by the operator. These penalty provisions do not apply to a potential buyer.

8. Prior to any drilling activities onto any public right-of-ways, it shall be the applicants responsibilities to contact and coordinate a Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits required for that City or to the County and follow all City or County Ordinances. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County a Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

9. Permit is valid only for the purpose specified herein. No changes in construction procedures, as described on this permit application. Boreholes shall not be converted to monitoring wells, without a permit application process.

Well Construction-Vapor monitoring well-Vapor monitoring well - 2 Wells
Driller: Cascade Drilling - Lic #: 938110 - Method: DP **Work Total: $265.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2016-0743	10/05/2016	01/29/2017	SV-10	4.00 in.	2.00 in.	1.00 ft	12.00 ft
W2016-0743	10/05/2016	01/29/2017	SV-9	4.00 in.	2.00 in.	1.00 ft	12.00 ft

Specific Work Permit Conditions

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 30 days, including permit number and site map.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters

generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

5. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

6. Applicant shall contact assigned inspector listed on the top of the permit at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

7. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

8. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

9. Electronic Reporting Regulations (Chapter 30, Division 3 of Title 23 & Division 3 of Title 27, CCR) require electronic submission of any report or data required by a regulatory agency from a cleanup site. Submission dates are set by a Regional Water Board or by a regulatory agency. Once a report/data is successfully uploaded, as required, you have met the reporting requirement (i.e. the compliance measure for electronic submittals is the actual upload itself). The upload date should be on or prior to the regulatory due date.

10. Vapor monitoring wells above water level constructed with tubing maybe be backfilled with pancake-batter consistency bentonite. Minimum surface seal thickness is two inches of cement grout around well box.

Vapor monitoring wells above water level constructed with pvc pipe shall have a minimum seal depth (Neat Cement Seal) of 2 feet below ground surface (BGS). Minimum surface seal thickness is two inches of cement grout around well box. All other conditions for monitoring well construction shall apply.

APPENDIX B

Soil Boring Logs

SOIL BORING LOG

Date Drilled:	10/31/2016	**ID:**	**SB-08**
Logged By:	Cameron McGovern		
Total Depth:	24 feet bgs	**Client:**	BP
Borehole Diameter:	4 inches	**Location:**	CA-4931
Drilling Company:	Cascade Drilling, LLC		731 West MacArthur Boulevard
Driller's Name:	Juan Morales		Oakland, CA 94609
Drilling Method:	Hand Auger and Direct Push	**Project #:**	GP09BPNA.C110.Q0000
Sampling Method:	Dual Tube / Continuous	**Reviewed By:**	Hollis Phillips, PG No. 6887

Depth (feet bgs)	Drilling Interval	Recovery (ft)	PID Reading (ppm)	Sample Interval	Sample ID	USCS Code	Geologic Column	Lithologic Description	Hydrostratigraphy	Depth (feet bgs)
0						Asphalt		Asphalt		0
1			0.1			ML / SP		SILT and SAND (ML/SP), very soft, dry, nonplastic, very fine- to medium-grained sand.		1
2			0.1			ML		SILT (ML), soft to medium stiff, dark brown, moist, low plasticity, little fine- to coarse-grained sand, trace clay.		2
3	HA	6.5	0.3			ML		GRAVELLY SILT (ML), very soft, very low plasticity, angular to subangular gravel (2- to 32-millimeters in diameter), little clay.		3
4			0.2							4
5			0.3	X	SB-08-5.0-5.5					5
6			0.3			ML		CLAYEY SILT (ML), stiff, moist, medium plasticity, little very fine-grained sand.		6
7	DP	1.5	0.1							7
8			0.6	X	SB-08-8.0-8.5					8
9			0.5			ML		SILT (ML), soft, moist, medium plasticity, some clay, trace very fine-grained sand.		9
10	DP	4	0.6							10
11			0.8							11
12			0.4	X	SB-08-12.0-12.5					12
13			0.6							13
14	DP	4	0.9							14
15			0.8			ML		GRAVELLY SILT (ML)		15
16			1.7			ML		SANDY SILT (ML) with little clay.		16
17			1.0			ML		SANDY SILT (ML), soft, very moist, low plasticity, very fine-grained sand.		17
18	DP	4	1.4							18
19			1.5							19
20			1.5							20
21			0.6			SM		SILTY, GRAVELLY SAND (SM), wet, nonplastic, fine- to very coarse-grained sand, subangular to subrounded gravel (2- to 40-millimeters in diameter), poorly sorted.	▽	21
22	DP	4	0.3							22
23			0.2							23
24			0.3	X	SB-08-23.5-24.0			Bottom of boring at 24 feet bgs.		24
25										25

Abbreviations: bgs = below ground surface, DP = direct push, HA = hand auger, NA = not available/not applicable, PID = photoionization detector, ppm = parts per million, USCS = Unified Soil Classification System

Notes: Measuring point is ground surface unless otherwise noted.
Depth to first groundwater = 20.5 feet bgs.

SOIL BORING LOG

Date Drilled:	10/31/2016	**ID:**	**SB-09**
Logged By:	Cameron McGovern		
Total Depth:	24 feet bgs	**Client:**	BP
Borehole Diameter:	4 inches	**Location:**	CA-4931
Drilling Company:	Cascade Drilling, LLC		731 West MacArthur Boulevard
Driller's Name:	Juan Morales		Oakland, CA 94609
Drilling Method:	Hand Auger and Direct Push	**Project #:**	GP09BPNA.C110.Q0000
Sampling Method:	Dual Tube / Continuous	**Reviewed By:**	Hollis Phillips, PG No. 6887

Depth (feet bgs)	Drilling Interval	Recovery (ft)	PID Reading (ppm)	Sample Interval	Sample ID	USCS Code	Geologic Column	Lithologic Description	Hydrostratigraphy	Depth (feet bgs)
0								Asphalt		0
1			0.4					FILL, gravelly silt, dark brown.		1
2			0.5			ML		SANDY SILT (ML), very stiff, light brown, moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout.		2
3	HA	6.5	0.4							3
4			0.8		SB-09-4.0-4.5	ML		SANDY SILT (ML), very stiff, green (GLEY 1), moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout, faint hydrocarbon odor.		4
5			0.4							5
6			0.5			CL		SANDY SILTY CLAY (CL), medium stiff to stiff, olive brown, moist, low to medium plasticity, very fine- to fine-grained sand.		6
7	DP	1.5	16.8							7
8			41.3		SB-09-8.0-8.5					8
9			21.6							9
10	DP	4	40.1							10
11			127.5							11
12			23.3			ML		SANDY SILT (ML), very stiff, green (GLEY 1), moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout, faint hydrocarbon odor.		12
13			11.3							13
14	DP	4	14.0							14
15			12.5							15
16			37.6							16
17			151.4		SB-09-17.0-17.5					17
18	DP	4	72.2							18
19			31.7			GP		SILTY SANDY GRAVEL (GP), loose, wet, subangular to subrounded (2- to 32-millimeters in diameter), fine- to very coarse-grained sand, poorly sorted.		19
20			433.9		SB-09-19.5-20.0					20
21			5.7						▽	21
22	DP	4	2.4							22
23			1.5							23
24			1.6		SB-09-23.5-24.0			Bottom of boring at 24 feet bgs.		24
25										25

Abbreviations: bgs = below ground surface, DP = direct push, HA = hand auger, NA = not available/not applicable, PID = photoionization detector, ppm = parts per million, USCS = Unified Soil Classification System

Notes: Measuring point is ground surface unless otherwise noted.
Depth to first groundwater = 20.5 feet bgs.

SOIL BORING LOG

Date Drilled:	10/31/2016	**ID:**	**SB-10**
Logged By:	Cameron McGovern		
Total Depth:	24 feet bgs	**Client:**	BP
Borehole Diameter:	4 inches	**Location:**	CA-4931
Drilling Company:	Cascade Drilling, LLC		731 West MacArthur Boulevard
Driller's Name:	Juan Morales		Oakland, CA 94609
Drilling Method:	Hand Auger and Direct Push	**Project #:**	GP09BPNA.C110.Q0000
Sampling Method:	Dual Tube / Continuous	**Reviewed By:**	Hollis Phillips, PG No. 6887

Depth (feet bgs)	Drilling Interval	Recovery (ft)	PID Reading (ppm)	Sample Interval	Sample ID	USCS Code	Geologic Column	Lithologic Description	Hydrostratigraphy	Depth (feet bgs)
0								Asphalt		0
1			1.5		SB-10-1.0-1.5			FILL, gravelly silt, dark brown.		1
2			0.9			ML		SANDY SILT (ML), very stiff, light brown, moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout.		2
3	HA	6.5	0.7							3
4			0.4			ML		SANDY SILT (ML), very stiff, green (GLEY 1), moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout, faint hydrocarbon odor.		4
5			1.0							5
6			0.4			CL		SANDY SILTY CLAY (CL), medium stiff to stiff, olive brown, moist, low to medium plasticity, very fine- to fine-grained sand.		6
7	DP	1.5	2.7							7
8			4.3							8
9			234.7		SB-10-9.0-9.5					9
10	DP	4	100.4							10
11			142.4							11
12			38.7			ML		SANDY SILT (ML), very stiff, green (GLEY 1), moist, low to medium plasticity, very fine-grained sand, some clay, trace gravels, subangular to subrounded (4- to 16-millimeters in diameter), iron oxidation throughout, faint hydrocarbon odor.		12
13			11.7							13
14	DP	4	5.9							14
15			2.1							15
16			1.6							16
17			1.0							17
18	DP	4	1.0							18
19			2.6			GP		SILTY SANDY GRAVEL (GP), loose, wet, subangular to subrounded (2- to 32-millimeters in diameter), fine- to very coarse-grained sand, poorly sorted.		19
20			588.2							20
21			607.7		SB-10-20.5-21.0				▽	21
22	DP	4	375.9							22
23			11.3							23
24			5.8		SB-10-23.5-24.0			Bottom of boring at 24 feet bgs.		24
25										25

Abbreviations: bgs = below ground surface, DP = direct push, HA = hand auger, NA = not available/not applicable, PID = photoionization detector, ppm = parts per million, USCS = Unified Soil Classification System

Notes: Measuring point is ground surface unless otherwise noted.
Depth to first groundwater = 20.5 feet bgs.

SOIL BORING LOG

Date Drilled:	10/31/2016	**ID:**	**SB-11**
Logged By:	Cameron McGovern		
Total Depth:	24 feet bgs	**Client:**	BP
Borehole Diameter:	4 inches	**Location:**	CA-4931
Drilling Company:	Cascade Drilling, LLC		731 West MacArthur Boulevard
Driller's Name:	Juan Morales		Oakland, CA 94609
Drilling Method:	Hand Auger and Direct Push	**Project #:**	GP09BPNA.C110.Q0000
Sampling Method:	Dual Tube / Continuous	**Reviewed By:**	Hollis Phillips, PG No. 6887

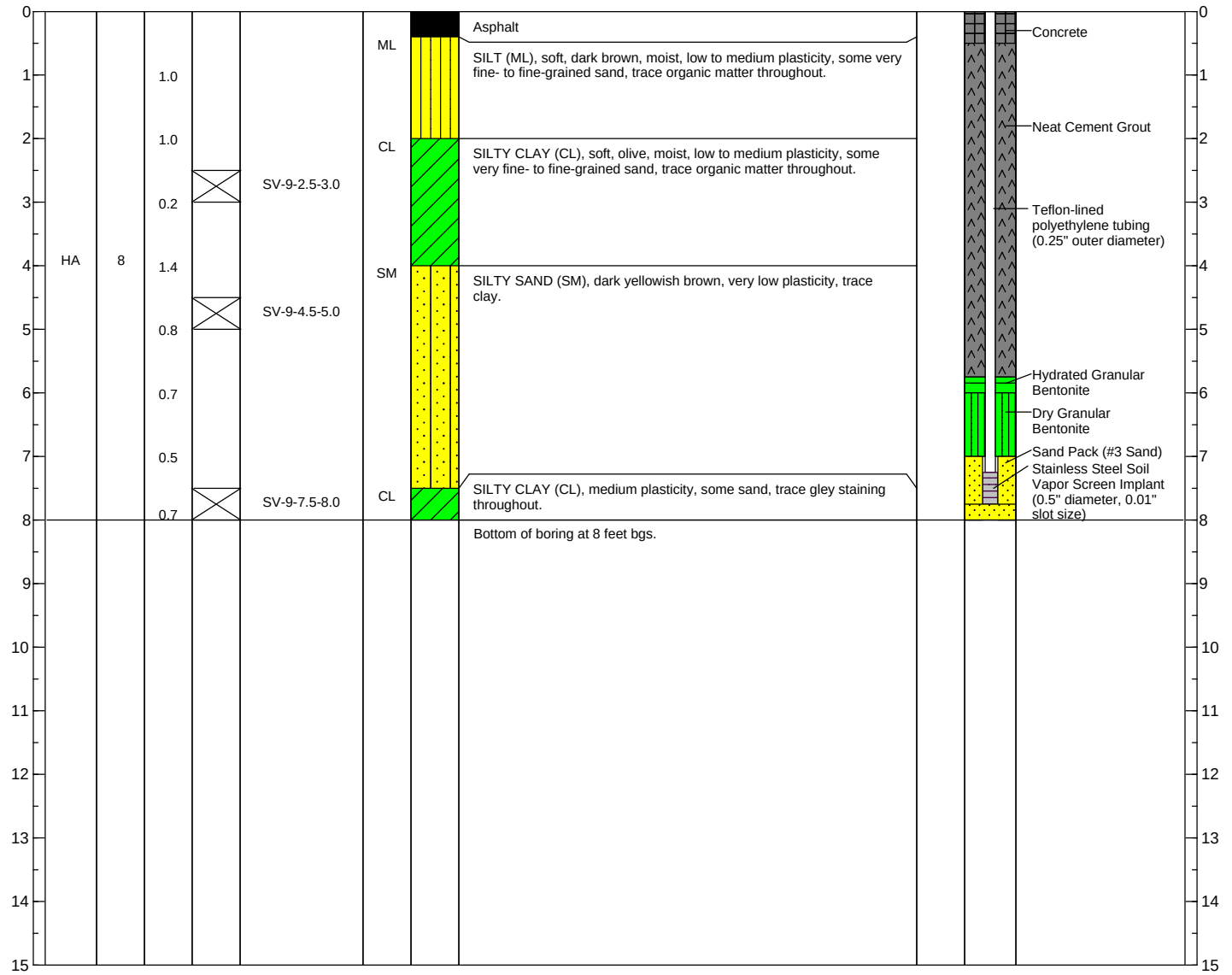
Depth (feet bgs)	Drilling Interval	Recovery (ft)	PID Reading (ppm)	Sample Interval	Sample ID	USCS Code	Geologic Column	Lithologic Description	Hydrostratigraphy	Depth (feet bgs)
0								Asphalt		0
1			1.4			ML		SILT (ML), soft, dark brown, moist, low to medium plasticity, some very fine- to fine-grained sand, trace organic matter throughout.		1
2			2.2		SB-11-1.5-2.0					2
3	HA	6.5	1.9			CL		SILTY CLAY (CL), soft, olive, moist, low to medium plasticity, some very fine- to fine-grained sand, trace organic matter throughout.		3
4			1.3			SM		SILTY SAND (SM), some clay.		4
5			1.5							5
6			1.9		SB-11-6.0-6.5					6
7	DP	1.5	1.0			ML		CLAYEY SILT (ML), soft, olive, medium plasticity, some very fine-grained sand.		7
8			1.5							8
9			4.1							9
10	DP	4	4.1							10
11			22.8							11
12			12.9							12
13			27.2							13
14	DP	4	14.4			ML		SANDY SILT (ML), moist, trace subangular to subrounded gravel (2- to 8-millimeters in diameter)		14
15			2.7			SM		SILTY SAND (SM)		15
16			1.4			ML		CLAYEY SANDY SILT (ML)		16
17			1.2							17
18	DP	4	1.0							18
19			1.5							19
20			1.8			GW		SILTY SANDY GRAVEL (GW), medium dense, very moist to damp, nonplastic, fine- to very coarse-grained sand, subangular to subrounded, well sorted.		20
21			1.5							21
22	DP	4	1.4			GW		SILTY SANDY GRAVEL (GW), medium dense, wet, nonplastic, fine- to very coarse-grained sand, subangular to subrounded (2- to 8-millimeters in diameter), well sorted.	▽	22
23			0.8							23
24			1.6		SB-11-23.5-24.0			Bottom of boring at 24 feet bgs.		24
25										25

Abbreviations: bgs = below ground surface, DP = direct push, HA = hand auger, NA = not available/not applicable, PID = photoionization detector, ppm = parts per million, USCS = Unified Soil Classification System

Notes: Measuring point is ground surface unless otherwise noted.
Depth to first groundwater = 22 feet bgs.

SOIL VAPOR BORING LOG

Date Drilled:	11/1/2016	**ID:**	**SV-09**
Logged By:	Cameron McGovern		
Total Depth:	8 feet bgs	**Client:**	BP
Borehole Diameter:	4 inches	**Location:**	CA-4931
Drilling Company:	Cascade Drilling, LLC		731 West MacArthur Boulevard
Driller's Name:	Juan Morales		Oakland, CA 94609
Drilling Method:	Hand Auger	**Project #:**	GP09BPNA.C110.Q0000
Sampling Method:	Teflon Tubing and Slotted Screen	**Reviewed By:**	Hollis Phillips, PG No. 6887



Abbreviations: bgs = below ground surface, HA = hand auger, NA = not available/not applicable, PID = photoionization detector, ppm = parts per million, USCS = Unified Soil Classification System

Notes:
Measuring point is ground surface unless otherwise noted.
Groundwater was not encountered at SV-09.

APPENDIX C

Soil Vapor Sampling Field Sheets

EQUIPCO RENTALS

RAE SYSTEMS MiniRAE 2000 PID CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: JRB DATE: 11 / 4 / 16

INSTRUMENT INFORMATION

RENTAL ID#: RAE2000. 42 SERIAL NUMBER: 110-012253 LAMP: ☒ 10.6eV ☐ 11.8eV

CALIBRATION INFORMATION

CALIBRATION GAS 1:
- ☒ Isobutylene 100 ppm, in air
- ☐ Hexane _____ppm, in air

RESPONSE TO GAS 1:
- ☒ 100 ppm ±2%

LOT#: K002893

ZERO AIR RESPONSE:
- ☒ 000.0ppm

LOT#: NA

NOTE: The following procedure must be performed in a clean "Fresh Air" environment. Please read the manual to familiarize yourself with the instrument.

