

**RECEIVED**

By Alameda County Environmental Health 9:31 am, May 18, 2016



2198 SIXTH STREET, SUITE 201 • BERKELEY, CA 94710  
TEL: (510)644-3123 • FAX: (510)644-3859  
GEOSCIENCE & ENGINEERING CONSULTING

May 17, 2016

Mr. Mark Detterman  
Alameda County Health Care Services  
Local Oversight Program  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Subject: Data Gap Investigation to Evaluate Potential Indoor Air Vapor Intrusion by Soil-Gas related to a Former Residential Underground Heating Oil Tank located at 811 Paramount Road, Oakland, CA. (Alameda County Fuel Leak Case No. RO0003143 and CA GeoTracker Global ID T10000006106)

Dear Mr. Detterman:

### **INTRODUCTION AND SCOPE OF WORK**

Stellar Environmental Solutions, Inc. (Stellar Environmental), on behalf of the property owners, presents Alameda County Health Care Services (ACHCS) with the findings of this sampling investigation to evaluate the extent of potential environmental contamination related to a former 350-gallon residential underground heating fuel storage tank (UST) that was removed on December 16, 2013. This report has been prepared to document the implementation of the Stellar Environmental Workplan, dated March 9, 2016 with the incorporation of modifications by ACHCS in their review and approval letter, dated March 10, 2016.

This report presents the results of the current soil sampling, soil-gas sampling and indoor air sampling conducted from March 31 to April 1, 2016, to investigate potential migration of hydrocarbon contaminants in vapor from the former UST and close the data gap impediments to achieving regulatory site closure. In addition, this report includes a revision of the September 23, 2015 soil-gas sampling analysis in which 1,1,2-trichloroethane (TCA) was erroneously detected along with an accompanying explanation from the laboratory. The revised certified analytical report is included in Attachment E.

Attached Figure 1 shows the site location and Figure 2 is a site plan showing the locations of current and historical sampling of the former UST. Figures are included in Attachment A

*Stellar Environmental Solutions, Inc.*

## **SUBJECT PROPERTY DESCRIPTION**

The subject property is located at 811 Paramount Road in Trestle Glen, a historical residential district in Oakland, California. The area has historically been a residential area since the turn of the 20<sup>th</sup> century. The property is situated on a ridgeline in the Oakland hills with an average elevation of approximately 210 feet above mean sea level (amsl) and a generally westward and southward topographic slope. Rainwater drains away from the residential front yard area of the former UST site to the street curb gutter where it is channeled into the storm drain system on Paramount Road.

### **Local Hydrogeology**

The site is underlain by Late Pleistocene alluvium that generally consist of weakly consolidated slightly weathered poorly sorted irregularly interbedded clay, silt, sand, and gravel. Local heterogeneities in shallow lithology and groundwater levels are typical of the alluvial deposits in this area. Shallow site lithology was determined in this current March 2016 and the previous June 2015 investigations by the visual method of the Unified Soils Classification System (USCS) using continuous core soil samples from this investigation. The predominant soil types encountered consisted of clay from the ground surface to between 6 and 8 feet below ground surface (bgs). Silt predominated from approximately 6 feet bgs to 29 feet bgs with the exception of a predominance of clay to 20 feet bgs in bore SB1. Gravelly and sandy to silty clay were observed from approximately 24 to 30 feet bgs in bores SB2 and SB3. Clay was encountered at approximately 29 - 31 feet bgs in bores SB1 and SB2 and observed to persist to the maximum depth advanced of 36 feet bgs in bore SB2. Groundwater was not encountered during the June 2015 or this current investigation.

### **Surface Water Bodies**

The nearest surface water bodies are Sausal Creek located approximately 5,000 feet east of the site; Central Reservoir located 5,000 southeast and Lake Merritt Lake located about 5,000 feet west of the site. These water bodies ultimately drain to San Francisco Bay, located approximately 3.75 miles to the west of the site.

## **HISTORICAL ENVIRONMENTAL BACKGROUND**

The former UST was discovered during property renovations in 2013 at which time the subject property owners contracted Golden Gate Tank Removal, Inc. (GGT) to remove the UST. The underground storage tank (UST) removal report, dated January 14, 2014 that was prepared by

*Stellar Environmental Solutions, Inc.*

GGT documents the December 2013 removal of one 350-gallon heating oil UST and 32.75 tons of associated fuel impacted soil from the subject site. The UST was found to be in poor condition with at least one visible hole. Soil discoloration and hydrocarbon odors were noted to be associated with overburden soil and soil underlying the UST.

The initial UST soil samples were collected at a depth of 7 feet on both the east end and west end beneath the UST after its removal on December 16, 2013. The analytical at 7 feet bgs on the east end (sample E7) was reported at 9,290 milligrams per kilogram (mg/kg) Total Petroleum Hydrocarbons in the carbon C10-C28 range, which includes the upper C8-C10 range of gasoline (TPHg), the full (C10-C23) range of diesel (TPHd) and into the motor oil (C18-C35) range (TPHmo). The 9,290 mg/kg detection exceeds the applicable Environmental Screening Limits (ESLs) for TPHg, TPHd and TPHmo. Also reported in sample E7 was 1.1 mg/kg ethylbenzene, 1.37 mg/kg total xylenes and 47.3 mg/kg naphthalene, with naphthalene above the ESL. Benzene and toluene were below the laboratory detection limit. The west end sample (sample W7) concentrations at 7 feet bgs were detected at 1,390 mg/kg in the C10-C28 range. The benzene, toluene, ethylbenzene and xylenes (BTEX) concentrations were near to below Laboratory Reporting Limits (RLs) of 79 µg/kg or less, and naphthalene concentration was 7.72 mg/kg, above its ESL.

Over-excavation to 12 feet bgs was subsequently performed on December 24, 2013. East end sample (sample E12) concentrations decreased two to three orders of magnitude to 28.0 mg/kg of TPH C10-C28, while BTEX and naphthalene concentrations were near to below RLs. The west end sample (sample E12) concentrations increased with depth to 3,960 mg/kg TPHd, and naphthalene concentrations increased to 25.2 mg/kg, in excess of their respective ESLs; BTEX concentrations were near to below RLs. MTBE was not analyzed in any of the samples.

ACHCS in their letter dated December 15, 2014, requested additional investigation of the residual soil contamination that was indicated by detections of TPHd and naphthalene above applicable ESLs that was reported in the UST removal report (GGT 2013). Stellar Environmental was retained by the property owners to prepare an investigation Workplan which was approved with the incorporation of modifications by ACHCS in their review and approval letter, dated March 30, 2015. The Workplan was implemented by Stellar Environmental in June 2015 and showed no detectable TPHd, TPHmo or fuel related volatile organic compounds (VOCs) in site soils indicating the potential residual soil contamination is neither laterally or vertically extensive. Groundwater was not encountered in any of the 3 bores that were advanced during the investigation, with the deepest bore extending to 36 feet bgs. The absence of residual soil

contaminantion indicates no threat to groundwater by potential contaminants of concern (COCs). However, soil-gas collected from soil-gas well SG5.5 feet bgs showed 880,000  $\mu\text{g}/\text{m}^3$  TPHg in excess of the Water Board residential ESL of 300,000  $\mu\text{g}/\text{m}^3$  for potential risk of vapor intrusion into the nearby building, and is the focus of this current investigation. The detection of residual TPHg in soil-gas is anomalous for a residential heating oil UST but appears to rapidly attenuate with depth as there were no detections of any COCs at 13 feet bgs immediately below the target contaminant depth where elevated TPHd and naphthalene in soil were reported in the UST removal report (GGT 2013). In addition, the June 2015 investigation documented 3.0 to 3.4 % oxygen) in shallow soil adjacent to the residential building,

The June 2015 investigation sampling detected no residual soil contamination, showed no threat to groundwater and only limited residual soil-gas detection of 880,000  $\mu\text{g}/\text{m}^3$  total petroleum hydrocarbons as gasoline in excess of the regulatory threshold criteria of 300,000  $\mu\text{g}/\text{m}^3$ . Thus, the only apparent potential exposure risk is soil vapor intrusion into the residential building.

The analytical results from the June 2015 investigation qualified the site for closure under the strict criteria of the Water Board Low Threat Closure Policy (LTCP), however due to the exceedance of TPHg over the Water Board ESL, ACHCS requested in their letter dated August 19, 2015, re-sampling of soil-gas, an evaluation of the building crawl space and additional sampling of potential toxic vapor intrusion into the site residence be conducted in the event that the soil-gas sampling results exceeded the applicable ESLs. A Workplan, dated September 9, 2015 was prepared by Stellar Environmental and approved with modifications by ACHCS in their letter dated September 10, 2015.

The soil-gas well SG5.5 was resampled on September 23, 2015 as prescribed in the Workplan. The analytical results showed 240,000  $\mu\text{g}/\text{m}^3$  TPHd, 2,000,000  $\mu\text{g}/\text{m}^3$  TPHg and 600  $\mu\text{g}/\text{m}^3$  benzene, in excess of their applicable residential ESLs of 68,000, 300,000  $\mu\text{g}/\text{m}^3$ , and 48  $\mu\text{g}/\text{m}^3$ , respectively. TCA was incorrectly reported by the laboratory to be detected in that sample event, however TCA was later confirmed not detected and the amended analytical laboratory report is attached to this report. The analytical results of the September 23, 2015 soil-gas sampling were subsequently shared with the ACHCS regulator and as prescribed in the Workplan, sampling of the indoor air was advanced. Benzene was the only site contaminant of concern that was detected in the indoor air at 0.20  $\mu\text{g}/\text{m}^3$ , slightly above its applicable ESL of 0.084  $\mu\text{g}/\text{m}^3$ , however at a concentration less than that detected in the ambient outdoor air suggesting that the benzene in the residential indoor air could be attributed to outdoor ambient sources. The compounds, TPHg and



TPHd, that were detected above their ESLs in the soil-gas, were not detected in the indoor-air survey.

The purpose of this current March 2016 investigation work is to address ACHCS's concern that the two previous soil-gas samplings of well SG5.5 have shown an increasing concentration trend in TPH-gasoline and benzene. ACHCS has thus requested additional soil and soil-gas sampling to investigate TPHd, TPHg, benzene and TCA that may possibly be related to the discolored green soil noted on the June 2015 investigation borings SB2 and SG5.5 log that occurred between 3.5 and 6 feet bgs; re-evaluation of oxygen that was previously measured below the LTCP bioattenuation zone criteria of 4%; and a second indoor air survey. Due to a laboratory error discussed above, TCA has been eliminated as a potential contaminant of concern. This report presents the findings of this investigation conducted to evaluate potential vapor intrusion of hydrocarbon contaminants related to the former UST and close the data gap impediments to achieving regulatory site closure.

## REGULATORY CONSIDERATIONS

The Water Board has established ESLs for evaluating the likelihood of environmental impact. ESLs are conservative screening-level criteria for soil and groundwater, designed to be generally protective of both drinking water resources and aquatic environments; they incorporate both environmental and human health risk considerations. ESLs are not cleanup criteria (i.e., health-based numerical values or disposal-based values). Rather, they are used as a preliminary guide in determining whether additional remediation and/or investigation may be warranted.

Different ESLs are published for commercial/industrial vs. residential land use, for sites where groundwater is a potential drinking water resource vs. is not a likely drinking water resource, and for the type of receiving water body. In our professional opinion, the appropriate ESL criteria for the subject site are *residential land use* and *groundwater is a potential drinking water resource*; based on the following:

- Residential land use as zoned by the City of Oakland.
- Groundwater is a potential a drinking water resource based on the location of the site being within the Department of Water Resources (DWR) designated East Bay Plain Groundwater Sub-Basin (DWR 2003) and the designation of this area of Oakland as "Zone A – Significant Drinking Water Resource (Water Board, 1999).
- The receiving body for groundwater discharge is an estuary (San Francisco Bay).

As stated above, ESLs are used as a preliminary guide in determining whether additional investigation, remediation or other action is warranted. Exceeding ESLs may warrant additional actions, such as monitoring plume stability to demonstrate no risk to sensitive receptors in the case of sites where drinking water is not threatened.

## **Regulatory Status**

There was previously no known documentation of the Underground Storage Tank (UST) removal(s) or other information in the regulatory Water Board GeoTracker system. ACHCS is the oversight agency for the UST site cleanups in Oakland and the site was assigned a GeoTracker Global ID No. T10000006106 and ACHCS Fuel Leak Case No. RO0003143.

This report has been prepared to address ACHCS correspondence and to evaluate the site for regulatory closure under the State Water Resources Control Board Low-Threat Underground Storage Tank Policy (LTCP) Title 23, 2923 (OAL File No. 2012-0618-02 S), adopted on May 1, 2012 and effective as of August 17, 2012 (Water Board 2012).

## **LABORATORY ANALYTICAL METHODS**

The required U. S. Environmental Protection Agency (EPA) analytical methods from Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846 (EPA, 1986) that were used to analyze the soil-gas sample during this project include

Soil Samples were analyzed using the following methods:

- TEH-mo (C18-C36), TEH-hydraulic oil (TEH-ho, C18-C36) and TEH-d (C10-C23) – by EPA Method 8015M
- TVH-g and volatile organic compounds (VOCs): full list including; naphthalene, benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary-butyl ether (MTBE) – by EPA Method 8260B
- Moisture – by ASTM 2216-92, required to evaluate COCs in soil on a dry-weight basis (soil samples only)

Soil-Gas and Indoor Air Samples were analyzed using the following methods:

- TPHg and VOCs: full list including; naphthalene, BTEX and MTBE - by EPA Method TO-15/Gas Range Organics (GRO).
- TPHg scan by Method 8260B (soil-gas only)

- TPHd and naphthalene - by EPA Method TO17 (soil-gas only)
- Oxygen and methane - by ASTM 1946-90 (soil-gas only)
- Helium, the leak check compound by ASTM 1946-90 (soil-gas only)

Laboratory-certified clean sampling equipment including summa™ canisters, manifolds equipped with a filter, pressure gauge and the appropriate flow controller were used. The soil and soil-gas samples were analyzed by McCampbell Analytical (Pittsburg, CA), a California and National Environmental Laboratory Accreditation Program-ELAP-certified analytical laboratory. Soil-gas analyzed by TO15/GRO analysis was collected in 1-liter Summa™ canisters. Soil-gas samples for TO17 analysis were collected in sorbent tubes that were wrapped in laboratory-grade aluminum and maintained on ice in a cooler. Indoor and outdoor ambient air samples for TO15/GRO analysis were collected in 6-liter Summa™ canisters. Samples collected in Summa™ canisters were maintained at ambient temperature and out of direct sunlight. All sampling equipment used was certified clean by the laboratory prior to use. All samples were transported by courier under chain of custody to the analytical laboratory. The analyses were performed at a standard turnaround.

### **FIELDWORK IMPLEMENTATION**

Field activities discussed under this heading were conducted on March 31st and April 1, 2016 and included collecting samples of soil, soil-gas, indoor-air and doing an inventory of site chemicals. Soil-gas was collected from well SG5.5 prior to auguring the adjacent (approximately 1.5 feet away) bore SB4 to avoid disturbing the subsurface environment before the soil-gas collection.

The analytical laboratory results are summarized in the tables included in Attachment B. A photo-documentation of the field activities is included in Attachment D. The certified laboratory analytical reports and chain-of-custody records are presented in Attachment E.

### **SOIL SAMPLING METHODOLOGY AND RESULTS**

One soil boring identified as SB4 was advanced utilizing a stainless steel hand auger in a location east and adjacent (within 2 feet) of soil-gas well SG5.5 to investigate the source of the contaminants TPHg, TPHd, benzene and 1,1,2-trichloroethane that were previously documented in soil-gas above their ESLs. Two soil samples from 3-3.5 and 5-5.5 feet bgs were collected by boring with the hand auger to the top of the target depth followed by retrieving the soil sample

with a hand-held drive hammer sampling tool. The boring lithology consisted of an upper 6 inches of garden soil overlying light brown silty clay. Light-green discoloration was noted in bore SB4 between 3-5 feet bgs and a light oil odor was noticeable in the 5 foot sample. The soil was collected in a stainless-steel sleeve held in the drive end of the sampler that is inserted into the borehole and driven from the top to the bottom of the target depth interval. The sampler retrieves a relatively undisturbed 1.5-inch-diameter, 6-inch-long soil sample from the desired depth. The samples contained in the steel sleeves were sealed with Teflon™ tape and non-reactive plastic caps, labeled, and placed in a chilled cooler. The drive hammer sampler was decontaminated with phosphate free soap and a triple rinsed between the two sampling locations.

The location of bore SB4 is shown on Figures 2 through 5 contained in Attachment A. The analytical results of the soil samples are included on Figure 3 and summarized in Tables 1 and 2 in Attachment B.

#### TPH Motor Oil/Hydraulic oil (C18-C36) and Diesel (C10-23)

The analysis of the 3 foot sample showed no detection of TPHmo/ho and a trace (17 mg/kg) TPHd. The 5 foot soil sample analysis contained 81 mg/kg TPHmo/ho below its ESL but showed 360 mg/kg TPHd in excess of the residential ESL of 230 mg/kg.

#### TVH Gasoline

TVHg was below laboratory detection in the 3 foot sample but was detected at 36 mg/kg TVHg in the 5 foot sample, but below the ESL of 100 mg/kg.

#### Volatile Organic Compounds (Full List Method 8260)

No VOCs including the fuel components; naphthalene, MTBE, benzene, toluene, ethylbenzene and xylenes were detected in the 3 foot soil sample. The 5 foot sample showed trace detections of the following compounds; sec-butyl benzene, 4-isopropyl toluene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, however all were below their respective ESLs, where published.

Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) were analyzed by the laboratory in accordance with the requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (Attachment D).

## **SOIL-GAS SAMPLING AND METHODOLOGY AND RESULTS**

The soil-gas wells were located and designed to evaluate potential for soil-gas intrusion into the residential site building. The two soil-gas wells were constructed during the June 2015 Stellar Environmental investigation in a cluster array approximately 2 feet apart with the subsurface diffuser implants installed at 5.5 and 13 feet bgs and labeled SG5.5 and SG13, respectively. A stainless-steel mesh air diffuser was set in the 3-inch diameter bore at the target depth, at the midpoint of a 1-foot sand pack and connected to the surface with Teflon<sup>®</sup> tubing (0.177-inch inside diameter) and terminated after the surface with about 2 feet of excess tubing and an inert plastic stopcock valve. Granular bentonite was emplaced over the sand pack and brought to the surface with hydrated bentonite to seal the diffuser and sand pack. The soil-gas well construction details are included on the geologic logs contained in the June 2015 Stellar Environmental Investigation report, dated July 20, 2015.

Department of Toxic Substance Control (DTSC, April 2012) guidelines were followed during set-up and sampling of site soil-gas well SG5.5. As specified in the DTSC guidelines, soil-gas sampling was not conducted during or within five days of a significant rain event (1/2-inch or greater). No significant rain event was noted to occur in Oakland, California from March 26 to 31, 2015 (NOAA, 2016).

*Pre-Soil-Gas Sampling:* A shut-in test was conducted on the sampling train to check for leaks in the above-ground fittings at each sampling point. The shut-in test was conducted by assembling the above-ground apparatus of the tubing and sample port valve and evacuating the sampling train using a dedicated purge Summa<sup>™</sup> canister. A shut-in test was conducted using an in-line vacuum gauge and evacuating the sampling train to a measured vacuum of about 100 inches of water, then shutting the vacuum in with a closed valve. The vacuum gauge was observed for about one minute and all above ground connections were considered “air-tight” if the pressure on the gauge did not noticeably dissipate.

The purge volume was calculated for a 1 foot of sand pack with 30% porosity (3-inch bore diameter) plus the length of the 1/4-inch tubing (0.177-inch inner diameter). Thus, one purge volume for the 5.5 foot deep implant with 7 feet of tubing equals 451 milliliters (mls). Three purge volumes were extracted prior to collecting the soil-gas sample by default as per DTSC guidance.

A Helium Shroud apparatus was used to test for ambient air leaks around the sampling train, and at the soil-gas tubing interface with the ground surface. The helium shroud apparatus was set

over the well head and laboratory grade helium was flooded into the shroud initially to a concentration of approximately 35% helium. A concentration of 22 - 28% was maintained in the shroud throughout the sampling procedure and verified every few minutes using a helium meter supplied by the laboratory. The helium shroud apparatus used during this sampling event was rented from McCampbell Analytical laboratory.

A leak test was conducted to evaluate whether adequate seals were established in the sampling train at the connection with the well head and at interface the ground surface. A leak test was conducted at the well before purging and sampling to ensure that the sample was not being diluted by ambient air as evidenced by measuring that no helium was detected. The leak check was conducted by pulling 3 tubing volumes (102 mls for well SG5.5) through the implant tubing at the well head which is sufficient as per DTSC, to check if helium in the shroud is pulled down the bore between the bore and tubing interface which would indicate an ambient leak. The leak checks detected no helium indicating no leakage between the soil-gas tubing interfaces with the ground surface during sample collection.

Soil-Gas Sampling for analysis by Method TO15/GRO for analysis of full list VOCs and TVHg was accomplished using a 1-liter Summa™ canister equipped with a filter and 150 milliliters per minute (ml/min) flow controller.

The Method TO17 analysis sample was collected using laboratory supplied sorbent tubes packed with Tenax™ absorbent and drawing approximately 1 liter of soil-gas through the sorbent tube at approximately 50 ml/min using an in-line flow controller and a Summa™ canister attached at the end of the sampling train behind each sorbent tube. The manifold was set up to collect duplicate sorbent tube soil-gas samples in a successive series arrangement.

### **Soil-Gas Well SG5.5 Analytical Results**

The analytical results of soil-gas sampling well SG5.5 are included on Figure 3 in Attachment A and summarized in Tables 3 and 4 in Attachment B.

#### TPH Diesel and Naphthalene (Method TO17 Analysis)

TPHd was detected 460,000  $\mu\text{g}/\text{m}^3$  and at 680,000  $\mu\text{g}/\text{m}^3$  in the duplicate, both samples in excess of the residential ESL of 68,000  $\mu\text{g}/\text{m}^3$ . This shows an increase since the October 2015 sampling event.

Naphthalene was not detected above the laboratory reporting limit of 17 µg/m<sup>3</sup> in either the primary or duplicate sample.

#### TVH Gasoline and Volatile Organic Compounds (Method TO15 Analysis)

##### *TVH Gasoline BTEX, MTBE and Naphthalene*

TVHg was detected at 690,000 µg/m<sup>3</sup> in excess of the Water Board residential ESL of 300,000 µg/m<sup>3</sup>. This is a lowering from the October 2015 sampling event which showed 2,000,000 µg/m<sup>3</sup>.

The volatile fuel components; benzene, toluene, and xylenes were detected; however only benzene, detected at 140 µg/m<sup>3</sup> was above its residential ESL of 48 µg/m<sup>3</sup>. This shows a lowering from the October 2015 sampling event.

##### *Chlorinated Hydrocarbons*

Various chlorinated hydrocarbon compounds were detected by the TO15 analysis, however this event showed the compounds methylene chloride (MC) at 650 µg/m<sup>3</sup>; tetrachloroethene (PCE) at 7,500 µg/m<sup>3</sup> above their ESLs. There was no detection (>0.70 µg/m<sup>3</sup>) of 1,1,2-trichloroethane (TCA) which was reported at 4,300 µg/m<sup>3</sup> in the September 2015 event and following this March 2016 event, it was determined to have been reported in error and a corrective action was prepared by the laboratory and has been included in Attachment E. Neither MC or PCE were previously detected in any of the media sampling.

#### Oxygen and Methane

Oxygen content in soil-gas well SG5.5 was analyzed to evaluate the LTCP “bioattenuation zone” and bioremediation potential of the site. Detected oxygen was measured at 1.2 % which shows a lowered concentration compared to the 3.0 % measured in this well in June 2015. The reason for this lowering may be the significantly higher soil moisture content due to the 2015-2016 El Nino rain season, however, both sampling events are below the LTCP criteria concentration of 4% that supports active biodegradation.

Methane was detected in soil gas sample SG6 at a concentration of 1,900 µL/L or 0.19%. This is approximately equal to the 0.21 % in June 2015 and below the lower explosive limit of 5%. The methane may possibly be indicative of anaerobic decomposition of organic material, including residual fuel product.

### Quality Control Samples

*Field QC samples:* One duplicate field QC soil-gas sample was collected for TPHd and analyzed by Method TO17. The manifold provided by the laboratory was set up to collect the duplicate in consecutive order. The primary sample contained 460,000  $\mu\text{g}/\text{m}^3$  and the duplicate showed 680,000  $\mu\text{g}/\text{m}^3$  which shows a fair agreement with a relative percent difference of 19.3%.

A helium shroud leak detection apparatus was used during the soil-gas collections. Helium was not detected during either the TO-15 indicating no leakage in the sampling train during collection. The TO-17 samples showed 0.13% helium in both the primary and duplicate sample analytical results. This small detection indicates a leak in the above ground manifold since the field leak check prior to sampling detected no helium.

*Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.)* were analyzed by the laboratory in accordance with the requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (Attachment D).

## **INDOOR AIR SURVEY METHODOLOGY AND RESULTS**

Because the soil-gas well SG5.5 sample analytical results showed contaminants exceeding the applicable ESL criteria, additional sampling for indoor-air was also conducted. Indoor-air was collected in accordance with the DTSC/Cal EPA Vapor Intrusion Guidance (October 2011) procedures and methodology.

The residential indoor air evaluation entailed a 24-hour air sampling test per procedures and protocols of the DTSC guidance. Stellar Environmental personnel set up the 24-hour sampling apparatus in three (3) locations: 1) within the residential building subfloor crawl space near the north side of the building, approximately 10 feet from the south side of the former UST excavation (as near to the near the former UST source area as accessible); 2) inside the basement activity room; and 3) an ambient “control” sample location was placed outside the residence, on the back porch, and not below the drip line of any site landscape trees.

The 24-hour test apparatus was set up at approximately 8:30 AM on Thursday March 31<sup>st</sup> and removed 24 hours later at approximately the same time the next day, April 1, 2016. The air flow



regulators controls the air inflow rate and was calibrated to 4 ml/minute by the laboratory for the TO15/GRO method sample collection.

The Summa™ sample canisters were identified and labeled when placed in their respective sampling locations at the beginning of the test and the date and time were recorded on the label the next day at the end of the test, thus the potential to confuse the sample locations is minimized.

The sampling locations for the indoor and outdoor air samples are shown on Figures 2 through 5, with the analytical data shown on Figure 5.

### **Indoor Air Survey Analytical Results**

The analytical results of the March 31 - April 1, 2016 indoor air survey indicated the residential indoor air to contain more contaminants than the ambient outdoor air which is the opposite situation of what was observed in the October 2015 survey. In general, the indoor air crawl space air showed 15 compounds detected, 4 of which exceeded their respective ESLs; the basement room air had 25 compound detections with 6 over their ESLs; and the outdoor air showed 12 compounds detected with 3 in excess of their ESLs.

Benzene, naphthalene and carbon tetrachloride are the only compounds that were detected in all three air samples. TPHg was only detected in the basement room air (sample OA-2) and was the only compound that was also detected in soil gas from well SG5.5.

The analytical results of the indoor-air and outdoor air samples for those compounds detected in excess of the indoor air ESLs are included on Figure 5 in Attachment A. The analytical results of all detected compounds in the indoor-air and outdoor air samples are summarized in Table 5 included in Attachment B. The certified laboratory results are contained in Attachment D.

### **Volatile Organic Compounds (Method TO15/GRO Analysis; Indoor-Air and Outdoor Air)**

Indoor-Air; Crawl-Space: The indoor-air (sample IA-1) analysis showed 15 compound detections of which benzene, carbon tetrachloride, 1,4-dichlorobenzene and naphthalene were detected slightly above their respective ESLs. All of the other compounds detected were below their respective ESLs. TPHg was not detected in the indoor-air. The crawl space was inspected in October 2015 and was measured at the north end, nearest the former UST to be approximately 21 inches high and approximately 4.5 feet high at the southern end near the basement access door (measured from the ground to the bottom of the overlying floor joists).

Indoor-Air; Basement Room: The indoor-air (sample IA-2) analysis showed 25 compound detections of which TPHg, benzene, carbon tetrachloride, chloroform, 1,4-dichlorobenzene and naphthalene were detected above their respective ESLs. All of the other compounds detected were below their respective ESLs. The basement is estimated to have a standard 8 foot high ceiling.

Outdoor-Air: The outdoor-air (sample OA-1) analysis showed 25 volatile compound detections of which benzene, carbon tetrachloride and naphthalene were detected slightly above their respective ESLs. All of the other compounds detected were below their respective ESLs.

All of the reported compounds can be detected in outdoor urban air spaces in varying concentrations that fluctuate with seasonally and prevailing wind patterns. Of the detected compounds, only TPHg, BTEX, naphthalene and 1,2,4-trimethylbenzene would be expected to be associated with hydrocarbons related to the former UST. The 1,4-dichlorobenzene is common in pesticides and disinfectants. The origin of the remaining detected compounds including the MC and PCE that was detected this March 2016 could be attributed to multiple possible sources either natural, or a result of human activities. The compounds may be laboratory contaminants, garden maintenance products, possibly materials used in the residential renovation that was taking place at the time of the discovery of the UST in 2013 or products discarded in the UST before it was abandoned and rediscovered in 2013.

Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes, etc.) were analyzed by the laboratory in accordance with the requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (Attachment D).

## **HOUSEHOLD CHEMICAL INVENTORY**

To evaluate potential sources of contaminants in indoor air, a chemical inventory was conducted on March 31, 2016. It was noted during the inspection that all chemical products observed were commercially available products in their original packaging, with no signs of spillage. Several of the products contained various aerosol petroleum distillates, Stoddard Solvent, butane, propane, isobutene, but none of the contaminants of concern specifically targeted in this investigation. Professional dry cleaned clothes were not observed. The chemical inventory is contained in Attachment C.

## **SUMMARY, CONCLUSIONS AND RECOMENDATIONS**

The work documented in this study was conducted in general accordance with standard EPA, Water Board and DTSC methods and protocols established for investigations of this type.

This March 2016 sampling investigation and the previous investigations indicate that residual contamination related to the former UST does not pose a threat to groundwater. The only remaining potential exposure risk is via soil vapor intrusion into the residential building which will continue to attenuate in time. Stellar Environmental previously prepared a site conceptual model and evaluated the site conditions against the Low Threat Closure Policy (LTCP) criteria (Stellar Environmental 2015b). The results of the June 2015 investigation qualified the site for closure under the strict criteria of the LTCP, however due to the exceedance of TPHg over the Water Board Tier 1 ESL, re-sampling of shallow soil-gas from soil-gas well SG5.5, an evaluation of the building crawl space and indoor air sampling were conducted during September to October 2015. This current March 2016 investigation showing the highest concentration of contaminants in the basement room air space, suggests a possible modification to the original conceptual model. The service piping from the UST into the building likely was routed along the eastern side of the building (it being the most direct route) and entered the basement to the pre-natural gas heater. None of that is evident now because the basement has been redone. This is further corroborated by the crawl space having a significant lesser indoor air space than the basement that is further away from the UST.

This additional work was advanced in consultation with the regulator to evaluate potential exposure risk of soil vapor intrusion into the residential building; that being the remaining impediment to full regulatory site closure. This March 2016 sampling event also included additional boring SB4 for collection of shallow soil samples from 3 and 5 feet bgs to investigate the source contamination.

### **SUMMARY AND CONCLUSIONS**

- A 350-gallon UST was removed in December 2013 along with 32.75 tons of associated fuel impacted soil that was disposed to a permitted non-hazardous landfill facility (GGT 2013).
- The Stellar Environmental June 2015 investigation was advanced to investigate residual contamination that was indicated by detections of TPHd and naphthalene above applicable ESLs in the UST excavation confirmation soil sample collected from 12 feet bgs that was reported in the UST removal report (GGT 2013).

- No TPHd, TPHmo or fuel related VOCs were detected in site soil from any of the 3 investigation borings during the in June 2015 investigation, indicating site residual soil contamination is not extensive. Additional boring SB4 was advanced in March 2016, one foot east of SG5.5, along the approximate edge of the former UST excavation for the collection of soil samples to investigate the source of the soil-gas detection in soil-gas well SG5.5. The 3-foot deep soil sample detected trace (17 mg/kg) TPHd and the 5-foot deep sample showed TPHmo/ho at 81 mg/kg and 360 mg/kg. The TPHd is in excess of its residential ESL of 230 mg/kg. TVHg was below laboratory detection in the 3 foot sample but was detected at 36 mg/kg TVHg in the 5 foot sample, but below the residential ESL of 100 mg/kg. No VOCs including the fuel components; naphthalene, MTBE, BTEX were detected in the 3 foot soil sample; however the 5 foot sample showed trace detections of the following compounds; sec-butyl benzene, 4-isopropyl toluene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, however all below applicable ESLs.
- Soil-gas collected during the June 2015 investigation from 6 feet bgs (SG5.5) showed 880,000  $\mu\text{g}/\text{m}^3$  TPHg in excess of the Water Board residential ESL of 300,000  $\mu\text{g}/\text{m}^3$  for potential risk of vapor intrusion into the nearby building.
- The residual TPHg in soil-gas appears to attenuate with depth as there were no detections of COCs in soil gas collected from 13 feet bgs immediately below the target contaminant depth where elevated TPHd and naphthalene in soil were reported in the UST removal report (GGT 2013). The March 2016 sampling of soil-gas well SG5.5 showed increasing concentration in TPH diesel, but a significant decrease in benzene and TPH-gasoline compared to the September 2015 event.
- Soil-gas well SG5.5 was sampled on September 23, 2015 and showed 240,000  $\mu\text{g}/\text{m}^3$  TPHd and 2,000,000  $\mu\text{g}/\text{m}^3$  TPHg in excess of the applicable residential ESLs of 68,000 and 300,000  $\mu\text{g}/\text{m}^3$ , respectively. In addition, benzene was detected at 600  $\mu\text{g}/\text{m}^3$  and 1,1,2-trichloroethane (TCA) was detected at 4,300  $\mu\text{g}/\text{m}^3$ , both above their respective ESLs in September 2015. However soil-gas sampling during this March 2016 event showed no detection of TCA but detected methylene chloride (MC) at 650  $\mu\text{g}/\text{m}^3$ ; and tetrachloroethene (PCE) at 7,500  $\mu\text{g}/\text{m}^3$ , both above their ESLs. Following receipt of the March 2016 results, the laboratory determined that the TCA had previously been reported in error and retracted the September 2015 detection as documented in the laboratory certified corrective action, dated May 22, 2016. The erroneously reported TCA was determined to be an unidentified compound by the laboratory.

- PCE and MC were detected in soil-gas well SG5.5 above their ESLs this March 2016, and also confirmed by the laboratory to not to have been detected in September 2015. However, considering that the lab already retracted their original finding of the TCA and neither MC or PCE were previously detected in any of the previous samples or other media prior to this event, these detections are considered unreliable and likely false positives or likely laboratory contaminants. In addition, the property history does not indicate any other reasonable chemical source for the chlorinated VOC compound detections in the soil gas.
- The non-fuel related CVOCs detected in the site soil-gas samples were collected in batch-certified (versus individually-certified Summa™ canisters used in the indoor air samples). The CVOC contamination is thus attributed to be false positive results related to the batch-certified Summa canisters.
- Oxygen was measured during this March 2016 event at 1.2 % in soil-gas well SG5.5. This shows a lowering concentration trend compared to the last measurement in June 2015 that showed 3.0 - 3.4 % in the soil-gas collected from soil-gas wells SG5.5 and SG13, respectively. The reason for this lowering may be the significantly higher soil moisture content due to the 2015-2016 El Nino rain season, however, both sampling events showed oxygen below the LTCP criteria concentration of 4% that supports active biodegradation.
- Methane was detected in soil gas sample SG6 at a concentration of 1,900 µL/L or 0.19% during this March 2016 event and is approximately equal to the 0.21 % detected in June 2015 and below the lower explosive limit of 5% with no flamability risk potential. The methane may possibly be indicative of anaerobic decomposition of organic material, including residual fuel product.
- To evaluate potential sources of contaminants in indoor air, a household chemical inventory conducted on March 31, 2016 revealed no chemical products other than commercially available products in their original packaging, with no signs of spillage. In addition, the owners, who have lived in the house since 1987 and who were also acquainted with the previous owner, were interviewed and have no knowledge of any site activities that used chemicals other than those used in routine household and garden maintenance that could be attributed to the detection of solvents such as PCE, methylene chloride or the unidentified compound(s) that was previously reported as TCA but since retracted by the laboratory.

- The recent soil boring SB4 sampling results showed some residual TPH-diesel in the 5 foot soil sample slightly above the applicable ESL. No VOCs other than trace TPH-gasoline were detected and it is considered technically impractical to try to remove (excavate) little stringers of contaminated soil (that has contamination >ESL) that were left in the periphery of the tank excavation that we believe are the main source of the soil-gas detections.
- Groundwater was not encountered in any of the 3 bores advanced in June 2015, with the deepest bore extending to 36 feet bgs. The absence of residual soil contamination indicates no threat to groundwater by potential COCs and deep groundwater is unlikely to be impacted and thus no volatilization risk from underlying groundwater exists.
- The sensitive receptor and well survey completed during the June 2015 study did not indicate the presence of a downgradient sensitive receptor that would be threatened by the residual soil-gas.
- The March 2016 indoor air from the central basement room (sample IA2) showed TPH-gasoline, naphthalene and 1,4-dichlorobenzene above their ESLs. Benzene and carbon tetrachloride were also above their ESLs but these can be discounted along with most of the naphthalene when compared to the outdoor air. This is similar to the October 29-30, 2015 indoor air survey results that detected benzene at a concentration less than in the ambient outdoor air suggesting that the benzene in the residential indoor air could likely be attributed to outdoor ambient sources.
- The residential sub-floor crawl space was inspected in October 2015, observed to be adequately vented and contained no potential contaminant source items with the exception of the natural gas piping to the central heating unit observed in the crawl space and no unusual, natural gas or petroleum odors were noticed during the October 2015 inspection.
- The risk of vapor intrusion into the site residence by UST source contaminants will continue to attenuate in time since the UST and associated fuel impacted soil were removed in December 2013.

## **RECOMMENDATIONS FOR ADDITIONAL SITE INVESTIGATION**

Stellar Environmental has discussed the analytical results of this March 2016 investigation with the property owner and the ACHCS caseworker and makes the following recommendation for additional site investigation:

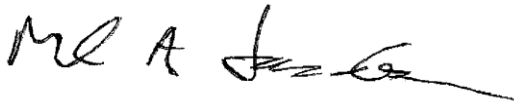
- We suggest trying to resolve the issue of evaluating the indoor air exposure risk by conducting another indoor air survey as done in March 2016, with the addition of one more sample collected in the main ground floor living room, above the basement room for analysis by Method TO15/GRO. The proposed survey would include 24-hour sampling in four locations: 1) within the residential building subfloor crawl space (location IA1); 2) inside the basement activity room (location IA2); 3) inside the ground floor of the residence (proposed location to be IA3); and 4) an ambient “control” sample placed outside the residence (location OA1) .
- The TO-15/GRO indoor air samples should be run only for the hydrocarbon analytes. (TPHg, naphthalene, MTBE, BTEX) and 1,4-dichlorobenzene which are the risk drivers in the basement space and related to the former UST) in order to eliminate household interference from other constituents. The indoor air samples were collected in “individually certified clean” Summa™ canisters that have not shown any suspected false positive detections as did the “batch cleaned” Summa™ that were provided by McCampbell Laboratory. We suggest it is not necessary to change laboratories for the indoor air analysis, however ACHCS may suggest we do.
- If the basement indoor air space still shows hydrocarbon analytes above ESLs but the main living space above does not, then we propose a remedy of installing an interior air ventilation/filter system.
- If ACHCS requires additional sampling and evaluation of what appears to be the false positive CVOC results in soil-gas well SG5.5, we propose to use a different lab, tentatively selected to be Curtis & Tompkins of Berkeley, to eliminate the potential for laboratory false positives suspected with McCampbell laboratory. We would also propose to use individually certified versus batch certified Summa™ canisters.
- Upon the results of the proposed sampling, we will evaluate the site for regulatory case closure.
- Stellar Environmental has uploaded this report and associated data to both ACHCS’s fileserver and the Water Board’s GeoTracker database and recommends following up with ACHCS following its receipt of this report, to discuss regulatory closure.
- Costs incurred for this investigation are eligible for reimbursement from the State of California Tank Cleanup Fund until regulatory site closure is achieved.

Mr. Mark Detterman  
Alameda County Health Care Services  
May 17, 2016  
Page 20 of 22

This report has been prepared for the exclusive use by the Property Owners (responsible party), the regulatory agencies, and their authorized assigns and/or representatives. No reliance on this report shall be made by anyone other than those for whom it was prepared.

We declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report are true and correct to the best of our knowledge. If you have any questions regarding this report, please contact us at (510) 644-3123.

Sincerely,



Mr. Mark A. Jacobson  
Property Owner-Responsible Party



Ms. Ilona Frieden  
Property Owner-Responsible Party



Mr. Henry Pietropaoli, P.G.  
Principal Geologist and Project Manager



Mr. Richard S. Makdisi, P.G.  
Principal Geochemist and President

cc: Mr. Amitai Schwartz, Esq—counsel to RPs.  
Alameda County Health Care and California GeoTracker fileservers





## **REFERENCES**

- California Department of Water Resources (DWR), 2003. San Francisco Bay Hydrologic Region, California's Groundwater, Update 2003. October.
- Department of Toxic Substances Control (DTSC), 2012. Active Soil-Gas Advisory prepared by the DTSC and Water Board-San Francisco Region. April
- Alameda County Health Care Services. 2014. Request for Data Gap Work Plan; Fuel Leak Case No. RO0003143 and GeoTracker Global ID T10000006106, Paramount UST, 811 Paramount Road, Oakland, CA 94610. December 15.
- Alameda County Health Care Services. 2015. *Review and Approval*: Request for Data Gap Work Plan; Fuel Leak Case No. RO0003143 and GeoTracker Global ID T10000006106, Paramount UST, 811 Paramount Road, Oakland, CA 94610. March 30.
- Environmental Data Resources, Inc., 2015. EDR Radius Map with Geocheck™ and Offsite Receptor Reports for 811 Paramount Road, Oakland, CA 94610. May 6.
- Golden Gate Tank Removal, Inc. 2014 Underground Storage Tank Removal, 811 Paramount Road Oakland, CA 94610. January 14.
- Regional Water Quality Control Board (Water Board), 1999. East Bay Plains Beneficial Use Study, San Francisco Bay. June 15.
- Regional Water Quality Control Board (Water Board), 2007. San Francisco Bay Basin (Region 2) Water Quality Control Board (Basin Plan). January 18.
- Regional Water Quality Control Board – San Francisco Bay Region (Water Board), 2016. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Revised February 22.
- National Oceanic and Atmospheric Administration Climates Services Website: Weather for Oakland, California, March 25 through April 1, 2016.
- State Water Resources Control Board, 2012. Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure: State of California Leaking Underground Fuel Tank Task Force. September.

Stellar Environmental Solutions, Inc. 2015a. Proposed Data Gap Investigation Workplan to Address Potential Impact from a Former Leaking Underground Heating Oil Tank located at 811 Paramount Road, Oakland, CA. February 23.

Stellar Environmental Solutions, Inc. 2015b. Data Gap Investigation to Address Potential Impact and Request for Closure of a Former Residential Underground Heating Oil Tank located at 811 Paramount Road, Oakland, CA. (Alameda County Fuel Leak Case No. RO0003143). July 20.

Stellar Environmental Solutions, Inc. 2015c. Additional Investigation Workplan to Address Potential Impact of Soil-Gas related to a Former Leaking Underground Heating Oil Tank located at 811 Paramount, Oakland, CA. September 9.

Stellar Environmental Solutions, Inc. 2015d. Data Gap Investigation to Evaluate Potential Indoor Air Vapor Intrusion by Soil-Gas related to a Former Residential Underground Heating Oil Tank located at 811 Paramount Road, Oakland, CA. November 20.

U.S. Geological Survey (USGS), 1959. Oakland East 7.5-minute Quadrangle, 1:24,000 scale, photorevised 1983.

# **ATTACHMENT A**

---

## **Figures**





**SITE LOCATION MAP**

**811 Paramount Avenue  
Oakland, CA**

By: MJC

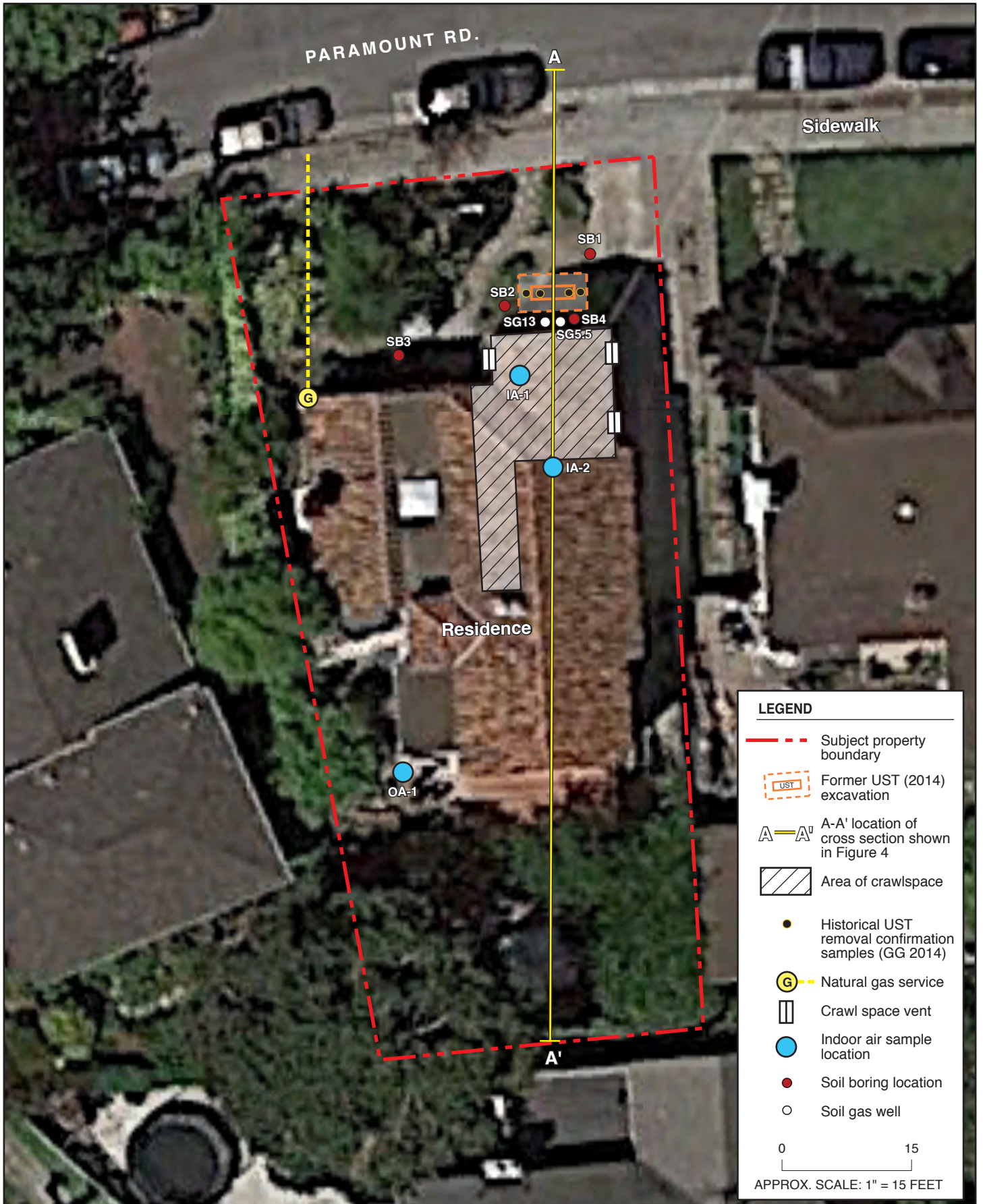
FEBRUARY 2015

**Figure 1**



2015-16-01





**LEGEND**

- - - Subject property boundary
- UST Former UST (2014) excavation
- A—A' A-A' location of cross section shown in Figure 4
- Area of crawspace
- Historical UST removal confirmation samples (GG 2014)
- Ⓞ Natural gas service
- Crawl space vent
- Indoor air sample location
- Soil boring location
- Soil gas well