1. Press the **MODE** key. The instrument goes through a warmup. It is complete once the unit reads the ppm value or READY.
2. To zero the instrument press and hold down both **MODE** and **N/-** keys for three seconds to enter programming mode.
3. The display will show **"CALIBRATE/select Gas?,"** press the **Y/+** key.
4. Attach the zero filter on the inlet.
5. The display will show **"FRESH AIR CAL?,"** press the **Y/+** key.
6. The unit will go through a fresh air calibration. If any it fails, verify you are in a fresh air environment and try again. If it still fails, contact EQUIPCO for technical support.
7. Remove the zero filter.
8. The instrument will now show **"SPAN CAL?,"** If you would like to calibrate the instrument press the **Y/+** key and proceed through calibration by applying the gas when prompted. If you do not want to calibrate the instrument, but you want to start sampling, press the **N/-** key.
9. Press the **MODE** key until the ppm or Ready is displayed.
10. Install the Hydrophobic filter. **Failure to operate this instrument with the Hydrophobic filter may cause the instrument to become contaminated, and give false readings. Do NOT put the end of the probe into any liquid or directly into the soil.** The instrument is now ready to sample.

THANK YOU FOR RENTING FROM EQUIPCO

This instrument has been thoroughly tested by a factory certified service technician before delivery to you. If you have any questions or difficulties please call us immediately and request technical support.

1-888-234-5678

EQUIPCO RENTALS

CES LANDTECH MODEL: GEM 2000
CALIBRATION CERTIFICATE

SERVICE TECHNICIAN: JRB DATE: 11/4/16

INSTRUMENT INFORMATION

RENTAL ID: GEM2000. 05

SERIAL NUMBER: 5320

CALIBRATION INFORMATION

1..CALIBRATION GAS: 35 % CO_2 LOT #: 573162

GAS RESPONSE: 35 % CO_2 ±2%

2. CALIBRATION GAS: 50 % Vol. Methane LOT #: 573162

GAS RESPONSE: 50 % Vol. Methane ±2%

OXYGEN RESPONSE IN FRESH AIR ENVIRONMENT: 20.9% ✓

OXYGEN DOWNSCALE RESPONSE CHECKED: 0% WITH 99.9% Nitrogen ✓

THIS INSTRUMENT HAS BEEN CALIBRATED TO STANDARDS SET FORTH BY THE MANUFACTURER

2100 Meridian Park Boulevard, Concord, CA. 94520 Phone (925) 609-1088 Fax (925) 609-1080

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Equipment Rental Form

Requestor: Richard Villafania **Date:** 10/25/2016 **Prepared By:** 10/25/2016 **Time Req.:** 4:39 PM

(individual QC requires 48 hours advance notice)

Analysis: TO-14A: ☐ TO-15: ☑ BTEX: ☐ TPH: ☐ FG: ☑ Naphathalene: ☑ Other: _____

Canisters:

Canister 6L:	Qty	Canister 1L:	Qty
Batch:		Batch:	
Individual:		Individual:	8
SIM:		SIM:	
Trip Blank:		Trip Blank:	1

Duplicate T / T Setup:

Soil Gas Manifold: 6

Flow Controllers:	QC Qty	Non QC Qty
Flow Cont - 24 hr.:		
Flow Cont - 12 hr.:		
Flow Cont - 10 hr.:		
Flow Cont - 8hr.:		
Flow Cont - 1hr.:		
Flow Cont - <200cc/min:		
Flow Cont - Adj.:		

TO-17 Sorbent Tube	Qty
Batch	5
Individual	
Trip Blank	

Notes: Include fittings for all summa canisters.

Adjust soil gas manifolds to 100ml/min.

Tripblank filled with Nitrogen.

Include (3) Air COCs.

Delivery Method: **Courier by:** _____ **Client P/U on:** _____ **Ship to Arrive by:** 11/3/2016 AM: ☐

Project Name: CA-04931 GP09BPNA.C110.Q0000 (in case of shipment, address must be completed) Any ☑

Client:	ARCADIS - Walnut Creek (BP)	**Ship to:**	ARCADIS - Walnut Creek (BP) (Default)
Address:	2999 Oak Rd	**Address:**	2999 Oak Rd, Suite 300
	Suite 300		
	Walnut Creek, CA 94597-2537		Walnut Creek, CA 94597-2537
Contact:	Jacob Henry	**Contact:**	Cameron McGovern
Phone#:	925-274-1100	**Phone#:**	415-432-6924

Equipment Information:

ID	EquipmentType	QC Type	VACout
LC833	Summa Canister 1L	TripBlank	10
LC361	Summa Canister 1L	Individual	-29.5
LC375	Summa Canister 1L	Individual	-29.5
LC002	Summa Canister 1L	Individual	-29.5
LC1089	Summa Canister 1L	Individual	-29.5
LC463	Summa Canister 1L	Individual	-29.5
LC1096	Summa Canister 1L	Individual	-29.5

ID	EquipmentType	QC Type	VACout
LC337	Summa Canister 1L	Individual	-29.5
LC197	Summa Canister 1L	Individual	-29.5
SGM317	Soil Gas Manifold	QC	N/A
SGM208	Soil Gas Manifold	QC	N/A
SGM345	Soil Gas Manifold	QC	N/A
SGM293	Soil Gas Manifold	QC	N/A
SGM423	Soil Gas Manifold	QC	N/A
SGM365	Soil Gas Manifold	QC	N/A

G0187172	TO-17 Sorbent Tube	Batch	N/A
G0189388	TO-17 Sorbent Tube	Batch	N/A
G0189661	TO-17 Sorbent Tube	Batch	N/A
G0186930	TO-17 Sorbent Tube	Batch	N/A
G0186857	TO-17 Sorbent Tube	Batch	N/A

By signing this form, I understand that the equipment listed above will be returned only to Calscience for analysis, and will be in the same condition as received. It is also understood that the rental period is **two weeks** from the date signed above, and must be returned within that two week period or additional rental **fees will be incurred**, as described in our Standard Fee Schedule. If a minor (one or two day) extension in the rental period is needed, you must contact your Calscience project manager before the rental period has ended to receive permission.

Relinquished By: _____ **Affiliation:** **CalScience Environmental Labs.**

Received By: _____ **Date/Time:** _____ **Hours:** _____

Printed Name: _____ **Affiliation:** _____

7440 Lincoln Way, Garden Grove, CA 92841-1427 TEL: (714) 895-5494 FAX: (714) 894-7501

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BATCH Sorbent Tube QC CERTIFICATION

Sorbent Tube IDs:

G 0188682 (Certified Tube)	G 0141393
0187172	0189619
0187156	0186857
0143041	0186987
0183852	0141389
0184750	0141308
0189388	0141379
0150021	0142533
0186980	0184771
0188675	

Method ☑ TO-17 VOC's ☐ TO-17 GRO ☐ TO-17 Diesel

Date Certified: 06/04/16

Date Cleaned: 08/04/16

Data File: 04Aug07.D

Instrument ID: GCMS MM

ECI Employee ID

Date

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BATCH Sorbent Tube QC CERTIFICATION

Sorbent Tube IDs:

G0141355 (Certified Tube)	
G0189661	
G0161886	
G0141359	
G0189314	
G0186950	
G0183864	

Method ☑ TO-17 VOC's ☐ TO-17 GRO ☑ TO-17 Diesel

Date Certified: 10/14/16

Date Cleaned: 10/14/16

Data File: 140618.d

Instrument ID: GenS MMM

658
ECI Employee ID

10/31/16
Date

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FLOW CONTROLLER QC CERTIFICATION

Flow Controller IDs:

SG1423	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
135	☐ 24hr	☑ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
323	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
290	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
365	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
344	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	

Canister ID:	LC940
Certification Level:	☐ TO-14 ☑ TO-15 ☐ TO-15 SIM
Date Certified:	10/07/16
Date Cleaned:	Various
Date Leak Checked:	10/10/16
Data File:	07oct09.d
Instrument ID:	GCMS 000
Oven/Rack ID:	OVEN 2

Flow controllers were cleaned per Eurofins Calscience SOP T-016. This certifies that the flow controllers referenced above contain no target analytes above the reporting limits stated in the applicable SOP.

658
ECI Employee ID

10/10/16
Date

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FLOW CONTROLLER QC CERTIFICATION

Flow Controller IDs:

SGM 307	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
290	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
288	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
293	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
345	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	
317	☐ 24hr	☐ 12hr	☐ 10hr	☐ 8hr	☐ 1hr
	☐ <200cc/min	☑ Soil Gas Manifold		☐ Adjustable	

Canister ID:	SLC 040
Certification Level:	☐ TO-14 ☐ TO-15 ☐ TO-15 SIM
Date Certified:	08/23/16
Date Cleaned:	Various
Date Leak Checked:	09/21/16
Data File:	22Aug20.D
Instrument ID:	GCMS KCH
Oven/Rack ID:	OVEN 2

Flow controllers were cleaned per Eurofins Calscience SOP T-016. This certifies that the flow controllers referenced above contain no target analytes above the reporting limits stated in the applicable SOP.

658
ECI Employee ID

09/21/16
Date

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Calscience

INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	2C361
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/28/16
Date Cleaned:	9/26/16
Date Leak Checked:	10/31/16
Data File:	28sep12.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41	11/1/16
ECI Employee ID	Date

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INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	1C375
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/28/16
Date Cleaned:	9/26/16
Date Leak Checked:	11/1/16
Data File:	28sep11.d
Instrument ID:	kkk
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/1/16
Date

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INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	LC 1089
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/22/16
Date Cleaned:	9/15/16
Date Leak Checked:	11/1/16
Data File:	22SEPT11.D
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/1/16
Date

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INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	YC 002
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/22/16
Date Cleaned:	9/15/16
Date Leak Checked:	11/1/16
Data File:	22sep T 12.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

91	11/1/16
ECI Employee ID	Date

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INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	IC463
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/22/16
Date Cleaned:	9/15/16
Date Leak Checked:	11/1/16
Data File:	22sep14.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/4/16
Date

111

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INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	ZC1096
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/22/16
Date Cleaned:	9/16/16
Date Leak Checked:	11/1/16
Data File:	22sep15.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/1/16
Date

eurofins | Calscience

INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	2C 337
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/23/16
Date Cleaned:	9/16/16
Date Leak Checked:	11/1/16
Data File:	22sep16.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11-1-16
Date

eurofins | Calscience

INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	JC 197
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☒ TO-15 ☐ TO-15 SIM
Date Certified:	9/22/16
Date Cleaned:	9/15/16
Date Leak Checked:	11/1/16
Data File:	22sep13cc
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/1/16
Date

eurofins | Calscience

INDIVIDUAL CANISTER QC CERTIFICATION

Certified Canister ID:	2C833 (TB)
Canister Size:	☐ 6L ☒ 1L
Certification Level:	☐ TO-14 ☐ TO-15 ☐ TO-15 SIM
Date Certified:	9/28/16
Date Cleaned:	9/26/16
Date Leak Checked:	11/1/16
Data File:	28sipT10.d
Instrument ID:	KKK
Oven/Rack ID:	4

Canister was cleaned per Eurofins Calscience SOP T-016. This certifies that the canister referenced above contains no target analytes above the reporting limits stated in the applicable SOP.

41
ECI Employee ID

11/1/16
Date

Site Visit Report

Arcadis Project Number:	Dates of Site Visit:
GP09BPNA.C110	11 - 7 -16
Arcadis Project Name:	Location of Project:
BP 4931	**731 West MacArthur Boulevard, Oakland, CA**
Arcadis Personnel Present:	Other Persons Present:
~~C. Edwards~~ C. McGovern / S. Maurer	
Purpose of Site Visit:	
~~Utility Locate~~ SV sampling (SV-7, SV-8, SV-9)	

Date & Time:	Activities:
0900	arrive onsite.
	↳ conduct H+S Tailgate.
0930	began constructing SV manifolds.

SV-7 / SV-8

$V = \pi r^2 h$

$= 3.14 (1.75\text{ in})^2 \, 12\text{ in}$

$= 3.14 (3.0625\text{ in}^2) \, 12\text{ in}$

$= 115.395\text{ in}^3 \times 16.87\text{ mL/in}^3$

$= 1,946.7\text{ mL} \times 0.4$ [porosity]

$= 778.69\text{ mL}$

$V = \pi r^2 h$

$= 3.14 (0.1875\text{ in})^2 \, 48\text{ in}$

$= 5.30\text{ in}^3 \times 16.87\text{ in}^3/\text{mL}$

$= 89.39\text{ mL}$

Total purge volume (1 Vol) = 868.10 mL

SV-9 — 4" diameter hand auger bucket used to install probe @ 8' bgs.

$V_p = 3.14 (2")^2 \, 12"$

$= 150.8\text{ in}^3 \times 16.87\text{ mL/in}^3 =$

$= 2543.94\text{ mL} \times 0.4$ [porosity]

$= 1017.57\text{ mL}$

$V_{TUBE} = 3.14 (0.1875\text{ in})^2 \, 84\text{ in} \times 16.87\text{ mL/in}^3 = 156.51\text{ mL}$

Site Visit Report

11/7/16

Date & Time:	Activities:
	He-1-20161107
	Canister ID: LC375 manifold ID: SGM 423 initial pressure: -30
	SV-7 (Dup-20161107)
	SV-7 can ID: LC002 manifold: SGM 365 Initial pressure: -30 *
	* PRESSURE GAUGE ON DUP SUMMA DAMAGED - USE PRESSURE GAUGE ON PARENT SUMMA TO DETERMINE WHEN SAMPLING IS COMPLETE.
	SV-8 CAN ID: LC1096 MANIFOLD: SGM 208 INITIAL P: -30.0
	SV-9 CAN ID: LC463 + HE-2-20161107 MANIFOLD: SGM317 INITIAL P: -30.0 CAN ID: LC1089 MANIFOLD: SGM293 INITIAL P: -30.0
	He-3-20161107 CANISTER: LC197 MANIFOLD: SGM 345 I. PRESSURE: -30.0 F. PRESSURE = -5.0
1400	depart site. end

Cameron Nielsen

ARCADIS Design & Consultancy for natural and built assets

Soil Gas Sample Collection Log

Date:	11/7/16	Sample ID:	SV-7	+ He-3-20161107	
Client:	AR BP	Tubing Information:	1/4" OD		
Site ID:	4931	Misc. Equipment:	Helium Detector, Multi-Gas Meter, PPB Rae		
Location:	731 W. Macarthur				
ARCADIS Project #:					
Sampler's Initials:	CM / SM	Purge Method:	Pump / SUMMA		
Sample Point Location:	SV-7	Appx. Purge Volume:	868.08 mL		
Sampling Depth:	5'	Tracer Gas Manufacturer:	Equipco		
Tracer Gas:	Helium (UHP)	Tracer Gas Shroud Concentration:	10.3 - 18 ppm		
Canister Size:	1-Liter	Canister ID:	LC002		
Flow Controller ID:	SGM 365				
Duplicate Canister Size:	1-Liter	Duplicate Canister ID:	LC361		
Duplicate Flow Controller ID:	SGM 365				
Sorbent Tube ID	~~6018~~ 6018 6130	Pre-Sampling Flow Rate			
Sample Start/End	1305 / 1306	Post-Sampling Flow Rate			
		Total Volume			
		Tracer Gas Post-Sampling Conc.			
Dup/DVP Sorbent Tube ID	6018717Z	DVP Pre-Sampling Flow Rate			
Dup/DVP Sample Start/End	1305 / 1306	DVP Post-Sampling Flow Rate			
		DVP Total Volume			
		Tracer Gas Post-Sampling Conc.			

Time	Canister Pressure (inches of Hg)	Temperature (°F or °C)	Relative Humidity (%)	~~Air Speed~~ Flow mL (ft/min)	Pressure Differential (inches of H_2O)	PID (ppm or ppb)
START 1245	-30.0	—	—	100		
STOP 1502	-5.0	—	—			
DUP						
DUP						

Nearby Groundwater Monitoring Wells/Water Levels

Well ID	Depth to Groundwater (ft.)

Start	Initial Manifold	General Observations/Notes	Stop	Final Manifold
Shutin:				
1022	-10		1032	-10 ✓

Purge: start: 1218
stop: 1225

LEAK TEST: He @ 20.2% / DETECTOR READING: 0.0 PPM

PID = 0.0 ppm
Landfill: CH_4 0.0%
O_2 ~~14.~~ 14.7%
CO_2 ~~0.0~~ 3.4%

SV-7 + DUP-20161107
+ He-3-20161107

Vacuum Test

Time	Observed Vacuum (inHg)

Shroud Helium Concentration

Time	Helium Concentration (%)
1246	12.1
1247	11.8
1248	12.9
1249	18.0
1250	17.9
1251	17.1
1252	13.9
1253	14.6
1254	12.8
1255	10.3
1256	11.5
1257	10.9
1258	12.6
1259	10.7
1300	12.6
1301	11.1
1302	10.5
1303	

Soil Gas Sample Collection Log

ARCADIS Design & Consultancy for natural and built assets

Date:	11-7-16	Sample ID:	SV-8
Client:	AR BP	Tubing Information:	1/4" OD
Site ID:	4931	Misc. Equipment:	Helium Detector, Multi-Gas Meter, PPB Rae
Location:	731 W. MACARTHUR		
ARCADIS Project #:			
Sampler's Initials:	CM/SM	Purge Method:	Pump / SUMMA
Sample Point Location:	SV-7	Appx. Purge Volume:	868.68 mL
Sampling Depth:	5'	Tracer Gas Manufacturer:	Equipco
Tracer Gas:	Helium (UHP)	Tracer Gas Shroud Concentration:	6.6 - 20.7 %
Canister Size:	1-LITER	Canister ID:	LC1096
Flow Controller ID:	56MZ08		
Duplicate Canister Size:		Duplicate Canister ID:	
Duplicate Flow Controller ID:			
Sorbent Tube ID	66176857	Pre-Sampling Flow Rate	
Sample Start/End	~~1109 1118~~ 1122 1123	Post-Sampling Flow Rate	
		Total Volume	
		Tracer Gas Post-Sampling Conc.	
Dup/DVP Sorbent Tube ID		DVP Pre-Sampling Flow Rate	
Dup/DVP Sample Start/End		DVP Post-Sampling Flow Rate	
		DVP Total Volume	
		Tracer Gas Post-Sampling Conc.	

Time	Canister Pressure (inches of Hg)	Temperature (°F or °C)	Relative Humidity (%)	Air Speed (ft/min)	Pressure Differential (inches of H_2O)	PID (ppm or ppb)
START 1109						
STOP 1118						
DUP						
DUP						

Nearby Groundwater Monitoring Wells/Water Levels

Well ID	Depth to Groundwater (ft.)