0 15  
APPROX. SCALE: 1" = 15 FEET



**SITE PLAN SHOWING LOCATIONS OF FORMER UST, HISTORICAL AND CURRENT INVESTIGATION SAMPLING**

811 Paramount Road  
Oakland, CA

By: MJC

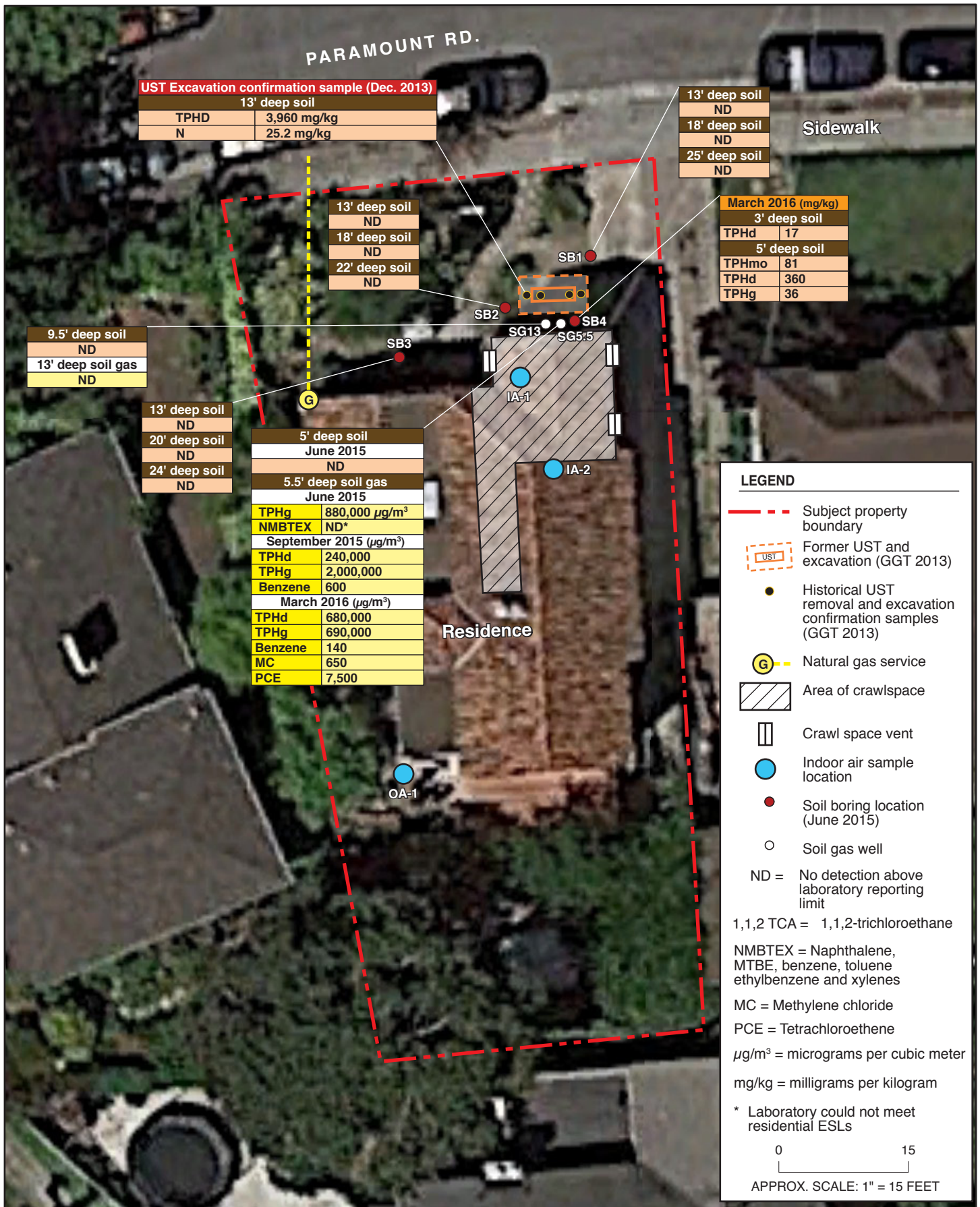
APRIL 2016

**Figure 2**



2015-16-14





N



**DISTRIBUTION OF ANALYTICAL RESULTS OF SOIL AND SOIL GAS**

811 Paramount Road  
Oakland, CA

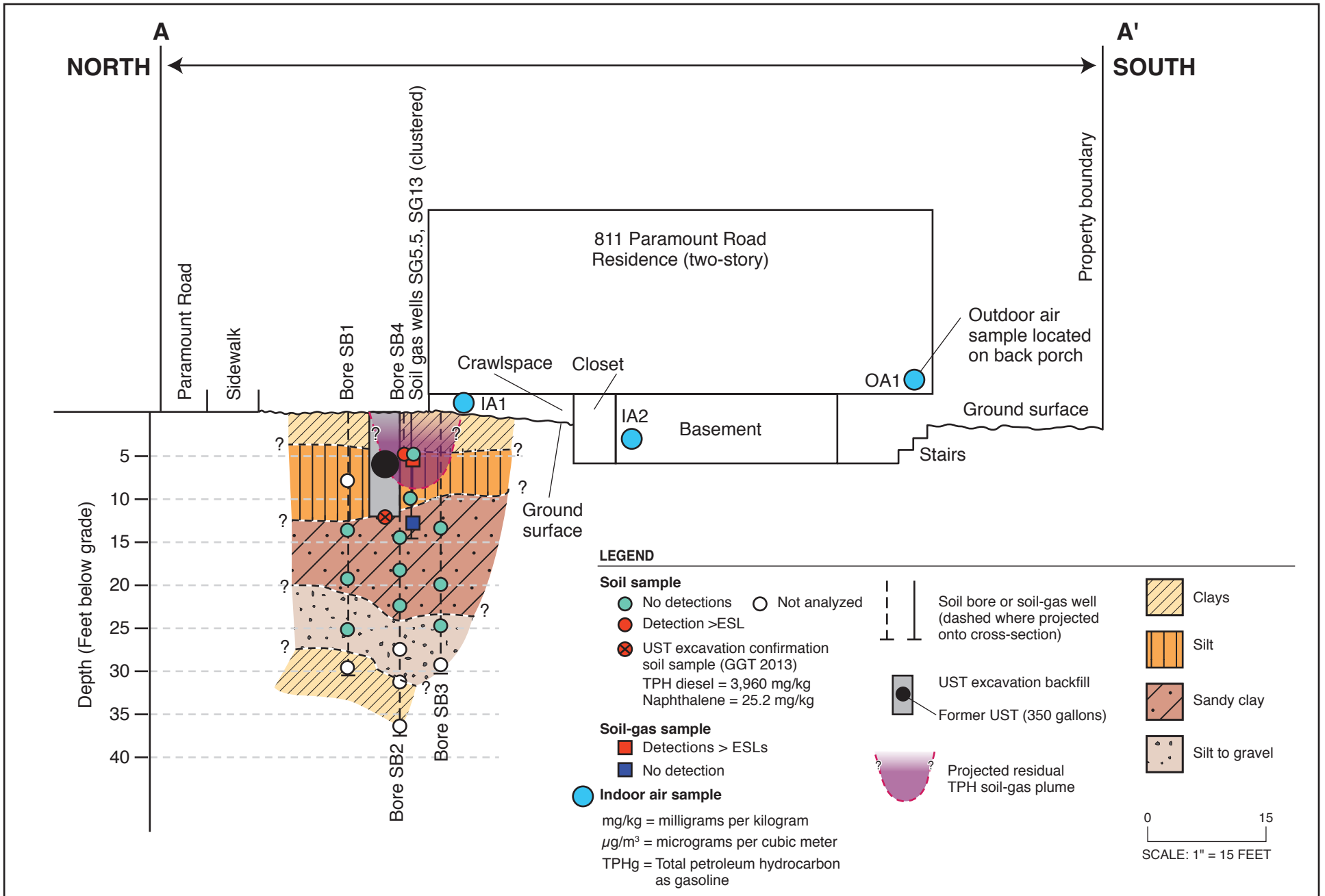
By: MJC

APRIL 2016

**Figure 3**

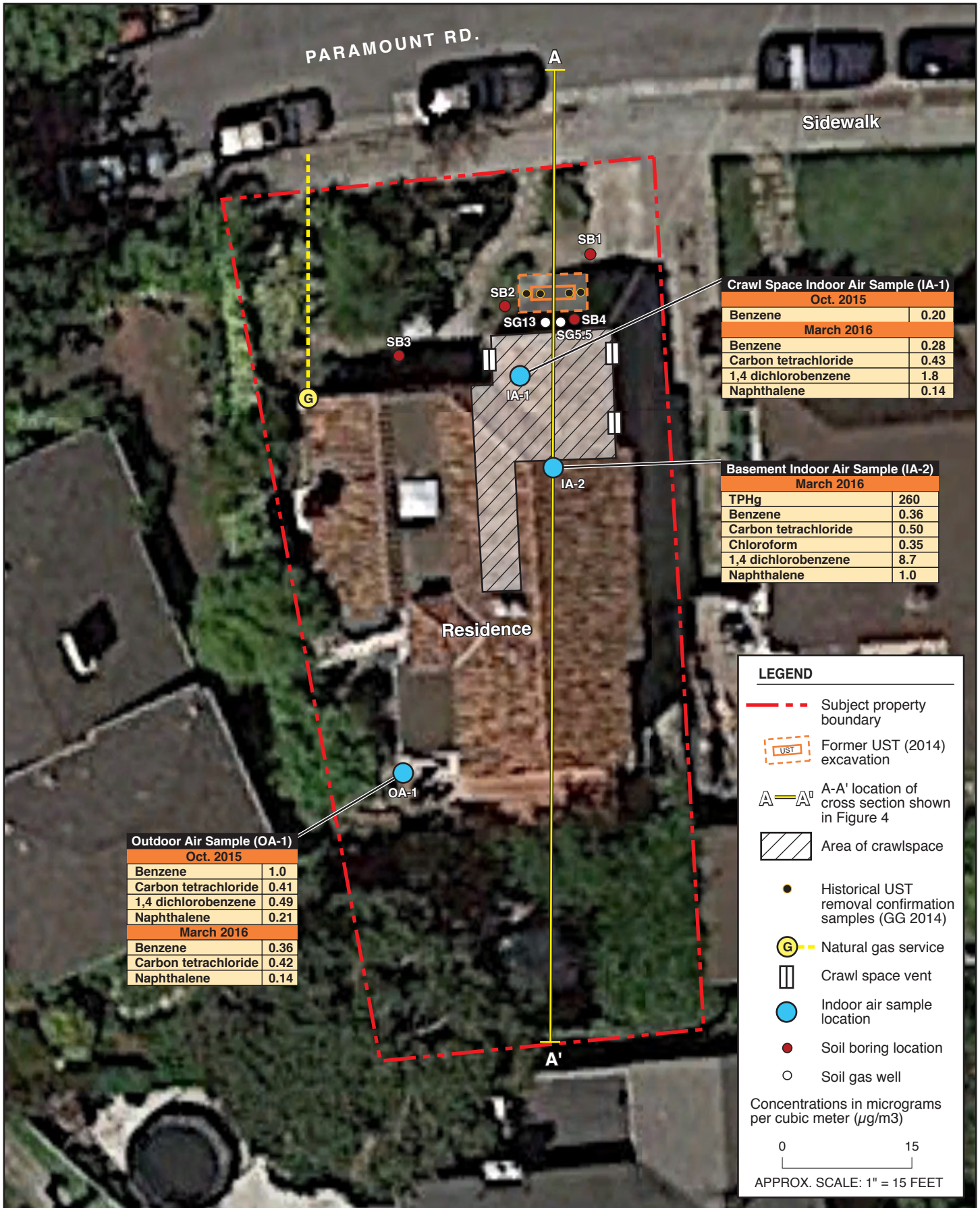


2015-16-17



2015-16-19





**ANALYTICAL RESULT OF CONTAMINANT >ESLs IN INDOOR AND OUTDOOR AIR**

811 Paramount Road  
Oakland, CA

By: MJC

MAY 2016

**Figure 5**





## **ATTACHMENT B**

---

### **Analytical Summary Tables**

**Table 1**  
**Current and Historical Soil Sample Analytical Results**  
**811 Paramount Road, Oakland, California**

Sample ID	Depth (feet bgs)	TPHmo/ho	TPHd	TPHg	benzene	toluene	ethylbenzene	xylenes	MTBE	Naphthalene
<i>June 2, 2015 Soil Samples (mg/kg)</i>										
SG5.5-5	5	<1.2	<6.0	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
SG13-9.5	9.5	<1.2	<5.8	NA	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
SB1-13	13	<1.2	<6.0	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
SB1-18	18	<1.2	<6.0	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
SB1-25	25	<1.2	<6.0	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
SB2-13	13	<1.2	<5.7	NA	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057	<0.0057
SB2-18	18	<1.2	<5.8	NA	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
SB2-22	22	<1.2	<5.6	NA	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056	<0.0056
SB3-13	13	<1.2	<6.0	NA	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060	<0.0060
SB3-20	20	<1.2	<5.8	NA	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058	<0.0058
SB3-24	24	<1.2	<5.9	NA	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059	<0.0059
<i>March 31, 2016 Soil Samples (mg/kg)</i>										
SB4-3.5	3	<5.9	17	<1.2	<0.0019	<0.0026	<0.0024	<0.0029	<0.0015	<0.00071
SB4-5.5	5	81	<b>360</b>	36	<0.0020	<0.0027	<0.0024	<0.0031	<0.0016	<0.00073
ESL	--	5,100	230	100	0.044	2.9	1.4	2.3	0.023	0.023

Notes:

TPHmo= total petroleum hydrocarbons as motor oil/hydraulic oil

TPHd = total petroleum hydrocarbons as diesel

TPHg = total petroleum hydrocarbons as gasoline

MTBE = methyl tertiary-butyl ether

ESL = Environmental Screening Levels for residential sites where groundwater is considered a potential drinking water resource (Water Board, 2016).

Analytical results shown as < italicized indicate a non-detection or less than the laboratory reporting limit.

All concentrations are expressed in milligrams per kilogram (mg/kg). Analytical results in bold type exceed the ESLs.

Sample concentrations reported on a dry weight basis. Moisture content in the soils ranged from 10.5 to 18.1 % .Moisture analyses included in Appendix D

bgs = below ground surface

**Table 2**  
**Analytical Results of Detected VOCs in Soil in Bore SB4 – March 31, 2016**  
**811 Paramount Road, Oakland, California**

Analyte	Sample ID		ESL
	SB4-3.5	SB4-5.5	
sec-butyl benzene	< <i>0.0040</i>	0.012	NLP
4-Isopropyl toluene	< <i>0.0037</i>	0.014	NLP
1,1,2,2-Tetrachloroethane	< <i>0.0015</i>	0.0017 j	0.018
1,2,3-Trichlorobenzene	< <i>0.00083</i>	0.0017 jb	1.5*

Notes:

ESL= Environmental Screening Level for shallow soil at residential sites (Water Board 2016).

ESL for 1,2,4-Trichlorobenzene shown

NLP= no level published; Results in **bold-face** type exceed regulatory ESLs.

Analytical results shown as < and *italicized* indicate a non-detection (ND) or less than the laboratory detection limit.

All results are reported in milligram per kilogram (mg/kg) on a dry wt basis, moisture ranged from 10.5 to 18.1 % . .

Moisture analyses included in Appendix D

j = indicates compound was detected below quantification limit and is a statistical estimated value.

b = analyte detected in the associated method blank and in the sample

**Table 3**  
**Current and Historical Analytical Results of Soil-Gas in Well SG-5.5 -**  
**811 Paramount Road, Oakland, California**

Sample I.D.	Contaminants ( $\mu\text{g}/\text{m}^3$ )								Gases (%)		Leak Check (%)
	TPHd	TVHg	Benzene	Ethyl-benzene	Toluene	Xylenes	MTBE	Naphthalene	O <sub>2</sub>	Methane	Helium
<i>June 4, 2015</i>											
SG6	NA	<b>880,000</b>	<250	<250	<250	<250	<250	<250	3.0	0.21	<0.050
SG6s	NA	NA	NA	NA	NA	NA	NA	<2.7	NA	NA	<0.068*
<i>September 23, 2015</i>											
SG6SA	NA	<b>2,000,000</b>	<b>600</b>	340	94	410 j	<33	<43	NA	NA	NA
SG6s	<b>240,000</b>	NA	NA	NA	NA	NA	NA	<3.0	NA	NA	<0.050*
SG6Sd	<b>230,000</b>	NA	NA	NA	NA	NA	NA	<3.0	NA	NA	<0.050*
<i>March 31, 2016</i>											
SG5.5	NA	<b>690,000</b>	<b>140</b>	<110	7,500	390	<92	<260	1.2	0.19	<0.050
SG5.5s	<b>460,000</b>	NA	NA	NA	NA	NA	NA	<17.0	NA	NA	0.13*
SG5.5sd	<b>680,000</b>	NA	NA	NA	NA	NA	NA	<17.0	NA	NA	0.13*
<b>ESL</b>	68,000	300,000	48	560	160,000	52,000	5,400	41	NR	NR	NR

Notes:

's' indicates sorbent tube TO17 analysis; d = indicates duplicate sample; \* = helium leak check during TO17 sorbent tube collection analyzed from in-line Summa

ESL = Environmental Screening Level applicable to both shallow (<3 meters) and deep (>3 meters) soil-gas in residential areas where groundwater is considered a potential drinking water resource, above which additional investigation is recommended (Water Board 2016)

Analytical results in **bold-face** type exceed ESL

Analytical results shown as < and *italicized* indicate a non-detection or less than the laboratory detection limit.

NA = not analyzed; NR = not relevant

TVHg = total petroleum hydrocarbons as gasoline; TPHd = total petroleum hydrocarbons as diesel

$\mu\text{g}/\text{m}^3$  = micrograms per cubic meter

**Table 4**  
**Analytical Results of Detected Compounds in Soil-Gas in Well SG5.5**  
**811 Paramount Road, Oakland, California**

Analyte	Sample SG6S		ESL
	September 23, 2015	March 31, 2016	
Acetone	<1,300	4,300	15,000,000
Benzene	<b>600</b>	<b>140</b>	48
2-butanone (MEK)	1,800 j	<3,800	2,600,000
t-butyl alcohol	<1,700	2,700	NLP
Cyclohexane	24,000	5,400	NLP
Dichlorodiflouromethane	<44	1,100	NLP
trans-1,3-dichloropropene	<1.4	180	NLP
Ethanol	<580	13,000	NLP
Ethyl acetate	<29	96	NLP
Ethylbenzene	340	<110	560
4-Ethyltoluene	130 j	<120	NLP
Heptane	11,000	2,100	NLP
Hexane	4,600	1,200	NLP
4-methyl-2-pentanone	170 j	<100	NLP
Methylene chloride	110	<b>650</b>	510
Styrene	<25	150	470,000
Tetrachloroethene	<55	<b>7,500</b>	240
Toluene	94	7,500	160,000
1,1,2-Trichloroethane	<12	<0.70	88
1,2,4-Trimethylbenzene	130	130	NLP
1,3,5-Trimethylbenzene	150 j	<120	NLP
Xylenes	410 j	390	52,000
Helium (leak check)*	<0.050	<0.050	NR

Notes:

ESL= Environmental Screening Level for shallow soil-gas at residential sites (Water Board 2016).

NLP= no level published; Results in **bold-face** type exceed regulatory ESLs.

Analytical results shown as < and *italicized* indicate a non-detection (ND) or less than the laboratory detection limit.

All results are reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )

j = indicates compound was detected below quantification limit and is a statistical estimated value.

NR = not relevant

\* Helium tracer analyzed by Method ASTM194

**Table 5:  
Current and Historical Analytical Results of Detected Compounds in Indoor and Outdoor Air  
811 Paramount Road, Oakland, California**

Analyte	Indoor Air (IA-1)	Outdoor Air (OA-1)	Indoor Air (Crawl Space) (IA-1)	Indoor Air (Basement Room) (IA-2)	Outdoor Air (OA-1)	ESL
	October 30, 2015		April 1, 2016			
<i>Method TO17 Analysis *</i>						
TPH-diesel	<31	NA	NA	NA	NA	140
Naphthalene **	0.51 j	NA	NA	NA	NA	0.83
<i>Method TO15 Analysis</i>						
TPH-gasoline	<36	<36	<36	<b>260</b>	<36	100
Acetone	<6.0	6.2	<6.0	62	<6.0	31,000
Acrolein	ND	ND	<0.58	5.3	<0.58	NLP
Acrylonitrile	<0.22	0.36	<0.22	<0.22	<0.22	NLP
Benzene	<b>0.20</b>	<b>1.0</b>	<b>0.28</b>	<b>0.36</b>	<b>0.36</b>	0.084
Bromodichloromethane	ND	ND	0.0074	0.022	<0.0070	0.076
2-Butadiene (MEK)	ND	ND	<7.5	7.5	<7.5	5,200
Carbon Tetrachloride	0.062	<b>0.41</b>	<b>0.43</b>	<b>0.50</b>	<b>0.42</b>	0.067
Chloroform	0.034	0.17	0.18	<b>0.35</b>	0.11	0.12
Chloromethane	<0.21	0.52	0.49	1.1	0.79	19
Cyclohexane	ND	ND	<1.8	2.8	<1.8	NLP
1,3-Dichlorobenzene	ND	ND	1.8	8.7	0.063	NLP
1,4-Dichlorobenzene	<0.030	<b>0.49</b>	<b>1.8</b>	<b>8.7</b>	<0.030	0.22
Dichlorodifluoromethane	<0.50	2.4	2.2	2.2	2.2	NLP
1,2-Dichloroethane	<0.0041	0.037	0.048	0.067	0.050	0.11
1,2-Dichloropropane	<0.0047	0.017	0.022	0.039	0.024	0.28

Table 5 with notes continued next page

Table 5 Continued

Analyte	Indoor Air (IA-1)	Outdoor Air (OA-1)	Indoor Air (Crawl Space) (IA-1)	Indoor Air (Basement Room) (IA-2)	Outdoor Air (OA-1)	ESL
	October 30, 2015		April 1, 2016			
<i>Method TO15 Analysis - continued</i>						
1,4-Dioxane	0.021	<0.018	0.041	<0.018	<0.018	0.36
Ethylbenzene	<0.44	0.82	<0.44	<0.44	<0.44	1.1
2-Hexanone	ND	ND	<0.42	0.67	<0.42	NLP
4-Methyl-2-Pentanone	ND	ND	<0.42	0.70	<0.42	NLP
Naphthalene	<0.050	<b>0.21</b>	<b>0.14</b>	<b>1.0</b>	<b>0.14</b>	0.083
Styrene	ND	ND	<0.43	1.9	<0.43	940
1,1,1,2-Tetrachlorethane	ND	ND	<0.0070	0.0091	0.0077	0.38
Tetrachloroethene	ND	ND	0.075	0.074	<0.069	0.48
Tetrahydrofuran	ND	ND	<0.60	12	<0.60	NLP
Toluene	0.56	3.9	0.92	3.0	0.65	310
Trichloroflouromethane	<0.57	1.3	1.1	1.2	1.2	NLP
1,2,4-Trimethylbenzene	<0.50	1.0	<0.50	<0.50	<0.50	2.1
Xylenes	<1.3	3.6	<1.3	1.5	<1.3	100

Notes:

ESL= Environmental Screening Level for residential Indoor-Air (Water Board 2016, Tier 1).

Results in **bold-face** type exceed regulatory ESLs; NLP= no level published

NA = not analyzed

\* = TO17 analysis reported to method detection limit, however method could not meet ESL for naphthalene;

\*\* = refer to TO15 results for additional method naphthalene analysis

j = indicates compound was detected below quantification limit and is a statistical estimated value.

All results are reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ )

# **ATTACHMENT C**

---

## **Chemical Inventory**



**Chemical Inventory - March 31, 2016**

**811 Paramount Road, Oakland**

<b>Quantity</b>	<b>Product</b>	<b>Active Chemicals</b>
1.3 qt	ZEP Pressure Washer Cleaner	Tetrasodium EDTA; C9-11 Alcohols ; Sodium Xylene Sulfonate; Sodium Orthosilicate; Sodium Sulfate; NaOH
2 qt	Capt'n Jacks Deadbug Brew	Spinosad or D-forosamine
4 oz	Gorilla Glue	diphenyl diisocyanate
2.5 qt	Benjamin Moore Latex Paint	Titanium dioxide, Titanium dioxide, Sodium C14-C16 olefin sulfonate
1 pt	Zinser Shellac	Ethanol, Acetone, Liquefied Petroleum, n-Butanol, 2-Propanol
2.5 lbs	HDX Weed and Grass Killer	Glyphosate, Isopropylamine salt
8 oz	WD-40 Solvent	Aliphatic Hydrocarbon, Petroleum Base Oil
12oz	Martens Wood Preservative	Pentachlorophenol, Hexachlorobenzene, Hexachlorodibenzo-8- dioxin
56 ozz	Oxy Clean Stain Remover	Hydrogen Peroxide, Dipropylene Glycol Monomethyl Ether
3 -32 oz	Scotch Guard	Acetone, Isopropyl Alcohol, Light Alkylate Petroleum Naphtha, Fluorochemical
14 Oz	Spot Shot Carpet Stain Remover	2-Butoxyethanol, Liquefied Petroleum Gas
16 oz	Natures Miracle Stain and Odor remover	Isopropyl Alcohol
16 oz	Boos Block Butcher Block Oil	di alpha tocopherol, White Mineral Oil, Carnauba Wax
1 qt	Tilex Mold cleaner	NaOCl, NaOH
1 qt	Glass Plus Glass Cleaner	biodegradable surfactant
32 oz	ZEP Drain Cleaner	NaOCl, NaOH, KOH
18 oz	Raid Insect Killer	1-cyclohexene-1,2- dicarboximido, 2-methylpropenyl, cyclopropanecarboxylate, butane, propane, isobutane
17.5 oz	Hot shot ant Killer	Mineral spirits, Propylene glycol monobutyl, ether,Hydrocarbon Propellant
14 oz	Turtle Wax Velour Cleaner	Isobutane, Propane, Stoddard Solvent
64 oz	Turtle Wax Zip Wax	water, soap, additives
8 oz	Brasso Metal Polish	STODDARD SOLVENT, OLEIC ACID, KAOLIN, AMMONIUM HYDROXIDE
12 oz	Butcher Block conditioning	Mineral oil, Beeswax, Carnauba wax
8 oz	Amazons Cutting Board Sealer	Mineral oil, Beeswax, Carnauba wax
20 oz	Niagra Spray Starch	Starch, Liquefied Petroleum, isobutane
28 oz	Turbo Power Lime Away	uronium hydrogen sulphate, Urea, methyl-, polymer with oxirane
30 oz	Speeds Toilet Care	Phosphoric acid
17.7 oz	Pledge Furniture Polish	butane, propane, isobutane
34 oz	Method Gel Hand Wash	PROPRIETARY NON-HAZARDOUS INGREDIENTS
1 lb, 3 oz	Chlorox Disinfectant Wipes	ammonium chloride, benzyl ammonium chloride
8 oz	Carpenters Wood Glue	PROPRIETARY NON-HAZARDOUS INGREDIENTS
2 qt	Chlorox Bleach	Sodium hypochlorite, Sodium hydroxide

# **ATTACHMENT D**

---

## **Photo-documentation**



Subject : Helium shroud soil-gas sampling apparatus over soil-gas well SG5.5

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 01



Subject: Auger down to 5 feet below surface located about 1 foot northeast of soil-gas well SG5.5

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 02





Subject : Drive hammer sampling apparatus used for soil collection

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 03



Subject: Basement room household chemicals removed to outside garden before indoor air survey

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 04



Subject: Ground floor household chemicals stored under kitchen sink

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 05



Subject: Indoor air basement room sampling location IA-2

Site: 811 Paramount Road, Oakland, California

Date Taken: March 31, 2016

Project No.: SES 2015-16

Photographer: H. Pietropaoli

Photo No.: 06

## **ATTACHMENT E**

---

### **Certified Laboratory Analytical Results and Chain-of-Custody Record**



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1604041

**Report Created for:** Stellar Environmental Solutions

2198 Sixth St. #201  
Berkeley, CA 94710

**Project Contact:** Richard Makdisi

**Project P.O.:**

**Project Name:** 2015-16; Residential Heating UST Investigation

**Project Received:** 04/01/2016

Analytical Report reviewed & approved for release on 04/11/2016 by:

Angela Rydelius,  
Laboratory Manager

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







## Glossary of Terms & Qualifier Definitions

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential Heating UST Investigation  
**WorkOrder:** 1604041

### Glossary Abbreviation

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





## Glossary of Terms & Qualifier Definitions

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential Heating UST Investigation  
**WorkOrder:** 1604041

### Analytical Qualifiers

B analyte detected in the associated Method Blank and in the sample  
J Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.  
d7 strongly aged gasoline or diesel range compounds are significant in the TPH(g) chromatogram  
e3 aged diesel is significant  
e4 gasoline range compounds are significant.  
e8 kerosene/kerosene range/jet fuel range  
i1 results are reported on a dry weight basis



# Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 19:10  
**Date Prepared:** 4/1/16  
**Project:** 2015-16; Residential Heating UST Investigation

**WorkOrder:** 1604041  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** mg/kg-dry

## Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	GC10	118932

Analytes	Result	MDL	RL	DF	Date Analyzed
Acetone	ND	0.046	0.12	1	04/10/2016 13:41
tert-Amyl methyl ether (TAME)	ND	0.0012	0.0059	1	04/10/2016 13:41
Benzene	ND	0.0019	0.0059	1	04/10/2016 13:41
Bromobenzene	ND	0.0020	0.0059	1	04/10/2016 13:41
Bromochloromethane	ND	0.0018	0.0059	1	04/10/2016 13:41
Bromodichloromethane	ND	0.0014	0.0059	1	04/10/2016 13:41
Bromoform	ND	0.00094	0.0059	1	04/10/2016 13:41
Bromomethane	ND	0.0024	0.0059	1	04/10/2016 13:41
2-Butanone (MEK)	ND	0.0064	0.024	1	04/10/2016 13:41
t-Butyl alcohol (TBA)	ND	0.0062	0.059	1	04/10/2016 13:41
n-Butyl benzene	ND	0.0041	0.0059	1	04/10/2016 13:41
sec-Butyl benzene	ND	0.0040	0.0059	1	04/10/2016 13:41
tert-Butyl benzene	ND	0.0035	0.0059	1	04/10/2016 13:41
Carbon Disulfide	ND	0.0020	0.0059	1	04/10/2016 13:41
Carbon Tetrachloride	ND	0.0020	0.0059	1	04/10/2016 13:41
Chlorobenzene	ND	0.0021	0.0059	1	04/10/2016 13:41
Chloroethane	ND	0.0019	0.0059	1	04/10/2016 13:41
Chloroform	ND	0.0019	0.0059	1	04/10/2016 13:41
Chloromethane	ND	0.0020	0.0059	1	04/10/2016 13:41
2-Chlorotoluene	ND	0.0026	0.0059	1	04/10/2016 13:41
4-Chlorotoluene	ND	0.0025	0.0059	1	04/10/2016 13:41
Dibromochloromethane	ND	0.0013	0.0059	1	04/10/2016 13:41
1,2-Dibromo-3-chloropropane	ND	0.0014	0.0047	1	04/10/2016 13:41
1,2-Dibromoethane (EDB)	ND	0.0015	0.0047	1	04/10/2016 13:41
Dibromomethane	ND	0.0017	0.0059	1	04/10/2016 13:41
1,2-Dichlorobenzene	ND	0.0017	0.0059	1	04/10/2016 13:41
1,3-Dichlorobenzene	ND	0.0021	0.0059	1	04/10/2016 13:41
1,4-Dichlorobenzene	ND	0.0021	0.0059	1	04/10/2016 13:41
Dichlorodifluoromethane	ND	0.0013	0.0059	1	04/10/2016 13:41
1,1-Dichloroethane	ND	0.0020	0.0059	1	04/10/2016 13:41
1,2-Dichloroethane (1,2-DCA)	ND	0.0017	0.0047	1	04/10/2016 13:41
1,1-Dichloroethene	ND	0.0020	0.0059	1	04/10/2016 13:41
cis-1,2-Dichloroethene	ND	0.0018	0.0059	1	04/10/2016 13:41
trans-1,2-Dichloroethene	ND	0.0019	0.0059	1	04/10/2016 13:41
1,2-Dichloropropane	ND	0.0017	0.0059	1	04/10/2016 13:41
1,3-Dichloropropane	ND	0.0019	0.0059	1	04/10/2016 13:41
2,2-Dichloropropane	ND	0.0015	0.0059	1	04/10/2016 13:41

(Cont.)



## Analytical Report

**Client:** Stellar Environmental Solutions      **WorkOrder:** 1604041  
**Date Received:** 4/1/16 19:10      **Extraction Method:** SW5030B  
**Date Prepared:** 4/1/16      **Analytical Method:** SW8260B  
**Project:** 2015-16; Residential Heating UST Investigation      **Unit:** mg/kg-dry

### Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	GC10	118932
Analytes	Result	MDL	RL	DF	Date Analyzed
1,1-Dichloropropene	ND	0.0021	0.0059	1	04/10/2016 13:41
cis-1,3-Dichloropropene	ND	0.0018	0.0059	1	04/10/2016 13:41
trans-1,3-Dichloropropene	ND	0.0017	0.0059	1	04/10/2016 13:41
Diisopropyl ether (DIPE)	ND	0.0017	0.0059	1	04/10/2016 13:41
Ethylbenzene	ND	0.0024	0.0059	1	04/10/2016 13:41
Ethyl tert-butyl ether (ETBE)	ND	0.0015	0.0059	1	04/10/2016 13:41
Freon 113	ND	0.0019	0.0059	1	04/10/2016 13:41
Hexachlorobutadiene	ND	0.0059	0.0059	1	04/10/2016 13:41
Hexachloroethane	ND	0.0029	0.0059	1	04/10/2016 13:41
2-Hexanone	ND	0.0029	0.0059	1	04/10/2016 13:41
Isopropylbenzene	ND	0.0026	0.0059	1	04/10/2016 13:41
4-Isopropyl toluene	ND	0.0037	0.0059	1	04/10/2016 13:41
Methyl-t-butyl ether (MTBE)	ND	0.0015	0.0059	1	04/10/2016 13:41
Methylene chloride	ND	0.0042	0.0059	1	04/10/2016 13:41
4-Methyl-2-pentanone (MIBK)	ND	0.00094	0.0059	1	04/10/2016 13:41
Naphthalene	ND	0.00071	0.0059	1	04/10/2016 13:41
n-Propyl benzene	ND	0.0034	0.0059	1	04/10/2016 13:41
Styrene	ND	0.0017	0.0059	1	04/10/2016 13:41
1,1,1,2-Tetrachloroethane	ND	0.0019	0.0059	1	04/10/2016 13:41
1,1,2,2-Tetrachloroethane	ND	0.0015	0.0059	1	04/10/2016 13:41
Tetrachloroethene	ND	0.0027	0.0059	1	04/10/2016 13:41
Toluene	ND	0.0026	0.0059	1	04/10/2016 13:41
1,2,3-Trichlorobenzene	ND	0.00083	0.0059	1	04/10/2016 13:41
1,2,4-Trichlorobenzene	ND	0.0013	0.0059	1	04/10/2016 13:41
1,1,1-Trichloroethane	ND	0.0021	0.0059	1	04/10/2016 13:41
1,1,2-Trichloroethane	ND	0.0019	0.0059	1	04/10/2016 13:41
Trichloroethene	ND	0.0020	0.0059	1	04/10/2016 13:41
Trichlorofluoromethane	ND	0.0019	0.0059	1	04/10/2016 13:41
1,2,3-Trichloropropane	ND	0.0022	0.0059	1	04/10/2016 13:41
1,2,4-Trimethylbenzene	ND	0.0028	0.0059	1	04/10/2016 13:41
1,3,5-Trimethylbenzene	ND	0.0032	0.0059	1	04/10/2016 13:41
Vinyl Chloride	ND	0.0018	0.0059	1	04/10/2016 13:41
Xylenes, Total	ND	0.0029	0.0059	1	04/10/2016 13:41

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Received:</b>	4/1/16 19:10	<b>Extraction Method:</b>	SW5030B
<b>Date Prepared:</b>	4/1/16	<b>Analytical Method:</b>	SW8260B
<b>Project:</b>	2015-16; Residential Heating UST Investigation	<b>Unit:</b>	mg/kg-dry

### Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	GC10	118932

Analytes	Result	MDL	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
Dibromofluoromethane	96		70-130		04/10/2016 13:41
Toluene-d8	95		70-130		04/10/2016 13:41
4-BFB	78		70-130		04/10/2016 13:41
Benzene-d6	78		60-140		04/10/2016 13:41
Ethylbenzene-d10	86		60-140		04/10/2016 13:41
1,2-DCB-d4	74		60-140		04/10/2016 13:41

Analyst(s): HK

Analytical Comments: i1



## Analytical Report

<b>Client:</b> Stellar Environmental Solutions	<b>WorkOrder:</b> 1604041
<b>Date Received:</b> 4/1/16 19:10	<b>Extraction Method:</b> SW5030B
<b>Date Prepared:</b> 4/1/16	<b>Analytical Method:</b> SW8260B
<b>Project:</b> 2015-16; Residential Heating UST Investigation	<b>Unit:</b> mg/kg-dry

### Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID	
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	GC16	118932	
<u>Analytes</u>	<u>Result</u>	<u>Qualifiers</u>	<u>MDL</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
Acetone	ND		0.048	0.12	1	04/10/2016 05:30
tert-Amyl methyl ether (TAME)	ND		0.0012	0.0061	1	04/10/2016 05:30
Benzene	ND		0.0020	0.0061	1	04/10/2016 05:30
Bromobenzene	ND		0.0021	0.0061	1	04/10/2016 05:30
Bromochloromethane	ND		0.0018	0.0061	1	04/10/2016 05:30
Bromodichloromethane	ND		0.0015	0.0061	1	04/10/2016 05:30
Bromoform	ND		0.00098	0.0061	1	04/10/2016 05:30
Bromomethane	ND		0.0024	0.0061	1	04/10/2016 05:30
2-Butanone (MEK)	ND		0.0066	0.024	1	04/10/2016 05:30
t-Butyl alcohol (TBA)	ND		0.0065	0.061	1	04/10/2016 05:30
n-Butyl benzene	ND		0.0043	0.0061	1	04/10/2016 05:30
sec-Butyl benzene	<b>0.012</b>		0.0042	0.0061	1	04/10/2016 05:30
tert-Butyl benzene	ND		0.0037	0.0061	1	04/10/2016 05:30
Carbon Disulfide	ND		0.0021	0.0061	1	04/10/2016 05:30
Carbon Tetrachloride	ND		0.0021	0.0061	1	04/10/2016 05:30
Chlorobenzene	ND		0.0022	0.0061	1	04/10/2016 05:30
Chloroethane	ND		0.0020	0.0061	1	04/10/2016 05:30
Chloroform	ND		0.0020	0.0061	1	04/10/2016 05:30
Chloromethane	ND		0.0021	0.0061	1	04/10/2016 05:30
2-Chlorotoluene	ND		0.0027	0.0061	1	04/10/2016 05:30
4-Chlorotoluene	ND		0.0026	0.0061	1	04/10/2016 05:30
Dibromochloromethane	ND		0.0013	0.0061	1	04/10/2016 05:30
1,2-Dibromo-3-chloropropane	ND		0.0015	0.0049	1	04/10/2016 05:30
1,2-Dibromoethane (EDB)	ND		0.0016	0.0049	1	04/10/2016 05:30
Dibromomethane	ND		0.0017	0.0061	1	04/10/2016 05:30
1,2-Dichlorobenzene	ND		0.0017	0.0061	1	04/10/2016 05:30
1,3-Dichlorobenzene	ND		0.0022	0.0061	1	04/10/2016 05:30
1,4-Dichlorobenzene	ND		0.0022	0.0061	1	04/10/2016 05:30
Dichlorodifluoromethane	ND		0.0013	0.0061	1	04/10/2016 05:30
1,1-Dichloroethane	ND		0.0021	0.0061	1	04/10/2016 05:30
1,2-Dichloroethane (1,2-DCA)	ND		0.0017	0.0049	1	04/10/2016 05:30
1,1-Dichloroethene	ND		0.0021	0.0061	1	04/10/2016 05:30
cis-1,2-Dichloroethene	ND		0.0018	0.0061	1	04/10/2016 05:30
trans-1,2-Dichloroethene	ND		0.0020	0.0061	1	04/10/2016 05:30
1,2-Dichloropropane	ND		0.0017	0.0061	1	04/10/2016 05:30
1,3-Dichloropropane	ND		0.0020	0.0061	1	04/10/2016 05:30
2,2-Dichloropropane	ND		0.0016	0.0061	1	04/10/2016 05:30

(Cont.)



## Analytical Report

**Client:** Stellar Environmental Solutions      **WorkOrder:** 1604041  
**Date Received:** 4/1/16 19:10      **Extraction Method:** SW5030B  
**Date Prepared:** 4/1/16      **Analytical Method:** SW8260B  
**Project:** 2015-16; Residential Heating UST Investigation      **Unit:** mg/kg-dry

### Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID	
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	GC16	118932	
Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
1,1-Dichloropropene	ND		0.0022	0.0061	1	04/10/2016 05:30
cis-1,3-Dichloropropene	ND		0.0018	0.0061	1	04/10/2016 05:30
trans-1,3-Dichloropropene	ND		0.0017	0.0061	1	04/10/2016 05:30
Diisopropyl ether (DIPE)	ND		0.0017	0.0061	1	04/10/2016 05:30
Ethylbenzene	ND		0.0024	0.0061	1	04/10/2016 05:30
Ethyl tert-butyl ether (ETBE)	ND		0.0016	0.0061	1	04/10/2016 05:30
Freon 113	ND		0.0020	0.0061	1	04/10/2016 05:30
Hexachlorobutadiene	ND		0.0061	0.0061	1	04/10/2016 05:30
Hexachloroethane	ND		0.0031	0.0061	1	04/10/2016 05:30
2-Hexanone	ND		0.0031	0.0061	1	04/10/2016 05:30
Isopropylbenzene	ND		0.0027	0.0061	1	04/10/2016 05:30
4-Isopropyl toluene	<b>0.014</b>		0.0038	0.0061	1	04/10/2016 05:30
Methyl-t-butyl ether (MTBE)	ND		0.0016	0.0061	1	04/10/2016 05:30
Methylene chloride	ND		0.0044	0.0061	1	04/10/2016 05:30
4-Methyl-2-pentanone (MIBK)	ND		0.00098	0.0061	1	04/10/2016 05:30
Naphthalene	ND		0.00073	0.0061	1	04/10/2016 05:30
n-Propyl benzene	ND		0.0035	0.0061	1	04/10/2016 05:30
Styrene	ND		0.0017	0.0061	1	04/10/2016 05:30
1,1,1,2-Tetrachloroethane	ND		0.0020	0.0061	1	04/10/2016 05:30
1,1,2,2-Tetrachloroethane	<b>0.0017</b>	J	0.0016	0.0061	1	04/10/2016 05:30
Tetrachloroethene	ND		0.0028	0.0061	1	04/10/2016 05:30
Toluene	ND		0.0027	0.0061	1	04/10/2016 05:30
1,2,3-Trichlorobenzene	<b>0.0019</b>	JB	0.00085	0.0061	1	04/10/2016 05:30
1,2,4-Trichlorobenzene	ND		0.0013	0.0061	1	04/10/2016 05:30
1,1,1-Trichloroethane	ND		0.0022	0.0061	1	04/10/2016 05:30
1,1,2-Trichloroethane	ND		0.0020	0.0061	1	04/10/2016 05:30
Trichloroethene	ND		0.0021	0.0061	1	04/10/2016 05:30
Trichlorofluoromethane	ND		0.0020	0.0061	1	04/10/2016 05:30
1,2,3-Trichloropropane	ND		0.0023	0.0061	1	04/10/2016 05:30
1,2,4-Trimethylbenzene	ND		0.0029	0.0061	1	04/10/2016 05:30
1,3,5-Trimethylbenzene	ND		0.0033	0.0061	1	04/10/2016 05:30
Vinyl Chloride	ND		0.0018	0.0061	1	04/10/2016 05:30
Xylenes, Total	ND		0.0031	0.0061	1	04/10/2016 05:30

(Cont.)

NELAP 4033ORELAP

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions      **WorkOrder:** 1604041  
**Date Received:** 4/1/16 19:10      **Extraction Method:** SW5030B  
**Date Prepared:** 4/1/16      **Analytical Method:** SW8260B  
**Project:** 2015-16; Residential Heating UST Investigation      **Unit:** mg/kg-dry

### Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	GC16	118932

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
<u>Surrogates</u>	<u>REC (%)</u>			<u>Limits</u>		
Dibromofluoromethane	99			70-130		04/10/2016 05:30
Toluene-d8	104			70-130		04/10/2016 05:30
4-BFB	94			70-130		04/10/2016 05:30
Benzene-d6	85			60-140		04/10/2016 05:30
Ethylbenzene-d10	103			60-140		04/10/2016 05:30
1,2-DCB-d4	77			60-140		04/10/2016 05:30

Analyst(s): AK

Analytical Comments: i1



## Analytical Report

<b>Client:</b> Stellar Environmental Solutions	<b>WorkOrder:</b> 1604041
<b>Date Received:</b> 4/1/16 19:10	<b>Extraction Method:</b> SW5030B
<b>Date Prepared:</b> 4/1/16	<b>Analytical Method:</b> SW8021B/8015Bm
<b>Project:</b> 2015-16; Residential Heating UST Investigation	<b>Unit:</b> mg/Kg-dry

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

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	GC19	118930
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	ND		1.2	1	04/04/2016 21:22
MTBE	---		0.059	1	04/04/2016 21:22
Benzene	---		0.0059	1	04/04/2016 21:22
Toluene	---		0.0059	1	04/04/2016 21:22
Ethylbenzene	---		0.0059	1	04/04/2016 21:22
Xylenes	---		0.018	1	04/04/2016 21:22
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
2-Fluorotoluene	110		70-130		04/04/2016 21:22
<u>Analyst(s):</u> IA		<u>Analytical Comments:</u> i1			

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	GC19	118930
<u>Analytes</u>	<u>Result</u>		<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	36		1.2	1	04/04/2016 23:23
MTBE	---		0.061	1	04/04/2016 23:23
Benzene	---		0.0061	1	04/04/2016 23:23
Toluene	---		0.0061	1	04/04/2016 23:23
Ethylbenzene	---		0.0061	1	04/04/2016 23:23
Xylenes	---		0.018	1	04/04/2016 23:23
<u>Surrogates</u>	<u>REC (%)</u>		<u>Limits</u>		
2-Fluorotoluene	97		70-130		04/04/2016 23:23
<u>Analyst(s):</u> IA		<u>Analytical Comments:</u> d7,i1			





## Analytical Report

**Client:** Stellar Environmental Solutions      **WorkOrder:** 1604041  
**Date Received:** 4/1/16 19:10      **Extraction Method:** ASTM D2216-92  
**Date Prepared:** 4/5/16      **Analytical Method:** E8000C  
**Project:** 2015-16; Residential Heating UST Investigation      **Unit:** wet wt%

### Percent Moisture

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	WetChem	119105

Analytes	Result	RL	DF	Date Analyzed
% Moisture	15.2	0.100	1	04/06/2016 14:40

Analyst(s): AL

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	WetChem	119105

Analytes	Result	RL	DF	Date Analyzed
% Moisture	18.1	0.100	1	04/06/2016 14:50

Analyst(s): AL

 Angela Rydelius, Lab Manager



## Analytical Report

<b>Client:</b> Stellar Environmental Solutions	<b>WorkOrder:</b> 1604041
<b>Date Received:</b> 4/1/16 19:10	<b>Extraction Method:</b> SW3550B
<b>Date Prepared:</b> 4/1/16	<b>Analytical Method:</b> SW8015B
<b>Project:</b> 2015-16; Residential Heating UST Investigation	<b>Unit:</b> mg/Kg-dry

### Total Extractable Petroleum Hydrocarbons w/out SG Clean-Up

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-3.5	1604041-001A	Soil	03/31/2016 11:30	GC11B	118929

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	17	1.2	1	04/04/2016 17:18
TPH-Motor Oil (C18-C36)	ND	5.9	1	04/04/2016 17:18
TPH-Hydraulic Oil (C18-C36)	ND	5.9	1	04/04/2016 17:18

Surrogates	REC (%)	Limits	Date Analyzed
C9	88	70-130	04/04/2016 17:18

**Analyst(s):** TK **Analytical Comments:** e8,e3,e4,i1

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SB4-5.5	1604041-002A	Soil	03/31/2016 11:50	GC11B	118929

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	360	6.1	5	04/04/2016 16:39
TPH-Motor Oil (C18-C36)	81	31	5	04/04/2016 16:39
TPH-Hydraulic Oil (C18-C36)	81	31	5	04/04/2016 16:39

Surrogates	REC (%)	Limits	Date Analyzed
C9	94	70-130	04/04/2016 16:39

**Analyst(s):** TK **Analytical Comments:** e3,e8,e4,i1



## Quality Control Report


<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Prepared:</b>	4/1/16	<b>BatchID:</b>	118932
<b>Date Analyzed:</b>	4/4/16	<b>Extraction Method:</b>	SW5030B
<b>Instrument:</b>	GC16, GC18	<b>Analytical Method:</b>	SW8260B
<b>Matrix:</b>	Soil	<b>Unit:</b>	mg/kg
<b>Project:</b>	2015-16; Residential Heating UST Investigation	<b>Sample ID:</b>	MB/LCS-118932 1604031-001AMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	0.039	0.10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	0.0380	0.0010	0.0050	0.050	-	76	53-116
Benzene	ND	0.0420	0.0016	0.0050	0.050	-	84	63-137
Bromobenzene	ND	-	0.0017	0.0050	-	-	-	-
Bromochloromethane	ND	-	0.0015	0.0050	-	-	-	-
Bromodichloromethane	ND	-	0.0012	0.0050	-	-	-	-
Bromoform	ND	-	0.00080	0.0050	-	-	-	-
Bromomethane	ND	-	0.0020	0.0050	-	-	-	-
2-Butanone (MEK)	ND	-	0.0054	0.020	-	-	-	-
t-Butyl alcohol (TBA)	ND	0.184	0.0053	0.050	0.20	-	92	41-135
n-Butyl benzene	ND	-	0.0035	0.0050	-	-	-	-
sec-Butyl benzene	ND	-	0.0034	0.0050	-	-	-	-
tert-Butyl benzene	ND	-	0.0030	0.0050	-	-	-	-
Carbon Disulfide	ND	-	0.0017	0.0050	-	-	-	-
Carbon Tetrachloride	ND	-	0.0017	0.0050	-	-	-	-
Chlorobenzene	ND	0.0430	0.0018	0.0050	0.050	-	86	77-121
Chloroethane	ND	-	0.0016	0.0050	-	-	-	-
Chloroform	ND	-	0.0016	0.0050	-	-	-	-
Chloromethane	ND	-	0.0017	0.0050	-	-	-	-
2-Chlorotoluene	ND	-	0.0022	0.0050	-	-	-	-
4-Chlorotoluene	ND	-	0.0021	0.0050	-	-	-	-
Dibromochloromethane	ND	-	0.0011	0.0050	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.0012	0.0040	-	-	-	-
1,2-Dibromoethane (EDB)	ND	0.0426	0.0013	0.0040	0.050	-	85	67-119
Dibromomethane	ND	-	0.0014	0.0050	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.0014	0.0050	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.0018	0.0050	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.0018	0.0050	-	-	-	-
Dichlorodifluoromethane	ND	-	0.0011	0.0050	-	-	-	-
1,1-Dichloroethane	ND	-	0.0017	0.0050	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	0.0441	0.0014	0.0040	0.050	-	88	58-135
1,1-Dichloroethene	ND	0.0275	0.0017	0.0050	0.050	-	55	42-145
cis-1,2-Dichloroethene	ND	-	0.0015	0.0050	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.0016	0.0050	-	-	-	-
1,2-Dichloropropane	ND	-	0.0014	0.0050	-	-	-	-
1,3-Dichloropropane	ND	-	0.0016	0.0050	-	-	-	-
2,2-Dichloropropane	ND	-	0.0013	0.0050	-	-	-	-

(Cont.)