Initial Pressure:
SV-08: -30"
He-20161107: -30"

Final
-5"
-6"

He-1
START: 1109
STOP: 1120

He-1-20161107 ~~He-20161107~~ SV-8

General Observations/Notes

START DW: START 1024 FLOWER P -10.9 STOP 1032 FINAL P -10.9 ✓

Purge start 10:58.00
stop 11:02.30

LEAK CHECK: He @ 36.4% / DETECTOR READING: 0 ppm

collect sample: start: 1109 stop: 1118 SV-8
1120 He-20161107

Landfill: CH_4 1.3%
O_2 0.0%
CO_2 10.1%

PID 0.1 ppm

11/7/16 SV-8 HeT-20161107

Vacuum Test

Time	Observed Vacuum (inHg)

Shroud Helium Concentration

Time	Helium Concentration (%)
1109	20.7
1110	21.2
1111	20.0
1112	15.2
1113	15.7
1114	14.6
1115	13.1
1116	12.9
1117	11.9
1118	11.0
1119	6.8
1120	6.6

ARCADIS Design & Consultancy for natural and built assets

Soil Gas Sample Collection Log

Date:	11-7-16	Sample ID:	~~SV-8~~ SV-9	+ HE-2-20161107

Client:	BP	Tubing Information:	1/4" OD
Site ID:	4931	Misc. Equipment:	Helium Detector, Multi-Gas Meter, PPB Rae
Location:	731 W. MACARTHUR		
ARCADIS Project #:			
Sampler's Initials:	SM CM	Purge Method:	(Pump) / SUMMA
Sample Point Location:	SV-9	Appx. Purge Volume:	1174 mL
Sampling Depth:	8'	Tracer Gas Manufacturer:	Equipco
Tracer Gas:	Helium (UHP)	Tracer Gas Shroud Concentration:	

Canister Size:	1-LITER	Canister ID:	6463
Flow Controller ID:	SGM 317		
Duplicate Canister Size:		Duplicate Canister ID:	
Duplicate Flow Controller ID:			
Sorbent Tube ID	GØ189661	Pre-Sampling Flow Rate	
Sample Start/End	1223 / 1224	Post-Sampling Flow Rate	
		Total Volume	
		Tracer Gas Post-Sampling Conc.	
Dup/DVP Sorbent Tube ID		DVP Pre-Sampling Flow Rate	
Dup/DVP Sample Start/End		DVP Post-Sampling Flow Rate	
		DVP Total Volume	
		Tracer Gas Post-Sampling Conc.	

	Time	Canister Pressure (inches of Hg)	Temperature (°F or °C)	Relative Humidity (%)	~~Air Speed (ft/min)~~ Flow mL	Pressure Differential (inches of H_2O)	PID (ppm or ppb)
START	1209	-30.0			100	—	
STOP	1219	-5.0					
DUP							
DUP							

Nearby Groundwater Monitoring Wells/Water Levels

Well ID	Depth to Groundwater (ft.)

General Observations/Notes

SHUT IN: START 1053 INITIAL P -10.0 STOP 1101 FINAL P -10.0

purge: 1151

~~stop~~: 1157

LEAK TEST: He @ 29.5% / DETECTOR READING: 0.0%

LANDTEC: CH4 0.0%. O2 12.1%. CO2 2.5%.

PID: 0.0 ppm

SV-9 + HE-2-20161107

Vacuum Test

Time	Observed Vacuum (inHg)

Shroud Helium Concentration

Time	Helium Concentration (%)
1209	13.8
1210	12.9
1211	11.9
1212	12.4
1213	11.8
1214	10.7
1215	10.3
1216	10.1
1217	14.9
1218	17.1
1219	16.4

APPENDIX D

Waste Disposal Sheets

IWM, Inc.

INTEGRATED WASTESTREAM MANAGEMENT, INC.
1945 CONCOURSE DRIVE, SAN JOSE, CA 95131
PHONE: 408.433.1990 FAX: 408.433.9521

CERTIFICATE OF DISPOSAL

Generator Name:	BP West Coast Products LLC	Facility Name:	BP-4931
Address:	201 Helios Way, Sixth Floor	Address:	731 West MacArthur Blvd
	Houston, TX 77079		Oakland, CA
Contact:	Hollis Phillips	Facility Contact:	Jamey Peterson, Arcadis US Inc
Phone:	510-219-7764	Phone:	707-889-6739

IWM Job #:	943
Description of Waste:	1 Drum(s) of
	Non-Hazardous
	Soil
Removal Date:	11/30/16
Ticket #:	RSVRL301116

Transporter Information

Name:	IWM, Inc.
Address:	1945 Concourse Drive
	San Jose, CA 95131
Phone:	(408) 433-1990

Disposal Facility Information

Name:	Republic Services Vasco Road Landfill
Address:	4001 N. Vasco Road
	Livermore, CA 94550
Phone:	(925) 447-0491

IWM, INC. CERTIFIES THAT THE ABOVE LISTED NON-HAZARDOUS WASTE WILL BE TREATED AND DISPOSED AT THE DESIGNATED FACILITY IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

William T. DeLon William T. DeLon — 11/30/16

Authorized Representative (Print Name and Signature) — Date

IWM, Inc.

INTEGRATED WASTESTREAM MANAGEMENT, INC.
1945 CONCOURSE DRIVE, SAN JOSE, CA 95131
PHONE: 408.433.1990 FAX: 408.433.9521

CERTIFICATE OF DISPOSAL

Generator Name:	BP West Coast Products LLC	Facility Name:	BP-4931
Address:	201 Helios Way Sixth Floor	Address:	731 West MacArthur Blvd
	Houston, CA 77079		Oakland, CA
Contact:	Hollis Phillips	Facility Contact:	Jamey Peterson, Arcadis
Phone:	510-219-7764	Phone:	707-889-6739

IWM Job #:	943
Description of Waste:	1 Drum(s) of
	Non-Hazardous
	Decon Water
Removal Date:	11/30/16
Ticket #:	SP301116-MISC

Transporter Information

Name:	IWM, Inc.
Address:	1945 Concourse Drive
	San Jose, CA 95131
Phone:	(408) 433-1990

Disposal Facility Information

Name:	Seaport Refining & Environmental
Address:	700 Seaport Blvd
	Redwood City, CA 94063
Phone:	(650) 364-1024

IWM, INC. CERTIFIES THAT THE ABOVE LISTED NON-HAZARDOUS WASTE WILL BE TREATED AND DISPOSED AT THE DESIGNATED FACILITY IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.

William T. DeLon William T. DeLon — 11/30/16

Authorized Representative (Print Name and Signature) — Date

APPENDIX E

Laboratory Analytical Results and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

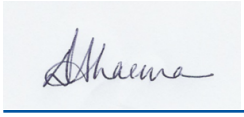
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-75522-2
Client Project/Site: BP #4931, Oakland

For:
ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco, California 94104

Attn: Jamey Peterson



Authorized for release by:
11/1/2016 3:01:06 PM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-75522-2

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-75522-2

Comments
No additional comments.

Receipt
The samples were received on 10/31/2016 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-5.0-5.5 — Lab Sample ID: 720-75522-10

No Detections.

Client Sample ID: SB-8-8.0-8.5 — Lab Sample ID: 720-75522-11

No Detections.

Client Sample ID: SB-8-12.0-12.5 — Lab Sample ID: 720-75522-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
MTBE	15		4.0		ug/Kg	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-8-23.5-24.0 — Lab Sample ID: 720-75522-13

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-5.0-5.5
Date Collected: 10/31/16 09:48
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-10
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Ethylbenzene	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Ethanol	ND		930		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
MTBE	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
TAME	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Ethyl t-butyl ether	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Toluene	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
EDB	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Xylenes, Total	ND		9.3		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
1,2-DCA	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
TBA	ND		93		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
DIPE	ND		4.6		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Naphthalene	ND		9.3		ug/Kg		10/31/16 16:45	10/31/16 21:39	1
Gasoline Range Organics (GRO) -C6-C12	ND		230		ug/Kg		10/31/16 16:45	10/31/16 21:39	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*45 - 131*	*10/31/16 16:45*	*10/31/16 21:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*	*10/31/16 16:45*	*10/31/16 21:39*	*1*
Toluene-d8 (Surr)	*105*		*58 - 140*	*10/31/16 16:45*	*10/31/16 21:39*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-8.0-8.5
Date Collected: 10/31/16 09:53
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-11
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Ethylbenzene	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Ethanol	ND		850		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
MTBE	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
TAME	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Ethyl t-butyl ether	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Toluene	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
EDB	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Xylenes, Total	ND		8.5		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
1,2-DCA	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
TBA	ND		85		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
DIPE	ND		4.2		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Naphthalene	ND		8.5		ug/Kg		10/31/16 16:45	10/31/16 22:08	1
Gasoline Range Organics (GRO) -C6-C12	ND		210		ug/Kg		10/31/16 16:45	10/31/16 22:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*45 - 131*	*10/31/16 16:45*	*10/31/16 22:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*96*		*60 - 140*	*10/31/16 16:45*	*10/31/16 22:08*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*	*10/31/16 16:45*	*10/31/16 22:08*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-12.0-12.5
Date Collected: 10/31/16 09:37
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-12
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Ethylbenzene	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Ethanol	ND		790		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
MTBE	**15**		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
TAME	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Ethyl t-butyl ether	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Toluene	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
EDB	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Xylenes, Total	ND		7.9		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
1,2-DCA	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
TBA	ND		79		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
DIPE	ND		4.0		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Naphthalene	ND		7.9		ug/Kg		10/31/16 16:45	10/31/16 22:38	1
Gasoline Range Organics (GRO) -C6-C12	ND		200		ug/Kg		10/31/16 16:45	10/31/16 22:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*45 - 131*	*10/31/16 16:45*	*10/31/16 22:38*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*60 - 140*	*10/31/16 16:45*	*10/31/16 22:38*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*	*10/31/16 16:45*	*10/31/16 22:38*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-23.5-24.0
Date Collected: 10/31/16 09:43
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-13
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Ethylbenzene	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Ethanol	ND		850		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
MTBE	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
TAME	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Ethyl t-butyl ether	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Toluene	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
EDB	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Xylenes, Total	ND		8.5		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
1,2-DCA	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
TBA	ND		85		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
DIPE	ND		4.3		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Naphthalene	ND		8.5		ug/Kg		10/31/16 16:45	10/31/16 23:08	1
Gasoline Range Organics (GRO) -C6-C12	ND		210		ug/Kg		10/31/16 16:45	10/31/16 23:08	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*96*		*45 - 131*	*10/31/16 16:45*	*10/31/16 23:08*	*1*
1,2-Dichloroethane-d4 (Surr)	*94*		*60 - 140*	*10/31/16 16:45*	*10/31/16 23:08*	*1*
Toluene-d8 (Surr)	*99*		*58 - 140*	*10/31/16 16:45*	*10/31/16 23:08*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(45-131)	(60-140)	(58-140)
720-75522-10	SB-8-5.0-5.5	102	91	105
720-75522-11	SB-8-8.0-8.5	101	96	102
720-75522-12	SB-8-12.0-12.5	101	94	102
720-75522-13	SB-8-23.5-24.0	96	94	99
LCS 720-212344/5	Lab Control Sample	104	86	106
LCS 720-212344/7	Lab Control Sample	106	91	107
LCSD 720-212344/6	Lab Control Sample Dup	106	87	106
LCSD 720-212344/8	Lab Control Sample Dup	106	89	106
MB 720-212344/4	Method Blank	102	91	107

Surrogate Legend

BFB = 4-Bromofluorobenzene
12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-212344/4
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethylbenzene	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethanol	ND		1000		ug/Kg			10/31/16 19:07	1
MTBE	ND		5.0		ug/Kg			10/31/16 19:07	1
TAME	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			10/31/16 19:07	1
Toluene	ND		5.0		ug/Kg			10/31/16 19:07	1
EDB	ND		5.0		ug/Kg			10/31/16 19:07	1
Xylenes, Total	ND		10		ug/Kg			10/31/16 19:07	1
1,2-DCA	ND		5.0		ug/Kg			10/31/16 19:07	1
TBA	ND		100		ug/Kg			10/31/16 19:07	1
DIPE	ND		5.0		ug/Kg			10/31/16 19:07	1
Naphthalene	ND		10		ug/Kg			10/31/16 19:07	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			10/31/16 19:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*45 - 131*		*10/31/16 19:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*		*10/31/16 19:07*	*1*
Toluene-d8 (Surr)	*107*		*58 - 140*		*10/31/16 19:07*	*1*

Lab Sample ID: LCS 720-212344/5
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	54.4		ug/Kg		109	70 - 130
Ethylbenzene	50.0	51.7		ug/Kg		103	80 - 137
Ethanol	2000	2180		ug/Kg		109	49 - 162
m-Xylene & p-Xylene	50.0	55.0		ug/Kg		110	70 - 146
MTBE	50.0	56.6		ug/Kg		113	70 - 144
TAME	50.0	54.6		ug/Kg		109	70 - 145
Ethyl t-butyl ether	50.0	51.5		ug/Kg		103	70 - 130
Toluene	50.0	56.6		ug/Kg		113	75 - 120
EDB	50.0	55.3		ug/Kg		111	70 - 140
1,2-DCA	50.0	49.7		ug/Kg		99	70 - 130
TBA	500	549		ug/Kg		110	63 - 130
DIPE	50.0	52.4		ug/Kg		105	70 - 131
Naphthalene	50.0	57.5		ug/Kg		115	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*86*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212344/7
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	961		ug/Kg		96	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212344/6
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	54.4		ug/Kg		109	70 - 130	0	20
Ethylbenzene			50.0	52.3		ug/Kg		105	80 - 137	1	20
Ethanol			2000	2000		ug/Kg		100	49 - 162	9	20
m-Xylene & p-Xylene			50.0	55.6		ug/Kg		111	70 - 146	1	20
MTBE			50.0	57.6		ug/Kg		115	70 - 144	2	20
TAME			50.0	55.7		ug/Kg		111	70 - 145	2	20
Ethyl t-butyl ether			50.0	52.2		ug/Kg		104	70 - 130	1	20
Toluene			50.0	57.2		ug/Kg		114	75 - 120	1	20
EDB			50.0	56.6		ug/Kg		113	70 - 140	2	20
1,2-DCA			50.0	50.2		ug/Kg		100	70 - 130	1	20
TBA			500	545		ug/Kg		109	63 - 130	1	20
DIPE			50.0	52.4		ug/Kg		105	70 - 131	0	20
Naphthalene			50.0	60.4		ug/Kg		121	60 - 147	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*87*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Lab Sample ID: LCSD 720-212344/8
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	991		ug/Kg		99	64 - 120	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*89*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

GC/MS VOA

Analysis Batch: 212344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-10	SB-8-5.0-5.5	Total/NA	Solid	8260B/CA_LUFT MS	212353
720-75522-11	SB-8-8.0-8.5	Total/NA	Solid	8260B/CA_LUFT MS	212353
720-75522-12	SB-8-12.0-12.5	Total/NA	Solid	8260B/CA_LUFT MS	212353
720-75522-13	SB-8-23.5-24.0	Total/NA	Solid	8260B/CA_LUFT MS	212353
MB 720-212344/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212344/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212344/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212344/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212344/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-10	SB-8-5.0-5.5	Total/NA	Solid	5035	
720-75522-11	SB-8-8.0-8.5	Total/NA	Solid	5035	
720-75522-12	SB-8-12.0-12.5	Total/NA	Solid	5035	
720-75522-13	SB-8-23.5-24.0	Total/NA	Solid	5035	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Client Sample ID: SB-8-5.0-5.5
Lab Sample ID: 720-75522-10
Date Collected: 10/31/16 09:48
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212353	10/31/16 16:45	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212344	10/31/16 21:39	JRM	TAL PLS

Client Sample ID: SB-8-8.0-8.5
Lab Sample ID: 720-75522-11
Date Collected: 10/31/16 09:53
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212353	10/31/16 16:45	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212344	10/31/16 22:08	JRM	TAL PLS

Client Sample ID: SB-8-12.0-12.5
Lab Sample ID: 720-75522-12
Date Collected: 10/31/16 09:37
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212353	10/31/16 16:45	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212344	10/31/16 22:38	JRM	TAL PLS

Client Sample ID: SB-8-23.5-24.0
Lab Sample ID: 720-75522-13
Date Collected: 10/31/16 09:43
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212353	10/31/16 16:45	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212344	10/31/16 23:08	JRM	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-18

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-75522-10	SB-8-5.0-5.5	Solid	10/31/16 09:48	10/31/16 15:30
720-75522-11	SB-8-8.0-8.5	Solid	10/31/16 09:53	10/31/16 15:30
720-75522-12	SB-8-12.0-12.5	Solid	10/31/16 09:37	10/31/16 15:30
720-75522-13	SB-8-23.5-24.0	Solid	10/31/16 09:43	10/31/16 15:30

720-75522

ARCADIS
Infrastructure Water Environment Buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of ___

172007
Lab Work Order #

11/1/2016

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Send Results to:
Contact & Company Name: Journey Peterson ARCADIS
Telephone:
Address: 100 Montgomery St, Suite 300
Fax:
City: SF State: CA Zip: 94104
E-mail Address: Journey.Peterson@arcadis.com
Project Name/Location (City, State): BP CA4931
Project #:
Sampler's Printed Name: Cameron McGovern
Sampler's Signature: Cameron McGovern

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	Preservative	Filtered (✓)	# of Containers	Container Information	GRO (8260)	BTEX, DIPE, MTBE, ETBE, TAME, TBA, 1,2-DCA, EDB, Ethanol (8260)	Naph. Analogue (8260)	
SB-10-1.0-1.5	10/31/16	1255	✓		So	-	-	5	5	X	X	X	
SB-10-9.0-9.5		1320				-	-	5	5				
SB-10-20.5-21.0		1330				-	-	5	5				
SB-10-23.5-24.0		1335				-	-	5	5				
SB-09-4.0-4.5		1040				-	-	5	5				
SB-09-8.0-8.5		1126				-	-	5	5				
SB-09-17.0-17.5		1135				-	-	5	5				
SB-09-19.5-20.0		1138				-	-	5	5				
SB-09-23.5-24.0		1144				-	-	5	5				
SB-08-5.0-5.5		0948				-	-	5	5				
SB-08-8.0-8.5		0953				-	-	5	5				
SB-08-12.0-12.5		0937				-	-	5	5				
SB-08-23.5-24.0		0943				-	-	5	5				

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key: A. H_2SO_4 B. HCL C HNO_3 D. NaOH E None F. Other: ___ G Other: ___ H. Other: ___

Container Information Key: 1. 40 ml Vial 2. 1 L Amber 3 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz. Glass 7 4 oz. Glass 8. 8 oz. Glass 9. Other: ___ 10 Other: ___

Matrix Key: SO - Soil SE - Sediment NL - NAPL/Oil W - Water SL - Sludge SW - Sample Wipe T - Tissue A - Air Other: ___

REMARKS

Standard TAT

RUSH

* 24 hour TAT *

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

5.9°C

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Test America	Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact	Printed Name: Cameron McGovern	Printed Name: Dennis Arias		
☒ Cooler packed with ice (✓)		Signature: Cameron McGovern	Signature:		
Specify Turnaround Requirements: * See Remarks *	Sample Receipt:	Firm: ARCADIS	Firm/Courier:		
Shipping Tracking #:	Condition/Cooler Temp: ___	Date/Time: 10/31/16 1530	Date/Time: 10/31/16 1530		

720-75522 Chain of Custody

20730826 CofC AR Form 01.12.2007

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-75522-2

Login Number: 75522
List Number: 1
Creator: Arauz, Dennis

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-75522-1
Client Project/Site: BP #4931, Oakland

For:
ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco, California 94104

Attn: Jamey Peterson

Authorized for release by:
11/8/2016 2:48:29 PM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-75522-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-75522-1

Comments
No additional comments.