NELAP 4033ORELAP

 QA/QC Officer



## Quality Control Report

<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Prepared:</b>	4/1/16	<b>BatchID:</b>	118932
<b>Date Analyzed:</b>	4/4/16	<b>Extraction Method:</b>	SW5030B
<b>Instrument:</b>	GC16, GC18	<b>Analytical Method:</b>	SW8260B
<b>Matrix:</b>	Soil	<b>Unit:</b>	mg/kg
<b>Project:</b>	2015-16; Residential Heating UST Investigation	<b>Sample ID:</b>	MB/LCS-118932 1604031-001AMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
1,1-Dichloropropene	ND	-	0.0018	0.0050	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.0015	0.0050	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.0014	0.0050	-	-	-	-
Diisopropyl ether (DIPE)	ND	0.0396	0.0014	0.0050	0.050	-	79	52-129
Ethylbenzene	ND	-	0.0020	0.0050	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	0.0408	0.0013	0.0050	0.050	-	82	53-125
Freon 113	ND	-	0.0016	0.0050	-	-	-	-
Hexachlorobutadiene	ND	-	0.0050	0.0050	-	-	-	-
Hexachloroethane	ND	-	0.0025	0.0050	-	-	-	-
2-Hexanone	ND	-	0.0025	0.0050	-	-	-	-
Isopropylbenzene	ND	-	0.0022	0.0050	-	-	-	-
4-Isopropyl toluene	ND	-	0.0031	0.0050	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	0.0405	0.0013	0.0050	0.050	-	81	58-122
Methylene chloride	ND	-	0.0036	0.0050	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.00080	0.0050	-	-	-	-
Naphthalene	0.00239,J	-	0.00060	0.0050	-	-	-	-
n-Propyl benzene	ND	-	0.0029	0.0050	-	-	-	-
Styrene	ND	-	0.0014	0.0050	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.0016	0.0050	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.0013	0.0050	-	-	-	-
Tetrachloroethene	ND	-	0.0023	0.0050	-	-	-	-
Toluene	ND	0.0498	0.0022	0.0050	0.050	-	99	76-130
1,2,3-Trichlorobenzene	0.00167,J	-	0.00070	0.0050	-	-	-	-
1,2,4-Trichlorobenzene	0.00163,J	-	0.0011	0.0050	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.0018	0.0050	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.0016	0.0050	-	-	-	-
Trichloroethene	ND	0.0419	0.0017	0.0050	0.050	-	84	72-132
Trichlorofluoromethane	ND	-	0.0016	0.0050	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.0019	0.0050	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.0024	0.0050	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.0027	0.0050	-	-	-	-
Vinyl Chloride	ND	-	0.0015	0.0050	-	-	-	-
Xylenes, Total	ND	-	0.0025	0.0050	-	-	-	-



## Quality Control Report

<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Prepared:</b>	4/1/16	<b>BatchID:</b>	118932
<b>Date Analyzed:</b>	4/4/16	<b>Extraction Method:</b>	SW5030B
<b>Instrument:</b>	GC16, GC18	<b>Analytical Method:</b>	SW8260B
<b>Matrix:</b>	Soil	<b>Unit:</b>	mg/kg
<b>Project:</b>	2015-16; Residential Heating UST Investigation	<b>Sample ID:</b>	MB/LCS-118932 1604031-001AMS/MSD

### QC Summary Report for SW8260B

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
<b>Surrogate Recovery</b>								
Dibromofluoromethane	0.130	0.109			0.12	104	87	70-130
Toluene-d8	0.154	0.133			0.12	123	107	70-130
4-BFB	0.0128	0.0123			0.012	102	99	70-130
Benzene-d6	0.104	0.0946			0.10	105	95	60-140
Ethylbenzene-d10	0.108	0.120			0.10	108	120	60-140
1,2-DCB-d4	0.0844	0.0857			0.10	84	86	60-140

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	0.0363	0.0380	0.050	ND	73	76	56-94	4.64	20
Benzene	0.0432	0.0450	0.050	ND	86	90	60-106	4.14	20
t-Butyl alcohol (TBA)	0.162	0.178	0.20	ND	81	89	56-140	9.79	20
Chlorobenzene	0.0380	0.0400	0.050	ND	76	80	61-108	5.12	20
1,2-Dibromoethane (EDB)	0.0369	0.0401	0.050	ND	74	80	54-119	8.29	20
1,2-Dichloroethane (1,2-DCA)	0.0426	0.0444	0.050	ND	85	89	48-115	4.35	20
1,1-Dichloroethene	0.0431	0.0446	0.050	ND	86	89	46-111	3.34	20
Diisopropyl ether (DIPE)	0.0408	0.0424	0.050	ND	82	85	53-111	4.06	20
Ethyl tert-butyl ether (ETBE)	0.0410	0.0431	0.050	ND	82	86	61-104	4.95	20
Methyl-t-butyl ether (MTBE)	0.0406	0.0425	0.050	ND	81	85	58-107	4.57	20
Toluene	0.0446	0.0468	0.050	ND	89	94	64-114	4.66	20
Trichloroethene	0.0384	0.0401	0.050	ND	77	80	60-116	4.35	20
<b>Surrogate Recovery</b>									
Dibromofluoromethane	0.112	0.111	0.12		90	89	70-130	1.08	20
Toluene-d8	0.128	0.127	0.12		102	102	70-130	0	20
4-BFB	0.0124	0.0118	0.012		99	94	88-121	4.55	20
Benzene-d6	0.0939	0.0976	0.10		94	98	60-140	3.87	20
Ethylbenzene-d10	0.102	0.109	0.10		102	109	60-140	7.03	20
1,2-DCB-d4	0.0762	0.0786	0.10		76	79	60-140	3.04	20



## Quality Control Report

<b>Client:</b> Stellar Environmental Solutions	<b>WorkOrder:</b> 1604041
<b>Date Prepared:</b> 4/1/16	<b>BatchID:</b> 118930
<b>Date Analyzed:</b> 4/2/16	<b>Extraction Method:</b> SW5030B
<b>Instrument:</b> GC7	<b>Analytical Method:</b> SW8021B/8015Bm
<b>Matrix:</b> Soil	<b>Unit:</b> mg/Kg
<b>Project:</b> 2015-16; Residential Heating UST Investigation	<b>Sample ID:</b> MB/LCS-118930 1604030-001AMS/MSD

### QC Summary Report for SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	0.524	0.40	0.60	-	87	70-130
MTBE	ND	0.0896	0.050	0.10	-	90	70-130
Benzene	ND	0.0916	0.0050	0.10	-	92	70-130
Toluene	ND	0.0854	0.0050	0.10	-	85	70-130
Ethylbenzene	ND	0.0984	0.0050	0.10	-	98	70-130
Xylenes	ND	0.307	0.015	0.30	-	102	70-130
<b>Surrogate Recovery</b>							
2-Fluorotoluene	0.117	0.122		0.10	117	122	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	0.492	0.480	0.60	ND	82	80	70-130	2.45	20
MTBE	0.0834	0.0814	0.10	ND	83	81	70-130	2.42	20
Benzene	0.0873	0.0896	0.10	ND	86	88	70-130	2.58	20
Toluene	0.0784	0.0834	0.10	ND	78	83	70-130	6.31	20
Ethylbenzene	0.0905	0.0943	0.10	ND	91	94	70-130	4.10	20
Xylenes	0.287	0.286	0.30	ND	96	95	70-130	0.542	20
<b>Surrogate Recovery</b>									
2-Fluorotoluene	0.111	0.116	0.10		111	117	70-130	4.66	20



# Quality Control Report

<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Prepared:</b>	4/5/16	<b>BatchID:</b>	119105
<b>Date Analyzed:</b>	4/6/16	<b>Extraction Method:</b>	ASTM D2216-92
<b>Instrument:</b>	WetChem	<b>Analytical Method:</b>	E8000C
<b>Matrix:</b>	Soil	<b>Unit:</b>	wet wt%
<b>Project:</b>	2015-16; Residential Heating UST Investigation		

## QC Summary Report for E8000C (% Moisture)

SampleID	Sample Result	Sample DF	Dup / Serial Dilution Result	Dup / Serial Dilution DF	RPD	Acceptance Criteria (%)
1604041-001A	15.2	1	15.5	1	2.12	<15

 QA/QC Officer



## Quality Control Report

<b>Client:</b>	Stellar Environmental Solutions	<b>WorkOrder:</b>	1604041
<b>Date Prepared:</b>	4/1/16	<b>BatchID:</b>	118929
<b>Date Analyzed:</b>	4/2/16 - 4/4/16	<b>Extraction Method:</b>	SW3550B
<b>Instrument:</b>	GC11B, GC39A	<b>Analytical Method:</b>	SW8015B
<b>Matrix:</b>	Soil	<b>Unit:</b>	mg/Kg
<b>Project:</b>	2015-16; Residential Heating UST Investigation	<b>Sample ID:</b>	MB/LCS-118929 1604028-001AMS/MSD

### QC Report for SW8015B w/out SG Clean-Up

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	44.8	1.0	40	-	112	70-130
TPH-Motor Oil (C18-C36)	ND	-	5.0	-	-	-	-
<b>Surrogate Recovery</b>							
C9	24.7	21.8		25	99	87	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH-Diesel (C10-C23)	44.7	39.2	40	2.851	105	91	70-130	13.0	30
<b>Surrogate Recovery</b>									
C9	21.8	22.4	25		87	89	70-130	2.61	30





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

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1604041

ClientCode: SESB

QuoteID: 5798

WaterTrax  
  WriteOn  
  EDF  
  Excel  
  EQUIS  
  Email  
  HardCopy  
  ThirdParty  
  J-flag

**Report to:**

Richard Makdisi  
Stellar Environmental Solutions  
2198 Sixth St. #201  
Berkeley, CA 94710  
510-644-3123      FAX: 510-644-3859

Email: rmakdisi@stellar-environmental.com;sbittm  
cc/3rd Party:  
PO:  
ProjectNo: 2015-16; Residential Heating UST Investigation

**Bill to:**

Accounts Payable  
Stellar Enviornmental Solutions  
2198 Sixth St. #201  
Berkeley, CA 94710  
lwheeler@stellar-environmental.com

**Requested TAT: 5 days;**

**Date Received: 04/01/2016**

**Date Logged: 04/01/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1604041-001	SB4-3.5	Soil	3/31/2016 11:30	<input type="checkbox"/>	A	A	A	A									
1604041-002	SB4-5.5	Soil	3/31/2016 11:50	<input type="checkbox"/>	A	A	A	A									

**Test Legend:**

1	8260B_S (J)	2	G-MBTEX_S	3	PERmoist_S	4	TPH_S
5		6		7		8	
9		10		11		12	

**Prepared by: Briana Cutino**

The following SampIDs: 001A, 002A contain testgroup.

**Comments:**

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



## WORK ORDER SUMMARY

**Client Name:** STELLAR ENVIRONMENTAL SOLUTIONS  
**Project:** 2015-16; Residential Heating UST Investigation  
**Comments:**

**QC Level:**  
**Client Contact:** Richard Makdisi  
**Contact's Email:** rmakdisi@stellar-  
 environmental.com;sbittman@stellar-

**Work Order:** 1604041  
**Date Logged:** 4/1/2016

WaterTrax     WriteOn     EDF     Excel     Fax     Email     HardCopy     ThirdParty     J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1604041-001A	SB4-3.5	Soil	E8000C (Percent Moisture)	1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	3/31/2016 11:30	5 days		<input type="checkbox"/>	
			Multi-Range TPH(g,d,mo)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW8260B (VOCs)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
1604041-002A	SB4-5.5	Soil	E8000C (Percent Moisture)	1	Stainless Steel tube 2"x6"	<input type="checkbox"/>	3/31/2016 11:50	5 days		<input type="checkbox"/>	
			Multi-Range TPH(g,d,mo)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			SW8260B (VOCs)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	

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

160404

### Chain of Custody Record

Lab job no. \_\_\_\_\_  
 Date \_\_\_\_\_  
 Page 1 of 1

Laboratory McC Campbell Analytical Inc  
 Address 1534 Willow Pass Road  
Pittsburg, CA 94565-1707  
877-252-9262

Method of Shipment Lab Courier  
 Shipment No. \_\_\_\_\_

Project Owner Mark Jacobson  
 Site Address 811 Paramount Road  
Oakland, CA

Airbill No. \_\_\_\_\_  
 Cooler No. \_\_\_\_\_  
 Project Manager Richard Makdisi  
 Telephone No. (510) 644-3123

Project Name Residential Heating UST Investigation  
 Project Number 2015-16

Fax No. (510) 644-3859  
 Samplers: (Signature) [Signature]

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		No.	Analysis Required			Remarks
						Cooler	Chemical		Filtered	No. of Containers		
SB4-3.5	3-3.5'	3/31/16	1130	Soil	6" SS sleeve	yes	no	No	1	X	X	★
SB4-5.5	5-5.5'	✓	1150	✓	✓	✓	✓		1	X	X	

*TPH and metals by 8260*

Relinquished by: [Signature]  
 Signature [Signature]  
 Printed Pietrynski  
 Company Stellar Environmental

Date 4/1/16  
 Received by: [Signature]  
 Signature [Signature]  
 Printed Cunningham  
 Company MAI

Date 4-1-16  
 Relinquished by: [Signature]  
 Signature [Signature]  
 Printed Cunningham  
 Company MAI

Date 1650  
 Received by: [Signature]  
 Signature [Signature]  
 Printed MAI  
 Company MAI

Turnaround Time: Standard  
 Comments: samples on ice  
Meet residential ESTs  
Report on a Dry weight basis

Relinquished by: \_\_\_\_\_  
 Signature \_\_\_\_\_  
 Printed \_\_\_\_\_  
 Company \_\_\_\_\_



2000-0003



### Sample Receipt Checklist

Client Name:	<b>Stellar Environmental Solutions</b>	Date and Time Received:	<b>4/1/2016 16:50</b>
Project Name:	<b>2015-16; Residential Heating UST Investigation</b>	Date Logged:	<b>4/1/2016</b>
WorkOrder №:	<b>1604041</b> Matrix: <u>Soil</u>	Received by:	Briana Cutino
Carrier:	<u>Bernie Cummins (MAI Courier)</u>	Logged by:	Briana Cutino

#### Chain of Custody (COC) Information

Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample IDs noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Date and Time of collection noted by Client on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler's name noted on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

#### Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper containers/bottles?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

#### Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample/Temp Blank temperature	Temp: 3°C		NA <input type="checkbox"/>
Water - VOA vials have zero headspace / no bubbles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Sample labels checked for correct preservation?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Samples Received on Ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

(Ice Type: WET ICE )

#### UCMR3 Samples:

Total Chlorine tested and acceptable upon receipt for EPA 522?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>
Free Chlorine tested and acceptable upon receipt for EPA 218.7, 300.1, 537, 539?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NA <input checked="" type="checkbox"/>

\* NOTE: If the "No" box is checked, see comments below.

Comments:



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1604039 **Amended:** 04/26/2016

**Report Created for:** Stellar Environmental Solutions

2198 Sixth St. #201  
Berkeley, CA 94710

**Project Contact:** Henry Pietropaoli

**Project P.O.:**

**Project Name:** 2015-16; Residential UST

**Project Received:** 04/01/2016

Analytical Report reviewed & approved for release on 04/13/2016 by:

Angela Rydelius,  
Laboratory Manager

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





## Glossary of Terms & Qualifier Definitions

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST  
**WorkOrder:** 1604039

### Glossary Abbreviation

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



## Glossary of Terms & Qualifier Definitions

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST  
**WorkOrder:** 1604039

### Analytical Qualifiers

B analyte detected in the associated Method Blank and in the sample  
E value above quantitation range  
J Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.  
S Surrogate spike recovery outside accepted recovery limits  
a2 sample diluted due to cluttered chromatogram  
c4 surrogate recovery outside of the control limits due to coelution with another peak(s) / cluttered chromatogram.  
c10 estimated value.  
e4 gasoline range compounds are significant.  
j1 see attached narrative

### Quality Control Qualifiers

F2 LCS/LCSD recovery and/or RPD is out of acceptance criteria.





## Case Narrative

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST

**Work Order:** 1604039  
April 14, 2016

### TO-15 ANALYSIS

All summa canisters are EVACUATED 5 days after the reporting of the results. Please call or email if a longer retention time is required.

In an effort to attain the lowest reporting limits possible for the majority of the TO-15 target list, high level compounds may be analyzed using EPA Method 8260B.

Polymer (Tedlar) bags are not recommended for TO15 samples. The disadvantages are listed in Appendix B of the DTSC Active Soil Gas Advisory of July 2015.

### TO-17 ANALYSIS

The reporting limit for naphthalene in samples SG5.5s and SG5.5sd were raised due to high organic content resulting in co-elution at the expected retention time. Naphthalene itself was not resolved or observed, however other naphthalene-type compounds such as Decahydro-dimethyl-Naphthalene were observed resulting in an elevated baseline for Naphthalene's quantitation ion. For this reason detection limits down to the regulatory limits are not obtainable.



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/6/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** %

### Helium

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC26	119100

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	ND	0.050	1	04/06/2016 09:05

SG5.5s	1604039-002A	SoilGas	03/31/2016 10:50	GC26	119100
--------	--------------	---------	------------------	------	--------

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.11	26.13	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	0.13	0.050	1	04/06/2016 09:18

SG5.5sd	1604039-003A	SoilGas	03/31/2016 11:15	GC26	119100
---------	--------------	---------	------------------	------	--------

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
14.15	28.30	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	0.13	0.050	1	04/06/2016 09:31

 Angela Rydelius, Lab Manager



# Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/4/16-4/15/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** uL/L

## Light Gases

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC26	119005

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

Analytes	Result	RL	DF	Date Analyzed
Methane	1900	2.0	1	04/04/2016 10:56
Oxygen	12,000	4000	1	04/15/2016 08:42

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### TPH gas

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 1	1604039-004A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.37	13.37	AK

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	36	1	04/05/2016 15:04
Surrogates	REC (%)	Limits		Date Analyzed
1,2-DCA-d4	108	70-130		04/05/2016 15:04

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 2	1604039-005A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
14.18	14.18	AK

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	260	36	1	04/05/2016 16:04
Surrogates	REC (%)	Limits		Date Analyzed
1,2-DCA-d4	97	70-130		04/05/2016 16:04

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
OA 1	1604039-006A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.82	13.82	AK

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	36	1	04/05/2016 17:04
Surrogates	REC (%)	Limits		Date Analyzed
1,2-DCA-d4	94	70-130		04/05/2016 17:04

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/8/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### TPH gas

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC29	119084

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

<u>Analytes</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Date Analyzed</u>
TPH(g)	690,000	36,000	50	04/08/2016 08:46

<u>Surrogates</u>	<u>REC (%)</u>	<u>Limits</u>	<u>Date Analyzed</u>
1,2-DCA-d4	104	70-130	04/08/2016 08:46

Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 1	1604039-004A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.37	13.37	AK

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	6.0	1	04/05/2016 15:04
Acrolein	ND	0.58	1	04/05/2016 15:04
Acrylonitrile	ND	0.22	1	04/05/2016 15:04
tert-Amyl methyl ether (TAME)	ND	0.42	1	04/05/2016 15:04
Benzene	<b>0.28</b>	0.032	1	04/05/2016 15:04
Benzyl chloride	ND	0.53	1	04/05/2016 15:04
Bromodichloromethane	<b>0.0074</b>	0.0070	1	04/05/2016 15:04
Bromoform	ND	1.1	1	04/05/2016 15:04
Bromomethane	ND	0.39	1	04/05/2016 15:04
1,3-Butadiene	ND	0.22	1	04/05/2016 15:04
2-Butanone (MEK)	ND	7.5	1	04/05/2016 15:04
t-Butyl alcohol (TBA)	ND	6.2	1	04/05/2016 15:04
Carbon Disulfide	ND	0.32	1	04/05/2016 15:04
Carbon Tetrachloride	<b>0.43</b>	0.0064	1	04/05/2016 15:04
Chlorobenzene	ND	0.47	1	04/05/2016 15:04
Chloroethane	ND	0.27	1	04/05/2016 15:04
Chloroform	<b>0.18</b>	0.025	1	04/05/2016 15:04
Chloromethane	<b>0.49</b>	0.21	1	04/05/2016 15:04
Cyclohexane	ND	1.8	1	04/05/2016 15:04
Dibromochloromethane	ND	0.87	1	04/05/2016 15:04
1,2-Dibromo-3-chloropropane	ND	0.050	1	04/05/2016 15:04
1,2-Dibromoethane (EDB)	ND	0.0078	1	04/05/2016 15:04
1,2-Dichlorobenzene	ND	0.61	1	04/05/2016 15:04
1,3-Dichlorobenzene	<b>1.8</b>	0.61	1	04/05/2016 15:04
1,4-Dichlorobenzene	<b>1.8</b>	0.030	1	04/05/2016 15:04
Dichlorodifluoromethane	<b>2.2</b>	0.50	1	04/05/2016 15:04
1,1-Dichloroethane	ND	0.41	1	04/05/2016 15:04
1,2-Dichloroethane (1,2-DCA)	<b>0.048</b>	0.0041	1	04/05/2016 15:04
1,1-Dichloroethene	ND	0.10	1	04/05/2016 15:04
cis-1,2-Dichloroethene	ND	0.40	1	04/05/2016 15:04
trans-1,2-Dichloroethene	ND	0.40	1	04/05/2016 15:04
1,2-Dichloropropane	<b>0.022</b>	0.0047	1	04/05/2016 15:04
cis-1,3-Dichloropropene	ND	0.12	1	04/05/2016 15:04

(Cont.)

Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 1	1604039-004A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.37	13.37	AK

Analytes	Result	RL	DF	Date Analyzed
trans-1,3-Dichloropropene	ND	0.12	1	04/05/2016 15:04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.71	1	04/05/2016 15:04
Diisopropyl ether (DIPE)	ND	0.42	1	04/05/2016 15:04
1,4-Dioxane	<b>0.041</b>	0.018	1	04/05/2016 15:04
Ethyl acetate	ND	0.92	1	04/05/2016 15:04
Ethyl tert-butyl ether (ETBE)	ND	0.42	1	04/05/2016 15:04
Ethylbenzene	ND	0.44	1	04/05/2016 15:04
4-Ethyltoluene	ND	0.50	1	04/05/2016 15:04
Freon 113	ND	0.78	1	04/05/2016 15:04
Heptane	ND	2.1	1	04/05/2016 15:04
Hexachlorobutadiene	ND	1.1	1	04/05/2016 15:04
Hexane	ND	1.8	1	04/05/2016 15:04
2-Hexanone	ND	0.42	1	04/05/2016 15:04
4-Methyl-2-pentanone (MIBK)	ND	0.42	1	04/05/2016 15:04
Methyl-t-butyl ether (MTBE)	ND	0.37	1	04/05/2016 15:04
Methylene chloride	ND	0.88	1	04/05/2016 15:04
Methyl methacrylate	ND	0.42	1	04/05/2016 15:04
Naphthalene	<b>0.14</b>	0.050	1	04/05/2016 15:04
Propene	ND	8.8	1	04/05/2016 15:04
Styrene	ND	0.43	1	04/05/2016 15:04
1,1,1,2-Tetrachloroethane	ND	0.0070	1	04/05/2016 15:04
1,1,2,2-Tetrachloroethane	ND	0.0070	1	04/05/2016 15:04
Tetrachloroethene	<b>0.075</b>	0.069	1	04/05/2016 15:04
Tetrahydrofuran	ND	0.60	1	04/05/2016 15:04
Toluene	<b>0.92</b>	0.38	1	04/05/2016 15:04
1,2,4-Trichlorobenzene	ND	0.75	1	04/05/2016 15:04
1,1,1-Trichloroethane	ND	0.55	1	04/05/2016 15:04
1,1,2-Trichloroethane	ND	0.0055	1	04/05/2016 15:04
Trichloroethene	ND	0.027	1	04/05/2016 15:04
Trichlorofluoromethane	<b>1.1</b>	0.57	1	04/05/2016 15:04
1,2,4-Trimethylbenzene	ND	0.50	1	04/05/2016 15:04
1,3,5-Trimethylbenzene	ND	0.50	1	04/05/2016 15:04
Vinyl Acetate	ND	1.8	1	04/05/2016 15:04

(Cont.)

 Angela Rydelius, Lab Manager





## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 1	1604039-004A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.37	13.37	AK

Analytes	Result	RL	DF	Date Analyzed
Vinyl Chloride	ND	0.013	1	04/05/2016 15:04
Xylenes, Total	ND	1.3	1	04/05/2016 15:04

Surrogates	REC (%)	Limits	Date Analyzed
1,2-DCA-d4	91	70-130	04/05/2016 15:04
Toluene-d8	101	70-130	04/05/2016 15:04
4-BFB	95	70-130	04/05/2016 15:04



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 2	1604039-005A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
14.18	14.18	AK

Analytes	Result	RL	DF	Date Analyzed
Acetone	62	60	10	04/05/2016 18:35
Acrolein	5.3	0.58	1	04/05/2016 16:04
Acrylonitrile	ND	0.22	1	04/05/2016 16:04
tert-Amyl methyl ether (TAME)	ND	0.42	1	04/05/2016 16:04
Benzene	0.36	0.032	1	04/05/2016 16:04
Benzyl chloride	ND	0.53	1	04/05/2016 16:04
Bromodichloromethane	0.022	0.0070	1	04/05/2016 16:04
Bromoform	ND	1.1	1	04/05/2016 16:04
Bromomethane	0.55	0.39	1	04/05/2016 16:04
1,3-Butadiene	ND	0.22	1	04/05/2016 16:04
2-Butanone (MEK)	7.5	7.5	1	04/05/2016 16:04
t-Butyl alcohol (TBA)	ND	6.2	1	04/05/2016 16:04
Carbon Disulfide	ND	0.32	1	04/05/2016 16:04
Carbon Tetrachloride	0.50	0.0064	1	04/05/2016 16:04
Chlorobenzene	ND	0.47	1	04/05/2016 16:04
Chloroethane	ND	0.27	1	04/05/2016 16:04
Chloroform	0.35	0.025	1	04/05/2016 16:04
Chloromethane	1.1	0.21	1	04/05/2016 16:04
Cyclohexane	2.8	1.8	1	04/05/2016 16:04
Dibromochloromethane	ND	0.87	1	04/05/2016 16:04
1,2-Dibromo-3-chloropropane	ND	0.050	1	04/05/2016 16:04
1,2-Dibromoethane (EDB)	ND	0.0078	1	04/05/2016 16:04
1,2-Dichlorobenzene	ND	0.61	1	04/05/2016 16:04
1,3-Dichlorobenzene	8.7	0.61	1	04/05/2016 16:04
1,4-Dichlorobenzene	8.7	0.030	1	04/05/2016 16:04
Dichlorodifluoromethane	2.2	0.50	1	04/05/2016 16:04
1,1-Dichloroethane	ND	0.41	1	04/05/2016 16:04
1,2-Dichloroethane (1,2-DCA)	0.067	0.0041	1	04/05/2016 16:04
1,1-Dichloroethene	ND	0.10	1	04/05/2016 16:04
cis-1,2-Dichloroethene	ND	0.40	1	04/05/2016 16:04
trans-1,2-Dichloroethene	ND	0.40	1	04/05/2016 16:04
1,2-Dichloropropane	0.039	0.0047	1	04/05/2016 16:04
cis-1,3-Dichloropropene	ND	0.12	1	04/05/2016 16:04

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 2	1604039-005A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
14.18	14.18	AK

Analytes	Result	RL	DF	Date Analyzed
trans-1,3-Dichloropropene	ND	0.12	1	04/05/2016 16:04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.71	1	04/05/2016 16:04
Diisopropyl ether (DIPE)	ND	0.42	1	04/05/2016 16:04
1,4-Dioxane	ND	0.018	1	04/05/2016 16:04
Ethyl acetate	<b>6.0</b>	0.92	1	04/05/2016 16:04
Ethyl tert-butyl ether (ETBE)	ND	0.42	1	04/05/2016 16:04
Ethylbenzene	ND	0.44	1	04/05/2016 16:04
4-Ethyltoluene	ND	0.50	1	04/05/2016 16:04
Freon 113	ND	0.78	1	04/05/2016 16:04
Heptane	ND	2.1	1	04/05/2016 16:04
Hexachlorobutadiene	ND	1.1	1	04/05/2016 16:04
Hexane	ND	1.8	1	04/05/2016 16:04
2-Hexanone	<b>0.67</b>	0.42	1	04/05/2016 16:04
4-Methyl-2-pentanone (MIBK)	<b>0.70</b>	0.42	1	04/05/2016 16:04
Methyl-t-butyl ether (MTBE)	ND	0.37	1	04/05/2016 16:04
Methylene chloride	ND	0.88	1	04/05/2016 16:04
Methyl methacrylate	ND	0.42	1	04/05/2016 16:04
Naphthalene	<b>1.0</b>	0.050	1	04/05/2016 16:04
Propene	ND	8.8	1	04/05/2016 16:04
Styrene	<b>1.9</b>	0.43	1	04/05/2016 16:04
1,1,1,2-Tetrachloroethane	<b>0.0091</b>	0.0070	1	04/05/2016 16:04
1,1,2,2-Tetrachloroethane	ND	0.0070	1	04/05/2016 16:04
Tetrachloroethene	<b>0.074</b>	0.069	1	04/05/2016 16:04
Tetrahydrofuran	<b>12</b>	0.60	1	04/05/2016 16:04
Toluene	<b>3.0</b>	0.38	1	04/05/2016 16:04
1,2,4-Trichlorobenzene	ND	0.75	1	04/05/2016 16:04
1,1,1-Trichloroethane	ND	0.55	1	04/05/2016 16:04
1,1,2-Trichloroethane	ND	0.0055	1	04/05/2016 16:04
Trichloroethene	ND	0.027	1	04/05/2016 16:04
Trichlorofluoromethane	<b>1.2</b>	0.57	1	04/05/2016 16:04
1,2,4-Trimethylbenzene	ND	0.50	1	04/05/2016 16:04
1,3,5-Trimethylbenzene	ND	0.50	1	04/05/2016 16:04
Vinyl Acetate	ND	1.8	1	04/05/2016 16:04

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
IA 2	1604039-005A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
14.18	14.18	AK

Analytes	Result	RL	DF	Date Analyzed
Vinyl Chloride	ND	0.013	1	04/05/2016 16:04
Xylenes, Total	1.5	1.3	1	04/05/2016 16:04

Surrogates	REC (%)	Limits	Date Analyzed
1,2-DCA-d4	89	70-130	04/05/2016 16:04
Toluene-d8	102	70-130	04/05/2016 16:04
4-BFB	98	70-130	04/05/2016 16:04



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
OA 1	1604039-006A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.82	13.82	AK

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	6.0	1	04/05/2016 17:04
Acrolein	ND	0.58	1	04/05/2016 17:04
Acrylonitrile	ND	0.22	1	04/05/2016 17:04
tert-Amyl methyl ether (TAME)	ND	0.42	1	04/05/2016 17:04
Benzene	<b>0.36</b>	0.032	1	04/05/2016 17:04
Benzyl chloride	ND	0.53	1	04/05/2016 17:04
Bromodichloromethane	ND	0.0070	1	04/05/2016 17:04
Bromoform	ND	1.1	1	04/05/2016 17:04
Bromomethane	ND	0.39	1	04/05/2016 17:04
1,3-Butadiene	ND	0.22	1	04/05/2016 17:04
2-Butanone (MEK)	ND	7.5	1	04/05/2016 17:04
t-Butyl alcohol (TBA)	ND	6.2	1	04/05/2016 17:04
Carbon Disulfide	ND	0.32	1	04/05/2016 17:04
Carbon Tetrachloride	<b>0.42</b>	0.0064	1	04/05/2016 17:04
Chlorobenzene	ND	0.47	1	04/05/2016 17:04
Chloroethane	ND	0.27	1	04/05/2016 17:04
Chloroform	<b>0.11</b>	0.025	1	04/05/2016 17:04
Chloromethane	<b>0.79</b>	0.21	1	04/05/2016 17:04
Cyclohexane	ND	1.8	1	04/05/2016 17:04
Dibromochloromethane	ND	0.87	1	04/05/2016 17:04
1,2-Dibromo-3-chloropropane	ND	0.050	1	04/05/2016 17:04
1,2-Dibromoethane (EDB)	ND	0.0078	1	04/05/2016 17:04
1,2-Dichlorobenzene	ND	0.61	1	04/05/2016 17:04
1,3-Dichlorobenzene	ND	0.61	1	04/05/2016 17:04
1,4-Dichlorobenzene	<b>0.063</b>	0.030	1	04/05/2016 17:04
Dichlorodifluoromethane	<b>2.2</b>	0.50	1	04/05/2016 17:04
1,1-Dichloroethane	ND	0.41	1	04/05/2016 17:04
1,2-Dichloroethane (1,2-DCA)	<b>0.050</b>	0.0041	1	04/05/2016 17:04
1,1-Dichloroethene	ND	0.10	1	04/05/2016 17:04
cis-1,2-Dichloroethene	ND	0.40	1	04/05/2016 17:04
trans-1,2-Dichloroethene	ND	0.40	1	04/05/2016 17:04
1,2-Dichloropropane	<b>0.024</b>	0.0047	1	04/05/2016 17:04
cis-1,3-Dichloropropene	ND	0.12	1	04/05/2016 17:04

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
OA 1	1604039-006A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.82	13.82	AK

Analytes	Result	RL	DF	Date Analyzed
trans-1,3-Dichloropropene	ND	0.12	1	04/05/2016 17:04
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.71	1	04/05/2016 17:04
Diisopropyl ether (DIPE)	ND	0.42	1	04/05/2016 17:04
1,4-Dioxane	ND	0.018	1	04/05/2016 17:04
Ethyl acetate	ND	0.92	1	04/05/2016 17:04
Ethyl tert-butyl ether (ETBE)	ND	0.42	1	04/05/2016 17:04
Ethylbenzene	ND	0.44	1	04/05/2016 17:04
4-Ethyltoluene	ND	0.50	1	04/05/2016 17:04
Freon 113	ND	0.78	1	04/05/2016 17:04
Heptane	ND	2.1	1	04/05/2016 17:04
Hexachlorobutadiene	ND	1.1	1	04/05/2016 17:04
Hexane	ND	1.8	1	04/05/2016 17:04
2-Hexanone	ND	0.42	1	04/05/2016 17:04
4-Methyl-2-pentanone (MIBK)	ND	0.42	1	04/05/2016 17:04
Methyl-t-butyl ether (MTBE)	ND	0.37	1	04/05/2016 17:04
Methylene chloride	ND	0.88	1	04/05/2016 17:04
Methyl methacrylate	ND	0.42	1	04/05/2016 17:04
Naphthalene	0.14	0.050	1	04/05/2016 17:04
Propene	ND	8.8	1	04/05/2016 17:04
Styrene	ND	0.43	1	04/05/2016 17:04
1,1,1,2-Tetrachloroethane	0.0077	0.0070	1	04/05/2016 17:04
1,1,2,2-Tetrachloroethane	ND	0.0070	1	04/05/2016 17:04
Tetrachloroethene	ND	0.069	1	04/05/2016 17:04
Tetrahydrofuran	ND	0.60	1	04/05/2016 17:04
Toluene	0.65	0.38	1	04/05/2016 17:04
1,2,4-Trichlorobenzene	ND	0.75	1	04/05/2016 17:04
1,1,1-Trichloroethane	ND	0.55	1	04/05/2016 17:04
1,1,2-Trichloroethane	ND	0.0055	1	04/05/2016 17:04
Trichloroethene	ND	0.027	1	04/05/2016 17:04
Trichlorofluoromethane	1.2	0.57	1	04/05/2016 17:04
1,2,4-Trimethylbenzene	ND	0.50	1	04/05/2016 17:04
1,3,5-Trimethylbenzene	ND	0.50	1	04/05/2016 17:04
Vinyl Acetate	ND	1.8	1	04/05/2016 17:04

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/5/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
OA 1	1604039-006A	Indoor Air	04/01/2016 08:30	GC29	119097

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.82	13.82	AK

Analytes	Result	RL	DF	Date Analyzed
Vinyl Chloride	ND	0.013	1	04/05/2016 17:04
Xylenes, Total	ND	1.3	1	04/05/2016 17:04

Surrogates	REC (%)	Limits	Date Analyzed
1,2-DCA-d4	86	70-130	04/05/2016 17:04
Toluene-d8	102	70-130	04/05/2016 17:04
4-BFB	93	70-130	04/05/2016 17:04

Angela Rydelius, Lab Manager





## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 16:50  
**Date Prepared:** 4/8/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC29	119084

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Acetone	4300		260	3000	50	04/08/2016 08:46
Acrolein	ND		12	290	50	04/08/2016 08:46
Acrylonitrile	ND		8.8	55	50	04/08/2016 08:46
tert-Amyl methyl ether (TAME)	ND		53	100	50	04/08/2016 08:46
Benzene	140		0.80	80	50	04/08/2016 08:46
Benzyl chloride	ND		13	130	50	04/08/2016 08:46
Bromodichloromethane	ND		0.70	180	50	04/08/2016 08:46
Bromoform	ND		29	260	50	04/08/2016 08:46
Bromomethane	ND		15	98	50	04/08/2016 08:46
1,3-Butadiene	ND		12	55	50	04/08/2016 08:46
2-Butanone (MEK)	ND		260	3800	50	04/08/2016 08:46
t-Butyl alcohol (TBA)	2700		1400	1600	50	04/08/2016 08:46
Carbon Disulfide	ND		11	80	50	04/08/2016 08:46
Carbon Tetrachloride	ND		0.65	160	50	04/08/2016 08:46
Chlorobenzene	ND		6.0	120	50	04/08/2016 08:46
Chloroethane	ND		11	67	50	04/08/2016 08:46
Chloroform	ND		0.85	120	50	04/08/2016 08:46
Chloromethane	ND		6.3	52	50	04/08/2016 08:46
Cyclohexane	5400		13	880	50	04/08/2016 08:46
Dibromochloromethane	ND		0.85	220	50	04/08/2016 08:46
1,2-Dibromo-3-chloropropane	ND		1.2	6.2	50	04/08/2016 08:46
1,2-Dibromoethane (EDB)	ND		0.60	200	50	04/08/2016 08:46
1,2-Dichlorobenzene	ND		20	150	50	04/08/2016 08:46
1,3-Dichlorobenzene	ND		15	150	50	04/08/2016 08:46
1,4-Dichlorobenzene	ND		0.75	150	50	04/08/2016 08:46
Dichlorodifluoromethane	1100		13	120	50	04/08/2016 08:46
1,1-Dichloroethane	ND		36	100	50	04/08/2016 08:46
1,2-Dichloroethane (1,2-DCA)	66	J	0.30	100	50	04/08/2016 08:46
1,1-Dichloroethene	ND		19	100	50	04/08/2016 08:46
cis-1,2-Dichloroethene	ND		10	100	50	04/08/2016 08:46
trans-1,2-Dichloroethene	ND		7.1	100	50	04/08/2016 08:46
1,2-Dichloropropane	44	J	0.45	120	50	04/08/2016 08:46
cis-1,3-Dichloropropene	ND		0.35	120	50	04/08/2016 08:46

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 16:50  
**Date Prepared:** 4/8/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC29	119084

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
trans-1,3-Dichloropropene	180		23	120	50	04/08/2016 08:46
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		18	180	50	04/08/2016 08:46
Diisopropyl ether (DIPE)	ND		8.5	100	50	04/08/2016 08:46
1,4-Dioxane	ND		0.25	92	50	04/08/2016 08:46
Ethanol	13,000		290	4800	50	04/08/2016 08:46
Ethyl acetate	96		7.4	92	50	04/08/2016 08:46
Ethyl tert-butyl ether (ETBE)	ND		34	100	50	04/08/2016 08:46
Ethylbenzene	100	J	8.8	110	50	04/08/2016 08:46
4-Ethyltoluene	ND		8.8	120	50	04/08/2016 08:46
Freon 113	ND		16	200	50	04/08/2016 08:46
Heptane	2100		7.3	1000	50	04/08/2016 08:46
Hexachlorobutadiene	ND		19	270	50	04/08/2016 08:46
Hexane	1200		12	900	50	04/08/2016 08:46
2-Hexanone	ND		8.4	100	50	04/08/2016 08:46
4-Methyl-2-pentanone (MIBK)	ND		10	100	50	04/08/2016 08:46
Methyl-t-butyl ether (MTBE)	ND		21	92	50	04/08/2016 08:46
Methylene chloride	650		16	440	50	04/08/2016 08:46
Methyl methacrylate	ND		10	100	50	04/08/2016 08:46
Naphthalene	67	JB	2.2	260	50	04/08/2016 08:46
Propene	ND		440	4400	50	04/08/2016 08:46
Styrene	150		8.7	110	50	04/08/2016 08:46
1,1,1,2-Tetrachloroethane	ND		0.50	180	50	04/08/2016 08:46
1,1,2,2-Tetrachloroethane	ND		1.6	180	50	04/08/2016 08:46
Tetrachloroethene	7500		0.70	170	50	04/08/2016 08:46
Tetrahydrofuran	ND		8.2	150	50	04/08/2016 08:46
Toluene	7500		7.6	95	50	04/08/2016 08:46
1,2,4-Trichlorobenzene	ND		23	190	50	04/08/2016 08:46
1,1,1-Trichloroethane	ND		25	140	50	04/08/2016 08:46
1,1,2-Trichloroethane	ND		0.70	140	50	04/08/2016 08:46
Trichloroethene	31	J	1.4	140	50	04/08/2016 08:46
Trichlorofluoromethane	ND		17	140	50	04/08/2016 08:46
1,2,4-Trimethylbenzene	130		11	120	50	04/08/2016 08:46
1,3,5-Trimethylbenzene	ND		15	120	50	04/08/2016 08:46

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 16:50  
**Date Prepared:** 4/8/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5	1604039-001A	SoilGas	03/31/2016 10:25	GC29	119084

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.80	25.59	AK

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Vinyl Acetate	ND		30	900	50	04/08/2016 08:46
Vinyl Chloride	ND		0.40	65	50	04/08/2016 08:46
Xylenes, Total	<b>390</b>		20	330	50	04/08/2016 08:46
Surrogates	REC (%)			Limits		
1,2-DCA-d4	94			70-130		04/08/2016 08:46
Toluene-d8	100			70-130		04/08/2016 08:46
4-BFB	108			70-130		04/08/2016 08:46

Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/11/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5s	1604039-002A	SoilGas	03/31/2016 10:50	GC37	119417

Analytes	Result	Qualifiers	RL	DF	Volume (L)	Date Analyzed
TPH-Diesel (C10-C23)	460,000	E	1100	1	0.89	04/11/2016 14:02

Surrogates	REC (%)	Qualifiers	Limits	
4-BFB	35	S	70-130	04/11/2016 14:02

**Analyst(s):** KBO **Analytical Comments:** c4,e4,c10

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5sd	1604039-003A	SoilGas	03/31/2016 11:15	GC37	119417

Analytes	Result	Qualifiers	RL	DF	Volume (L)	Date Analyzed
TPH-Diesel (C10-C23)	680,000	E	1000	1	0.96	04/11/2016 17:59

Surrogates	REC (%)	Qualifiers	Limits	
4-BFB	42	S	70-130	04/11/2016 17:59

**Analyst(s):** KBO **Analytical Comments:** c4,e4,c10

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 4/1/16 18:53  
**Date Prepared:** 4/11/16  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5s	1604039-002A	SoilGas	03/31/2016 10:50	GC37	119417

Analytes	Result	RL	DF	Volume (L)	Date Analyzed
Naphthalene	ND	17	1	0.89	04/11/2016 14:02

Surrogates	REC (%)	Qualifiers	Limits	
4-BFB	36	S	70-130	04/11/2016 14:02

**Analyst(s):** KBO **Analytical Comments:** j1,a2,c4

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG5.5sd	1604039-003A	SoilGas	03/31/2016 11:15	GC37	119417

Analytes	Result	RL	DF	Volume (L)	Date Analyzed
Naphthalene	ND	17	1	0.96	04/11/2016 17:59

Surrogates	REC (%)	Qualifiers	Limits	
4-BFB	44	S	70-130	04/11/2016 17:59

**Analyst(s):** KBO **Analytical Comments:** j1,a2,c4

 Angela Rydelius, Lab Manager



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/6/16  
**Instrument:** GC26  
**Matrix:** Soilgas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119100  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** %  
**Sample ID:** MB/LCS-119100

---

### QC Summary Report for ASTM D1946-90

---

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Helium	ND	0.0799	0.025	0.10	-	80	60-140

---

QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/4/16 - 4/15/16  
**Date Analyzed:** 4/4/16 - 4/15/16  
**Instrument:** GC26  
**Matrix:** SoilGas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119005  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** uL/L  
**Sample ID:** MB/LCS-119005

### QC Summary Report for ASTM D1946-90

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Methane	ND	109	1.0	100	-	109	70-130
Oxygen	ND	4920	2000	7000	-	70	70-130

QA/QC Officer





## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/5/16  
**Instrument:** GC29  
**Matrix:** Indoor Air  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119097  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:**  $\mu\text{g}/\text{m}^3$   
**Sample ID:** MB-119097

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(g)	ND	-	36	-	-	-	-
<b>Surrogate Recovery</b>							
1,2-DCA-d4	98.0	-		100	98	-	-
Toluene-d8	101	-		100	101	-	-
4-BFB	97.9	-		100	98	-	-

QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/4/16 - 4/5/16  
**Instrument:** GC29  
**Matrix:** Indoor Air  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119097  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119097

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	12.7	6.0	12	-	106	60-140
Acrolein	ND	13.0	0.58	11.65	-	112	60-140
Acrylonitrile	ND	12.5	0.22	11	-	113	60-140
tert-Amyl methyl ether (TAME)	ND	21.8	0.42	21	-	104	60-140
Benzene	ND	14.8	0.032	16	-	92	60-140
Benzyl chloride	ND	29.8	0.53	26.5	-	113	60-140
Bromodichloromethane	ND	31.7	0.0070	35	-	91	60-140
Bromoform	ND	57.0	1.1	52.5	-	109	60-140
Bromomethane	ND	27.6	0.39	19.5	-	142, F2	60-140
1,3-Butadiene	ND	12.7	0.22	11	-	115	60-140
2-Butanone (MEK)	ND	15.7	7.5	15	-	105	60-140
t-Butyl alcohol (TBA)	ND	16.2	6.2	15.5	-	105	60-140
Carbon Disulfide	ND	17.0	0.32	16	-	106	60-140
Carbon Tetrachloride	ND	30.7	0.0064	32	-	96	60-140
Chlorobenzene	ND	23.7	0.47	23.5	-	101	60-140
Chloroethane	ND	14.6	0.27	13.5	-	108	60-140
Chloroform	ND	21.2	0.025	24.5	-	87	60-140
Chloromethane	ND	9.05	0.21	10.5	-	86	60-140
Cyclohexane	ND	17.7	1.8	17.5	-	101	60-140
Dibromochloromethane	ND	44.0	0.87	43.5	-	101	60-140
1,2-Dibromo-3-chloropropane	ND	64.8	0.050	49	-	132	60-140
1,2-Dibromoethane (EDB)	ND	36.9	0.0078	39	-	95	60-140
1,2-Dichlorobenzene	ND	28.6	0.61	30.5	-	94	60-140
1,3-Dichlorobenzene	ND	28.8	0.61	30.5	-	95	60-140
1,4-Dichlorobenzene	ND	28.4	0.030	30.5	-	93	60-140
Dichlorodifluoromethane	ND	23.6	0.50	25	-	95	60-140
1,1-Dichloroethane	ND	19.7	0.41	20.5	-	96	60-140
1,2-Dichloroethane (1,2-DCA)	ND	19.0	0.0041	20.5	-	93	60-140
1,1-Dichloroethene	ND	19.5	0.10	20	-	98	60-140
cis-1,2-Dichloroethene	ND	20.8	0.40	20	-	104	60-140
trans-1,2-Dichloroethene	ND	20.2	0.40	20	-	101	60-140
1,2-Dichloropropane	ND	22.9	0.0047	23.5	-	97	60-140
cis-1,3-Dichloropropene	ND	23.0	0.12	23	-	100	60-140
trans-1,3-Dichloropropene	ND	22.9	0.12	23	-	100	60-140
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	35.5	0.71	35.5	-	100	60-140
Diisopropyl ether (DIPE)	ND	22.9	0.42	21	-	109	60-140
1,4-Dioxane	ND	17.4	0.018	18.5	-	94	60-140

(Cont.)

QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/4/16 - 4/5/16  
**Instrument:** GC29  
**Matrix:** Indoor Air  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119097  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119097

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Ethyl acetate	ND	18.0	0.92	18.5	-	97	60-140
Ethyl tert-butyl ether (ETBE)	ND	21.0	0.42	21	-	100	60-140
Ethylbenzene	ND	21.4	0.44	22	-	98	60-140
4-Ethyltoluene	ND	24.9	0.50	25	-	100	60-140
Freon 113	ND	37.8	0.78	39	-	97	60-140
Heptane	ND	21.0	2.1	21	-	100	60-140
Hexachlorobutadiene	ND	50.8	1.1	54	-	94	60-140
Hexane	ND	20.3	1.8	18	-	113	60-140
2-Hexanone	ND	23.0	0.42	21	-	110	60-140
4-Methyl-2-pentanone (MIBK)	ND	20.6	0.42	21	-	98	60-140
Methyl-t-butyl ether (MTBE)	ND	17.4	0.37	18.5	-	94	60-140
Methylene chloride	ND	17.3	0.88	17.5	-	99	60-140
Methyl methacrylate	ND	21.2	0.42	20.8	-	102	60-140
Naphthalene	ND	58.4	0.050	53	-	110	60-140
Propene	ND	ND	8.8	8.5	-	98	60-140
Styrene	ND	22.2	0.43	21.5	-	103	60-140
1,1,1,2-Tetrachloroethane	ND	37.1	0.0070	35	-	106	60-140
1,1,2,2-Tetrachloroethane	ND	40.1	0.0070	35	-	115	60-140
Tetrachloroethene	ND	33.2	0.069	34.5	-	96	60-140
Tetrahydrofuran	ND	13.4	0.60	15	-	89	60-140
Toluene	ND	18.9	0.38	19	-	100	60-140
1,2,4-Trichlorobenzene	ND	38.0	0.75	37.5	-	101	60-140
1,1,1-Trichloroethane	ND	25.3	0.55	27.5	-	92	60-140
1,1,2-Trichloroethane	ND	26.3	0.0055	27.5	-	96	60-140
Trichloroethene	ND	24.2	0.027	27.5	-	88	60-140
Trichlorofluoromethane	ND	27.6	0.57	28.5	-	97	60-140
1,2,4-Trimethylbenzene	ND	24.5	0.50	25	-	98	60-140
1,3,5-Trimethylbenzene	ND	26.9	0.50	25	-	108	60-140
Vinyl Acetate	ND	21.5	1.8	18	-	119	60-140
Vinyl Chloride	ND	13.7	0.013	13	-	105	60-140
Xylenes, Total	ND	64.5	1.3	66	-	98	60-140
<b>Surrogate Recovery</b>							
1,2-DCA-d4	89.6	86.8		100	90	87	70-130
Toluene-d8	100	96.4		100	100	96	70-130
4-BFB	94.5	93.8		100	94	94	70-130



## Quality Control Report


**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/6/16  
**Instrument:** GC29  
**Matrix:** SoilGas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119084  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119084

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	60.7	2.6	30	60	-	101	60-140
Acrolein	ND	66.2	0.12	2.9	58.25	-	114	60-140
Acrylonitrile	ND	57.6	0.090	0.55	55	-	105	60-140
tert-Amyl methyl ether (TAME)	ND	103	0.55	1.0	105	-	98	60-140
Benzene	0.0473,J	75.9	0.0080	0.80	80	-	95	60-140
Benzyl chloride	ND	154	0.13	1.3	132.5	-	116	60-140
Bromodichloromethane	ND	154	0.0070	1.8	175	-	88	60-140
Bromoform	ND	265	0.29	2.6	262.5	-	101	60-140
Bromomethane	ND	125	0.15	1.0	97.5	-	128	60-140
1,3-Butadiene	ND	61.6	0.12	0.55	55	-	112	60-140
2-Butanone (MEK)	ND	88.1	2.6	38	75	-	117	60-140
t-Butyl alcohol (TBA)	ND	74.9	14	16	77.5	-	97	60-140
Carbon Disulfide	ND	85.3	0.11	0.80	80	-	107	60-140
Carbon Tetrachloride	ND	150	0.0065	1.6	160	-	94	60-140
Chlorobenzene	ND	120	0.060	1.2	117.5	-	103	60-140
Chloroethane	ND	72.3	0.12	0.65	67.5	-	107	60-140
Chloroform	ND	104	0.0085	1.2	122.5	-	85	60-140
Chloromethane	ND	48.2	0.065	0.50	52.5	-	92	60-140
Cyclohexane	ND	88.3	0.13	9.0	87.5	-	101	60-140
Dibromochloromethane	ND	217	0.0085	2.2	217.5	-	100	60-140
1,2-Dibromo-3-chloropropane	ND	298	0.012	0.060	245	-	121	60-140
1,2-Dibromoethane (EDB)	ND	187	0.0060	2.0	195	-	96	60-140
1,2-Dichlorobenzene	ND	145	0.20	1.5	152.5	-	95	60-140
1,3-Dichlorobenzene	ND	144	0.16	1.5	152.5	-	94	60-140
1,4-Dichlorobenzene	0.0497,J	140	0.0075	1.5	152.5	-	92	60-140
Dichlorodifluoromethane	ND	116	0.12	1.2	125	-	93	60-140
1,1-Dichloroethane	ND	96.9	0.36	1.0	102.5	-	94	60-140
1,2-Dichloroethane (1,2-DCA)	ND	91.3	0.0030	1.0	102.5	-	89	60-140
1,1-Dichloroethene	ND	97.4	0.19	1.0	100	-	97	60-140
cis-1,2-Dichloroethene	ND	105	0.10	1.0	100	-	105	60-140
trans-1,2-Dichloroethene	ND	101	0.070	1.0	100	-	101	60-140
1,2-Dichloropropane	ND	116	0.0045	1.2	117.5	-	99	60-140
cis-1,3-Dichloropropene	ND	117	0.0035	1.2	115	-	102	60-140
trans-1,3-Dichloropropene	ND	115	0.23	1.2	115	-	100	60-140
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	174	0.18	1.8	177.5	-	98	60-140
Diisopropyl ether (DIPE)	ND	103	0.085	1.0	105	-	98	60-140
1,4-Dioxane	ND	90.8	0.0025	0.90	92.5	-	98	60-140

(Cont.)

 QA/QC Officer



## Quality Control Report


**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/6/16  
**Instrument:** GC29  
**Matrix:** SoilGas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119084  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119084

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Ethanol	ND	67.8	2.9	48	47.5	-	143, F2	60-140
Ethyl acetate	ND	88.3	0.075	0.90	92.5	-	95	60-140
Ethyl tert-butyl ether (ETBE)	ND	97.4	0.34	1.0	105	-	93	60-140
Ethylbenzene	ND	111	0.090	1.1	110	-	101	60-140
4-Ethyltoluene	ND	127	0.090	1.2	125	-	102	60-140
Freon 113	ND	187	0.16	2.0	195	-	96	60-140
Heptane	ND	104	0.075	10	105	-	99	60-140
Hexachlorobutadiene	ND	262	0.19	2.7	270	-	97	60-140
Hexane	ND	101	0.12	9.0	90	-	112	60-140
2-Hexanone	ND	117	0.085	1.0	105	-	112	60-140
4-Methyl-2-pentanone (MIBK)	ND	102	0.10	1.0	105	-	97	60-140
Methyl-t-butyl ether (MTBE)	ND	85.7	0.21	0.90	92.5	-	93	60-140
Methylene chloride	ND	87.0	0.16	4.4	87.5	-	99	60-140
Methyl methacrylate	ND	109	0.10	1.0	104	-	105	60-140
Naphthalene	0.280,J	300	0.022	2.6	265	-	113	60-140
Propene	ND	40.2,J	4.4	44	42.5	-	95	60-140
Styrene	ND	110	0.085	1.1	107.5	-	103	60-140
1,1,1,2-Tetrachloroethane	ND	173	0.0050	1.8	175	-	99	60-140
1,1,2,2-Tetrachloroethane	ND	205	0.016	1.8	175	-	117	60-140
Tetrachloroethene	0.0163,J	168	0.0070	1.7	172	-	98	60-140
Tetrahydrofuran	0.631,J	73.7	0.080	1.5	75	-	98	60-140
Toluene	ND	96.8	0.075	0.95	95	-	102	60-140
1,2,4-Trichlorobenzene	ND	214	0.22	1.9	187.5	-	114	60-140
1,1,1-Trichloroethane	ND	126	0.25	1.4	137.5	-	91	60-140
1,1,2-Trichloroethane	ND	134	0.0070	1.4	137.5	-	97	60-140
Trichloroethene	ND	122	0.014	1.4	137.5	-	88	60-140
Trichlorofluoromethane	ND	134	0.17	1.4	142.5	-	94	60-140
1,2,4-Trimethylbenzene	ND	128	0.11	1.2	125	-	102	60-140
1,3,5-Trimethylbenzene	ND	138	0.15	1.2	125	-	110	60-140
Vinyl Acetate	ND	101	0.30	9.0	90	-	112	60-140
Vinyl Chloride	ND	67.2	0.0040	0.65	65	-	103	60-140
Xylenes, Total	ND	332	0.20	3.3	330	-	101	60-140

(Cont.)

 QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/6/16  
**Date Analyzed:** 4/6/16  
**Instrument:** GC29  
**Matrix:** SoilGas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119084  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119084

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
<b>Surrogate Recovery</b>								
1,2-DCA-d4	429	414			500	86	83	70-130
Toluene-d8	504	481			500	101	96	70-130
4-BFB	463	461			500	93	92	70-130

QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/11/16  
**Date Analyzed:** 4/11/16  
**Instrument:** GC37  
**Matrix:** Sorbent Tube  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119417  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119417

### QC Summary Report for TO17

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	11,000	1000	10000	-	110	60-140
<b>Surrogate Recovery</b>							
4-BFB	101	92.3		100	101	92	60-140

QA/QC Officer



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 4/11/16  
**Date Analyzed:** 4/11/16  
**Instrument:** GC37  
**Matrix:** Sorbent Tube  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1604039  
**BatchID:** 119417  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB/LCS-119417

### QC Summary Report for TO17

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Naphthalene	ND	4.27	2.7	5	-	85	60-140
<b>Surrogate Recovery</b>							
4-BFB	105	101		100	105	101	60-140

QA/QC Officer



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



# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1604039

ClientCode: SESB

QuoteID: 5798

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  EQUIS   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

**Report to:**  
 Henry Pietropaoli  
 Stellar Environmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 510-644-3123    FAX: 510-644-3859

Email: hpietropaoli@stellar-environmental.com; r  
 cc/3rd Party:  
 PO:  
 ProjectNo: 2015-16; Residential UST

**Bill to:**  
 Accounts Payable  
 Stellar Enviornmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 lwheeler@stellar-environmental.com

**Requested TAT: 5 days;**  
  
**Date Received: 04/01/2016**  
**Date Logged: 04/01/2016**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)											
					1	2	3	4	5	6	7	8	9	10	11	12
1604039-001	SG5.5	SoilGas	3/31/2016 10:25	<input type="checkbox"/>	A	A	A	A		A	A		A			
1604039-002	SG5.5s	SoilGas	3/31/2016 10:50	<input type="checkbox"/>	A									A		
1604039-003	SG5.5sd	SoilGas	3/31/2016 11:15	<input type="checkbox"/>	A									A		
1604039-004	IA 1	Soil	4/1/2016 8:30	<input type="checkbox"/>					A			A				
1604039-005	IA 2	Soil	4/1/2016 8:30	<input type="checkbox"/>					A			A				
1604039-006	OA 1	Soil	4/1/2016 8:30	<input type="checkbox"/>					A			A				

**Test Legend:**

1	HELIUM_LC_SOILGAS(%)	2	LG_SUMMA_SOILGAS	3	PREFD REPORT	4	PRHELIUM SHROUD
5	TO15_SCAN-SIM_Indoor(ug/m3)	6	TO15_Scan-SIM_SOIL(UG/M3)	7	TO15-8260_SOIL(UG/M3)	8	TO15GAS_SCAN-SIM_INDOOR(UG/M3)
9	TO15GAS_Scan-SIM_SOIL(UG/M3)	10	TO17_ST(UG/M3)	11		12	

Prepared by: Jena Alfaro

The following SamplIDs: 001A, 002A, 003A, 004A, 005A, 006A contain testgroup.

**Comments:**

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



## WORK ORDER SUMMARY

**Client Name:** STELLAR ENVIRONMENTAL SOLUTIONS

**QC Level:**

**Work Order:** 1604039

**Project:** 2015-16; Residential UST

**Client Contact:** Henry Pietropaoli

**Date Logged:** 4/1/2016

**Comments:**

**Contact's Email:** hpietropaoli@stellar-environmental.com;  
 rmakdisi@stellar-

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  Fax   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1604039-001A	SG5.5	SoilGas	ASTM D1946-90 (Light Gases) <Methane_4, Oxygen> TO15 + Gas w/ Helium	1	1L Summa	<input type="checkbox"/>	3/31/2016 10:25	5 days		<input type="checkbox"/>	
1604039-002A	SG5.5s	SoilGas	TO17 with Helium as a Leak Check	1	Sorbent Tube	<input type="checkbox"/>	3/31/2016 10:50	5 days		<input type="checkbox"/>	
1604039-002B	SG5.5s	SoilGas		1	1L Summa	<input type="checkbox"/>	3/31/2016 10:50			<input type="checkbox"/>	
1604039-003A	SG5.5sd	SoilGas	TO17 with Helium as a Leak Check	1	Sorbent Tube	<input type="checkbox"/>	3/31/2016 11:15	5 days		<input type="checkbox"/>	
1604039-003B	SG5.5sd	SoilGas		1	1L Summa	<input type="checkbox"/>	3/31/2016 11:15			<input type="checkbox"/>	
1604039-004A	IA 1	Soil	TO15 + TPHgas for Indoor Air	1	6L Summa	<input type="checkbox"/>	4/1/2016 8:30	5 days		<input type="checkbox"/>	
1604039-005A	IA 2	Soil	TO15 + TPHgas for Indoor Air	1	6L Summa	<input type="checkbox"/>	4/1/2016 8:30	5 days		<input type="checkbox"/>	
1604039-006A	OA 1	Soil	TO15 + TPHgas for Indoor Air	1	6L Summa	<input type="checkbox"/>	4/1/2016 8:30	5 days		<input type="checkbox"/>	

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

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



# McC Campbell Analytical, Inc.

1534 Willow Pass Rd. / Pittsburg, Ca. 94565-1701  
 www.mcccampbell.com / main@mcccampbell.com  
 Telephone: (877) 252-9262 / Fax: (925) 252-9269

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH  1 Day  2 Day  3 Day  5 DAY   
 GeoTracker EDF  PDF  EDD  EQuIS  10 DAY   
 UST Clean Up Fund Project  Claim #

1604039

Report To: *H. Pietropoli* Bill To: *R*  
 Company: *Stellar Environmental Solutions Inc*  
*2198 Sixth St Berkeley, CA 94710*  
*hpietropoli@stellar-environmental.com*  
 Tele: (510) 644 3123 Fax: (510) 644 3859  
 Project #: *2015-16* Project Name: *Residential UST*  
 Project Location: *811 Paramount Rd Oakland, CA*  
 Sampler Signature: *Hes Prober*

### Analysis Requested

Helium Shroud SN# *A0239935*

Other:  
 Notes: Please Specify units if different than defaults VOCs is ug/m3 and fixed gas is uL/L. Leak check default is IPA.

*He Shroud 22-28%*

Field Sample ID (Location)	Collection		Canister SN# <i>or Sorbent tube</i>	Sampler Kit SN#
	Date	Time		
SG5.5	<i>3/31/16</i>	<i>1025</i>	<i>J1984</i>	<i>man316T317</i>
SG5.5s	<i>↓</i>	<i>1050</i>	<i>G-0148915</i>	<i>man316T998</i>
SG5.5s	<i>↓</i>	<i>1050</i>	<i>G311</i>	<i>↓</i>
SG5.5s	<i>↓</i>	<i>1115</i>	<i>G-0148180</i>	<i>↓</i>
SG5.5sd	<i>↓</i>	<i>1115</i>	<i>J1919</i>	<i>↓</i>
<del>IA 1</del>	<del>4/1/16</del>	<del>0830</del>	<del>4782</del>	<del>GL</del>
<del>IA 2</del>	<del>↓</del>	<del>0830</del>	<del>7788</del>	<del>↓</del>
<del>OA 1</del>	<del>↓</del>	<del>083</del>	<del>2734</del>	<del>↓</del>

VOCs by TO-15 (ug/m3)	8010 by TO-15 (ug/m3)	TPH(g) (ug/m3)	LEED (inc. 4PCH, Formaldehyde, CO, Total VOCs)	Fixed Gas: CO2, Methane, Ethane, Ethylene, Acetylene, CO (please circle or indicate in notes) uL/L	Fixed Gas: O2, N2 (please circle) uL/L	Fixed Gas: Propane uL/L	Helium Leak Check (%)	Leak Check (IPA, Norflorane, 1,1-difluoroethane) ug/m3	APH: Aliphatic and/or Aromatic (please circle) ug/m3	Other: <i>TO17 diesel, naphthalene</i>
-----------------------	-----------------------	----------------	------------------------------------------------	----------------------------------------------------------------------------------------------------	----------------------------------------	-------------------------	-----------------------	--------------------------------------------------------	------------------------------------------------------	----------------------------------------

Matrix		Cannister Pressure/ Vacuum	
Soilgas	Indoor Air	Initial	Final
X	↓	<i>-30</i>	<i>-4</i>
X	↓	<i>50ml/min</i>	
X	↓	<i>-28.5</i>	<i>-3.5</i>
X	↓	<i>50 ml/min</i>	
X	↓	<i>-28</i>	<i>-0.5</i>
X	X	<i>-30</i>	<i>-3.5</i>
X	X	<i>-30</i>	<i>-0.5</i>
X	X	<i>-30</i>	<i>-3.0</i>

Relinquished By: *Hes Prober* Date: *4/1/16* Time: *1340* Received By: *[Signature]*  
 Relinquished By: *[Signature]* Date: *4/1/16* Time: *1650* Received By: *[Signature]*  
 Relinquished By: *[Signature]* Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

Temp (°C) : \_\_\_\_\_ Work Order #: \_\_\_\_\_  
 Condition: \_\_\_\_\_  
 Custody Seals Intact?: Yes \_\_\_\_\_ No \_\_\_\_\_ None \_\_\_\_\_  
 Shipped Via: *Courier*

★ meet Residential ESLs, see quote #5798



### Sample Receipt Checklist

Client Name: **Stellar Environmental Solutions**  
 Project Name: **2015-16; Residential UST**  
 WorkOrder No: **1604039** Matrix: Soil/SoilGas  
 Carrier: Client Drop-In

Date and Time Received: **4/1/2016 16:50**  
 Date Logged: **4/1/2016**  
 Received by: **Jena Alfaro**  
 Logged by: **Jena Alfaro**

**Chain of Custody (COC) Information**

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

**Sample Receipt Information**

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

**Sample Preservation and Hold Time (HT) Information**

All samples received within holding time? Yes  No   
 Sample/Temp Blank temperature Temp: 3.5°C NA   
 Water - VOA vials have zero headspace / no bubbles? Yes  No  NA   
 Sample labels checked for correct preservation? Yes  No   
 pH acceptable upon receipt (Metal: <2; 522: <4; 218.7: >8)? Yes  No  NA   
 Samples Received on Ice? Yes  No

(Ice Type: WET ICE )

**UCMR3 Samples:**

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

\* NOTE: If the "No" box is checked, see comments below.

-----

Comments: ST's Received on ICE.





**McCAMPBELL ANALYTICAL INC.**

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701

Telephone : 925-252-9262 Fax : 925-252-9269

[www.mccampbell.com](http://www.mccampbell.com) : [main@mccampbell.com](mailto:main@mccampbell.com)

**MCCAMPBELL ANALYTICAL INC. LABORATORY  
NONCONFORMANCE/CORRECTIVE ACTION/PREVENTATIVE ACTION  
REPORT (NC/CAR/PR)**

**Identification**

Originator	Jennifer	Analytical Area: VOC/TO15	Date: 4-22-16	NCR # 16-28
------------	----------	---------------------------	---------------	-------------

**Nonconformance/Preventative Action Description** (Describe the nonconformance; ensure the applicable requirements, planned activities, procedures, specifications, drawing, standards, serial numbers, etc. are noted.)

On 4-18-16, client questioned why the analysis collected in the sample in April 2016 report was positive for PCE and negative for 112 TCA that was detected in Sept 2015 and whether this could be a mix up.

The chemists evaluated the two samples in question. Unfortunately we found that compound 1,1,2 Trichloroethane was indeed miss-identified in sample SG6sa (1509a12-003A). The chemist said that the chromatogram is cluttered. He also confirmed that this peak is neither PCE nor any other compound in our NIST Library.

**Corrective/Preventive Action and Root Cause**

**Corrective/Preventative Action and Root Cause** (Describe for each cause what action(s) will be taken with the item or process, including as applicable, the completion dates, disposition of material, and responsible staff for each action. Describe, as applicable, what actions are needed to prevent recurrence of the identified nonconformance, such as process improvement, procedure revision, training plan, etc.)

The client questioned the results from work order 1509A12 on 4-18-16 in response to the data from work order 1604039 not matching up with historical data. The compound in question was 1,1,2- Trichloroethane. Originally 4300 ug/M3 was reported in sample 1509A12-003A. After a careful re-evaluation of the analytical run the TO15 analysts have confirmed that this compound was mis-identified. The compound was mis-identified due to the presence of ions 97 and 83. The ratio of these qualifying ions was not an acceptable match to that of 1,1,2-Trichloroethane and was initially overlooked. Moving forward to ensure this does not happen again, the comparative ion spectrum will be updated. Chemists have been made aware of this issue and will be required to have a second opinion when the spectrums are questionable or co-elution is suspected.

**Closing the Nonconformance**

<b>Action Completed</b>	<b>Client was notified</b> <input checked="" type="checkbox"/>	<b>Quality Assurance Verification Completed</b>
Angela Rydelius	04/28/16	Theresa Johnson
<i>Name Laboratory Manager</i>	<i>Date</i>	4/28/2016
		<i>Name QA Dept. Date</i>



**McGAMPBELL ANALYTICAL INC.**

"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701

Telephone : 925-252-9262 Fax : 925-252-9269

[www.mccampbell.com](http://www.mccampbell.com) : [main@mccampbell.com](mailto:main@mccampbell.com)

## FOLLOW UP TO CORRECTIVE ACTION

DATE: 4/28/2016

NCR # 16- 28

**Results of the follow up:** Training was provided to the VOC department to ensure all analysts understand the importance of questioning the spectrums when they appear suspect. A second reviewer will help the process of not misidentification of analytes.

QA will provide a follow up in 2 weeks (by 5/13/2016) to see if there has been a reoccurrence of the issue.  
-Theresa Johnson 4/28/2016

**Results of any additional follow up:**

### Closing the Nonconformance

**If the result of the follow up requires further corrective action, an additional NC/CAR/PR form needs to be initiated.**

**Quality Assurance Verification Completed**

Theresa Johnson

*Name*

*QA Dept*

*Date*



# McC Campbell Analytical, Inc.

"When Quality Counts"

## Analytical Report

**WorkOrder:** 1509A12 **Amended:** 04/20/2016

**Report Created for:** Stellar Environmental Solutions

2198 Sixth St. #201  
Berkeley, CA 94710

**Project Contact:** Henry Pietropaoli

**Project P.O.:**

**Project Name:** 2015-16; Residential UST

**Project Received:** 09/24/2015

Analytical Report reviewed & approved for release on 10/07/2015 by:

Angela Rydelius,  
Laboratory Manager

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





## Glossary of Terms & Qualifier Definitions

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST  
**WorkOrder:** 1509A12

### Glossary Abbreviation

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





## **Glossary of Terms & Qualifier Definitions**

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST  
**WorkOrder:** 1509A12

### **Analytical Qualifiers**

B analyte detected in the associated Method Blank and in the sample  
J Result is less than the RL/ML but greater than the MDL. The reported concentration is an estimated value.  
S spike recovery outside accepted recovery limits  
c2 surrogate recovery outside of the control limits due to matrix interference.  
c9 Internal standard is out of acceptance criteria due to matrix interference therefore values are estimated  
j1 see attached narrative



## Case Narrative

**Client:** Stellar Environmental Solutions  
**Project:** 2015-16; Residential UST

**Work Order:** 1509A12  
October 07, 2015

### TO-15 ANALYSIS

All summa canisters are EVACUATED 5 days after the reporting of the results. Please call or email if a longer retention time is required.

In an effort to attain the lowest reporting limits possible for the majority of the TO-15 target list, high level compounds may be analyzed using EPA Method 8260B.

Polymer (Tedlar) bags are not recommended for TO15 samples. The disadvantages are listed in Appendix B of the DTSC Advisory of April 2012.

### TO-17 ANALYSIS

10/2/15 TO-17 GC-37

Samples: SG6S (1509A12-001A) and SG6SD (1509A12-002A)

Due to the high organic content observed in the samples, a quantification of the internal standards was unobtainable. The quantitated TPH-diesel and naphthalene concentrations are calculated using a modified TO-17 analytical procedure which includes an external calibration. The TPH-diesel and naphthalene results are estimated. The quantitated results for diesel exceeded the upper range of the calibration. It is noted that the majority of the calculated TPH-diesel concentration is derived from an observed, lighter eluting TPH-gas range pattern from C5 through C15 of branched and unbranched alkanes.