Receipt
The samples were received on 10/31/2016 3:30 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.9º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 720-212509 recovered outside control limits for the following analytes: Ethanol. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-10-1.0-1.5 — Lab Sample ID: 720-75522-1

No Detections.

Client Sample ID: SB-10-9.0-9.5 — Lab Sample ID: 720-75522-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C12	4500		190		ug/Kg	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-10-20.5-21.0 — Lab Sample ID: 720-75522-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	11000		3600		ug/Kg	1000		8260B/CA_LUFT MS	Total/NA
Gasoline Range Organics (GRO) -C6-C12	990000		180000		ug/Kg	1000		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-10-23.5-24.0 — Lab Sample ID: 720-75522-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C12	440		190		ug/Kg	1		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-9-4.0-4.5 — Lab Sample ID: 720-75522-5

No Detections.

Client Sample ID: SB-9-8.0-8.5 — Lab Sample ID: 720-75522-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C12	87000		23000		ug/Kg	100		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-9-17.0-17.5 — Lab Sample ID: 720-75522-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	410		390		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Ethylbenzene	1700		390		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Xylenes, Total	2400		770		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Naphthalene	930		770		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Gasoline Range Organics (GRO) -C6-C12	84000		19000		ug/Kg	100		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-9-19.5-20.0 — Lab Sample ID: 720-75522-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	1700		380		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Xylenes, Total	7200		760		ug/Kg	100		8260B/CA_LUFT MS	Total/NA
Naphthalene	1400		760		ug/Kg	100		8260B/CA_LUFT MS	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: SB-9-19.5-20.0 (Continued)

Lab Sample ID: 720-75522-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Organics (GRO) -C6-C12	140000		19000		ug/Kg	100		8260B/CA_LUFT MS	Total/NA

Client Sample ID: SB-9-23.5-24.0

Lab Sample ID: 720-75522-9

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-10-1.0-1.5
Date Collected: 10/31/16 12:55
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-1
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Ethylbenzene	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Ethanol	ND		710		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
MTBE	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
TAME	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Ethyl t-butyl ether	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Toluene	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
EDB	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Xylenes, Total	ND		7.1		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
1,2-DCA	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
TBA	ND		71		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
DIPE	ND		3.6		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Naphthalene	ND		7.1		ug/Kg		10/31/16 18:43	11/02/16 15:57	1
Gasoline Range Organics (GRO) -C6-C12	ND		180		ug/Kg		10/31/16 18:43	11/02/16 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*96*		*45 - 131*	*10/31/16 18:43*	*11/02/16 15:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*60 - 140*	*10/31/16 18:43*	*11/02/16 15:57*	*1*
Toluene-d8 (Surr)	*100*		*58 - 140*	*10/31/16 18:43*	*11/02/16 15:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-10-9.0-9.5
Date Collected: 10/31/16 13:20
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-2
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Ethylbenzene	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Ethanol	ND		760		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
MTBE	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
TAME	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Ethyl t-butyl ether	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Toluene	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
EDB	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Xylenes, Total	ND		7.6		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
1,2-DCA	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
TBA	ND		76		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
DIPE	ND		3.8		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Naphthalene	ND		7.6		ug/Kg		10/31/16 18:43	11/01/16 05:35	1
Gasoline Range Organics (GRO) -C6-C12	**4500**		190		ug/Kg		10/31/16 18:43	11/01/16 05:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*106*		*45 - 131*	*10/31/16 18:43*	*11/01/16 05:35*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*60 - 140*	*10/31/16 18:43*	*11/01/16 05:35*	*1*
Toluene-d8 (Surr)	*106*		*58 - 140*	*10/31/16 18:43*	*11/01/16 05:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-10-20.5-21.0
Date Collected: 10/31/16 13:30
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-3
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Ethylbenzene	**11000**		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Ethanol	ND		360000		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
MTBE	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
TAME	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Ethyl t-butyl ether	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Toluene	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
EDB	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Xylenes, Total	ND		7200		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
1,2-DCA	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
TBA	ND		7200		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
DIPE	ND		3600		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Naphthalene	ND		7200		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000
Gasoline Range Organics (GRO) -C6-C12	**990000**		180000		ug/Kg		10/31/16 18:43	11/01/16 13:35	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*66 - 148*	*10/31/16 18:43*	*11/01/16 13:35*	*1000*
1,2-Dichloroethane-d4 (Surr)	*93*		*62 - 137*	*10/31/16 18:43*	*11/01/16 13:35*	*1000*
Toluene-d8 (Surr)	*98*		*65 - 141*	*10/31/16 18:43*	*11/01/16 13:35*	*1000*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-10-23.5-24.0
Date Collected: 10/31/16 13:35
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-4
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Ethylbenzene	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Ethanol	ND		770		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
MTBE	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
TAME	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Ethyl t-butyl ether	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Toluene	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
EDB	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Xylenes, Total	ND		7.7		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
1,2-DCA	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
TBA	ND		77		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
DIPE	ND		3.9		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Naphthalene	ND		7.7		ug/Kg		10/31/16 18:43	11/02/16 16:27	1
Gasoline Range Organics (GRO) -C6-C12	**440**		190		ug/Kg		10/31/16 18:43	11/02/16 16:27	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*110*		*45 - 131*	*10/31/16 18:43*	*11/02/16 16:27*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*60 - 140*	*10/31/16 18:43*	*11/02/16 16:27*	*1*
Toluene-d8 (Surr)	*106*		*58 - 140*	*10/31/16 18:43*	*11/02/16 16:27*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-4.0-4.5
Date Collected: 10/31/16 10:40
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-5
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Ethylbenzene	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Ethanol	ND		790		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
MTBE	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
TAME	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Ethyl t-butyl ether	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Toluene	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
EDB	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Xylenes, Total	ND		7.9		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
1,2-DCA	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
TBA	ND		79		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
DIPE	ND		4.0		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Naphthalene	ND		7.9		ug/Kg		10/31/16 18:43	11/02/16 16:57	1
Gasoline Range Organics (GRO) -C6-C12	ND		200		ug/Kg		10/31/16 18:43	11/02/16 16:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*98*		*45 - 131*	*10/31/16 18:43*	*11/02/16 16:57*	*1*
1,2-Dichloroethane-d4 (Surr)	*102*		*60 - 140*	*10/31/16 18:43*	*11/02/16 16:57*	*1*
Toluene-d8 (Surr)	*104*		*58 - 140*	*10/31/16 18:43*	*11/02/16 16:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-8.0-8.5
Date Collected: 10/31/16 11:26
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-6
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
Ethylbenzene	ND		450		ug/Kg		10/31/16 18:40	11/03/16 21:56	100
Ethanol	ND		840		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
MTBE	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
TAME	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
Ethyl t-butyl ether	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
Toluene	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
EDB	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
Xylenes, Total	ND		900		ug/Kg		10/31/16 18:40	11/03/16 21:56	100
1,2-DCA	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
TBA	ND		84		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
DIPE	ND		4.2		ug/Kg		10/31/16 18:43	11/02/16 00:32	1
Naphthalene	ND		900		ug/Kg		10/31/16 18:40	11/03/16 21:56	100
Gasoline Range Organics (GRO) -C6-C12	**87000**		23000		ug/Kg		10/31/16 18:40	11/03/16 21:56	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*111*		*45 - 131*	*10/31/16 18:43*	*11/02/16 00:32*	*1*
4-Bromofluorobenzene	*107*		*66 - 148*	*10/31/16 18:40*	*11/03/16 21:56*	*100*
1,2-Dichloroethane-d4 (Surr)	*93*		*60 - 140*	*10/31/16 18:43*	*11/02/16 00:32*	*1*
1,2-Dichloroethane-d4 (Surr)	*88*		*62 - 137*	*10/31/16 18:40*	*11/03/16 21:56*	*100*
Toluene-d8 (Surr)	*104*		*58 - 140*	*10/31/16 18:43*	*11/02/16 00:32*	*1*
Toluene-d8 (Surr)	*107*		*65 - 141*	*10/31/16 18:40*	*11/03/16 21:56*	*100*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-17.0-17.5
Date Collected: 10/31/16 11:35
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-7
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**410**		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Ethylbenzene	**1700**		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Ethanol	ND	*	39000		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
MTBE	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
TAME	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Ethyl t-butyl ether	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Toluene	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
EDB	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Xylenes, Total	**2400**		770		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
1,2-DCA	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
TBA	ND		770		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
DIPE	ND		390		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Naphthalene	**930**		770		ug/Kg		10/31/16 18:40	11/03/16 22:25	100
Gasoline Range Organics (GRO) -C6-C12	**84000**		19000		ug/Kg		10/31/16 18:40	11/03/16 22:25	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*106*		*66 - 148*	*10/31/16 18:40*	*11/03/16 22:25*	*100*
1,2-Dichloroethane-d4 (Surr)	*92*		*62 - 137*	*10/31/16 18:40*	*11/03/16 22:25*	*100*
Toluene-d8 (Surr)	*107*		*65 - 141*	*10/31/16 18:40*	*11/03/16 22:25*	*100*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-19.5-20.0
Date Collected: 10/31/16 11:38
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-8
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Ethylbenzene	**1700**		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Ethanol	ND	*	38000		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
MTBE	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
TAME	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Ethyl t-butyl ether	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Toluene	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
EDB	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Xylenes, Total	**7200**		760		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
1,2-DCA	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
TBA	ND		760		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
DIPE	ND		380		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Naphthalene	**1400**		760		ug/Kg		10/31/16 18:40	11/03/16 22:55	100
Gasoline Range Organics (GRO) -C6-C12	**140000**		19000		ug/Kg		10/31/16 18:40	11/03/16 22:55	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*109*		*66 - 148*	*10/31/16 18:40*	*11/03/16 22:55*	*100*
1,2-Dichloroethane-d4 (Surr)	*89*		*62 - 137*	*10/31/16 18:40*	*11/03/16 22:55*	*100*
Toluene-d8 (Surr)	*107*		*65 - 141*	*10/31/16 18:40*	*11/03/16 22:55*	*100*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-23.5-24.0
Date Collected: 10/31/16 11:44
Date Received: 10/31/16 15:30

Lab Sample ID: 720-75522-9
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Ethylbenzene	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Ethanol	ND		720		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
MTBE	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
TAME	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Ethyl t-butyl ether	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Toluene	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
EDB	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Xylenes, Total	ND		7.2		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
1,2-DCA	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
TBA	ND		72		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
DIPE	ND		3.6		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Naphthalene	ND		7.2		ug/Kg		10/31/16 18:43	11/01/16 23:02	1
Gasoline Range Organics (GRO) -C6-C12	ND		180		ug/Kg		10/31/16 18:43	11/01/16 23:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*99*		*45 - 131*	*10/31/16 18:43*	*11/01/16 23:02*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*60 - 140*	*10/31/16 18:43*	*11/01/16 23:02*	*1*
Toluene-d8 (Surr)	*102*		*58 - 140*	*10/31/16 18:43*	*11/01/16 23:02*	*1*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(45-131)	(60-140)	(58-140)
720-75522-1	SB-10-1.0-1.5	96	103	100
720-75522-2	SB-10-9.0-9.5	106	106	106
720-75522-4	SB-10-23.5-24.0	110	104	106
720-75522-5	SB-9-4.0-4.5	98	102	104
720-75522-6	SB-9-8.0-8.5	111	93	104
720-75522-9	SB-9-23.5-24.0	99	101	102
LCS 720-212344/5	Lab Control Sample	104	86	106
LCS 720-212344/7	Lab Control Sample	106	91	107
LCS 720-212411/6	Lab Control Sample	109	96	106
LCS 720-212411/8	Lab Control Sample	106	97	107
LCS 720-212422/5	Lab Control Sample	104	88	107
LCS 720-212422/7	Lab Control Sample	105	89	107
LCSD 720-212344/6	Lab Control Sample Dup	106	87	106
LCSD 720-212344/8	Lab Control Sample Dup	106	89	106
LCSD 720-212411/7	Lab Control Sample Dup	107	95	106
LCSD 720-212411/9	Lab Control Sample Dup	107	97	107
LCSD 720-212422/6	Lab Control Sample Dup	107	89	107
LCSD 720-212422/8	Lab Control Sample Dup	105	91	107
MB 720-212344/4	Method Blank	102	91	107
MB 720-212411/5	Method Blank	100	101	101
MB 720-212422/4	Method Blank	105	87	107

Surrogate Legend

BFB = 4-Bromofluorobenzene

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BFB	12DCE	TOL
Lab Sample ID	Client Sample ID	(66-148)	(62-137)	(65-141)
720-75522-3	SB-10-20.5-21.0	100	93	98
720-75522-6	SB-9-8.0-8.5	107	88	107
720-75522-7	SB-9-17.0-17.5	106	92	107
720-75522-8	SB-9-19.5-20.0	109	89	107
LCS 720-212355/5	Lab Control Sample	98	91	97
LCS 720-212355/7	Lab Control Sample	99	94	97
LCS 720-212509/5	Lab Control Sample	104	96	107
LCS 720-212509/7	Lab Control Sample	103	96	107
LCSD 720-212355/6	Lab Control Sample Dup	97	91	97
LCSD 720-212355/8	Lab Control Sample Dup	99	95	97
LCSD 720-212509/6	Lab Control Sample Dup	109	94	107
LCSD 720-212509/8	Lab Control Sample Dup	104	91	106
MB 720-212355/4	Method Blank	96	90	96
MB 720-212509/4	Method Blank	100	99	108

Surrogate Legend

BFB = 4-Bromofluorobenzene

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

12DCE = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-212344/4
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethylbenzene	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethanol	ND		1000		ug/Kg			10/31/16 19:07	1
MTBE	ND		5.0		ug/Kg			10/31/16 19:07	1
TAME	ND		5.0		ug/Kg			10/31/16 19:07	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			10/31/16 19:07	1
Toluene	ND		5.0		ug/Kg			10/31/16 19:07	1
EDB	ND		5.0		ug/Kg			10/31/16 19:07	1
Xylenes, Total	ND		10		ug/Kg			10/31/16 19:07	1
1,2-DCA	ND		5.0		ug/Kg			10/31/16 19:07	1
TBA	ND		100		ug/Kg			10/31/16 19:07	1
DIPE	ND		5.0		ug/Kg			10/31/16 19:07	1
Naphthalene	ND		10		ug/Kg			10/31/16 19:07	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			10/31/16 19:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*45 - 131*		*10/31/16 19:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*		*10/31/16 19:07*	*1*
Toluene-d8 (Surr)	*107*		*58 - 140*		*10/31/16 19:07*	*1*

Lab Sample ID: LCS 720-212344/5
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	54.4		ug/Kg		109	70 - 130
Ethylbenzene	50.0	51.7		ug/Kg		103	80 - 137
Ethanol	2000	2180		ug/Kg		109	49 - 162
m-Xylene & p-Xylene	50.0	55.0		ug/Kg		110	70 - 146
MTBE	50.0	56.6		ug/Kg		113	70 - 144
TAME	50.0	54.6		ug/Kg		109	70 - 145
Ethyl t-butyl ether	50.0	51.5		ug/Kg		103	70 - 130
Toluene	50.0	56.6		ug/Kg		113	75 - 120
EDB	50.0	55.3		ug/Kg		111	70 - 140
1,2-DCA	50.0	49.7		ug/Kg		99	70 - 130
TBA	500	549		ug/Kg		110	63 - 130
DIPE	50.0	52.4		ug/Kg		105	70 - 131
Naphthalene	50.0	57.5		ug/Kg		115	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*86*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212344/7
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	961		ug/Kg		96	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212344/6
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	54.4		ug/Kg		109	70 - 130	0	20
Ethylbenzene			50.0	52.3		ug/Kg		105	80 - 137	1	20
Ethanol			2000	2000		ug/Kg		100	49 - 162	9	20
m-Xylene & p-Xylene			50.0	55.6		ug/Kg		111	70 - 146	1	20
MTBE			50.0	57.6		ug/Kg		115	70 - 144	2	20
TAME			50.0	55.7		ug/Kg		111	70 - 145	2	20
Ethyl t-butyl ether			50.0	52.2		ug/Kg		104	70 - 130	1	20
Toluene			50.0	57.2		ug/Kg		114	75 - 120	1	20
EDB			50.0	56.6		ug/Kg		113	70 - 140	2	20
1,2-DCA			50.0	50.2		ug/Kg		100	70 - 130	1	20
TBA			500	545		ug/Kg		109	63 - 130	1	20
DIPE			50.0	52.4		ug/Kg		105	70 - 131	0	20
Naphthalene			50.0	60.4		ug/Kg		121	60 - 147	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*87*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Lab Sample ID: LCSD 720-212344/8
Matrix: Solid
Analysis Batch: 212344

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	991		ug/Kg		99	64 - 120	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*89*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-212355/4
Matrix: Solid
Analysis Batch: 212355

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		500		ug/Kg			11/01/16 08:49	100
Ethylbenzene	ND		500		ug/Kg			11/01/16 08:49	100
Ethanol	ND		50000		ug/Kg			11/01/16 08:49	100
MTBE	ND		500		ug/Kg			11/01/16 08:49	100
TAME	ND		500		ug/Kg			11/01/16 08:49	100
Ethyl t-butyl ether	ND		500		ug/Kg			11/01/16 08:49	100
Toluene	ND		500		ug/Kg			11/01/16 08:49	100
EDB	ND		500		ug/Kg			11/01/16 08:49	100
Xylenes, Total	ND		1000		ug/Kg			11/01/16 08:49	100
1,2-DCA	ND		500		ug/Kg			11/01/16 08:49	100
TBA	ND		1000		ug/Kg			11/01/16 08:49	100
DIPE	ND		500		ug/Kg			11/01/16 08:49	100
Naphthalene	ND		1000		ug/Kg			11/01/16 08:49	100
Gasoline Range Organics (GRO) -C6-C12	ND		25000		ug/Kg			11/01/16 08:49	100

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*96*		*66 - 148*		*11/01/16 08:49*	*100*
1,2-Dichloroethane-d4 (Surr)	*90*		*62 - 137*		*11/01/16 08:49*	*100*
Toluene-d8 (Surr)	*96*		*65 - 141*		*11/01/16 08:49*	*100*

Lab Sample ID: LCS 720-212355/5
Matrix: Solid
Analysis Batch: 212355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5000	5380		ug/Kg		108	76 - 122
Ethylbenzene	5000	5080		ug/Kg		102	76 - 137
Ethanol	200000	192000		ug/Kg		96	70 - 130
m-Xylene & p-Xylene	5000	5160		ug/Kg		103	71 - 142
MTBE	5000	5540		ug/Kg		111	71 - 146
TAME	5000	5390		ug/Kg		108	70 - 130
Ethyl t-butyl ether	5000	4870		ug/Kg		97	70 - 130
Toluene	5000	4990		ug/Kg		100	77 - 120
EDB	5000	5910		ug/Kg		118	70 - 138
1,2-DCA	5000	5060		ug/Kg		101	67 - 126
TBA	50000	51400		ug/Kg		103	70 - 130
DIPE	5000	4460		ug/Kg		89	70 - 130
Naphthalene	5000	5070		ug/Kg		101	62 - 151

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*98*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*
Toluene-d8 (Surr)	*97*		*65 - 141*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212355/7
Matrix: Solid
Analysis Batch: 212355

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			100000	98100		ug/Kg		98	61 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*99*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
Toluene-d8 (Surr)	*97*		*65 - 141*

Lab Sample ID: LCSD 720-212355/6
Matrix: Solid
Analysis Batch: 212355

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			5000	5410		ug/Kg		108	76 - 122	0	20
Ethylbenzene			5000	5080		ug/Kg		102	76 - 137	0	20
Ethanol			200000	190000		ug/Kg		95	70 - 130	1	20
m-Xylene & p-Xylene			5000	5150		ug/Kg		103	71 - 142	0	20
MTBE			5000	5540		ug/Kg		111	71 - 146	0	20
TAME			5000	5340		ug/Kg		107	70 - 130	1	20
Ethyl t-butyl ether			5000	4840		ug/Kg		97	70 - 130	1	20
Toluene			5000	5010		ug/Kg		100	77 - 120	1	20
EDB			5000	5880		ug/Kg		118	70 - 138	0	20
1,2-DCA			5000	5090		ug/Kg		102	67 - 126	1	20
TBA			50000	50500		ug/Kg		101	70 - 130	2	20
DIPE			5000	4430		ug/Kg		89	70 - 130	1	20
Naphthalene			5000	5360		ug/Kg		107	62 - 151	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*97*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*
Toluene-d8 (Surr)	*97*		*65 - 141*

Lab Sample ID: LCSD 720-212355/8
Matrix: Solid
Analysis Batch: 212355

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			100000	99900		ug/Kg		100	61 - 120	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*99*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*95*		*62 - 137*
Toluene-d8 (Surr)	*97*		*65 - 141*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-212411/5
Matrix: Solid
Analysis Batch: 212411

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		5.0		ug/Kg			11/01/16 19:34	1
Ethylbenzene	ND		5.0		ug/Kg			11/01/16 19:34	1
Ethanol	ND		1000		ug/Kg			11/01/16 19:34	1
MTBE	ND		5.0		ug/Kg			11/01/16 19:34	1
TAME	ND		5.0		ug/Kg			11/01/16 19:34	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			11/01/16 19:34	1
Toluene	ND		5.0		ug/Kg			11/01/16 19:34	1
EDB	ND		5.0		ug/Kg			11/01/16 19:34	1
Xylenes, Total	ND		10		ug/Kg			11/01/16 19:34	1
1,2-DCA	ND		5.0		ug/Kg			11/01/16 19:34	1
TBA	ND		100		ug/Kg			11/01/16 19:34	1
DIPE	ND		5.0		ug/Kg			11/01/16 19:34	1
Naphthalene	ND		10		ug/Kg			11/01/16 19:34	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			11/01/16 19:34	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*45 - 131*		*11/01/16 19:34*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*60 - 140*		*11/01/16 19:34*	*1*
Toluene-d8 (Surr)	*101*		*58 - 140*		*11/01/16 19:34*	*1*

Lab Sample ID: LCS 720-212411/6
Matrix: Solid
Analysis Batch: 212411

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	53.7		ug/Kg		107	70 - 130
Ethylbenzene	50.0	53.9		ug/Kg		108	80 - 137
Ethanol	2000	2450		ug/Kg		122	49 - 162
m-Xylene & p-Xylene	50.0	57.3		ug/Kg		115	70 - 146
MTBE	50.0	56.5		ug/Kg		113	70 - 144
TAME	50.0	55.0		ug/Kg		110	70 - 145
Ethyl t-butyl ether	50.0	52.8		ug/Kg		106	70 - 130
Toluene	50.0	56.3		ug/Kg		113	75 - 120
EDB	50.0	57.7		ug/Kg		115	70 - 140
1,2-DCA	50.0	56.5		ug/Kg		113	70 - 130
TBA	500	572		ug/Kg		114	63 - 130
DIPE	50.0	52.4		ug/Kg		105	70 - 131
Naphthalene	50.0	57.7		ug/Kg		115	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*109*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*96*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212411/8
Matrix: Solid
Analysis Batch: 212411

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	1030		ug/Kg		103	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*97*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212411/7
Matrix: Solid
Analysis Batch: 212411

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	54.0		ug/Kg		108	70 - 130	0	20
Ethylbenzene			50.0	53.7		ug/Kg		107	80 - 137	0	20
Ethanol			2000	2280		ug/Kg		114	49 - 162	7	20
m-Xylene & p-Xylene			50.0	57.1		ug/Kg		114	70 - 146	0	20
MTBE			50.0	57.1		ug/Kg		114	70 - 144	1	20
TAME			50.0	54.8		ug/Kg		110	70 - 145	0	20
Ethyl t-butyl ether			50.0	52.8		ug/Kg		106	70 - 130	0	20
Toluene			50.0	56.8		ug/Kg		114	75 - 120	1	20
EDB			50.0	56.5		ug/Kg		113	70 - 140	2	20
1,2-DCA			50.0	55.1		ug/Kg		110	70 - 130	2	20
TBA			500	564		ug/Kg		113	63 - 130	1	20
DIPE			50.0	52.7		ug/Kg		105	70 - 131	1	20
Naphthalene			50.0	57.3		ug/Kg		115	60 - 147	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*95*		*60 - 140*
Toluene-d8 (Surr)	*106*		*58 - 140*

Lab Sample ID: LCSD 720-212411/9
Matrix: Solid
Analysis Batch: 212411

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	1030		ug/Kg		103	64 - 120	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*97*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-212422/4
Matrix: Solid
Analysis Batch: 212422

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		5.0		ug/Kg			11/02/16 08:30	1
Ethylbenzene	ND		5.0		ug/Kg			11/02/16 08:30	1
Ethanol	ND		1000		ug/Kg			11/02/16 08:30	1
MTBE	ND		5.0		ug/Kg			11/02/16 08:30	1
TAME	ND		5.0		ug/Kg			11/02/16 08:30	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			11/02/16 08:30	1
Toluene	ND		5.0		ug/Kg			11/02/16 08:30	1
EDB	ND		5.0		ug/Kg			11/02/16 08:30	1
Xylenes, Total	ND		10		ug/Kg			11/02/16 08:30	1
1,2-DCA	ND		5.0		ug/Kg			11/02/16 08:30	1
TBA	ND		100		ug/Kg			11/02/16 08:30	1
DIPE	ND		5.0		ug/Kg			11/02/16 08:30	1
Naphthalene	ND		10		ug/Kg			11/02/16 08:30	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			11/02/16 08:30	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*105*		*45 - 131*		*11/02/16 08:30*	*1*
1,2-Dichloroethane-d4 (Surr)	*87*		*60 - 140*		*11/02/16 08:30*	*1*
Toluene-d8 (Surr)	*107*		*58 - 140*		*11/02/16 08:30*	*1*

Lab Sample ID: LCS 720-212422/5
Matrix: Solid
Analysis Batch: 212422

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	51.7		ug/Kg		103	70 - 130
Ethylbenzene	50.0	48.6		ug/Kg		97	80 - 137
Ethanol	2000	1840		ug/Kg		92	49 - 162
m-Xylene & p-Xylene	50.0	51.8		ug/Kg		104	70 - 146
MTBE	50.0	55.6		ug/Kg		111	70 - 144
TAME	50.0	53.8		ug/Kg		108	70 - 145
Ethyl t-butyl ether	50.0	49.8		ug/Kg		100	70 - 130
Toluene	50.0	52.2		ug/Kg		104	75 - 120
EDB	50.0	53.3		ug/Kg		107	70 - 140
1,2-DCA	50.0	47.8		ug/Kg		96	70 - 130
TBA	500	514		ug/Kg		103	63 - 130
DIPE	50.0	47.8		ug/Kg		96	70 - 131
Naphthalene	50.0	54.9		ug/Kg		110	60 - 147

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*88*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212422/7
Matrix: Solid
Analysis Batch: 212422

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	954		ug/Kg		95	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*89*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212422/6
Matrix: Solid
Analysis Batch: 212422

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	51.6		ug/Kg		103	70 - 130	0	20
Ethylbenzene			50.0	49.9		ug/Kg		100	80 - 137	3	20
Ethanol			2000	1720		ug/Kg		86	49 - 162	7	20
m-Xylene & p-Xylene			50.0	53.4		ug/Kg		107	70 - 146	3	20
MTBE			50.0	57.7		ug/Kg		115	70 - 144	4	20
TAME			50.0	55.3		ug/Kg		111	70 - 145	3	20
Ethyl t-butyl ether			50.0	50.4		ug/Kg		101	70 - 130	1	20
Toluene			50.0	54.1		ug/Kg		108	75 - 120	4	20
EDB			50.0	55.4		ug/Kg		111	70 - 140	4	20
1,2-DCA			50.0	48.6		ug/Kg		97	70 - 130	2	20
TBA			500	505		ug/Kg		101	63 - 130	2	20
DIPE			50.0	48.1		ug/Kg		96	70 - 131	0	20
Naphthalene			50.0	58.2		ug/Kg		116	60 - 147	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*89*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212422/8
Matrix: Solid
Analysis Batch: 212422

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	963		ug/Kg		96	64 - 120	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: MB 720-212509/4
Matrix: Solid
Analysis Batch: 212509

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		500		ug/Kg			11/03/16 19:27	100
Ethylbenzene	ND		500		ug/Kg			11/03/16 19:27	100
Ethanol	ND		50000		ug/Kg			11/03/16 19:27	100
MTBE	ND		500		ug/Kg			11/03/16 19:27	100
TAME	ND		500		ug/Kg			11/03/16 19:27	100
Ethyl t-butyl ether	ND		500		ug/Kg			11/03/16 19:27	100
Toluene	ND		500		ug/Kg			11/03/16 19:27	100
EDB	ND		500		ug/Kg			11/03/16 19:27	100
Xylenes, Total	ND		1000		ug/Kg			11/03/16 19:27	100
1,2-DCA	ND		500		ug/Kg			11/03/16 19:27	100
TBA	ND		1000		ug/Kg			11/03/16 19:27	100
DIPE	ND		500		ug/Kg			11/03/16 19:27	100
Naphthalene	ND		1000		ug/Kg			11/03/16 19:27	100
Gasoline Range Organics (GRO) -C6-C12	ND		25000		ug/Kg			11/03/16 19:27	100

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*66 - 148*		*11/03/16 19:27*	*100*
1,2-Dichloroethane-d4 (Surr)	*99*		*62 - 137*		*11/03/16 19:27*	*100*
Toluene-d8 (Surr)	*108*		*65 - 141*		*11/03/16 19:27*	*100*

Lab Sample ID: LCS 720-212509/5
Matrix: Solid
Analysis Batch: 212509

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	5000	5390		ug/Kg		108	76 - 122
Ethylbenzene	5000	5410		ug/Kg		108	76 - 137
Ethanol	200000	287000	*	ug/Kg		144	70 - 130
m-Xylene & p-Xylene	5000	5760		ug/Kg		115	71 - 142
MTBE	5000	4310		ug/Kg		86	71 - 146
TAME	5000	4250		ug/Kg		85	70 - 130
Ethyl t-butyl ether	5000	3730		ug/Kg		75	70 - 130
Toluene	5000	5690		ug/Kg		114	77 - 120
EDB	5000	5580		ug/Kg		112	70 - 138
1,2-DCA	5000	5580		ug/Kg		112	67 - 126
TBA	50000	61600		ug/Kg		123	70 - 130
DIPE	5000	4250		ug/Kg		85	70 - 130
Naphthalene	5000	5560		ug/Kg		111	62 - 151
o-Xylene	5000	5640		ug/Kg		113	71 - 142

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
Toluene-d8 (Surr)	*107*		*65 - 141*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212509/7
Matrix: Solid
Analysis Batch: 212509

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			100000	85700		ug/Kg		86	61 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*103*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*96*		*62 - 137*
Toluene-d8 (Surr)	*107*		*65 - 141*

Lab Sample ID: LCSD 720-212509/6
Matrix: Solid
Analysis Batch: 212509

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			5000	5470		ug/Kg		109	76 - 122	1	20
Ethylbenzene			5000	5530		ug/Kg		111	76 - 137	2	20
Ethanol			200000	278000	*	ug/Kg		139	70 - 130	3	20
m-Xylene & p-Xylene			5000	5910		ug/Kg		118	71 - 142	2	20
MTBE			5000	4470		ug/Kg		89	71 - 146	4	20
TAME			5000	4460		ug/Kg		89	70 - 130	5	20
Ethyl t-butyl ether			5000	3930		ug/Kg		79	70 - 130	5	20
Toluene			5000	5770		ug/Kg		115	77 - 120	1	20
EDB			5000	5490		ug/Kg		110	70 - 138	2	20
1,2-DCA			5000	5410		ug/Kg		108	67 - 126	3	20
TBA			50000	63000		ug/Kg		126	70 - 130	2	20
DIPE			5000	4470		ug/Kg		89	70 - 130	5	20
Naphthalene			5000	5300		ug/Kg		106	62 - 151	5	20
o-Xylene			5000	5820		ug/Kg		116	71 - 142	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*109*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*94*		*62 - 137*
Toluene-d8 (Surr)	*107*		*65 - 141*

Lab Sample ID: LCSD 720-212509/8
Matrix: Solid
Analysis Batch: 212509

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			100000	91700		ug/Kg		92	61 - 120	7	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*104*		*66 - 148*
1,2-Dichloroethane-d4 (Surr)	*91*		*62 - 137*
Toluene-d8 (Surr)	*106*		*65 - 141*

GC/MS VOA

Analysis Batch: 212344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-2	SB-10-9.0-9.5	Total/NA	Solid	8260B/CA_LUFT MS	212353
MB 720-212344/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212344/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212344/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212344/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212344/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212353

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-2	SB-10-9.0-9.5	Total/NA	Solid	5035	

Analysis Batch: 212355

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-3	SB-10-20.5-21.0	Total/NA	Solid	8260B/CA_LUFT MS	212374
MB 720-212355/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212355/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212355/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212355/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212355/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-3	SB-10-20.5-21.0	Total/NA	Solid	5035	
720-75522-6	SB-9-8.0-8.5	Total/NA	Solid	5035	
720-75522-9	SB-9-23.5-24.0	Total/NA	Solid	5035	

Analysis Batch: 212411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-6	SB-9-8.0-8.5	Total/NA	Solid	8260B/CA_LUFT MS	212374
720-75522-9	SB-9-23.5-24.0	Total/NA	Solid	8260B/CA_LUFT MS	212374
MB 720-212411/5	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212411/6	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212411/8	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212411/7	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212411/9	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

GC/MS VOA (Continued)

Analysis Batch: 212422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-1	SB-10-1.0-1.5	Total/NA	Solid	8260B/CA_LUFT MS	212439
720-75522-4	SB-10-23.5-24.0	Total/NA	Solid	8260B/CA_LUFT MS	212439
720-75522-5	SB-9-4.0-4.5	Total/NA	Solid	8260B/CA_LUFT MS	212439
MB 720-212422/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212422/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212422/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212422/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212422/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212439

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-1	SB-10-1.0-1.5	Total/NA	Solid	5035	
720-75522-4	SB-10-23.5-24.0	Total/NA	Solid	5035	
720-75522-5	SB-9-4.0-4.5	Total/NA	Solid	5035	

Analysis Batch: 212509

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-6	SB-9-8.0-8.5	Total/NA	Solid	8260B/CA_LUFT MS	212518
720-75522-7	SB-9-17.0-17.5	Total/NA	Solid	8260B/CA_LUFT MS	212518
720-75522-8	SB-9-19.5-20.0	Total/NA	Solid	8260B/CA_LUFT MS	212518
MB 720-212509/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212509/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212509/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212509/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212509/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75522-6	SB-9-8.0-8.5	Total/NA	Solid	5035	
720-75522-7	SB-9-17.0-17.5	Total/NA	Solid	5035	
720-75522-8	SB-9-19.5-20.0	Total/NA	Solid	5035	

Client Sample ID: SB-10-1.0-1.5 — **Lab Sample ID: 720-75522-1**
Date Collected: 10/31/16 12:55 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212439	10/31/16 18:43	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212422	11/02/16 15:57	JRM	TAL PLS

Client Sample ID: SB-10-9.0-9.5 — **Lab Sample ID: 720-75522-2**
Date Collected: 10/31/16 13:20 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212353	10/31/16 18:43	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212344	11/01/16 05:35	JRM	TAL PLS

Client Sample ID: SB-10-20.5-21.0 — **Lab Sample ID: 720-75522-3**
Date Collected: 10/31/16 13:30 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212374	10/31/16 18:43	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1000	212355	11/01/16 13:35	LPL	TAL PLS

Client Sample ID: SB-10-23.5-24.0 — **Lab Sample ID: 720-75522-4**
Date Collected: 10/31/16 13:35 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212439	10/31/16 18:43	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212422	11/02/16 16:27	JRM	TAL PLS

Client Sample ID: SB-9-4.0-4.5 — **Lab Sample ID: 720-75522-5**
Date Collected: 10/31/16 10:40 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212439	10/31/16 18:43	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212422	11/02/16 16:57	JRM	TAL PLS

Client Sample ID: SB-9-8.0-8.5 — **Lab Sample ID: 720-75522-6**
Date Collected: 10/31/16 11:26 — **Matrix: Solid**
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212374	10/31/16 18:43	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212411	11/02/16 00:32	JRM	TAL PLS

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Client Sample ID: SB-9-8.0-8.5

Lab Sample ID: 720-75522-6

Date Collected: 10/31/16 11:26
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212518	10/31/16 18:40	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		100	212509	11/03/16 21:56	JRM	TAL PLS

Client Sample ID: SB-9-17.0-17.5

Lab Sample ID: 720-75522-7

Date Collected: 10/31/16 11:35
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212518	10/31/16 18:40	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		100	212509	11/03/16 22:25	JRM	TAL PLS

Client Sample ID: SB-9-19.5-20.0

Lab Sample ID: 720-75522-8

Date Collected: 10/31/16 11:38
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212518	10/31/16 18:40	BSY	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		100	212509	11/03/16 22:55	JRM	TAL PLS

Client Sample ID: SB-9-23.5-24.0

Lab Sample ID: 720-75522-9

Date Collected: 10/31/16 11:44
Matrix: Solid
Date Received: 10/31/16 15:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212374	10/31/16 18:43	LPL	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212411	11/01/16 23:02	JRM	TAL PLS

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-18

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75522-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-75522-1	SB-10-1.0-1.5	Solid	10/31/16 12:55	10/31/16 15:30
720-75522-2	SB-10-9.0-9.5	Solid	10/31/16 13:20	10/31/16 15:30
720-75522-3	SB-10-20.5-21.0	Solid	10/31/16 13:30	10/31/16 15:30
720-75522-4	SB-10-23.5-24.0	Solid	10/31/16 13:35	10/31/16 15:30
720-75522-5	SB-9-4.0-4.5	Solid	10/31/16 10:40	10/31/16 15:30
720-75522-6	SB-9-8.0-8.5	Solid	10/31/16 11:26	10/31/16 15:30
720-75522-7	SB-9-17.0-17.5	Solid	10/31/16 11:35	10/31/16 15:30
720-75522-8	SB-9-19.5-20.0	Solid	10/31/16 11:38	10/31/16 15:30
720-75522-9	SB-9-23.5-24.0	Solid	10/31/16 11:44	10/31/16 15:30

720-75522

ARCADIS
Infrastructure Water Environment Buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of __

Lab Work Order # [7200]

Send Results to:
Contact & Company Name: Jamey Peterson ARCADIS
Telephone:
Address: 100 Montgomery St, Suite 800
Fax:
City: SF State: CA Zip: 94104
E-mail Address: Jamey.Peterson@arcadis.com
Project Name/Location (City, State): BP CA 4931
Project #:
Sampler's Printed Name: Cameron McGovern
Sampler's Signature: Cameron McGovern

Preservative	-	-	-	-	-		
Filtered (✓)	-	-	-	-	-		
# of Containers							
Container Information	5	5	5	5	5		

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key: A. H_2SO_4 B. HCL C. HNO_3 D. NaOH E. None F. Other: G. Other: H. Other:

Container Information Key: 1. 40 ml Vial 2. 1 L Amber 3. 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz. Glass 7. 4 oz. Glass 8. 8 oz. Glass 9. Other: 10. Other:

Matrix Key: SO - Soil W - Water T - Tissue SE - Sediment SL - Sludge A - Air NL - NAPL/Oil SW - Sample Wipe Other:

Sample ID	Collection Date	Collection Time	Comp	Grab	Matrix	GRO (8260)	BTEX, DIPE, MTBE, ETBE	TAME, TBA, 1,2-DCA, EDB	Ethanol (8260)	Naphthalene (8260)			REMARKS
SB-10-1.0-1.5	10/31/16	1255	✓		So	X	X	X	X	X			Standard TAT
SB-10-9.0-9.5	↓	1320	↓		↓	↓	↓	↓	↓	↓			↓
SB-10-20.5-21.0	↓	1330	↓		↓	↓	↓	↓	↓	↓			↓
SB-10-23.5-24.0	↓	1335	↓		↓	↓	↓	↓	↓	↓			↓
SB-09-4.0-4.5	↓	1040	↓		↓	↓	↓	↓	↓	↓			↓
SB-09-8.0-8.5	↓	1126	↓		↓	↓	↓	↓	↓	↓			↓
SB-09-17.0-17.5	↓	1135	↓		↓	↓	↓	↓	↓	↓			↓
SB-09-19.5-20.0	↓	1138	↓		↓	↓	↓	↓	↓	↓			↓
SB-09-23.5-24.0	↓	1144	↓		↓	↓	↓	↓	↓	↓			↓
SB-08-5.0-5.5	↓	0948	↓		↓	↓	↓	↓	↓	↓			* 24 hour TAT*
SB-08-8.0-8.5	↓	0953	↓		↓	↓	↓	↓	↓	↓			↓
SB-08-12.0-12.5	↓	0937	↓		↓	↓	↓	↓	↓	↓			↓
SB-08-23.5-24.0	↓	0943	↓		↓	↓	↓	↓	↓	↓			↓

RUSH

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

5.4°C

Laboratory Information and Receipt
Lab Name: Test America
☒ Cooler packed with ice (✓)
Specify Turnaround Requirements: * See Remarks*
Shipping Tracking #:
Cooler Custody Seal (✓)
☐ Intact ☐ Not Intact
Sample Receipt:
Condition/Cooler Temp:

	Relinquished By	Received By	Relinquished By	Laboratory Received By
Printed Name:	Cameron McGovern	Dennis Arias		
Signature:	Cameron McGovern	DA		
Firm:	ARCADIS	TA		
Date/Time:	10/31/16 1530	10/31/16 1530		

720-75522 Chain of Custody

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

720-75522

ARCADIS
Infrastructure Water Environment Buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of __

[7200]

Lab Work Order #

Send Results to:

Contact & Company Name: Jamey Peterson ARCADIS	Telephone:
Address: 100 Montgomery St, Suite 800	Fax
City: SF State: CA Zip: 94104	E-mail Address: Jamey.Peterson@arcadis.com
Project Name/Location (City, State): BP CA 4931	Project #:
Sampler's Printed Name: Cameron McGovern	Sampler's Signature: Cameron McGovern

Preservative	–	–	–	–	–
Filtered (✓)	–	–	–	–	–
# of Containers					
Container Information	5	5	5	5	5

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key: A. H_2SO_4 B. HCL C. HNO_3 D. NaOH E. None F. Other: ___ G. Other: ___ H. Other: ___

Container Information Key: 1. 40 ml Vial 2. 1 L Amber 3. 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz. Glass 7. 4 oz. Glass 8. 8 oz. Glass 9. Other: ___ 10. Other: ___

Matrix Key: SO - Soil W - Water T - Tissue SE - Sediment SL - Sludge A - Air NL - NAPL/Oil SW - Sample Wipe Other: ___

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	GRO (8260)	BTEX, DIPE MTBE, ETBE,	TAME, TBA, 1,2-DCA, EDB	Ethanol (8260)	Naphthalene (8260)			REMARKS
SB-10-1.0-1.5	10/31/16	1255	✓		So	X	X	X	X	X			Standard TAT
SB-10-9.0-9.5	↓	1320	↓		↓	↓	↓	↓	↓	↓			↓
SB-10-20.5-21.0		1330											
SB-10-23.5-24.0		1335											RUSH
SB-09-4.0-4.5		1040											
SB-09-8.0-8.5		1126											
SB-09-17.0-17.5		1135											
SB-09-19.5-20.0		1138											
SB-09-23.5-24.0		1144											↓
SB-08-5.0-5.5		0948											* 24 hour TAT*
SB-08-8.0-8.5		0953											↓
SB-08-12.0-12.5		0937											
SB-08-23.5-24.0	↓	0943	↓		↓	↓	↓	↓	↓	↓			↓

Special Instructions/Comments:

☐ **Special QA/QC Instructions(✓):**

5.9°C

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Test America	Cooler Custody Seal (✓)	Printed Name: Cameron McGovern	Printed Name: Dennis Arias	Printed Name:	
☒ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature: Cameron McGovern	Signature: [signature]		
Specify Turnaround Requirements: * See Remarks*	Sample Receipt:	Firm: ARCADIS	Firm/Courier: TA	720-75522 Chain of Custody	
Shipping Tracking #:	Condition/Cooler Temp: ___	Date/Time: 10/31/16 1530	Date/Time: 10/31/16 1530		

20730826 CofC AR Form 01.12.2007

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-75522-1

Login Number: 75522

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Arauz, Dennis

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-75551-1
Client Project/Site: BP #4931, Oakland

For:
ARCADIS U.S., Inc.
100 Montgomery Street
Suite 300
San Francisco, California 94104

Attn: Jamey Peterson

Authorized for release by:
11/9/2016 5:45:01 PM

Dimple Sharma, Senior Project Manager
(925)484-1919
dimple.sharma@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 720-75551-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-75551-1

Comments
No additional comments.

Receipt
The samples were received on 11/1/2016 12:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.4° C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SB-11-1.5-2.0 **Lab Sample ID: 720-75551-1**

No Detections.

Client Sample ID: SB-11-6.0-6.5 **Lab Sample ID: 720-75551-2**

No Detections.

Client Sample ID: SB-11-23.5-24.0 **Lab Sample ID: 720-75551-3**

No Detections.

Client Sample ID: SV-9-2.5-3.0 **Lab Sample ID: 720-75551-4**

No Detections.

Client Sample ID: SV-9-4.5-5.0 **Lab Sample ID: 720-75551-5**

No Detections.

Client Sample ID: SV-9-7.5-8.0 **Lab Sample ID: 720-75551-6**

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SB-11-1.5-2.0
Date Collected: 11/01/16 10:40
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-1
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Ethylbenzene	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Ethanol	ND		780		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
MTBE	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
TAME	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Ethyl t-butyl ether	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Toluene	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
EDB	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Xylenes, Total	ND		7.8		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
1,2-DCA	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
TBA	ND		78		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
DIPE	ND		3.9		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Naphthalene	ND		7.8		ug/Kg		11/01/16 23:59	11/04/16 11:07	1
Gasoline Range Organics (GRO) -C6-C12	ND		200		ug/Kg		11/01/16 23:59	11/04/16 11:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*95*		*45 - 131*	*11/01/16 23:59*	*11/04/16 11:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*100*		*60 - 140*	*11/01/16 23:59*	*11/04/16 11:07*	*1*
Toluene-d8 (Surr)	*104*		*58 - 140*	*11/01/16 23:59*	*11/04/16 11:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SB-11-6.0-6.5
Date Collected: 11/01/16 10:52
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-2
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Ethylbenzene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Ethanol	ND		800		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
MTBE	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
TAME	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Ethyl t-butyl ether	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Toluene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
EDB	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Xylenes, Total	ND		8.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
1,2-DCA	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
TBA	ND		80		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
DIPE	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Naphthalene	ND		8.0		ug/Kg		11/01/16 23:59	11/04/16 11:37	1
Gasoline Range Organics (GRO) -C6-C12	ND		200		ug/Kg		11/01/16 23:59	11/04/16 11:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*102*		*45 - 131*	*11/01/16 23:59*	*11/04/16 11:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*60 - 140*	*11/01/16 23:59*	*11/04/16 11:37*	*1*
Toluene-d8 (Surr)	*104*		*58 - 140*	*11/01/16 23:59*	*11/04/16 11:37*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SB-11-23.5-24.0
Date Collected: 11/01/16 11:00
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-3
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Ethylbenzene	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Ethanol	ND		700		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
MTBE	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
TAME	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Ethyl t-butyl ether	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Toluene	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
EDB	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Xylenes, Total	ND		7.0		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
1,2-DCA	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
TBA	ND		70		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
DIPE	ND		3.5		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Naphthalene	ND		7.0		ug/Kg		11/01/16 23:59	11/04/16 12:07	1
Gasoline Range Organics (GRO) -C6-C12	ND		170		ug/Kg		11/01/16 23:59	11/04/16 12:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*97*		*45 - 131*	*11/01/16 23:59*	*11/04/16 12:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*99*		*60 - 140*	*11/01/16 23:59*	*11/04/16 12:07*	*1*
Toluene-d8 (Surr)	*101*		*58 - 140*	*11/01/16 23:59*	*11/04/16 12:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SV-9-2.5-3.0
Date Collected: 11/01/16 09:00
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-4
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Ethylbenzene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Ethanol	ND		790		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
MTBE	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
TAME	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Ethyl t-butyl ether	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Toluene	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
EDB	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Xylenes, Total	ND		7.9		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
1,2-DCA	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
TBA	ND		79		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
DIPE	ND		4.0		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Naphthalene	ND		7.9		ug/Kg		11/01/16 23:59	11/04/16 12:37	1
Gasoline Range Organics (GRO) -C6-C12	ND		200		ug/Kg		11/01/16 23:59	11/04/16 12:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*98*		*45 - 131*	*11/01/16 23:59*	*11/04/16 12:37*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*60 - 140*	*11/01/16 23:59*	*11/04/16 12:37*	*1*
Toluene-d8 (Surr)	*100*		*58 - 140*	*11/01/16 23:59*	*11/04/16 12:37*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SV-9-4.5-5.0
Date Collected: 11/01/16 09:05
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-5
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Ethylbenzene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Ethanol	ND		840		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
MTBE	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
TAME	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Ethyl t-butyl ether	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Toluene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
EDB	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Xylenes, Total	ND		8.4		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
1,2-DCA	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
TBA	ND		84		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
DIPE	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Naphthalene	ND		8.4		ug/Kg		11/01/16 23:59	11/04/16 13:07	1
Gasoline Range Organics (GRO) -C6-C12	ND		210		ug/Kg		11/01/16 23:59	11/04/16 13:07	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*101*		*45 - 131*	*11/01/16 23:59*	*11/04/16 13:07*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*60 - 140*	*11/01/16 23:59*	*11/04/16 13:07*	*1*
Toluene-d8 (Surr)	*103*		*58 - 140*	*11/01/16 23:59*	*11/04/16 13:07*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SV-9-7.5-8.0
Date Collected: 11/01/16 09:10
Date Received: 11/01/16 12:50

Lab Sample ID: 720-75551-6
Matrix: Solid

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Ethylbenzene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Ethanol	ND		850		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
MTBE	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
TAME	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Ethyl t-butyl ether	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Toluene	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
EDB	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Xylenes, Total	ND		8.5		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
1,2-DCA	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
TBA	ND		85		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
DIPE	ND		4.2		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Naphthalene	ND		8.5		ug/Kg		11/01/16 23:59	11/04/16 13:36	1
Gasoline Range Organics (GRO) -C6-C12	ND		210		ug/Kg		11/01/16 23:59	11/04/16 13:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*99*		*45 - 131*	*11/01/16 23:59*	*11/04/16 13:36*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*60 - 140*	*11/01/16 23:59*	*11/04/16 13:36*	*1*
Toluene-d8 (Surr)	*100*		*58 - 140*	*11/01/16 23:59*	*11/04/16 13:36*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)								
		BFB	12DCE	TOL						
Lab Sample ID	Client Sample ID	(45-131)	(60-140)	(58-140)						
720-75551-1	SB-11-1.5-2.0	95	100	104						
720-75551-2	SB-11-6.0-6.5	102	105	104						
720-75551-3	SB-11-23.5-24.0	97	99	101						
720-75551-4	SV-9-2.5-3.0	98	108	100						
720-75551-5	SV-9-4.5-5.0	101	107	103						
720-75551-6	SV-9-7.5-8.0	99	106	100						
LCS 720-212527/5	Lab Control Sample	107	92	107						
LCS 720-212527/7	Lab Control Sample	105	95	107						
LCSD 720-212527/6	Lab Control Sample Dup	105	91	107						
LCSD 720-212527/8	Lab Control Sample Dup	106	96	107						
MB 720-212527/4	Method Blank	100	93	106						

Surrogate Legend

BFB = 4-Bromofluorobenzene

12DCE = 1,2-Dichloroethane-d4 (Surr)

TOL = Toluene-d8 (Surr)

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS

Lab Sample ID: MB 720-212527/4
Matrix: Solid
Analysis Batch: 212527

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		5.0		ug/Kg			11/04/16 08:39	1
Ethylbenzene	ND		5.0		ug/Kg			11/04/16 08:39	1
Ethanol	ND		1000		ug/Kg			11/04/16 08:39	1
MTBE	ND		5.0		ug/Kg			11/04/16 08:39	1
TAME	ND		5.0		ug/Kg			11/04/16 08:39	1
Ethyl t-butyl ether	ND		5.0		ug/Kg			11/04/16 08:39	1
Toluene	ND		5.0		ug/Kg			11/04/16 08:39	1
EDB	ND		5.0		ug/Kg			11/04/16 08:39	1
Xylenes, Total	ND		10		ug/Kg			11/04/16 08:39	1
1,2-DCA	ND		5.0		ug/Kg			11/04/16 08:39	1
TBA	ND		100		ug/Kg			11/04/16 08:39	1
DIPE	ND		5.0		ug/Kg			11/04/16 08:39	1
Naphthalene	ND		10		ug/Kg			11/04/16 08:39	1
Gasoline Range Organics (GRO) -C6-C12	ND		250		ug/Kg			11/04/16 08:39	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene	*100*		*45 - 131*		*11/04/16 08:39*	*1*
1,2-Dichloroethane-d4 (Surr)	*93*		*60 - 140*		*11/04/16 08:39*	*1*
Toluene-d8 (Surr)	*106*		*58 - 140*		*11/04/16 08:39*	*1*

Lab Sample ID: LCS 720-212527/5
Matrix: Solid
Analysis Batch: 212527

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	50.0	54.8		ug/Kg		110	70 - 130
Ethylbenzene	50.0	53.6		ug/Kg		107	80 - 137
Ethanol	2000	2590		ug/Kg		129	49 - 162
m-Xylene & p-Xylene	50.0	57.4		ug/Kg		115	70 - 146
MTBE	50.0	49.5		ug/Kg		99	70 - 144
TAME	50.0	47.1		ug/Kg		94	70 - 145
Ethyl t-butyl ether	50.0	41.8		ug/Kg		84	70 - 130
Toluene	50.0	57.3		ug/Kg		115	75 - 120
EDB	50.0	58.3		ug/Kg		117	70 - 140
1,2-DCA	50.0	54.3		ug/Kg		109	70 - 130
TBA	500	617		ug/Kg		123	63 - 130
DIPE	50.0	43.4		ug/Kg		87	70 - 131
Naphthalene	50.0	56.3		ug/Kg		113	60 - 147
o-Xylene	50.0	56.1		ug/Kg		112	70 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*107*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*92*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Method: 8260B/CA_LUFTMS - 8260B / CA LUFT MS (Continued)

Lab Sample ID: LCS 720-212527/7
Matrix: Solid
Analysis Batch: 212527

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (GRO) -C6-C12			1000	908		ug/Kg		91	64 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*95*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212527/6
Matrix: Solid
Analysis Batch: 212527

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			50.0	54.4		ug/Kg		109	70 - 130	1	20
Ethylbenzene			50.0	53.4		ug/Kg		107	80 - 137	0	20
Ethanol			2000	2550		ug/Kg		128	49 - 162	1	20
m-Xylene & p-Xylene			50.0	56.8		ug/Kg		114	70 - 146	1	20
MTBE			50.0	47.0		ug/Kg		94	70 - 144	5	20
TAME			50.0	47.2		ug/Kg		94	70 - 145	0	20
Ethyl t-butyl ether			50.0	40.5		ug/Kg		81	70 - 130	3	20
Toluene			50.0	57.4		ug/Kg		115	75 - 120	0	20
EDB			50.0	58.7		ug/Kg		117	70 - 140	1	20
1,2-DCA			50.0	53.8		ug/Kg		108	70 - 130	1	20
TBA			500	609		ug/Kg		122	63 - 130	1	20
DIPE			50.0	43.5		ug/Kg		87	70 - 131	0	20
Naphthalene			50.0	57.8		ug/Kg		116	60 - 147	3	20
o-Xylene			50.0	55.3		ug/Kg		111	70 - 140	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*105*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*91*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

Lab Sample ID: LCSD 720-212527/8
Matrix: Solid
Analysis Batch: 212527

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C12			1000	884		ug/Kg		88	64 - 120	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene	*106*		*45 - 131*
1,2-Dichloroethane-d4 (Surr)	*96*		*60 - 140*
Toluene-d8 (Surr)	*107*		*58 - 140*

GC/MS VOA

Analysis Batch: 212527

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75551-1	SB-11-1.5-2.0	Total/NA	Solid	8260B/CA_LUFT MS	212537
720-75551-2	SB-11-6.0-6.5	Total/NA	Solid	8260B/CA_LUFT MS	212537
720-75551-3	SB-11-23.5-24.0	Total/NA	Solid	8260B/CA_LUFT MS	212537
720-75551-4	SV-9-2.5-3.0	Total/NA	Solid	8260B/CA_LUFT MS	212537
720-75551-5	SV-9-4.5-5.0	Total/NA	Solid	8260B/CA_LUFT MS	212537
720-75551-6	SV-9-7.5-8.0	Total/NA	Solid	8260B/CA_LUFT MS	212537
MB 720-212527/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212527/5	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 720-212527/7	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212527/6	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	
LCSD 720-212527/8	Lab Control Sample Dup	Total/NA	Solid	8260B/CA_LUFT MS	

Prep Batch: 212537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-75551-1	SB-11-1.5-2.0	Total/NA	Solid	5035	
720-75551-2	SB-11-6.0-6.5	Total/NA	Solid	5035	
720-75551-3	SB-11-23.5-24.0	Total/NA	Solid	5035	
720-75551-4	SV-9-2.5-3.0	Total/NA	Solid	5035	
720-75551-5	SV-9-4.5-5.0	Total/NA	Solid	5035	
720-75551-6	SV-9-7.5-8.0	Total/NA	Solid	5035	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Client Sample ID: SB-11-1.5-2.0 — Lab Sample ID: 720-75551-1

Date Collected: 11/01/16 10:40 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 11:07	JRM	TAL PLS

Client Sample ID: SB-11-6.0-6.5 — Lab Sample ID: 720-75551-2

Date Collected: 11/01/16 10:52 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 11:37	JRM	TAL PLS

Client Sample ID: SB-11-23.5-24.0 — Lab Sample ID: 720-75551-3

Date Collected: 11/01/16 11:00 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 12:07	JRM	TAL PLS

Client Sample ID: SV-9-2.5-3.0 — Lab Sample ID: 720-75551-4

Date Collected: 11/01/16 09:00 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 12:37	JRM	TAL PLS

Client Sample ID: SV-9-4.5-5.0 — Lab Sample ID: 720-75551-5

Date Collected: 11/01/16 09:05 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 13:07	JRM	TAL PLS

Client Sample ID: SV-9-7.5-8.0 — Lab Sample ID: 720-75551-6

Date Collected: 11/01/16 09:10 — **Matrix: Solid**
Date Received: 11/01/16 12:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5035			212537	11/01/16 23:59	JRM	TAL PLS
Total/NA	Analysis	8260B/CA_LUFTMS		1	212527	11/04/16 13:36	JRM	TAL PLS

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-18

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Method	Method Description	Protocol	Laboratory
8260B/CA_LUFTMS	8260B / CA LUFT MS	SW846	TAL PLS

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PLS = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: BP #4931, Oakland

TestAmerica Job ID: 720-75551-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-75551-1	SB-11-1.5-2.0	Solid	11/01/16 10:40	11/01/16 12:50
720-75551-2	SB-11-6.0-6.5	Solid	11/01/16 10:52	11/01/16 12:50
720-75551-3	SB-11-23.5-24.0	Solid	11/01/16 11:00	11/01/16 12:50
720-75551-4	SV-9-2.5-3.0	Solid	11/01/16 09:00	11/01/16 12:50
720-75551-5	SV-9-4.5-5.0	Solid	11/01/16 09:05	11/01/16 12:50
720-75551-6	SV-9-7.5-8.0	Solid	11/01/16 09:10	11/01/16 12:50

ARCADIS
Infrastructure Water Environment Buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order # 172029

720-75551

11/9/2016

Send Results to:

Contact & Company Name	Telephone
Jamey Peterson Arcadis	
Address	Fax
100 Montgomery St, Suite 300	
City / State / Zip	E-mail Address
SF CA 94104	Jamey.Peterson@arcadis.com
Project Name/Location (City, State)	Project #
BP CA-4931	
Sampler's Printed Name: Cameron McGovern	Sampler's Signature:

Preservation Used
Filtered (✓)
# of Containers: 3
Container Information: 5

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key: A. H2SO4 B. HCL C. HNO3 D. NaOH E. None F. Other: G. Other: H. Other:

Container Information Key: 1. 40 ml Vial 2. 1L Amber 3. 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz. Glass 7. 4 oz. Glass 8. 8 oz. Glass 9. Other: 10. Other:

Matrix Key: SO - Soil SE - Sediment NL - NAPL/Oil W - Water SL - Sludge SW - Sample Wipe T - Tissue A - Air Other:

Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	GRO (8260)	* VOCs (8260)	Naphthalene (8260)	REMARKS
SB-11-1.5-2.0	11/1/16	1040		✓	SO	X	X	X	
SB-11-6.0-6.5		1052							
SB-11-23.5-24.0		1100							
SV-9-2.5-3.0		900							
SV-9-4.5-5.0		905							
SV-9-7.5-8.0		910							

720-75551 Chain of Custody

Special Instructions/Comments:

* VOCs = BTEX, MTBE, DIPE, ETBE, TAME, TBA, 1,2-DCA, EDB, Ethanol via (8260)

☐ Special QA/QC Instructions(✓):

5.4°

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: Test America	Cooler Custody Seal (✓) ☐ Intact ☐ Not Intact	Printed Name: Cameron McGovern	Printed Name:	Printed Name	Printed Name: Joan Mullen
☒ Cooler packed with Ice (✓)		Signature: Cameron McGovern	Signature:	Signature:	Signature: Joan Mullen
Specify Turnaround Requirements: Standard	Sample Receipt:	Firm: ARCADIS	Firm/Courier:	Firm/Courier	Firm: TA
Shipping Tracking #:	Condition/Cooler Temp:	Date/Time: 11/1/16 1250	Date/Time	Date/Time	Date/Time: 11-1-16 1250

20730826 CofC AR Form 01.12.2007

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 720-75551-1

Login Number: 75551

List Source: TestAmerica Pleasanton

List Number: 1

Creator: Mullen, Joan

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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WORK ORDER NUMBER: 16-11-0723

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AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Arcadis, US Inc.

Client Project Name: CA-04931 GP09BPNA.C110

Attention: Jamey Peterson
100 Smith Ranch Road
Suite 329
San Rafael, CA 94903-1925

Approved for release on 11/22/2016 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Client Project Name: CA-04931 GP09BPNA.C110
Work Order Number: 16-11-0723

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Work Order Narrative

Work Order: 16-11-0723 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 11/09/16. They were assigned to Work Order 16-11-0723.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Arcadis, US Inc. 100 Smith Ranch Road, Suite 329 San Rafael, CA 94903-1925	Work Order:	16-11-0723
		Project Name:	CA-04931 GP09BPNA.C110
		PO Number:	
		Date/Time Received:	11/09/16 10:00
		Number of Containers:	5
Attn:	Jamey Peterson		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
SV-7	16-11-0723-1	11/07/16 13:05	1	Air
SV-8	16-11-0723-2	11/07/16 11:22	1	Air
SV-9	16-11-0723-3	11/07/16 12:23	1	Air
DUP-20161107	16-11-0723-4	11/07/16 13:05	1	Air
EB-20161107	16-11-0723-5	11/07/16 13:30	1	Air

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Project: CA-04931 GP09BPNA.C110

Date Received: 11/09/16
Work Order: 16-11-0723
Preparation: N/A
Method: EPA TO-17 (M)
Units: ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-7	**16-11-0723-1-A**	**11/07/16 13:05**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 19:47**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	27	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	91	57-129	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-8	**16-11-0723-2-A**	**11/07/16 11:22**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 20:30**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	27	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	77	57-129	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-9	**16-11-0723-3-A**	**11/07/16 12:23**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 21:12**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	27	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	90	57-129	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP-20161107	**16-11-0723-4-A**	**11/07/16 13:05**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 19:04**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	27	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	115	57-129	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
EB-20161107	**16-11-0723-5-A**	**11/07/16 13:30**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 18:22**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	27	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	88	57-129	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0723
Preparation: N/A
Method: EPA TO-17 (M)
Units: ug/m3

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-15-178-50**	**N/A**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 17:27**	**161109L01**

Comment(s): - MB data is reported in ng/sample.

Parameter	Result	RL	DF	Qualifiers
Naphthalene	ND	2.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	87	57-129	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - LCS/LCSD

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0723
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-17 (M)
Project: CA-04931 GP09BPNA.C110			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-15-178-50	**LCS**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 15:21**	**161109L01**
099-15-178-50	**LCSD**	**Air**	**GC/MS MMM**	**N/A**	**11/09/16 16:02**	**161109L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	100.0	91.44	91	97.05	97	40-190	6	0-35	

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RPD: Relative Percent Difference. CL: Control Limits

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Sample Analysis Summary Report

Work Order: 16-11-0723 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
EPA TO-17 (M)	N/A	953	GC/MS MMM	2

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Glossary of Terms and Qualifiers

Work Order: 16-11-0723 Page 1 of 1

Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

AIR CHAIN-OF-CUSTODY RECORD

WO NO. / LAB USE ONLY: **16-11-0723**

DATE: 11/7/16
PAGE: 1 OF 1

LABORATORY CLIENT: ARCADIS
ADDRESS: 100 Montgomery St. Suite 300
CITY: San Francisco STATE: CA ZIP: 94104
TEL: E-MAIL: Jamey.Peterson@arcadis.com

CLIENT PROJECT NAME / NO.: BP CA-4931
PROJECT CONTACT: Jamey Peterson
PROJECT ADDRESS: 731 W. MacArthur Blvd
CITY: Oakland STATE: CA ZIP:

P.O. NO.: GP09BPNA.C110.Q0000
LAB CONTACT OR QUOTE NO.: Richard V.
SAMPLER(S): (PRINT) Cameron McGovern

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☒ STANDARD

EDD: ☒ COELT EDF ☐ OTHER
UNITS:

SPECIAL INSTRUCTIONS:
- TO-17 sorbent Tube sample;
- all samples collect 75mL of soil vapor.

REQUESTED ANALYSES: TO-17 Naphthalene

LAB USE ONLY	SAMPLE ID	FIELD ID / POINT OF COLLECTION	MATRIX: Indoor (I) Soil Vap. (SV) Ambient (A)	SAMPLING EQUIPMENT: Media ID	Canister Size 6L or 1L	Flow Controller ID	START SAMPLING INFORMATION: Date	Time (24 hr clock)	Canister Pressure (in Hg)	STOP SAMPLING INFORMATION: Date	Time (24 hr clock)	Canister Pressure (in Hg)	TO-17 Naphthalene
1	SV-7		SV	G01186930			11/7/16	1305		11/7/16			X
2	SV-8		↓	G01186857			↓	1122		↓			↓
3	SV-9			G01189661				1223					
4	DUP-20161107	SV-7		G01187172				1305					
5	EB-20161107		A	G01189388			11/7/16	1330		↓			↓

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Cameron McGovern 11/7/16 1340		11/7/16	1340
		11/9/16	1000

2014-07-01 Revision

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WORK ORDER NUMBER: 16-11- 0723

SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: Arcadis

DATE: 11 / 09 / 2016

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC3A (CF: 0.0°C); Temperature (w/o CF): 4.9 °C (w/ CF): 4.9 °C; ☐ Blank ☑ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☐ Air ☐ Filter Checked by: 836

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 836

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 1053

SAMPLE CONDITION:

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☐	☐	☑
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Container(s) for certain analysis free of headspace	☐	☐	☑
☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA**h** ☐ VOA**na$_2$** ☐ 100PJ ☐ 100PJ**na$_2$** ☐ 125AGB ☐ 125AGB**h** ☐ 125AGB**p** ☐ 125PB

☐ 125PB**znna** ☐ 250AGB ☐ 250CGB ☐ 250CGB**s** ☐ 250PB ☐ 250PB**n** ☐ 500AGB ☐ 500AGJ ☐ 500AGJ**s**

☐ 500PB ☐ 1AGB ☐ 1AGB**na$_2$** ☐ 1AGB**s** ☐ 1PB ☐ 1PB**na** ☐ _____ ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® (_____) ☐ TerraCores® (_____) ☐ _____

Air: ☐ Tedlar™ ☐ Canister ☑ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **x** = Na_2SO_3+$NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: 1053

Reviewed by: 836

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WORK ORDER NUMBER: 16-11-0727

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Arcadis, US Inc.

Client Project Name: CA-04931 GP09BPNA.C110

Attention: Jamey Peterson
100 Smith Ranch Road
Suite 329
San Rafael, CA 94903-1925

Approved for release on 11/17/2016 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Eurofins Calscience, Inc. (Calscience) certifies that the test results provided in this report meet all NELAC requirements for parameters for which accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

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Client Project Name: CA-04931 GP09BPNA.C110
Work Order Number: 16-11-0727

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Work Order Narrative

Work Order: 16-11-0727 Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 11/09/16. They were assigned to Work Order 16-11-0727.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

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Sample Summary

Client:	Arcadis, US Inc. 100 Smith Ranch Road, Suite 329 San Rafael, CA 94903-1925	Work Order:	16-11-0727
		Project Name:	CA-04931 GP09BPNA.C110
		PO Number:	GP09BPNA.C110.Q0000
		Date/Time Received:	11/09/16 10:00
		Number of Containers:	8
Attn:	Jamey Peterson		

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
SV-7	16-11-0727-1	11/07/16 13:02	1	Air
SV-8	16-11-0727-2	11/07/16 11:18	1	Air
SV-9	16-11-0727-3	11/07/16 12:19	1	Air
He-1-20161107	16-11-0727-4	11/07/16 11:20	1	Air
He-2-20161107	16-11-0727-5	11/07/16 12:19	1	Air
He-3-20161107	16-11-0727-6	11/07/16 12:59	1	Air
Trip Blank-20161107	16-11-0727-7	11/07/16 00:00	1	Air
DUP-20161107	16-11-0727-8	11/07/16 13:02	1	Air

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-7	**16-11-0727-1-A**	**11/07/16 13:02**	**Air**	**GC 65**	**N/A**	**11/11/16 12:24**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	1.56	0.500	1.00	
Oxygen (+ Argon)	18.8	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-8	**16-11-0727-2-A**	**11/07/16 11:18**	**Air**	**GC 65**	**N/A**	**11/11/16 12:42**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	8.39	0.500	1.00	
Oxygen (+ Argon)	5.25	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-9	**16-11-0727-3-A**	**11/07/16 12:19**	**Air**	**GC 65**	**N/A**	**11/11/16 13:03**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	2.11	0.500	1.00	
Oxygen (+ Argon)	14.1	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Trip Blank-20161107	**16-11-0727-7-A**	**11/07/16 00:00**	**Air**	**GC 65**	**N/A**	**11/11/16 13:53**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Oxygen (+ Argon)	1.20	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP-20161107	**16-11-0727-8-A**	**11/07/16 13:02**	**Air**	**GC 65**	**N/A**	**11/11/16 14:16**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	2.84	0.500	1.00	
Oxygen (+ Argon)	16.2	0.500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-16-444-509**	**N/A**	**Air**	**GC 65**	**N/A**	**11/10/16 19:09**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Oxygen (+ Argon)	ND	0.500	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Project: CA-04931 GP09BPNA.C110

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: ASTM D-1946 (M)
Units: %v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-7	**16-11-0727-1-A**	**11/07/16 13:02**	**Air**	**GC 55**	**N/A**	**11/09/16 20:16**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	ND	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-8	**16-11-0727-2-A**	**11/07/16 11:18**	**Air**	**GC 55**	**N/A**	**11/09/16 19:39**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	ND	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-9	**16-11-0727-3-A**	**11/07/16 12:19**	**Air**	**GC 55**	**N/A**	**11/09/16 18:36**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	0.0312	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
He-1-20161107	**16-11-0727-4-A**	**11/07/16 11:20**	**Air**	**GC 55**	**N/A**	**11/09/16 15:29**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	10.5	0.0200	2.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
He-2-20161107	**16-11-0727-5-A**	**11/07/16 12:19**	**Air**	**GC 55**	**N/A**	**11/09/16 17:14**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	6.79	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
He-3-20161107	**16-11-0727-6-A**	**11/07/16 12:59**	**Air**	**GC 55**	**N/A**	**11/09/16 16:54**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	7.89	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Trip Blank-20161107	**16-11-0727-7-A**	**11/07/16 00:00**	**Air**	**GC 55**	**N/A**	**11/09/16 17:37**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	ND	0.0100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP-20161107	**16-11-0727-8-A**	**11/07/16 13:02**	**Air**	**GC 55**	**N/A**	**11/09/16 17:58**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	ND	0.0100	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	ASTM D-1946 (M)
		Units:	%v
Project: CA-04931 GP09BPNA.C110			Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-872-1000**	**N/A**	**Air**	**GC 55**	**N/A**	**11/09/16 10:45**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Helium	ND	0.0100	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-7	**16-11-0727-1-A**	**11/07/16 13:02**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 18:35**	**161111L01**

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	1.6	1.00	
Ethylbenzene	ND	2.2	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Toluene	2.0	1.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	78	68-134	
1,2-Dichloroethane-d4	90	67-133	
Toluene-d8	89	70-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-8	**16-11-0727-2-A**	**11/07/16 11:18**	**Air**	**GC/MS NN**	**N/A**	**11/12/16 17:02**	**161112L04**

Comment(s): - Reporting limit is elevated due to high levels of non-target hydrocarbons.

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	32	20.0	
Ethylbenzene	ND	43	20.0	
Methyl-t-Butyl Ether (MTBE)	ND	140	20.0	
o-Xylene	ND	43	20.0	
p/m-Xylene	ND	170	20.0	
Xylenes (total)	ND	43	1.00	
Tert-Butyl Alcohol (TBA)	ND	120	20.0	
Toluene	ND	38	20.0	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	68-134	
1,2-Dichloroethane-d4	94	67-133	
Toluene-d8	126	70-130	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-9	**16-11-0727-3-A**	**11/07/16 12:19**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 19:36**	**161111L01**

Parameter	Result	RL	DF	Qualifiers
Benzene	30	2.0	1.23	
Ethylbenzene	38	2.7	1.23	
Methyl-t-Butyl Ether (MTBE)	360	8.9	1.23	
o-Xylene	33	2.7	1.23	
p/m-Xylene	97	11	1.23	
Xylenes (total)	130	2.7	1.00	
Tert-Butyl Alcohol (TBA)	ND	7.5	1.23	
Toluene	190	2.3	1.23	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	101	68-134	
1,2-Dichloroethane-d4	90	67-133	
Toluene-d8	116	70-130	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Trip Blank-20161107	**16-11-0727-7-A**	**11/07/16 00:00**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 17:44**	**161111L01**

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	1.6	1.00	
Ethylbenzene	ND	2.2	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Toluene	ND	1.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	77	68-134	
1,2-Dichloroethane-d4	90	67-133	
Toluene-d8	91	70-130	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP-20161107	**16-11-0727-8-A**	**11/07/16 13:02**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 20:37**	**161111L01**

Parameter	Result	RL	DF	Qualifiers
Benzene	4.7	2.2	1.39	
Ethylbenzene	ND	3.0	1.39	
Methyl-t-Butyl Ether (MTBE)	ND	10	1.39	
o-Xylene	ND	3.0	1.39	
p/m-Xylene	ND	12	1.39	
Xylenes (total)	ND	3.0	1.00	
Tert-Butyl Alcohol (TBA)	ND	8.4	1.39	
Toluene	3.7	2.6	1.39	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	79	68-134	
1,2-Dichloroethane-d4	86	67-133	
Toluene-d8	88	70-130	

Method Blank	**095-01-021-17716**	**N/A**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 15:35**	**161111L01**

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	1.6	1.00	
Ethylbenzene	ND	2.2	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Toluene	ND	1.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	77	68-134	
1,2-Dichloroethane-d4	89	67-133	
Toluene-d8	89	70-130	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: CA-04931 GP09BPNA.C110

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-021-17728**	**N/A**	**Air**	**GC/MS NN**	**N/A**	**11/12/16 15:04**	**161112L04**

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	1.6	1.00	
Ethylbenzene	ND	2.2	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Toluene	ND	1.9	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	79	68-134	
1,2-Dichloroethane-d4	89	67-133	
Toluene-d8	92	70-130	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Analytical Report

Arcadis, US Inc.
100 Smith Ranch Road, Suite 329
San Rafael, CA 94903-1925

Project: CA-04931 GP09BPNA.C110

Date Received: 11/09/16
Work Order: 16-11-0727
Preparation: N/A
Method: EPA TO-3M
Units: ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-7	**16-11-0727-1-A**	**11/07/16 13:02**	**Air**	**GC 38**	**N/A**	**11/10/16 14:03**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	ND	3800	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-8	**16-11-0727-2-A**	**11/07/16 11:18**	**Air**	**GC 38**	**N/A**	**11/09/16 18:08**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	2200000	7600	2.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SV-9	**16-11-0727-3-A**	**11/07/16 12:19**	**Air**	**GC 38**	**N/A**	**11/09/16 16:57**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	68000	3800	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Trip Blank-20161107	**16-11-0727-7-A**	**11/07/16 00:00**	**Air**	**GC 38**	**N/A**	**11/09/16 15:00**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	ND	3800	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP-20161107	**16-11-0727-8-A**	**11/07/16 13:02**	**Air**	**GC 38**	**N/A**	**11/09/16 16:21**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	ND	3800	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-431-664**	**N/A**	**Air**	**GC 38**	**N/A**	**11/09/16 10:58**	**161109L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	ND	3800	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-14-431-665**	**N/A**	**Air**	**GC 38**	**N/A**	**11/10/16 13:00**	**161110L01**

Parameter	Result	RL	DF	Qualifiers
Gasoline Range Organics (C6-C12)	ND	3800	1.00	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

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Quality Control - Sample Duplicate

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-3M
Project: CA-04931 GP09BPNA.C110			Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
SV-8	**Sample**	**Air**	**GC 38**	**N/A**	**11/09/16 18:08**	**161109D01**
SV-8	**Sample Duplicate**	**Air**	**GC 38**	**N/A**	**11/09/16 18:48**	**161109D01**

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	2160000	2342000	8	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	ASTM D-1946
Project: CA-04931 GP09BPNA.C110			Page 1 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-16-444-509	**LCS**	**Air**	**GC 65**	**N/A**	**11/10/16 18:25**	**161110L01**
099-16-444-509	**LCSD**	**Air**	**GC 65**	**N/A**	**11/10/16 18:48**	**161110L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	4.500	4.467	99	4.361	97	80-120	2	0-30	
Carbon Dioxide	15.00	15.41	103	15.13	101	80-120	2	0-30	
Oxygen (+ Argon)	4.010	3.853	96	4.230	105	80-120	9	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	ASTM D-1946 (M)
Project: CA-04931 GP09BPNA.C110			Page 2 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-872-1000	**LCS**	**Air**	**GC 55**	**N/A**	**11/09/16 10:05**	**161109L01**
099-12-872-1000	**LCSD**	**Air**	**GC 55**	**N/A**	**11/09/16 10:25**	**161109L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Helium	1.000	0.9282	93	0.9436	94	80-120	2	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-15
Project: CA-04931 GP09BPNA.C110			Page 3 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-17716	**LCS**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 12:46**	**161111L01**
095-01-021-17716	**LCSD**	**Air**	**GC/MS NN**	**N/A**	**11/11/16 13:39**	**161111L01**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	79.87	72.26	90	71.98	90	70-130	0	0-30	
Ethylbenzene	108.6	108.4	100	107.1	99	70-130	1	0-30	
Methyl-t-Butyl Ether (MTBE)	90.13	74.35	82	74.53	83	68-130	0	0-30	
o-Xylene	108.6	105.8	97	105.0	97	69-130	1	0-30	
p/m-Xylene	217.1	224.4	103	221.0	102	70-132	2	0-30	
Tert-Butyl Alcohol (TBA)	151.6	121.3	80	121.8	80	66-144	0	0-30	
Toluene	94.21	92.91	99	91.06	97	70-130	2	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS/LCSD

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-15
Project: CA-04931 GP09BPNA.C110			Page 4 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-17728	**LCS**	**Air**	**GC/MS NN**	**N/A**	**11/12/16 12:17**	**161112L04**
095-01-021-17728	**LCSD**	**Air**	**GC/MS NN**	**N/A**	**11/12/16 13:10**	**161112L04**

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	79.87	77.01	96	76.06	95	70-130	1	0-30	
Ethylbenzene	108.6	113.1	104	113.3	104	70-130	0	0-30	
Methyl-t-Butyl Ether (MTBE)	90.13	77.78	86	78.68	87	68-130	1	0-30	
o-Xylene	108.6	110.5	102	110.4	102	69-130	0	0-30	
p/m-Xylene	217.1	232.6	107	230.1	106	70-132	1	0-30	
Tert-Butyl Alcohol (TBA)	151.6	127.6	84	128.6	85	66-144	1	0-30	
Toluene	94.21	95.19	101	94.94	101	70-130	0	0-30	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-3M
Project: CA-04931 GP09BPNA.C110			Page 5 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-431-664	**LCS**	**Air**	**GC 38**	**N/A**	**11/09/16 10:12**	**161109L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Gasoline Range Organics (C6-C12)	382400	314200	82	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

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Quality Control - LCS

Arcadis, US Inc.		Date Received:	11/09/16
100 Smith Ranch Road, Suite 329		Work Order:	16-11-0727
San Rafael, CA 94903-1925		Preparation:	N/A
		Method:	EPA TO-3M
Project: CA-04931 GP09BPNA.C110			Page 6 of 6

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-14-431-665	**LCS**	**Air**	**GC 38**	**N/A**	**11/10/16 12:05**	**161110L01**

Parameter	Spike Added	Conc. Recovered	LCS %Rec.	%Rec. CL	Qualifiers
Gasoline Range Organics (C6-C12)	382400	426600	112	80-120	

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RPD: Relative Percent Difference. CL: Control Limits

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Summa Canister Vacuum Summary

Work Order: 16-11-0727 Page 1 of 1

Sample Name	Vacuum Out	Vacuum In	Equipment	Description
SV-7	-29.50 in Hg	-6.50 in Hg	LC002	Summa Canister 1L
SV-8	-29.50 in Hg	-5.40 in Hg	LC1096	Summa Canister 1L
SV-9	-29.50 in Hg	-5.00 in Hg	LC463	Summa Canister 1L
He-1-20161107	-29.50 in Hg	-5.00 in Hg	LC375	Summa Canister 1L
He-2-20161107	-29.50 in Hg	-5.80 in Hg	LC1089	Summa Canister 1L
He-3-20161107	-29.50 in Hg	-7.00 in Hg	LC197	Summa Canister 1L
Trip Blank-20161107	10.00 psi	9.50 psi	LC833	Summa Canister 1L
DUP-20161107	-29.50 in Hg	-6.40 in Hg	LC361	Summa Canister 1L

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Sample Analysis Summary Report

Work Order: 16-11-0727 Page 1 of 1

Method	Extraction	Chemist ID	Instrument	Analytical Location
ASTM D-1946	N/A	1074	GC 65	2
ASTM D-1946 (M)	N/A	929	GC 55	2
ASTM D-1946 (M)	N/A	1078	GC 55	2
EPA TO-15	N/A	866	GC/MS NN	2
EPA TO-3M	N/A	929	GC 38	2
EPA TO-3M	N/A	1074	GC 38	2

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Glossary of Terms and Qualifiers

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Qualifiers	Definition
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

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7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us26_sales@eurofinsus.com or call us.

AIR CHAIN-OF-CUSTODY RECORD

WO NO. / LAB USE ONLY: **16-11-0727**

DATE: 11/7/16
PAGE: 1 OF 1

LABORATORY CLIENT: ARCADIS
ADDRESS: 100 Montgomery St, Suite 300
CITY: San Francisco STATE: CA ZIP: 94104
TEL: E-MAIL: Jamey.Peterson@arcadis.com

CLIENT PROJECT NAME / NO.: BP CA-4931
PROJECT CONTACT: Jamey Peterson
PROJECT ADDRESS: 731 W. MacArthur Blvd, Oakland CA

P.O. NO.: GP09BPNA.C110.Q0000
LAB CONTACT OR QUOTE NO.: Richard Villafania / Linda Ta
SAMPLER(S): (PRINT) Cameron McGovern

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☒ STANDARD

EDD: ☒ COELT EDF ☐ OTHER
UNITS:

SPECIAL INSTRUCTIONS:
cc: Cameron.McGovern@arcadis.com

LAB USE ONLY	SAMPLE ID	FIELD ID / POINT OF COLLECTION	MATRIX: Indoor (I) Soil Vap. (SV) Ambient (A)	SAMPLING EQUIPMENT: Media ID	Canister Size 6L or 1L	Flow Controller ID	START SAMPLING INFORMATION: Date	Time (24 hr clock)	Canister Pressure (in Hg)	STOP SAMPLING INFORMATION: Date	Time (24 hr clock)	Canister Pressure (in Hg)	REQUESTED ANALYSES: CH4, CO, O2, He (D-1946)	GRO (TO-3M)	BTEX, MTBE, TBA (TO-15)		He ONLY (D-1946)
1	SV-7		SV	LC002	1L	SGM345	11/7/16	1245	-30	11/7/16	1302	-5	X	X	X		
2	SV-8		↓	LC1096	↓	SGM208	↓	1109	↓	↓	1118	-5	↓	↓	↓		
3	SV-9		↓	LC463	↓	SGM317	↓	1208	↓	↓	1219	-6	↓	↓	↓		
4	He-1-20161107	SV-8	A	LC375	↓	SGM423	↓	1109	↓	↓	1120	-6					X
5	He-2-20161107	SV-9	↓	LC1089	↓	SGM293	↓	1208	↓	↓	1219	-5					↓
6	He-3-20161107	SV-7	↓	LC197	↓	SGM345	↓	1245	↓	↓	1259	-5					↓
7	Trip blank-20161107		A	LC833	↓	—	↓	—	10	↓	—	10	X	X	X		
8	DUP-20161107	SV-7	SV	LC361	↓	—	↓	1245	-30	↓	1302	-7	X	X	X		

Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:
Cameron McGovern 11/7/16 1340	11/7/16 1340		
Relinquished by: (Signature) 11/8/16 0900	Received by: (Signature/Affiliation)	Date: 11/09/16	Time: 1000
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

2014-07-01 Revision

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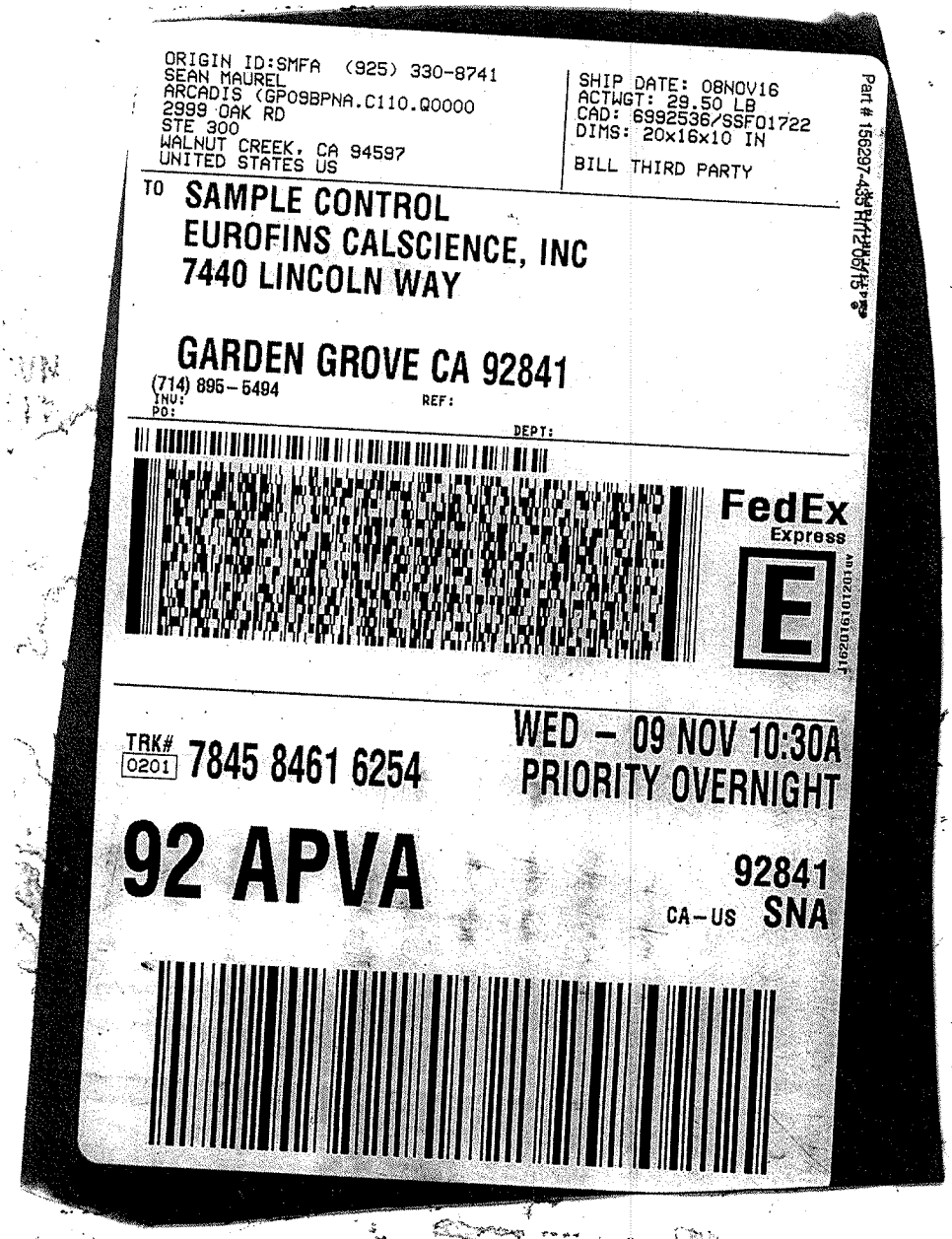

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WORK ORDER NUMBER: 16-11- 0727

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: Arcadis

DATE: 11 / 09 / 2016

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC3A (CF: 0.0°C); Temperature (w/o CF): _____°C (w/ CF): _____°C; ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____)

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

☐ Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: ☑ Air ☐ Filter Checked by: 836

CUSTODY SEAL:

Cooler ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present (BOX) ☐ N/A Checked by: 836

Sample(s) ☐ Present and Intact ☐ Present but Not Intact ☑ Not Present ☐ N/A Checked by: 1053

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Sampling date ☐ Sampling time ☐ Matrix ☐ Number of containers			
☐ No analysis requested ☐ Not relinquished ☐ No relinquished date ☐ No relinquished time			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and in good condition	☑	☐	☐
Proper containers for analyses requested	☑	☐	☐
Sufficient volume/mass for analyses requested	☑	☐	☐
Samples received within holding time	☑	☐	☐
Aqueous samples for certain analyses received within 15-minute holding time			
☐ pH ☐ Residual Chlorine ☐ Dissolved Sulfide ☐ Dissolved Oxygen	☐	☐	☑
Proper preservation chemical(s) noted on COC and/or sample container	☐	☐	☑
Unpreserved aqueous sample(s) received for certain analyses			
☐ Volatile Organics ☐ Total Metals ☐ Dissolved Metals			
Container(s) for certain analysis free of headspace	☐	☐	☑
☐ Volatile Organics ☐ Dissolved Gases (RSK-175) ☐ Dissolved Oxygen (SM 4500)			
☐ Carbon Dioxide (SM 4500) ☐ Ferrous Iron (SM 3500) ☐ Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE: (Trip Blank Lot Number: _____)

Aqueous: ☐ VOA ☐ VOA**h** ☐ VOA**na$_2$** ☐ 100PJ ☐ 100PJ**na$_2$** ☐ 125AGB ☐ 125AGB**h** ☐ 125AGB**p** ☐ 125PB

☐ 125PB**znna** ☐ 250AGB ☐ 250CGB ☐ 250CGB**s** ☐ 250PB ☐ 250PB**n** ☐ 500AGB ☐ 500AGJ ☐ 500AGJ**s**

☐ 500PB ☐ 1AGB ☐ 1AGB**na$_2$** ☐ 1AGB**s** ☐ 1PB ☐ 1PB**na** ☐ _____ ☐ _____ ☐ _____ ☐ _____

Solid: ☐ 4ozCGJ ☐ 8ozCGJ ☐ 16ozCGJ ☐ Sleeve (_____) ☐ EnCores® (_____) ☐ TerraCores® (_____) ☐ _____

Air: ☐ Tedlar™ ☑ Canister ☐ Sorbent Tube ☐ PUF ☐ _____ **Other Matrix** (_____): ☐ _____ ☐ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO_3, **na** = NaOH, **na$_2$** = $Na_2S_2O_3$, **p** = H_3PO_4, **s** = H_2SO_4, **u** = ultra-pure, **x** = Na_2SO_3+$NaHSO_4.H_2O$, **znna** = Zn $(CH_3CO_2)_2$ + NaOH

Labeled/Checked by: 1053

Reviewed by: 360

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STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_REPORT FILE

SUCCESS

Your GEO_REPORT file has been successfully submitted!

Submittal Type:	**GEO_REPORT**
Report Title:	**Site Investigation and Soil Vapor Sampling Report 121616**
Report Type:	**Site Investigation**
Report Date:	**12/16/2016**
Facility Global ID:	**T0600100110**
Facility Name:	**ARCO #04931**
File Name:	**CA 4931 161216 BP - Site Investigation and Soil Vapor Sampling Report.pdf**
Organization Name:	**ARCADIS**
Username:	**ARCADISBP**
IP Address:	**199.116.168.108**
Submittal Date/Time:	**12/16/2016 1:24:36 PM**
Confirmation Number:	**3424264729**

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