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 9/28/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** %

### Helium

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6S	1509A12-001B	SoilGas	09/23/2015 11:00	GC26	111042

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.42	24.74	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	ND	0.050	1	09/28/2015 18:32

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SD	1509A12-002B	SoilGas	09/23/2015 11:00	GC26	111042

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
13.56	27.05	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	ND	0.050	1	09/28/2015 18:45

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SA	1509A12-003A	SoilGas	09/23/2015 11:30	GC26	111042

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.46	24.83	AK

Analytes	Result	RL	DF	Date Analyzed
Helium	ND	0.050	1	09/28/2015 18:58



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 10/7/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/m<sup>3</sup>

### TPH gas by P&T and GC/MS in µg/m<sup>3</sup>

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SA	1509A12-003A	SoilGas	09/23/2015 11:30	GC18	111206

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.46	24.83	KBO

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	<b>2,000,000</b>	100,000	2	10/07/2015 16:41
Surrogates	REC (%)	Limits		Date Analyzed
Dibromofluoromethane	110	70-130		10/07/2015 16:41



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 10/7/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SA	1509A12-003A	SoilGas	09/23/2015 11:30	GC24	111201

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.46	24.83	GM

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Acetone	ND		1300	6000	100	10/07/2015 09:09
Acrolein	ND		120	580	100	10/07/2015 09:09
Acrylonitrile	ND		29	110	100	10/07/2015 09:09
tert-Amyl methyl ether (TAME)	ND		76	210	100	10/07/2015 09:09
Benzene	<b>600</b>		29	160	100	10/07/2015 09:09
Benzyl chloride	ND		41	260	100	10/07/2015 09:09
Bromodichloromethane	ND		9.8	350	100	10/07/2015 09:09
Bromoform	ND		79	520	100	10/07/2015 09:09
Bromomethane	ND		30	200	100	10/07/2015 09:09
1,3-Butadiene	ND		47	110	100	10/07/2015 09:09
2-Butanone (MEK)	<b>1800</b>	J	480	7500	100	10/07/2015 09:09
t-Butyl alcohol (TBA)	ND		1700	3100	100	10/07/2015 09:09
Carbon Disulfide	ND		32	160	100	10/07/2015 09:09
Carbon Tetrachloride	ND		51	320	100	10/07/2015 09:09
Chlorobenzene	ND		40	240	100	10/07/2015 09:09
Chloroethane	ND		35	130	100	10/07/2015 09:09
Chloroform	ND		41	240	100	10/07/2015 09:09
Chloromethane	ND		20	100	100	10/07/2015 09:09
Cyclohexane	<b>24,000</b>		510	1800	100	10/07/2015 09:09
Dibromochloromethane	ND		66	440	100	10/07/2015 09:09
1,2-Dibromo-3-chloropropane	ND		4.9	12	100	10/07/2015 09:09
1,2-Dibromoethane (EDB)	ND		56	390	100	10/07/2015 09:09
1,2-Dichlorobenzene	ND		79	300	100	10/07/2015 09:09
1,3-Dichlorobenzene	ND		61	300	100	10/07/2015 09:09
1,4-Dichlorobenzene	ND		62	300	100	10/07/2015 09:09
Dichlorodifluoromethane	ND		44	250	100	10/07/2015 09:09
1,1-Dichloroethane	ND		34	200	100	10/07/2015 09:09
1,2-Dichloroethane (1,2-DCA)	ND		6.2	200	100	10/07/2015 09:09
1,1-Dichloroethene	ND		40	200	100	10/07/2015 09:09
cis-1,2-Dichloroethene	ND		28	200	100	10/07/2015 09:09
trans-1,2-Dichloroethene	ND		35	200	100	10/07/2015 09:09
1,2-Dichloropropane	ND		6.6	240	100	10/07/2015 09:09
cis-1,3-Dichloropropene	ND		1.4	230	100	10/07/2015 09:09
trans-1,3-Dichloropropene	ND		26	230	100	10/07/2015 09:09

(Cont.)

Angela Rydelius, Lab Manager



# Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 10/7/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m³

## Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SA	1509A12-003A	SoilGas	09/23/2015 11:30	GC24	111201

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.46	24.83	GM

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND		60	360	100	10/07/2015 09:09
Diisopropyl ether (DIPE)	ND		34	210	100	10/07/2015 09:09
1,4-Dioxane	ND		4.2	180	100	10/07/2015 09:09
Ethanol	ND		580	9600	100	10/07/2015 09:09
Ethyl acetate	ND		29	180	100	10/07/2015 09:09
Ethyl tert-butyl ether (ETBE)	ND		34	210	100	10/07/2015 09:09
Ethylbenzene	340		38	220	100	10/07/2015 09:09
4-Ethyltoluene	130	J	50	250	100	10/07/2015 09:09
Freon 113	ND		70	390	100	10/07/2015 09:09
Heptane	11,000		610	2100	100	10/07/2015 09:09
Hexachlorobutadiene	ND		28	540	100	10/07/2015 09:09
Hexane	4600		540	1800	100	10/07/2015 09:09
2-Hexanone	ND		42	210	100	10/07/2015 09:09
4-Methyl-2-pentanone (MIBK)	170	J	39	210	100	10/07/2015 09:09
Methyl-t-butyl ether (MTBE)	ND		33	180	100	10/07/2015 09:09
Methylene chloride	110	JB	44	880	100	10/07/2015 09:09
Methyl methacrylate	ND		42	210	100	10/07/2015 09:09
Naphthalene	ND		43	530	100	10/07/2015 09:09
Propene	ND		310	8800	100	10/07/2015 09:09
Styrene	ND		25	220	100	10/07/2015 09:09
1,1,1,2-Tetrachloroethane	ND		59	350	100	10/07/2015 09:09
1,1,2,2-Tetrachloroethane	ND		57	350	100	10/07/2015 09:09
Tetrachloroethene	ND		55	340	100	10/07/2015 09:09
Tetrahydrofuran	ND		43	300	100	10/07/2015 09:09
Toluene	94	J	22	190	100	10/07/2015 09:09
1,2,4-Trichlorobenzene	ND		90	380	100	10/07/2015 09:09
1,1,1-Trichloroethane	ND		47	280	100	10/07/2015 09:09
1,1,2-Trichloroethane	ND		12	280	100	10/07/2015 09:09
Trichloroethene	ND		47	280	100	10/07/2015 09:09
Trichlorofluoromethane	ND		80	280	100	10/07/2015 09:09
1,2,4-Trimethylbenzene	130	J	49	250	100	10/07/2015 09:09
1,3,5-Trimethylbenzene	150	J	42	250	100	10/07/2015 09:09
Vinyl Acetate	ND		11	1800	100	10/07/2015 09:09
Vinyl Chloride	ND		3.9	130	100	10/07/2015 09:09

(Cont.)

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 10/7/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SA	1509A12-003A	SoilGas	09/23/2015 11:30	GC24	111201

Initial Pressure (psia)	Final Pressure (psia)	Analyst(s)
12.46	24.83	GM

Analytes	Result	Qualifiers	MDL	RL	DF	Date Analyzed
Xylenes, Total	420	J	45	660	100	10/07/2015 09:09
Surrogates	REC (%)			Limits		
1,2-DCA-d4	88			70-130	10/07/2015 09:09	
Toluene-d8	102			70-130	10/07/2015 09:09	
4-BFB	118			70-130	10/07/2015 09:09	

 Angela Rydelius, Lab Manager



## Analytical Report

**Client:** Stellar Environmental Solutions  
**Date Received:** 9/24/15 15:50  
**Date Prepared:** 10/2/15-10/3/15  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** µg/m<sup>3</sup>

### Volatile Organic Compounds in µg/m<sup>3</sup>

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6S	1509A12-001A	SoilGas	09/23/2015 11:00	GC37	111095

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	240,000	1100	1	10/02/2015 20:57
Naphthalene	ND	3.0	1	10/02/2015 20:57

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
4-BFB	0	S	70-130	10/02/2015 20:57

Analyst(s): KBO

Analytical Comments: c9,c2,j1

Client ID	Lab ID	Matrix	Date Collected	Instrument	Batch ID
SG6SD	1509A12-002A	SoilGas	09/23/2015 11:00	GC37	111095

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	230,000	1100	1	10/03/2015 01:01
Naphthalene	ND	3.0	1	10/03/2015 01:01

Surrogates	REC (%)	Qualifiers	Limits	Date Analyzed
4-BFB	0	S	70-130	10/03/2015 01:01

Analyst(s): KBO

Analytical Comments: c9,c2,j1





## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 9/28/15  
**Date Analyzed:** 9/28/15  
**Instrument:** GC26  
**Matrix:** Soilgas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**BatchID:** 111042  
**Extraction Method:** ASTM D 1946-90  
**Analytical Method:** ASTM D 1946-90  
**Unit:** %  
**Sample ID:** MB/LCS-111042

---

### QC Summary Report for ASTM D1946-90

---

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Helium	ND	0.0791	0.025	0.10	-	79	60-140

---



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 10/7/15  
**Date Analyzed:** 10/7/15  
**Instrument:** GC18  
**Matrix:** Soilgas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**BatchID:** 111206  
**Extraction Method:** SW5030B  
**Analytical Method:** SW8260B  
**Unit:** µg/m<sup>3</sup>  
**Sample ID:** MB-111206

### QC SUMMARY REPORT FOR SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(g)	ND	-	25,000	-	-	-	-
<b>Surrogate Recovery</b>							
Dibromofluoromethane	14,200	-		12500	114	-	-



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 10/6/15  
**Date Analyzed:** 10/6/15  
**Instrument:** GC24  
**Matrix:** Soilgas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**BatchID:** 111201  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** nL/L  
**Sample ID:** MB/LCS-111201

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	2.8	12	-	-	-	-
Acrolein	ND	26.1	0.25	1.2	25	-	104	60-140
Acrylonitrile	ND	28.4	0.065	0.25	25	-	114	60-140
tert-Amyl methyl ether (TAME)	0.182,J	27.6	0.090	0.25	25	-	110	60-140
Benzene	ND	25.6	0.046	0.25	25	-	102	60-140
Benzyl chloride	ND	29.0	0.038	0.25	25	-	116	60-140
Bromodichloromethane	ND	24.4	0.0070	0.25	25	-	98	60-140
Bromoform	ND	27.7	0.038	0.25	25	-	111	60-140
Bromomethane	ND	30.4	0.0075	0.25	25	-	122	60-140
1,3-Butadiene	ND	26.8	0.10	0.25	25	-	107	60-140
2-Butanone (MEK)	ND	-	0.80	12	-	-	-	-
t-Butyl alcohol (TBA)	ND	25.5	2.7	5.0	25	-	102	60-140
Carbon Disulfide	ND	26.9	0.050	0.25	25	-	107	60-140
Carbon Tetrachloride	ND	25.9	0.040	0.25	25	-	104	60-140
Chlorobenzene	ND	26.0	0.043	0.25	25	-	104	60-140
Chloroethane	ND	27.6	0.065	0.25	25	-	110	60-140
Chloroform	ND	21.6	0.042	0.25	25	-	86	60-140
Chloromethane	ND	24.0	0.048	0.25	25	-	96	60-140
Cyclohexane	ND	25.1	0.75	2.5	25	-	100	60-140
Dibromochloromethane	ND	25.5	0.038	0.25	25	-	102	60-140
1,2-Dibromo-3-chloropropane	ND	23.7	0.0025	0.0060	25	-	95	60-140
1,2-Dibromoethane (EDB)	ND	24.8	0.036	0.25	25	-	99	60-140
1,2-Dichlorobenzene	ND	25.9	0.065	0.25	25	-	104	60-140
1,3-Dichlorobenzene	ND	25.6	0.050	0.25	25	-	103	60-140
1,4-Dichlorobenzene	ND	24.2	0.050	0.25	25	-	97	60-140
Dichlorodifluoromethane	ND	24.6	0.044	0.25	25	-	98	60-140
1,1-Dichloroethane	ND	25.0	0.042	0.25	25	-	100	60-140
1,2-Dichloroethane (1,2-DCA)	ND	22.4	0.0075	0.25	25	-	90	60-140
1,1-Dichloroethene	ND	25.4	0.050	0.25	25	-	102	60-140
cis-1,2-Dichloroethene	ND	24.6	0.034	0.25	25	-	98	60-140
trans-1,2-Dichloroethene	ND	26.1	0.044	0.25	25	-	104	60-140
1,2-Dichloropropane	ND	24.0	0.0070	0.25	25	-	96	60-140
cis-1,3-Dichloropropene	0.0122,J	27.0	0.0015	0.25	25	-	108	60-140
trans-1,3-Dichloropropene	ND	27.2	0.028	0.25	25	-	109	60-140
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	24.7	0.042	0.25	25	-	99	60-140
Diisopropyl ether (DIPE)	ND	25.4	0.040	0.25	25	-	102	60-140
1,4-Dioxane	ND	27.0	0.0055	0.25	25	-	108	60-140
Ethanol	0.255,J	-	0.019	25	-	-	-	-

(Cont.)



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 10/6/15  
**Date Analyzed:** 10/6/15  
**Instrument:** GC24  
**Matrix:** Soilgas  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**BatchID:** 111201  
**Extraction Method:** TO15  
**Analytical Method:** TO15  
**Unit:** nL/L  
**Sample ID:** MB/LCS-111201

### QC Summary Report for TO15

Analyte	MB Result	LCS Result	MDL	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Ethyl acetate	ND	27.2	0.039	0.25	25	-	109	60-140
Ethyl tert-butyl ether (ETBE)	ND	25.5	0.040	0.25	25	-	102	60-140
Ethylbenzene	ND	26.0	0.043	0.25	25	-	104	60-140
4-Ethyltoluene	ND	26.7	0.050	0.25	25	-	107	60-140
Freon 113	ND	24.7	0.045	0.25	25	-	99	60-140
Heptane	ND	27.6	0.75	2.5	25	-	110	60-140
Hexachlorobutadiene	ND	24.6	0.013	0.25	25	-	98	60-140
Hexane	ND	24.7	0.75	2.5	25	-	99	60-140
2-Hexanone	ND	24.2	0.050	0.25	25	-	97	60-140
4-Methyl-2-pentanone (MIBK)	ND	30.1	0.046	0.25	25	-	121	60-140
Methyl-t-butyl ether (MTBE)	ND	25.4	0.044	0.25	25	-	101	60-140
Methylene chloride	0.317,J	23.3	0.065	1.2	25	-	92	60-140
Methyl methacrylate	ND	31.3	0.25	0.25	25	-	125	60-140
Naphthalene	ND	50.9	0.040	0.50	50	-	102	60-140
Propene	ND	-	0.90	25	-	-	-	-
Styrene	ND	27.4	0.030	0.25	25	-	109	60-140
1,1,1,2-Tetrachloroethane	ND	22.8	0.042	0.25	25	-	91	60-140
1,1,2,2-Tetrachloroethane	ND	24.2	0.040	0.25	25	-	97	60-140
Tetrachloroethene	ND	23.7	0.040	0.25	25	-	95	60-140
Tetrahydrofuran	ND	25.3	0.070	0.50	25	-	101	60-140
Toluene	ND	26.2	0.029	0.25	25	-	105	60-140
1,2,4-Trichlorobenzene	ND	26.8	0.060	0.25	25	-	107	60-140
1,1,1-Trichloroethane	ND	24.9	0.043	0.25	25	-	100	60-140
1,1,2-Trichloroethane	ND	25.5	0.011	0.10	25	-	102	60-140
Trichloroethene	ND	24.3	0.042	0.25	25	-	97	60-140
Trichlorofluoromethane	ND	25.6	0.070	0.25	25	-	103	60-140
1,2,4-Trimethylbenzene	ND	26.8	0.049	0.25	25	-	107	60-140
1,3,5-Trimethylbenzene	ND	25.7	0.042	0.25	25	-	103	60-140
Vinyl Acetate	ND	29.2	0.015	2.5	25	-	117	60-140
Vinyl Chloride	ND	25.8	0.0075	0.25	25	-	103	60-140
Xylenes, Total	ND	76.7	0.75	0.75	75	-	102	60-140

#### Surrogate Recovery

1,2-DCA-d4	452	414			500	91	83	70-130
Toluene-d8	492	513			500	98	103	70-130
4-BFB	477	481			500	95	96	70-130



## Quality Control Report

**Client:** Stellar Environmental Solutions  
**Date Prepared:** 10/2/15  
**Date Analyzed:** 10/2/15  
**Instrument:** GC37  
**Matrix:** Sorbent Tube  
**Project:** 2015-16; Residential UST

**WorkOrder:** 1509A12  
**BatchID:** 111095  
**Extraction Method:** TO17  
**Analytical Method:** TO17  
**Unit:** nL/L  
**Sample ID:** MB/LCS-111095

### QC Summary Report for TO17

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	6720	1000	8300	-	81	60-140
Naphthalene	ND	3.59	0.50	5	-	72	60-140
<b>Surrogate Recovery</b>							
4-BFB	114	59.8		100	114	60	60-140

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

# CHAIN-OF-CUSTODY RECORD

WorkOrder: 1509A12

ClientCode: SESB

WaterTrax   
  WriteOn   
  EDF   
  Excel   
  EQuIS   
  Email   
  HardCopy   
  ThirdParty   
  J-flag

**Report to:**  
 Henry Pietropaoli  
 Stellar Environmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 510-644-3123    FAX: 510-644-3859

**Email:** hpietropaoli@stellar-environmental.com; r  
 cc/3rd Party:  
**PO:**  
 ProjectNo: 2015-16; Residential UST

**Bill to:**  
 Accounts Payable  
 Stellar Enviornmental Solutions  
 2198 Sixth St. #201  
 Berkeley, CA 94710  
 lwheeler@stellar-environmental.com

**Requested TAT: 5 days;**  
  
**Date Received: 09/24/2015**  
**Date Printed: 09/29/2015**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below)												
					1	2	3	4	5	6	7	8	9	10	11	12	
1509A12-001	SG6S	SoilGas	9/23/2015 11:00	<input type="checkbox"/>	B	A	B							A			
1509A12-002	SG6SD	SoilGas	9/23/2015 11:00	<input type="checkbox"/>	B									A			
1509A12-003	SG6SA	SoilGas	9/23/2015 11:30	<input type="checkbox"/>	A			A	A	A	A	A					

**Test Legend:**

1	HELIUM_LC_SOILGAS(%)	2	PREFD REPORT	3	PRHESHROUDRENTAL	4	TO15_Scan-SIM_SOIL(UG/M3)
5	TO15-8260_SOIL(UG/M3)	6	TO15-8260GAS_SOIL(UG/M3)	7	TO158260SCANSIM_SOIL(UG/M3)	8	TO15GAS_Scan-SIM_SOIL(UG/M3)
9	TO17_ST(UG/M3)	10		11		12	

The following SampID: 003A contains testgroup.

**Prepared by: Jena Alfaro**

**Comments:**

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



## WORK ORDER SUMMARY

**Client Name:** STELLAR ENVIRONMENTAL SOLUTIONS

**QC Level:** LEVEL 2

**Work Order:** 1509A12

**Project:** 2015-16; Residential UST

**Client Contact:** Henry Pietropaoli

**Date Received:** 9/24/2015

**Comments:**

**Contact's Email:** hpietropaoli@stellar-environmental.com;  
 rmakdisi@stellar-

WaterTrax     WriteOn     EDF     Excel     Fax     Email     HardCopy     ThirdParty     J-flag

Lab ID	Client ID	Matrix	Test Name	Containers /Composites	Bottle & Preservative	De-chlorinated	Collection Date & Time	TAT	Sediment Content	Hold	SubOut
1509A12-001A	SG6S	SoilGas	TO17 (VOCs) (µg/m³) <Naphthalene, TPH-Diesel (C10-C23)>	1	Sorbent Tube	<input type="checkbox"/>	9/23/2015 11:00	5 days		<input type="checkbox"/>	
1509A12-001B	SG6S	SoilGas	ASTM D1946-90 (Helium)	1	1L Summa	<input type="checkbox"/>	9/23/2015 11:00	5 days		<input type="checkbox"/>	
1509A12-002A	SG6SD	SoilGas	TO17 (VOCs) (µg/m³) <Naphthalene, TPH-Diesel (C10-C23)>	1	Sorbent Tube	<input type="checkbox"/>	9/23/2015 11:00	5 days		<input type="checkbox"/>	
1509A12-002B	SG6SD	SoilGas	ASTM D1946-90 (Helium)	1	1L Summa	<input type="checkbox"/>	9/23/2015 11:00	5 days		<input type="checkbox"/>	
1509A12-003A	SG6SA	SoilGas	TO15 (Soil Gas by SW8260B SCANSIM) (µg/m³)	1	1L Summa	<input type="checkbox"/>	9/23/2015 11:30	5 days		<input type="checkbox"/>	
			TO15 (TPH-gas by SW8260B) (µg/m³)			<input type="checkbox"/>		5 days		<input type="checkbox"/>	
			TO15 + Gas w/ Helium			<input type="checkbox"/>		5 days		<input type="checkbox"/>	

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

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





# McC Campbell Analytical, Inc.

1534 Willow Pass Rd. / Pittsburg, Ca. 94565-1701  
www.mcccampbell.com / main@mcccampbell.com  
Telephone: (877) 252-9262 / Fax: (925) 252-9269

~~1509760~~  
1509A1

## CHAIN OF CUSTODY RECORD

TURN AROUND TIME: RUSH  1 Day  2 Day  3 Day  5 DAY   
GeoTracker EDF  PDF  EDD  EQUIS  10 DAY   
UST Clean Up Fund Project  Claim #

Report To: *H. Pletropoul.* Bill To: *Same*  
Company: *Stellar Environmental Solutions*  
*2198 Sixth* Berkeley  
*hpretropoul@stellar-environmental.com* E-Mail:  
Tele: (510) 644-3123 Fax: (510) 644-3859  
Project #: *2015-16* Project Name: *Residential US*  
Project Location: *811 Paramount Oakland*  
Sampler Signature: *Henry Pletropoul*

Analysis Requested

Helium Shroud SN#

Other:  
Notes: Please Specify units if different than defaults VOCs is ug/m3 and fixed gas is uL/L. Leak check default is ~~10~~ *Helium* *shroud ~ 25%-28%*  
*See Blake for Details*

Field Sample ID (Location)	Collection		Canister SN#	Sampler Kit SN#	VOCs by TO-15 (ug/m3)	8010 by TO-15 (ug/m3)	TPH(g) (ug/m3)	LEED (inc. 4PCH, Formaldehyde, CO, Total VOCs)	Fixed Gas: CO2, Methane, Ethane, Ethylene, Acetylene, CO (please circle or indicate in notes) uL/L	Fixed Gas: O2, N2 (please circle) uL/L	Fixed Gas: Propane uL/L	Helium Leak Check (%)	Leak Check (IPA, Norflorane, 1,1-difluoroethane) ug/m3	APH: Aliphatic and/or Aromatic (please circle) ug/m3	Other: <i>TO-17, TPH, Napthalene</i>	Matrix		Cannister Pressure/ Vacuum		
	Date	Time														Soilgas	Indoor Air	Initial	Final	
<i>SG 65</i>	<i>9/23/15</i>	<i>1100</i>	<i>6049933</i>	<i>3167-775</i>												X	X		<i>50 ml/min</i>	
<i>SG 65</i>			<i>51923</i>									X					X		<i>-30</i>	<i>-3.5</i>
<i>SG 65d</i>			<i>6014775</i>													X	X		<i>50 ml/min</i>	
<i>SG 65d</i>			<i>6310</i>									X					X		<i>-30</i>	<i>-3.5</i>
<i>SG 65A</i>		<i>1130</i>	<i>6174</i>	<i>3167-776</i>	X	X						X					X		<i>-30</i>	<i>-4</i>

Relinquished By: *Henry Pletropoul* Date: *9/24/15* Time: *1130* Received By: *[Signature]*

Relinquished By: *[Signature]* Date: *9/24/15* Time: *1150* Received By: *[Signature]*

Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

Temp (°C): \_\_\_\_\_ Work Order #: \_\_\_\_\_

Condition: \_\_\_\_\_

Custody Seals Intact?: Yes \_\_\_\_\_ No \_\_\_\_\_ None \_\_\_\_\_

Shipped Via: *courier*

Notes: Analyze TO15 by 8260 SIM/SCAN; *Star* RLs to meet residential ESLs *Star*  
- EDF needed. *Star* Refer. to McC Campbell sample 1506310-001A for potential





### Sample Receipt Checklist

Client Name: **Stellar Environmental Solutions** Date and Time Received: **9/24/2015 3:50:00 PM**  
 Project Name: **2015-16; Residential UST** LogIn Reviewed by: **Jena Alfaro**  
 WorkOrder No: **1509A12** Matrix: SoilGas Carrier: Bernie Cummins (MAI Courier)

**Chain of Custody (COC) Information**

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

**Sample Receipt Information**

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

**Sample Preservation and Hold Time (HT) Information**

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

(Ice Type: WET ICE )

**UCMR3 Samples:**

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

\* NOTE: If the "No" box is checked, see comments below.

-----  
 Comments: