

PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT

**NEIGHBORHOOD SEWER SYSTEMS IMPROVEMENTS
SUNSET & UNIVERSITY BOULEVARDS AND WESTHEIMER ROAD
HOUSTON, TEXAS**

WBS NO. R-002011-0065-4



PREPARED FOR:
AMANI ENGINEERING, INC.
HOUSTON, TEXAS

BY:
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HOUSTON, TEXAS

REPORT NO: E14-105
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June 30, 2014

AMANI ENGINEERING, INC.
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HOUSTON, TEXAS 77074

RE: PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT

NEIGHBORHOOD SEWER SYSTEMS IMPROVEMENTS
SUNSET BLVD., UNIVERSITY BLVD, AND WESTHEIMER ROAD
WBS No. R-002011-0065-4
HOUSTON, TEXAS
ATL REPORT NO.: E14-105

Mr. Dutta:

Associated Testing Laboratories (ATL) is pleased to submit the following Phase II ESA report for the above-mentioned project.

Thank you for considering ATL for this project. We appreciate the opportunity to conduct environmental service for this project and are looking forward to serving you again on future projects. The following provides a brief summary of the Phase II ESA results:

EXECUTIVE SUMMARY

ATL performed a Limited Phase II Environmental Site Assessment (ESA) for the Neighborhood Sewer Line Improvements in the Sunset Boulevard, University Boulevard and Westheimer Road project in Houston, Texas. Please refer to Figures Section for the location and site details. The following is reported:

- Twenty-one (21) environmental soil borings were completed to at seven (7) sites of Recognized Environmental Conditions (RECs). Soil samples were screened utilizing a MiniRAE Photo Ionization Detector (PID) instrument in the field. PID readings and visual inspection directed the submittal of soil samples and the sample with the greatest PID reading was submitted from each soil boring, and one soil sample was selected from each of the boring. In the event of no significant PID readings, default soil samples were collected from various representative depths and submitted for laboratory analyses. Soil samples were analyzed for total petroleum hydrocarbons (TPH) and methyl tert-butyl ether/benzene, toluene, ethyl-benzene and total xylenes (MTBE/BTEX).

- During the Phase II ESA, groundwater was not encountered in the soil borings SB-4 through SB-6 and SB-7 through SB-9, SB-10, and SB-19 through SB-21.
- Groundwater was encountered in soil borings SB-1 through SB-3, SB-11 and SB-12, SB-13 through SB-15 and SB-16 through SB-18 at varying depths below ground surface. Groundwater samples were collected and submitted for laboratory analyses from soil borings SB-2, SB-11, SB-13 and SB-16.

The following provides a summary of the soil and groundwater laboratory analytical results for the REC locations:

- Individual MTBE/BTEX constituents and TPH concentrations were below the sample detection limit at two (2) of seven (7) investigated REC locations.
- The REC locations with environmental conditions are as follows:
 - Shakespeare Street at Kirby Drive: Based on the soil laboratory analytical results, the Shakespeare Street REC location was reported to be below the sample detection limit or non-detect for MTBE/BTEX and TPH constituents. However, the REC location was reported to have a detection of 1.1 mg/L for TPH carbon range >C₁₂-C₂₈ in groundwater of SB-2/TWP-2. Groundwater is affected at the location. The area is a potentially petroleum contaminated area (PPCA).
 - Westheimer Road at South Post Oak Boulevard: Based on the laboratory analytical results, soil sample SB-16 at 14-16 feet bgs exceeds the TCEQ TRRP Total Soil Combined (^{Tot}Soil_{Comb}) TPH Protective Concentration Level (PCLs) for a 0.5-acre residential use and is a potential concern to construction workers. The detection limit for benzene and MTBE also were elevated for the samples, typically due to matrix interference. Other MTBE/BTEX exceedences were reported above the groundwater protective (^{GW}Soil_{Ing}) PCLs for this soil sample. Soil and groundwater are affected at the location. The area is a potentially petroleum contaminated area (PPCA).
 - Westheimer Road, east of US IH W. Loop 610 S.: Based on the soil laboratory analytical results, very minor toluene, ethyl-benzene and total xylene and TPH detections were reported. None of the concentrations exceed TCEQ PCLs, but the detections indicate special handling practices of the soil are necessary. Soil is affected at the location. The area is a potentially petroleum contaminated area (PPCA).
 - University Boulevard at Morningside Drive: Based on the soil laboratory analytical results, toluene, ethyl-benzene and total xylene detection were reported. One exceedence of a TCEQ TRRP (^{GW}Soil_{Ing}) TPH Protective Concentration Level (PCLs) for a 0.5-acre residential use was reported. Soil and groundwater are affected at the location. The area is a potentially petroleum contaminated area (PPCA).

- University Boulevard at Kirby Drive: Based on the soil laboratory analytical results, the REC location was reported to be below the sample detection limit or non-detect for MTBE/BTEX and TPH constituents. Based on the groundwater laboratory analytical results, groundwater is affected at the location. The area is a potentially petroleum contaminated area (PPCA).

RECOMMENDATIONS

ATL performed a Limited Phase II Environmental Site Assessment (ESA) for the Neighborhood Sewer Systems Improvements: Sunset Boulevard, University Boulevard and Westheimer Road project in Houston, Texas. Based on field observations and soil laboratory analytical results, the following is noted:

- Based on the lab data and PID readings at soil boring SB-10 (east end of University Blvd.) and SB-16 (Westheimer Road at S. Post Oak Boulevard), air monitoring is required at these two REC locations. Based on the Phase II ESA results, additional environmental investigation work is not warranted. Additionally, the following is reported for the REC locations:

Shakespeare Street at Kirby Drive

- Based on the soil laboratory analytical results, no MTBE/BTEX or TPH constituents were reported above the sample detection limit. However, the REC location was reported to have a detection of 1.1 mg/L for TPH carbon range >C₁₂-C₂₈ in groundwater of SB-2/TWP-2. Groundwater is affected at the location. Based on the groundwater laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special groundwater handling practices will be required at the REC location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project. Groundwater shall be contained, sampled, discharged or disposed as appropriate. Pertinent permits should be obtained related to discharge. Solvent resistant piping and gaskets is not required at the location.
 - The Station Nos. are from 1+00 to 3+00 (Shakespeare Street).

University Boulevard at Morningside Drive

- A TPH C₆-C₁₂ concentration was reported that exceed the TCEQ TRRP groundwater protective (^{GW}Soil_{ing}) PCLs for the soil sample at soil boring SB-10 at 12-14 feet. Low-level toluene, ethyl-benzene and total xylenes detections also were reported in the soil samples (SB-10, 11 & 12). Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Also, groundwater is hydrocarbon-affected at the REC location. Additionally, solvent resistant piping and gaskets will be required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.
 - The Station Nos. are from 9+25 to 12+50 (University Blvd.).

University Boulevard at Kirby Drive

- No TCEQ TRRP $TotSoil_{Comb}$ or TRRP groundwater protective ($^{GW}Soil_{Ing}$) PCL exceedences were reported for soil. However, low level detections for toluene, ethyl-benzene, total xylenes and two TPH carbon ranges were reported in the soil laboratory analytical results. Additionally, groundwater is hydrocarbon-affected at the REC location. Based on the soil and groundwater laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Groundwater shall be contained, sampled, discharged or disposed as appropriate. Additionally, solvent resistant piping and gaskets will be required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.
 - The Station Nos. are from 1+50 to 3+00 (University Blvd).

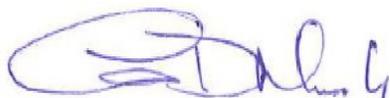
Westheimer Road and S. Post Oak Boulevard

- A TPH C_6-C_{12} concentration was reported that exceed the TCEQ TRRP $TotSoil_{Comb}$ PCL. Other TCEQ TRRP groundwater protective ($^{GW}Soil_{Ing}$) PCLs exceedence also were reported for soil sample SB-16 at 14-16 feet (2821 S. Post Oak Blvd.). Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Also, groundwater is a hydrocarbon affected at the REC location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project. Groundwater shall be contained, sampled, discharged or disposed as appropriate. Additionally, solvent resistant piping and gaskets will be required at the location.
 - The Station Nos. are from 1+75 to 4+25 (Westheimer Road).

Westheimer Road, east of US IH W. Loop 610 S.

- No significant detections were reported at this REC location and the soil sample analytical results do not exceed TCEQ TRRP $TotSoil_{Comb}$ PCLs or $^{GW}Soil_{Ing}$ PCLs. Very minor toluene, ethyl-benzene and total xylene and TPH detections were reported. Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Solvent resistant piping and gaskets are not required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.
 - The Station Nos. are from 9+25 to 12+50 (Westheimer Road).

Regards,



Tom Murphy
Environmental Project Manager
Attachment

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1.0 INTRODUCTION

Sewer lines are proposed to be replaced on select streets in the Rice Village and Galleria area and the project is identified as the Neighborhood Sewer Systems Improvements. The environmental evaluation of the sewer line replacement project includes: portions of Sunset Boulevard, Nottingham Street, University Boulevard and Westheimer Road in Houston, Texas. Phase II ESA activities occurred at seven locations along the proposed water line alignment. Location maps (Key Map©© and United States Geological Survey Topographic Map), FIGURE 1A and 1B identify the investigated areas (RECs) and are presented in Figures Section of this report.

2.0 SCOPE-OF-WORK

Associated Testing Laboratories (ATL) was retained by Amani Engineering, Inc. to evaluate whether the project alignment has been affected by several leaking petroleum storage tank (LPST) facilities, historical gas stations, Texas Voluntary Cleanup Program (TxVCP) facility and Texas Innocent Owner/Operator (TxIOP) listings at the project alignment and are as follows (REC locations):

1. TxVCP facility/site (2500 Shakespeare Street)
2. TxIOP, LPST facilities/sites (Nottingham Street at 5600 Blk. Kirby Dr.)
3. LPST facility/active gas station (5418 Kirby Driver at Sunset Blvd.)
4. LPST and historical gas stations (2403/2407 University Blvd.)
5. Historic gas station (2540 University Blvd.)
6. Former Exxon gas station/LPST facility (2821 S. Post Oak Blvd at Westheimer Rd.)
7. TxIOP site, Hotel Derek (2525 W. Loop S. at Westheimer Rd.)

Sampling and analyses was conducted to determine whether petroleum contamination is present at the REC locations. The following Phase II Assessment activities were performed:

- Conducted an investigation of facilities with the potential for environmental conditions as identified in a previously conducted Phase I ESA for the project alignment.
- Completed Texas Excavation Safety (Texas 811) notification.
- Soil sampling locations placed at equidistant locations to provide adequate coverage of the REC locations. Submitted soil samples for laboratory analytical testing based upon field observations (visual and olfactory) and field screening.
- Conducted continuous field screening of soil cores at 2.0-foot intervals utilizing a photo-ionization detector (PID) calibrated to 100 ppm isobutylene standard.

- Completed 21 soil borings at the project alignment.
- Submitted soil samples for laboratory analyses of methyl tert-butyl ether/benzene, toluene, ethyl-benzene and total xylenes (MTBE/BTEX) and total petroleum hydrocarbons (TPH).
- Converted 4 soil borings, SB-2, SB-11, SB-13 and SB-16 into temporary well points for the collection of groundwater. Submitted groundwater samples, TWP-2, TWP-11, TWP-13 and TWP-16 for laboratory analyses of methyl tert-butyl ether/benzene, toluene, ethyl-benzene and total xylenes (MTBE/BTEX) and total petroleum hydrocarbons (TPH).
- Detailed site assessment activities, reviewed laboratory analytical results and presented the results and conclusions in a Limited Phase II ESA investigation report.

3.0 PHASE II ASSESSMENT ACTIVITIES

On May 12th, 14th, 15th, and 18th, 2014, ATL completed twenty-one soil borings, SB-1 through SB-21 at select locations along the project alignment. The soil borings were completed to 20 feet below ground surface (bgs).

Soil borings were advanced utilizing a track-, tractor- and truck-mounted hydraulically-driven drilling rig with 4-foot stainless sleeves. Soil samples were continuously collected at 2-foot intervals and field screened utilizing a photo-ionization detector (PID). PID field screening ranged from non-detect (0.0 ppm) to 1,268 ppm. Geologic stratigraphy (lithology) and subsurface characteristics were recorded by the field geologist. FIGURES 2 through 4 provide investigated site details and soil boring locations. Soil boring logs are presented in APPENDIX A.

Prior to the initial soil boring and between each 4-foot advancement, all sampling devices were thoroughly cleaned and decontaminated using a hospital grade detergent, water and distilled water. Soil samples were obtained by personnel utilizing appropriate sampling tools and wearing clean, disposable gloves. Disposable nitrile gloves were changed between each sample collection. Two discrete (grab) samples were collected from each 2-foot interval of the soil borings. One sample was placed in a disposable bag for headspace screening. The second soil sample was placed in a separate 4-ounce sterile glass container equipped with a Teflon-lined lid furnished by the testing laboratory. Each container was filled to capacity with soil to limit the amount of headspace present. All samples were labeled in the field and stored at approximately 4°C prior to submission to A & B Laboratories in Houston, Texas for laboratory analyses. Chain-of-custody documentation accompanied the samples in accordance with standard quality assurance and quality control measures.

3.1 SOIL SAMPLING (2500 Shakespeare Street)

Three soil borings, SB-1, SB-2 and SB-3 were advanced in the

westbound lane or north side of Shakespeare Street, east of Kirby Drive. PID readings were non-detect (0.0 ppm) for the soil boring soil cores and default soil samples were collected and submitted for laboratory analyses. Groundwater was encountered at 14-15 feet bgs at this REC location. FIGURE 2 provides site details and soil boring locations.

A Texas Voluntary Cleanup listing was noted to be present at the western extent of the project area on Shakespeare Street, just east of Kirby Drive. The location of the TxVCP site is the northeast corner of Kirby Drive and Shakespeare Street. Three groundwater monitoring wells were observed at the location and the site is utilized for parking of Joseph A. Banks clothing store.

3.2 SOIL SAMPLING (West end of Nottingham Drive)

Three soil borings, SB-4, SB-5 and SB-6 were advanced in the eastbound lane (south side) of Nottingham Street, just east of Kirby Drive. PID readings were non-detect (0.0 ppm) for the soil boring soil cores. Default soil samples were collected and submitted for laboratory analyses. Groundwater was not encountered to 20 feet bgs at this REC location. FIGURE 3 provides site details and soil boring locations.

A Texas Innocent Owner/Operator (TxIOP) listing (2600 Block of Nottingham Street), LPST listing and historical gasoline services stations (5600 Block of Kirby Drive) were noted at, and west of this REC location.

3.3 SOIL SAMPLING (5415 Kirby Dr. at Sunset Blvd.)

Three soil borings, SB-7, SB-8 and SB-9 were advanced in the westbound lane (north side) of Sunset Drive, just east of Kirby Drive. PID readings were non-detect (0.0 ppm) for the soil boring soil cores. Default soil samples were collected from each soil boring and submitted for laboratory analytical testing. Groundwater was not encountered to 20 feet bgs at this REC location. FIGURE 3 provides site details and soil boring locations.

The REC location is an active gasoline service station, Valero Corner Store (5415 Kirby Drive). The site was a previously a Diamond Shamrock No. 2609 that has had an LPST event. Valero acquired select assets of Diamond Shamrock in a merger.

3.4 SOIL SAMPLING (East end of University Blvd.)

Three soil borings, SB-10, SB-11 and SB-12 were advanced in the eastbound lane (south side) of University to the west of Morningside Drive. PID readings ranged from non-detect (0.0 ppm) to 1,186 ppm. The highest PID readings (SB-10 & SB-12) and default soil samples (SB-11) were collected and submitted for laboratory analyses at this REC location.

Groundwater was encountered to 16 feet bgs (SB-11 & SB-12). FIGURE 2 provides site details and soil boring locations.

Two historical gasoline service stations (2403 & 2407 University Boulevard) were formerly present on and near the southwest corner area of University Boulevard and Morningside Drive at this REC location. One of the facilities later known as Blue Hand (2403 University Blvd.) also has had an LPST event. The larger property that encompasses both facilities has been redeveloped with a BBVA Compass Bank.

3.5 SOIL SAMPLING (West end of University Blvd.)

Three soil borings, SB-13, SB-14 and SB-15 were advanced in the westbound lane (north side) of University, east of Kirby Drive. PID readings ranged from non-detect (0.0 ppm) to 100 ppm. The highest PID readings (SB-13 & SB-14) and default soil samples (SB-15) were collected and submitted for laboratory analyses at this REC location. Groundwater was encountered at 16 feet bgs. FIGURE 2 provides site details and soil boring locations.

A historical gasoline service station (2540 University Boulevard) was formerly present on the northeast corner area of University Boulevard and Kirby Drive at this REC location. The former gas station site is now part of a parking area and retail shopping center. The GAP, a clothing store is the closest tenant in the shopping center.

3.6 SOIL SAMPLING (2821 S. Post Oak Blvd at Westheimer Road)

Three soil borings, SB-16, SB-17 and SB-18 were advanced in the northern most westbound lane of Westheimer Road, east of South Post Oak Boulevard. PID readings ranged from non-detect (0.0 ppm) to 1,268 ppm. Soil samples with the highest PID readings were collected and submitted for laboratory analyses at this REC location. Groundwater was encountered to 16 feet bgs. FIGURE 4 provides site details and soil boring locations.

An Exxon Co., USA RAS No. 6-4075 (successor ExxonMobil) gasoline service station (2821 S. Post Oak Blvd.) was formerly situated on the northeast corner of Westheimer Road and South Post Oak Boulevard. The facility also has had an LPST event. The property has been redeveloped with a Starbucks and Jamba Juice and parking area of a larger shopping center.

3.7 SOIL SAMPLING (2525 W. Loop S and Westheimer Rd.)

Three soil borings, SB-19, SB-20 and SB-21 were advanced in the westbound lane (north side) of Westheimer Road, east of US West Loop

610 South. PID readings were non-detect (0.0 ppm). Default soil samples were collected and submitted for laboratory analyses at this REC location. Groundwater was not encountered to 20 feet bgs at this REC location. FIGURE 4 provides site details and soil boring locations.

A TxIOP listing and a nearby former gasoline service station was present at this REC location. The gas station property has been redeveloped. A CVS Pharmacy is currently present at the location.

3.8 GROUNDWATER SAMPLING

Four of the twenty-one soil borings were converted to temporary well points SB-2/TWP-2, SB-11/TWP-11, SB-13/TWP-13 and SB-16/TWP-16. After the completion of select soil borings, a ¾-inch PVC temporary well point was placed in the boring. The temporary well point was developed by slowly purging the well with a peristaltic pump and purge water was co-mingled with drummed soil cuttings. After purging and recharge, groundwater samples were collected utilizing a dedicated plastic bailer. Groundwater was transferred from the bailer into glass 40 ml vials equipped with Teflon-lined lids furnished by the testing laboratory. Each container was filled to capacity with groundwater to an inverted meniscus. All samples were labeled in the field and stored at approximately 4°C prior to submission to A & B Laboratories of Houston, Texas. Chain-of-custody documentation accompanied the samples in accordance with standard quality assurance and quality control measures. FIGURE 2 and 4 provides site details and temporary well point location. Soil boring logs for temporary well point and other soil borings are presented in APPENDIX A.

4.0 REGULATORY FRAMEWORK

The Texas Commission on Environmental Quality (TCEQ) administers the Environmental Protection Agency (EPA) regulations and enforcement in Texas. It has additionally established its own standards for environmental compliance. The Texas Risk Reduction Program (TRRP) administered by TCEQ, as provided for in 30 TAC Chapter 350, addresses levels of regulated compounds and allowable levels of such contaminants to protect human health, safety, and the environment. The TCEQ TRRP applies to closures, corrective actions, and remediation efforts subject to the jurisdiction of the TCEQ. The TRRP, whether residential or commercial, contains provisions for Remedy Standard A (no physical controls required) or Remedy Standard B (physical controls required). Implementation of Remedy Standard A or Remedy Standard B is a tiered process, as described in general terms below:

- Tier 1 is a risk-based analysis to derive non site-specific protective concentration limits (PCLs) for complete or reasonably anticipated to be complete exposure pathways. Tier 1 is based on default exposure factors and affected property parameters, and assumes exposure occurs at,

above, or below the source area (i.e., no lateral transport) (TCEQ Subchapter D Section 350.75 (b)).

- Tier 2 is a risk-based analysis to derive site-specific PCLs for complete or reasonably anticipated to be completed exposure pathways utilizing site-specific exposure factors, as allowable, and/or affected property parameters and Tier 1 equations. Tier 2 PCLs may also include lateral transport considerations (TCEQ, Subchapter D Section 350.75 (c)).
- Tier 3 is a risk-based analysis to derive site-specific PCLs for complete or reasonably anticipated to be completed exposure pathways. Tier 3 PCLs are based on measured natural attenuation factors and/or natural attenuation factor models/equations other than those provided for Tier 1 or 2; and may also include site-specific exposure factors, as allowable, and/or affected property parameters (TCEQ, Subchapter D Section 350.75 (d)).

The below provided soil PCLs are concentrations which are protective of human health and the environment:

- | | | | |
|---|---------------------|---|---|
| * | $^{GW}Soil_{Ing}$ | * | Groundwater Soil Ingestion ($^{GW}Soil_{Ing}$) is the groundwater protection standard for either residential or commercial use. Concentration in soil is assumed protective of groundwater considering cross-medial contamination of groundwater from contaminated soil. This is the critical PCL for special handling practices of the soil for the project. |
| * | $^{Tot}Soil_{Comb}$ | * | The Total Soil Combined ($^{Tot}Soil_{Comb}$) PCLs are a combined exposure standard for residential use. The PCL considers cross-media contamination of human ingestion, inhalation and dermal pathways. This is the critical PCL for construction worker exposure concentrations. |

The following details groundwater PCLs:

- | | | | |
|---|-----------------|---|---|
| * | $^{GW}GW_{Ing}$ | * | Groundwater Ingestion ($^{GW}GW_{Ing}$) is the groundwater protection standard for either residential or commercial use. The $^{GW}GW_{Ing}$ PCLs are the same as the Federal Drinking Water Standards Maximum Concentration Limits (MCLs). This will be utilized to determine whether the groundwater is acceptable for surface discharge. |
|---|-----------------|---|---|

MTBE/BTEX concentrations, if any, will be the predominant environmental and exposure consideration of this project. TPH concentrations, if any, also will be evaluated, but typically involves special handling practices of the soil and not necessarily human exposure considerations. The ^{Tot}Soil_{Comb} and ^{GW}GW_{Ing} PCLs are the action levels for this project. TABLE I provide the PCLs, soil laboratory analytical and is presented in the attachments of the report. The ^{GW}GW_{Ing} PCLs may also be a consideration for the Phase II ESA (TABLE II). Groundwater conditions also will be discussed.

5.0 SOIL/GROUNDWATER LABORATORY ANALYTICAL RESULTS

A total of twenty-one soil samples were collected from the twenty-one soil borings and soil samples were submitted to a certified laboratory for analyses. The soil samples were analyzed for methyl tert-butyl ether/benzene, toluene, ethyl-benzene and total xylenes (MTBE/BTEX) by EPA Method SW846-8021B and total petroleum hydrocarbons (TPH) by Texas Commission on Environmental Quality (TCEQ) Texas Method 1005. Four groundwater samples were collected from temporary well points, TWP-2, TWP-11, TWP-13 and TWP-16 and submitted for MTBE/BTEX and TPH analyses. The following details the laboratory methodology:

5.1 LABORATORY ANALYTICAL METHODS

Methyl tert-butyl ether/benzene, toluene, ethyl-benzene, and xylene (MTBE/BTEX) by SW-846 EPA Method 8021B: This laboratory analysis employs a gas chromatograph (GC) equipped with a photoionization detector and/or electrolytic conductivity detectors to detect and quantify certain regulated, volatile organic compounds in a soil or water sample. Compounds on this list include certain chlorinated solvents used in dry cleaning and printing processes, refined petroleum products such as gasoline and diesel, and others. This method can also be used to test for MTBE/BTEX compounds, which are a portion of the entire VOA list. These compounds are common components of most formulated gasolines, and their presence is a reliable indicator that a gasoline release has occurred.

Total Petroleum Hydrocarbons (TPH) by TCEQ Method 1005: This laboratory analysis utilizes a GC equipped with a flame ionization detector (FID) to quantify levels of petroleum compounds or derivatives in the range from C6 to C28, in a soil or groundwater medium. Results are reported in two to three distinct ranges, from C6 to C12, >C12 to C28 and >C28 to C35. This allows some interpretation as to the possible source of the release, based upon the indicated carbon range. Petroleum hydrocarbons are not necessarily hazardous or toxic. The analysis is designed to determine if TPH is present, and to quantify the level of petroleum hydrocarbons. This analysis is especially useful as a broad category procedure, and may indicate additional testing for the specific hazardous or toxic constituents that may be present and contribute to the

TPH levels assessed. Some constituents of petroleum hydrocarbons may be hazardous or toxic, high levels of TPH require additional testing of the sample area.

5.2 SOIL LABORATORY ANALYTICAL RESULTS

Soil samples, SB-1 at 6-8 feet, SB-2 at 10-12 feet, SB-3 at 4-6 feet; SB-4 at 16-18 feet, SB-5 at 4-6 feet, SB-6 at 8-10 feet; SB-7 at 4-6 feet, SB-8 at 14-16 feet, SB-9 at 6-8 feet, SB-10 at 12-14 feet, SB-11 at 6-8 feet, SB-12 at 14-16 feet, SB-13 at 14-16 feet SB-14 at 12-14 feet SB-15 at 6-8 feet SB-16 at 14-16 feet SB-17 at 4-6 feet SB-18 at 1-2 feet SB-19 at 6-8 feet SB-20 at 4-6 feet and SB-21 at 8-10 feet were submitted for TPH and MTBE/BTEX analyses from the soil borings. The resulting laboratory analytical data was compared to the TCEQ TRRP Total Soil Combined ($^{Tot}Soil_{Comb}$) Protective Concentration Limits (PCLs) and Groundwater Soil Ingestion ($^{GW}Soil_{Ing}$) PCLs.

5.2.1 LAB ANALYTICAL RESULTS (Shakespeare Street)

Three soil samples, SB-1 at 6-8 feet bgs, SB-2 at 10-12 feet bgs and SB-3 at 4-6 feet bgs, were collected, submitted, and analyzed for this location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Benzene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Toluene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Ethyl-benzene concentrations were determined to be below the sample detection limit (<0.006 mg/kg).
- Total xylene concentrations were determined to be below the sample detection limit (<0.002 mg/kg).

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C_6-C_{12} were determined to be below the sample detection limit and ranged from <27.8 mg/kg to <29.1 mg/kg.
- TPH carbon ranges $>C_{12}-C_{28}$ were determined to be below the sample detection limit and ranged from <23.8 mg/kg to <24.9 mg/kg.
- TPH carbon ranges $>C_{28}-C_{35}$ were determined to be below the sample detection limit and ranged from <20.8 mg/kg to <21.7 mg/kg.

TABLE I summarizes the laboratory analytical results. Individual MTBE/BTEX and TPH constituents were determined to be below the sample detection limit at its location. None of the soil laboratory analytical concentrations exceed the TCEQ $^{Tot}Soil_{Comb}$ and/or are not a health concern to construction workers. Additionally, the soil laboratory analytical results are below $^{GW}Soil_{Ing}$ PCLs and do not require special handling practices. A copy of the laboratory analytical results is presented in APPENDIX B. Photographs of some of the field activities are presented in APPENDIX C.

5.2.2 LAB ANALYTICAL RESULTS (Nottingham Street)

Three soil samples, SB-4 at 16-18 feet bgs, SB-5 at 4-6 feet bgs and SB-6 at 8-10 feet bgs, were collected, submitted, and analyzed for this location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Benzene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Toluene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Ethyl-benzene concentrations were determined to be below the sample detection limit (<0.006 mg/kg).
- Total xylene concentrations were determined to be below the sample detection limit (<0.002 mg/kg).

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C_6-C_{12} were determined to be below the sample detection limit and ranged from <28.7 mg/kg to <29.2 mg/kg.
- TPH carbon ranges $>C_{12}-C_{28}$ were determined to be below the sample detection limit and ranged from <24.5 mg/kg to <25.0 mg/kg.
- TPH carbon ranges $>C_{28}-C_{35}$ were determined to be below the sample detection limit and ranged from <21.4 mg/kg to <21.8 mg/kg.

Individual MTBE/BTEX and TPH constituents were determined to be below the sample detection limit at its location. None of the soil laboratory analytical concentrations exceed the TCEQ $^{Tot}Soil_{Comb}$ and/or are not a health concern to construction workers. Additionally, the soil laboratory analytical results are below $^{GW}Soil_{Ing}$ PCLs and do not require special handling practices. No environmental action is necessary at the REC location.

5.2.3 LAB ANALYTICAL RESULTS (Sunset Boulevard)

Three soil samples, SB-7 at 4-6 feet bgs, SB-8 at 14-16 feet bgs and SB-9 at 6-8 feet bgs, were collected, submitted, and analyzed for this location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Benzene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Toluene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Ethyl-benzene concentrations were determined to be below the sample detection limit (<0.006 mg/kg).
- Total xylene concentrations were determined to be below the sample detection limit (<0.002 mg/kg to <0.003 mg/kg).

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C₆-C₁₂ were determined to be below the sample detection limit and ranged from <29.0 mg/kg to <30.1 mg/kg.
- TPH carbon ranges >C₁₂-C₂₈ were determined to be below the sample detection limit and ranged from <24.9 mg/kg to <25.8 mg/kg.
- TPH carbon ranges >C₂₈-C₃₅ below the sample detection limit and ranged from <21.7 mg/kg to <22.5 mg/kg.

Individual MTBE/BTEX constituents were determined to be less than or below the sample detection limit at the REC location. TPH concentrations were determined to be below the sample detection limit. No environmental action is necessary at the REC location.

5.2.4 LAB ANALYTICAL RESULTS (University Boulevard)

Three soil samples, SB-10 at 12-14 feet bgs, SB-11 at 6-8 feet bgs and SB-12 at 14-16 feet bgs, were collected, submitted, and analyzed at the eastern extent of the project on University Boulevard at Morningside Drive for this REC location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg <0.023 mg/kg).
- Benzene concentrations were determined to range from below the sample detection limit (<0.001 mg/kg to <0.023 mg/kg) to 0.014 mg/kg.
- Toluene concentrations were determined to range from 0.006

- mg/kg to 5.20 mg/kg.
- Ethyl-benzene concentrations were determined to range from 0.019 mg/kg to 7.14 mg/kg.
- Total xylene concentrations were determined to range from below the sample detection limit (<0.002 mg/kg) to 33.5 mg/kg.

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C₆-C₁₂ were determined to range from below the sample detection limit (<27.2 mg/kg) to 503 mg/kg. The reported TPH C₆-C₁₂ concentration in soil boring SB-10 at 12-14 feet exceeds the ^{GW}Soil_{ing} PCLs of 0.026 mg/kg.
- TPH carbon ranges >C₁₂-C₂₈ were determined to range from below the sample detection limit (<23.2 mg/kg) to 26.8 mg/kg.
- TPH carbon ranges >C₂₈-C₃₅ were determined below the sample detection limit and ranged from <20.3 mg/kg to <20.5 mg/kg.

Individual BTEX constituents were detected for benzene, toluene, ethyl-benzene and total xylenes for the three soil samples. None of the soil laboratory analytical concentrations exceed the TCEQ ^{Tot}Soil_{Comb} and/or are not a health concern to construction workers. Soil sample location, SB-10 at 12-14 feet bgs, had a TPH detection above the TCEQ TRRP ^{GW}Soil_{ing} PCLs. Based on the elevated PID readings air monitoring is warranted at the location. Additionally, the TPH soil laboratory analytical results are above the ^{GW}Soil_{ing} PCLs. The REC location is a potentially petroleum contaminated area (PPCA). Special soil handling practices will be required. Additionally, special pipe and gaskets will be required at the REC location. FIGURE 2 delineates the PPCA.

5.2.5 LAB ANALYTICAL RESULTS (University Boulevard)

Three soil samples, SB-13 at 14-16 feet bgs, SB-14 at 12-14 feet bgs and SB-15 at 6-8 feet bgs, were collected, submitted, and analyzed at the western extent of the project on University Boulevard at Kirby Drive for this REC location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Benzene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Toluene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Ethyl-benzene concentrations were determined to be below the sample detection limit (<0.006 mg/kg).

- Total xylene concentrations were determined to be below the sample detection limit (<0.002 mg/kg).

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C₆-C₁₂ were determined to be below the sample detection limit and ranged from <25.2 mg/kg to <28.3 mg/kg.
- TPH carbon ranges >C₁₂-C₂₈ were determined to be below the sample detection limit and ranged from <21.5 mg/kg to <24.3 mg/kg.
- TPH carbon ranges >C₂₈-C₃₅ below the sample detection limit and ranged from <18.8 mg/kg to <21.1 mg/kg.

Individual MTBE/BTEX constituents were determined to be less than or below the sample detection limit at the REC location. TPH concentrations were determined to be below the sample detection limit. However, it should be noted that during the Phase II ESA, the soil had a hydrocarbon odor and PID detections at the REC location (SB-13 and SB-14). The location does have hydrocarbon-affected groundwater and is a PPCA.

5.2.6 LAB ANALYTICAL RESULTS (Westheimer Road)

Three soil samples, SB-16 at 14-16 feet bgs, SB-17 at 4-6 feet bgs and SB-18 at 0-2 feet bgs, were collected, submitted, and analyzed at the southeast corner of Westheimer Road and South Post Oak Boulevard for this REC location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to range from below the sample detection limit (<0.001 mg/kg to <1.26 mg/kg) to 0.017 mg/kg. The detection limit for MTBE in soil sample SB-16 at 14-16 feet is considered likely to exceed the ^{GW}Soil_{Ing} PCL of 0.621 mg/kg.
- Benzene concentrations were determined to range from below the sample detection limit (<0.001 mg/kg to <1.26 mg/kg). The detection limit for benzene in soil sample SB-16 at 14-16 feet is considered likely to exceed the ^{GW}Soil_{Ing} PCL of 0.026 mg/kg.
- Toluene concentrations were determined to range from 0.033 mg/kg to 264 mg/kg. Soil sample SB-16 at 14-16 feet exceeds the ^{GW}Soil_{Ing} PCL of 8.20 mg/kg.
- Ethyl-benzene concentrations were determined to range from 0.033 mg/kg to 172 mg/kg. Soil sample SB-16 at 14-16 feet exceeds the ^{GW}Soil_{Ing} PCL of 7.80 mg/kg.
- Total xylene concentrations were determined to range from 0.258 mg/kg to 900 mg/kg. Soil sample SB-16 at 14-16 feet

exceeds the ^{GW}Soil_{Ing} PCL of 120 mg/kg.

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C₆-C₁₂ were determined to range from below the sample detection limit (<27.1 mg/kg) to 1,984 mg/kg. The reported TPH C₆-C₁₂ concentration in soil boring SB-16 at 14-16 feet exceeds the Total Combined PCL of 1,600 mg/kg. The concentration is above construction worker exposure and requires air monitoring.
- TPH carbon ranges >C₁₂-C₂₈ were determined to range from below the sample detection limit (<23.2 mg/kg) to 130 mg/kg.
- TPH carbon ranges >C₂₈-C₃₅ were determined below the sample detection limit and ranged from <20.2 mg/kg to <21.1 mg/kg.

Soil sample SB-16 at 14-16 feet exceeds the detection limit for benzene and MTBE, exceeds the ^{GW}Soil_{Ing} PCLs for toluene, ethylbenzene and total xylenes. Individual MTBE/BTEX constituents at lower concentrations were reported for soil samples from SB-17 and SB-18. Soil sample SB-16 at 14-16 feet exceeds the TCEQ ^{Tot}Soil_{Comb} PCL for TPH carbon ranges C₆-C₁₂ of 1,600 mg/kg.

Based on the elevated PID readings and soil sample, SB-16 at 14-16 feet analytical result, air monitoring is warranted at the REC location. Additionally, the TPH soil laboratory analytical results are above the ^{Tot}Soil_{Comb} and/or ^{GW}Soil_{Ing} PCLs. The REC location is a potentially petroleum contaminated area (PPCA). Special soil handling practices will be required. Additionally, special pipe and gaskets will be required at the REC location. FIGURE 4 delineates the PPCA.

5.2.7 LAB ANALYTICAL RESULTS (Westheimer Road)

Three soil samples, SB-19 at 6-8 feet bgs, SB-20 at 4-6 feet bgs and SB-21 at 8-10 feet bgs, were collected, submitted, and analyzed on Westheimer Road, just east of US IH W. Loop 610 S. for this REC location. The following was reported for individual MTBE/BTEX constituents for the soil samples:

- MTBE concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Benzene concentrations were determined to be below the sample detection limit (<0.001 mg/kg).
- Toluene concentrations were determined to range from below the sample detection limit (<0.006 mg/kg) to 0.013 mg/kg.
- Ethylbenzene concentrations were determined to range from below the sample detection limit (<0.006 mg/kg) to 0.009 mg/kg.

- Total xylene concentrations were determined to range from below the sample detection limit (<0.003 mg/kg) to 0.069 mg/kg.

The following was reported in the designated carbon ranges for the soil samples:

- TPH carbon ranges C₆-C₁₂ were determined to range from below the sample detection limit (<30.0 mg/kg to <31.0 mg/kg).
- TPH carbon ranges >C₁₂-C₂₈ were determined to range from below the sample detection limit (<26.6 mg/kg) to a J value of 30.8 mg/kg J.
- TPH carbon ranges >C₂₈-C₃₅ were determined to range from below the sample detection limit (<22.4 mg/kg) to a J values of <32.4 mg/kg.

Individual MTBE/BTEX and TPH constituents were determined to be below the TCEQ TRRP ^{GW}Soil_{Ing} and ^{Tot}Soil_{Comb} PCLs. The soil laboratory analytical concentrations are not a health concern to construction workers. However, due to the detections, special soil handling practices at the location are necessary.

5.3 GROUNDWATER LABORATORY ANALYTICAL RESULTS

Groundwater samples were collected from soil boring (SB-2, SB-11, SB-13, & SB-16) that were converted to temporary well points (TWP-6; TWP-11, TWP-13 & TWP-16) and analyzed for MTBE/BTEX by EPA Method SW846-8021 and TPH by Texas Method 1005.

5.3.1 GW LAB ANALYTICAL RESULTS (Shakespeare St.)

Groundwater sample, TWP-2 was collected from the above-noted location (Figure 2). The following was reported for individual MTBE/BTEX constituents for the groundwater sample:

- MTBE concentration was determined to be below the sample detection limit (<0.001 mg/L).
- Benzene concentration was determined to be below the sample detection limit (<0.0008 mg/L).
- Toluene concentration was determined to be below the sample detection limit (<0.001 mg/L).
- Ethyl-benzene concentration was determined to be below the sample detection limit (<0.0008 mg/L).
- Total xylene concentration was determined to be below the sample detection limit (<0.003 mg/L).

The following was reported in the designated carbon ranges for the groundwater samples:

- TPH carbon ranges C_6-C_{12} was determined to be non-detect (<0.849 mg/L).
- TPH carbon ranges $>C_{12}-C_{28}$ was determined to be <1.1 mg/L.
- TPH carbon ranges $>C_{28}-C_{35}$ was determined to be non-detect (<0.965 mg/L).

MTBE/BTEX concentrations were determined to be non-detect at this location. No MTBE/BTEX concentrations were detected above TCEQ $^{GW}GW_{Ing}$ PCL and Federal Drinking Water Standard Maximum Concentration Limits (MCLs). TPH concentrations ranged from non-detect to <1.1 mg/L. Due to the TPH detection above the PCL, dewatering special management practices should be implemented. Groundwater cannot be discharged to the surface without special handling practices of the generated water. Special piping and gaskets is not required at the REC location.

A copy of the laboratory analytical results is presented in APPENDIX B.

5.3.2 GW LAB ANALYTICAL RESULTS (University Blvd.)

Groundwater sample, TWP-11 was collected from the above-noted location (Figure 2). The following was reported for individual MTBE/BTEX constituents for the groundwater sample:

- MTBE concentration was determined to be below the sample detection limit (<0.0006 mg/L).
- Benzene concentration was determined to be below the sample detection limit (<0.0002 mg/L).
- Toluene concentration was determined to be below the sample detection limit (<0.0002 mg/L).
- Ethyl-benzene concentration was determined to be below the sample detection limit (<0.0004 mg/L).
- Total xylene concentration was determined to be below the sample detection limit (<0.0004 mg/L).

The following was reported in the designated carbon ranges for the groundwater samples:

- TPH carbon ranges C_6-C_{12} was determined to be non-detect (<0.752 mg/L).
- TPH carbon ranges $>C_{12}-C_{28}$ was determined to be <1.18 mg/L.
- TPH carbon ranges $>C_{28}-C_{35}$ was determined to be <1.03 mg/L.

MTBE/BTEX concentrations were determined to be non-detect at this location. No MTBE/BTEX concentrations were detected above TCEQ $^{GW}GW_{Ing}$ PCL and Federal Drinking Water Standard Maximum Concentration Limits (MCLs). TPH concentrations were reported to range

from non-detect to low level detections. Due to the two TPH detection limit exceedences above the PCL, dewatering special management practices should be implemented (PPCA). Groundwater cannot be discharged to the surface without special handling practices of the generated water. Due to TPH detections, special piping and gaskets will be required at the REC location.

5.3.2 GW LAB ANALYTICAL RESULTS (University Blvd.)

Groundwater sample, TWP-13 was collected from the above-noted location (Figure 2). The following was reported for individual MTBE/BTEX constituents for the groundwater sample:

- MTBE concentration was determined to be below the sample detection limit (<0.001 mg/L).
- Benzene concentration was determined to be below the sample detection limit (<0.0008 mg/L).
- Toluene concentration was determined to be below the sample detection limit (<0.001 mg/L).
- Ethyl-benzene concentration was determined to be 0.006 mg/L.
- Total xylene concentration was determined to be below the sample detection limit (<0.003 mg/L).

The following was reported in the designated carbon ranges for the groundwater samples:

- TPH carbon ranges C₆-C₁₂ was determined to be non-detect (<0.936 mg/L).
- TPH carbon ranges >C₁₂-C₂₈ was determined to be <1.22 mg/L.
- TPH carbon ranges >C₂₈-C₃₅ was determined to be <1.06 mg/L.

MTBE/BTEX concentrations were predominantly determined to be non-detect at this location. A low level ethyl-benzene detection was reported. No MTBE/BTEX concentrations were detected above TCEQ ^{GW}GW_{Ing} PCL and Federal Drinking Water Standard Maximum Concentration Limits (MCLs). TPH concentrations were above the detection limit for two carbon ranges. Dewatering special management practices should be implemented (PPCA). Groundwater cannot be discharged to the surface without special handling practices of the generated water. Special piping and gaskets will be required at the REC location.

5.3.2 GW LAB ANALYTICAL RESULTS (Westheimer Rd.)

Groundwater sample, TWP-16 was collected from the above-noted location (Figure 4). The following was reported for individual MTBE/BTEX constituents for the groundwater sample:

- The MTBE detection limit of <0.700 mg/L is above the PCL of

- 0.244 mg/L.
- The benzene detection limit of <0.400 mg/L is above the PCL of 0.005 mg/L.
 - Toluene concentration was determined to be 33.4 mg/L and is above the PCL of 1.0 mg/L.
 - Ethyl-benzene concentration was determined to be 86.4 mg/L and is above the PCL of 0.7 mg/L.
 - Total xylene concentration was determined to be 554 mg/L and is above the PCL of 10 mg/L.

The following was reported in the designated carbon ranges for the groundwater samples:

- TPH carbon ranges C₆-C₁₂ was determined to be 334 mg/L and exceeds the PCL.
- TPH carbon ranges >C₁₂-C₂₈ was determined to be 17 mg/L and exceeds the PCL.
- TPH carbon ranges >C₂₈-C₃₅ was determined to be <1.05 mg/L and the detection limit exceeds the PCL.

All MTBE/BTEX concentrations were determined to have concentrations that require groundwater management practices or specifications. Elevated TPH concentrations also were reported in the laboratory analytical results. Dewatering special management practices should be implemented (PPCA). Groundwater cannot be discharged to the surface without special handling practices of the generated water. Special piping and gaskets will be required at the REC location.

6.0 AIR MONITORING/WASTE MANAGEMENT PRACTICES

Based on the PID readings of the Phase II ESA, air monitoring is warranted at the Westheimer Road and South Post Oak Boulevard, University Boulevard at Morningside Drive and University Boulevard at Kirby Drive REC locations. Air monitoring is not required at the other REC locations. Confined space protocol may still apply depending on construction activities.

Special handling practices" of the soil is required at Westheimer Road and S. Post Oak Blvd., University and Morningside Drive. The soil laboratory analytical results for University Blvd. at Kirby Drive (SB-13, SB-14 and SB-15) did not indicated laboratory detections for petroleum constituents. However, PID readings and hydrocarbon odors were noted 10 feet bgs in soil borings SB-13 and SB-14.

Special handling practices of groundwater if dewatering is utilized will be required at Westheimer and Post Oak Blvd, University Blvd. at Morningside Dr. and University at Kirby Drive and Shakespeare Street at Kirby Drive. Figure 2 and 4 delineates the PPCA.

7.0 CONCLUSIONS

The purpose of the assessment was to determine the absence or presence and concentration levels of petroleum hydrocarbons in soil and/or groundwater. Phase II ESA activities were conducted in accordance with ATL, Inc.'s proposal/workplan dated April 24, 2014. Phase II ESA activities also were conducted in accordance with the ASTM 1903 Standard Practice and the City of Houston Department of Public Works & Engineering Infrastructure Design Manual, Chapter 11. The following was indicated by the laboratory analytical results:

Soil & Groundwater Analytical Results

The following provides a summary of the soil and groundwater laboratory analytical results for the REC locations:

- Individual MTBE/BTEX constituents and TPH concentrations were below the sample detection limit at two (2) of seven (7) investigated REC locations.
- The REC locations with environmental conditions are as follows:
 - Shakespeare Street at Kirby Drive: Based on the soil laboratory analytical results, the Shakespeare Street REC location was reported to be below the sample detection limit or non-detect for MTBE/BTEX and TPH constituents. However, the REC location was reported to have a detection of 1.1 mg/L for TPH carbon range >C₁₂-C₂₈ in groundwater of SB-2/TWP-2. Groundwater is affected at the location. The area is a potentially petroleum contaminated area (PPCA).
 - Westheimer Road at South Post Oak Boulevard: Based on the laboratory analytical results, soil sample SB-16 at 14-16 feet bgs exceeds the TCEQ TRRP Total Soil Combined (^{Tot}Soil_{Comb}) TPH Protective Concentration Level (PCLs) for a 0.5-acre residential use and is a potential concern to construction workers. The detection limit for benzene and MTBE also were elevated for the samples, typically due to matrix interference. Other MTBE/BTEX exceedences were reported above the groundwater protective (^{GW}Soil_{Ing}) PCLs for this soil sample. Soil and groundwater are affected at the location. The area is a potentially petroleum contaminated area (PPCA).
 - Westheimer Road, east of US IH W. Loop 610 S.: Based on the soil laboratory analytical results, very minor toluene, ethylbenzene and total xylene and TPH detections were reported. None of the concentrations exceed TCEQ PCLs, but the detections indicate special handling practices of the soil are

necessary. Soil is affected at the location. The area is a potentially petroleum contaminated area (PPCA).

- University Boulevard at Morningside Drive: Based on the soil laboratory analytical results, toluene, ethyl-benzene and total xylene detection were reported. One exceedence of a TCEQ TRRP (^{GW}Soil_{ing}) TPH Protective Concentration Level (PCLs) for a 0.5-acre residential use was reported. Soil and groundwater are affected at the location. The area is a potentially petroleum contaminated area (PPCA).
- University Boulevard at Kirby Drive: Based on the soil laboratory analytical results, the REC location was reported to be below the sample detection limit or non-detect for MTBE/BTEX and TPH constituents. Based on the groundwater laboratory analytical results, groundwater is affected at the location. The area is a potentially petroleum contaminated area (PPCA).

Groundwater

During the Phase II ESA, groundwater was not encountered in the soil borings SB-4 through SB-6 and SB-7 through SB-9, SB-10, and SB-19 through SB-21.

Groundwater was encountered in soil borings SB-1 through SB-3, SB-11 and SB-12, SB-13 through SB-15 and SB-16 through SB-18 at varying depths below ground surface. Groundwater samples were collected and submitted for laboratory analyses from soil borings SB-2, SB-11, SB-13 and SB-16.

8.0 RECOMMENDATIONS

Based on the laboratory analytical results and field observations of the Limited Phase II Environmental Site Assessment for the Neighborhood Sewer Systems Improvements: Sunset Boulevard, University Boulevard and Westheimer Road in Houston, Harris County, Texas, the following is noted:

- Based on the lab data and PID readings at soil boring SB-10 (east end of University Blvd.) and SB-16 (Westheimer Road at S. Post Oak Boulevard), air monitoring is required at these two REC locations. Based on the Phase II ESA results, additional environmental investigation work is not warranted. The following is reported for REC locations:

Shakespeare Street at Kirby Drive

- Based on the soil laboratory analytical results, no MTBE/BTEX or TPH constituents were reported above the sample detection limit. However, the REC location was reported to have a detection of 1.1

mg/L for TPH carbon range $>C_{12}-C_{28}$ in groundwater of SB-2/TWP-2. Groundwater is affected at the location. Based on the groundwater laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special groundwater handling practices will be required at the REC location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project. Groundwater shall be contained, sampled, discharged or disposed as appropriate. Pertinent permits should be obtained related to discharge. Solvent resistant piping and gaskets is not required at the location.

- The Station Nos. are from 1+00 to 3+00 (Shakespeare Street).

University Boulevard at Morningside Drive

- A TPH C_6-C_{12} concentration was reported that exceed the TCEQ TRRP groundwater protective ($^{GW}Soil_{Inq}$) PCLs for the soil sample at soil boring SB-10 at 12-14 feet. Low-level toluene, ethyl-benzene and total xylenes detections also were reported in the soil samples (SB-10, 11 & 12). Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Also, groundwater is hydrocarbon-affected at the REC location. Additionally, solvent resistant piping and gaskets will be required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.

- The Station Nos. are from 9+25 to 12+50 (University Blvd.).

University Boulevard at Kirby Drive

- No TCEQ TRRP $^{Tot}Soil_{Comb}$ or TRRP groundwater protective ($^{GW}Soil_{Inq}$) PCL exceedences were reported for soil. However, low level detections for toluene, ethyl-benzene, total xylenes and two TPH carbon ranges were reported in the soil laboratory analytical results. Additionally, groundwater is hydrocarbon-affected at the REC location. Based on the soil and groundwater laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Groundwater shall be contained, sampled, discharged or disposed as appropriate. Additionally, solvent resistant piping and gaskets will be required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.

- The Station Nos. are from 1+50 to 3+00 (University Blvd).

Westheimer Road and S. Post Oak Boulevard

- A TPH C_6-C_{12} concentration was reported that exceed the TCEQ TRRP $^{Tot}Soil_{Comb}$ PCL. Other TCEQ TRRP groundwater protective

(^{GW}Soil_{Ing}) PCLs exceedence also were reported for soil sample SB-16 at 14-16 feet (2821 S. Post Oak Blvd.). Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Also, groundwater is a hydrocarbon affected at the REC location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project. Groundwater shall be contained, sampled, discharged or disposed as appropriate. Additionally, solvent resistant piping and gaskets will be required at the location.

- The Station Nos. are from 1+75 to 4+25 (Westheimer Road).

Westheimer Road, east of US IH W. Loop 610 S.

- No significant detections were reported at this REC location and the soil sample analytical results do not exceed TCEQ TRRP ^{Tot}Soil_{Comb} PCLs or ^{GW}Soil_{Ing} PCLs. Very minor toluene, ethyl-benzene and total xylene and TPH detections were reported. Based on the soil laboratory analytical results, the area shall be defined as a Potentially Petroleum Contaminated Area (PPCA). Special soil handling practices will be required at the REC location. Solvent resistant piping and gaskets are not required at the location. Specifications 02105 and 02120 shall be utilized to direct environmental work at the construction project.

- The Station Nos. are from 9+25 to 12+50 (Westheimer Road).

FIGURES

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L** ASSOCIATED TESTING
LABORATORIES, INC.



FIGURE 2
Limited Phase II Environmental Site Assessment
Neighborhood Sewer Systems Improvements
Soil Boring Location Map - TxVCP, LPST Facility & Historic gas stations
(2500 Shakespeare Street, 2403/2407 & 2540 University Boulevard)
Houston, Harris County, Texas
ATL Project No. E14-105

Approximate Scale:
1" = 150'

LEGEND

- SB-4 - Soil Boring Location
- Potentially Petroleum Contaminated Area
- Special Gaskets Required
- Hydrocarbon-Affected Groundwater

A
T L

ASSOCIATED TESTING
LABORATORIES, INC.

Valero Corner Store
(5415)

SB-8

SB-9

SB-7

Suset Boulevard

Chase Bank
(5505)

Bank of Texas

5600 Block

SB-5

SB-4

SB-6

Nottingham Street

IBC Plaza
Office Building
(5615)

Kirby Drive

Kelvin Drive

Village
Plaza

FIGURE 3

Limited Phase II Environmental Site Assessment

Neighborhood Sewer Systems Improvements

Soil Boring Location Map - LPST Facility/Active gas station, historic gas stations and TxIOP Site

(West end of Nottingham Street & 5415 Kirby Drive)

Houston, Harris County, Texas

ATL Project No. E14-105

Approximate Scale:
1" = 91'

LEGEND

● SB-4 - Soil Boring Location



ATL

ASSOCIATED TESTING LABORATORIES, INC.



FIGURE 4
Limited Phase II Environmental Site Assessment
 Neighborhood Sewer Systems Improvements
 Soil Boring Location Map - LPST Facility & TxIOP Site
 (2821 S. Post Oak Blvd. & 2525 W. Loop S.)
 Houston, Harris County, Texas
 ATL Project No. E14-105

Approximate Scale:
 1" = 188'

LEGEND

- SB-16 - Soil Boring Location
- Potentially Petroleum Contaminated Area
- Special Gaskets Required
- Hydrocarbon-Affected Groundwater

TABLE

TABLE I

**SUMMARY OF SOIL LABORATORY ANALYTICAL RESULTS - BTEX-MTBE/TPH
NEIGHBORHOOD SEWER SYSTEMS IMPROVEMENTS
HOUSTON, HARRIS COUNTY, TEXAS**

Sample ID	Date	Depth (feet)	MTBE (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	BTEX (mg/kg)	TPH C6-C12 (mg/kg)	TPH >C12-C28 (mg/kg)	TPH >C28-C35 (mg/kg)	Total TPH (mg/kg)
TRRP Tier 1 PCLs (^{Tot} Soil _{Comb})			804	32.0	4,500	5,300	6,400	NA	1,600	2,300	NA	NA
*TRRP Tier 1 PCLs (^{GW} Soil _{mg})			0.621	0.026	8.20	7.80	120	NA	65	200	NA	NA
SOIL BORING SOIL SAMPLES												
<i>TxVCP facility/site & suspect old gasoline service station (2500 Shakespeare Street)</i>												
SB-1	05/12/14	6-8	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<29.1	<24.9	<21.7	<SDL
SB-2	05/12/14	10-12	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<27.8	<23.8	<20.8	<SDL
SB-3	05/12/14	4-6	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<28.1	<24.1	<21.0	<SDL
<i>LPST Facilities & TxIOP Site (West end of Nottingham Street)</i>												
SB-4	05/12/14	16-18	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<29.2	<25.0	<21.8	<SDL
SB-5	06/12/15	4-6	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<28.9	<24.8	<21.6	<SDL
SB-6	05/12/14	8-10	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<28.7	<24.5	<21.4	<SDL
<i>LPST Facility/Active gasoline service station facility (5415 Kirby Drive)</i>												
SB-7	05/14/14	4-6	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<29.0	<24.9	<21.7	<SDL
SB-8	05/14/14	14-16	<0.001	<0.001	<0.001	<0.006	<0.003	<SDL	<30.1	<25.8	<22.5	<SDL
SB-9	05/14/14	6-8	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<29.6	<25.3	<22.1	<SDL
<i>LPST Facility & historic gasoline service stations (2403 & 2407 University Blvd.)</i>												
SB-10	05/14/14	12-14	<0.023	<0.023	5.20	7.14	33.5	45.84	503	26.8	<20.3	529.8
SB-11	05/14/14	6-8	<0.001	<0.001	0.006	0.019	0.059	0.084	<27.5	<23.5	<20.5	<SDL
SB-12	05/14/14	14-16	<0.001	0.014	0.070	0.085	<0.002	0.169	<27.2	<23.3	<20.3	<SDL
<i>Historic gasoline service station (2540 University Blvd.)</i>												
SB-13	04/14/14	14-16	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<27.6	<23.7	<20.6	<SDL
SB-14	05/14/14	12-14	<0.001	<0.001	<0.001	<0.005	<0.002	<SDL	<25.2	<21.5	<18.8	<SDL
SB-15	05/14/14	6-8	<0.001	<0.001	<0.001	<0.006	<0.002	<SDL	<28.3	<24.3	<21.1	<SDL
<i>LPST Facility/Former Exxon gasoline service station (2821 S. Post Oak Blvd. at Westheimer Rd.)</i>												
SB-16	05/18/14	14-16	<1.26	<1.26	264	172	900	1,337	1,984	130	<22.3	2,114
SB-17	05/18/14	4-6	<0.001	<0.001	0.158	0.185	1.02	1.363	<27.1	<23.2	<20.2	<SDL
SB-18	05/18/14	0-2	0.017	<0.001	0.033	0.033	0.258	0.341	<28.2	<24.2	<21.1	<SDL
<i>TxIOP site, historic gasoline service station (2525 W. Loop S. at Westheimer Rd.)</i>												
SB-19	05/18/14	6-8	<0.001	<0.001	<0.001	<0.006	0.029	0.029	<30.0	30.8 J	<22.4	30.8
SB-20	05/18/14	4-6	<0.001	<0.001	0.013	0.009	0.069	0.091	<31.0	<26.6	31.9 J	31.9
SB-21	05/14/14	8-10	<0.001	<0.001	<0.001	<0.006	<0.003	<SDL	<30.9	29.8 J	32.4 J	62.2

Notes:

- PCLs indicates TRRP Tier 1 Tables protective concentration limits.
- TRRP Tier 1 PCLs (^{10T}Soil_{Comb}) indicates the PCLs for the combined soil exposure pathways (Residential, 0.5-acre site).
- TRRP Tier 1 PCLs (^{GW}Soil_{mg}) indicates the PCLs for the leaching of soil concentrations into groundwater (Residential, 0.5-acre site).
- Analyses by the following methods: BTEX - EPA Method SW846-8021B; TPH - Texas Method 1005.
- Detections are provided in bold font.
- NA indicates Not Applicable, or Not Available.
- <SDL indicates less than or below sample detection limit (SDL).

TABLE II

SUMMARY OF GROUNDWATER ANALYTICAL DATA - BTEX/TPH
 NEIGHBORHOOD SEWER SYSTEMS IMPROVEMENTS
 HOUSTON, HARRIS COUNTY, TEXAS

Sample ID	Date	Benzene (mg/L)	Toluene (mg/L)	Ethyl-Benzene (mg/L)	Xylenes (mg/L)	BTEX (mg/L)	MTBE (mg/L)	TPH C6-C12 (mg/L)	TPH >C12-C28 (mg/L)	TPH >C28-C35 (mg/L)	Total TPH (mg/L)
TRRP Tier 1 PCLs (^{GW} GW _{Ing})		0.005	1.0	0.7	10.0	NA	0.244	0.98	0.98	0.98	NA
TRRP Tier 1 PCLs (^{GW} GW _{Class 3})		0.5	100	70	1,000	NA	24.4	97	97	97	NA
TRRP Tier 1 PCLs (^{Air} GW _{Inh-v})		50	6,203	15,648	1,676	NA	4,038	4,250	7,497	NA	NA
SOIL BORINGS/TEMPORARY WELL POINTS											
<i>TxVCP facility/site & suspect old gasoline service station (2500 Shakespeare Street)</i>											
SB-2/TWP-2	05/12/14	<0.0008	<0.001	<0.0008	<0.003	<SDL	<0.001	<0.849	<1.11	<0.965	<1.1
<i>LPST Facility & historic gasoline service stations (2403 & 2407 University Blvd.)</i>											
SB-11/TWP-11	05/14/13	<0.0008	<0.001	<0.0008	<0.003	<SDL	<0.001	<0.904	<1.18	<1.03	<1.18
<i>Historic gasoline service station (2540 University Blvd.)</i>											
SB-13/TWP-13	05/14/14	<0.0008	<0.001	0.006	<0.003	0.006	<0.001	<0.936	<1.22	<1.06	<1.22
<i>LPST Facility/Former Exxon gasoline service station (2821 S. Post Oak Blvd. at Westheimer Rd.)</i>											
SB-16/TWP-16	05/18/14	<0.400	33.4	86.4	554	673.8	<0.700	344	17	<1.05	361

Notes:

- PCLs indicates TRRP Tier 1 Tables protective concentration limits.
- TRRP Tier 1 PCLs (^{GW}GW_{Ing}) indicates the PCLs for groundwater ingestion and is the same as MCLs under Federal Drinking Water Standards.
- TRRP Tier 1 PCLs (^{GW}GW_{Class 3}) indicates the PCLs for Class 3 groundwater conditions.
- TRRP Tier 1 PCLs (^{Air}GW_{Inh-v}) indicates the PCLs for the inhalation of water vapor.
- Analyses by the following methods: BTEX/MTBE - EPA Method SW846-8021; TPH - Texas Method 1005
- Detections are provided in bold font.
- NA indicates Not Applicable, or Not Available
- <SDL indicates below Sample Detection Limit
- Shaded cell indicates PCL exceedence, if applicable
- Italics* indicates detection limit exceeded the PCL.

APPENDIX A

Soil Boring Logs

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: TxVCP facility/site (2500 Shakespeare Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 9:45-10:27.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
 BORING NUMBER : SB-1 TEMP. WELL NUMBER :

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Aphalt/Concrete (5")	
0.0						
0.0						
5				CL	Sandy clay; Gray and light gray sandy clay, fines, moist with FE and MG staining (surface to 12 feet)	SB-1 @ 6-8'; 9:55, 1-4 oz
0.0						
0.0						
10				CL	Sandy clay; Dark gray clay, fines, moist with Fe staining and sand lenses at 15-16 feet and 18-19 feet (12-20 feet)	
0.0						
0.0						
15						
0.0						
0.0						
20						
0.0						
0.0						
25						
0.0						
0.0						
30						
0.0						
0.0						
35						
0.0						
0.0						
40						
0.0						
0.0						
45						

FILTER SAND BENTONITE SEAL GROUT / CONCRETE SURFACE WATER ENCOUNTERED

A **Associated Testing**
TL **Laboratories, Inc.**

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: TxVCP facility/site (2500 Shakespeare Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 10:38-11:09.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Appl.

BOREHOLE MONITOR WELL
BORING NUMBER : SB-2 **TEMP. WELL NUMBER :**

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Aphalt/Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 4 feet)	SB-2 @ 10-12'; 11:00, 1-4 oz
5.0		CL		Sandy clay; Light gray sandy clay, fines, moist with FE and MG staining and calcareous concretions (4-13 feet)		
10.0		SM	Yellowish-brown (tan) aggregate sand, medium-graned moist to wet (13-18 feet)			
15.0		CL	Sandy clay; Light gray sandy clay, fines, moist with Fe staining (18-20 feet)			
20.0			Total Depth = 20 ft			
25.0			Note: Groundwater encountered at 14 feet. Concrete drilled at 10:36. Subsurface clearance at 10:37. No odor.			
30.0			Groundwater sampled at 12:33.			
35.0						
40.0						
45.0						

A T L Associated Testing Laboratories, Inc.

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: TxVCP facility/site (2500 Shakespeare Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 11:21-12:01.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
BORING NUMBER : SB-3 **TEMP. WELL NUMBER :**

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Aphalt/Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 4 feet)	SB-3 @ 4-6'; 11:26, 1-4 oz
5.0				CL	Sandy clay; Light gray sandy clay, fines, moist with FE and MG staining and calcareous concretions (4-13 feet)	
15.0				SM	Yellowish-brown (grayish-white) aggregate sand, medium-graned moist to wet (13-18 feet)	
20.0				CL	Sandy clay; Light gray sandy clay, fines, moist with Fe staining (18-20 feet)	
Total Depth = 20 ft						
Note: Groundwater encountered at 14 feet. Concrete drilled at 11:19. Subsurface clearance at 11:20. No odor.						

FILTER SAND BENTONITE SEAL GROUT / CONCRETE SURFACE WATER ENCOUNTERED

A T L Associated Testing Laboratories, Inc. TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: TxIOP facility/site & LPST facilities (west end of Nottingham Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 14:46-15:56.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Appl.

BOREHOLE MONITOR WELL
BORING NUMBER : SB-4 **TEMP. WELL NUMBER :**

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 4 feet)	
5.0				CL	Sandy clay; Light gray and light brown sandy clay, fines, moist with FE staining and some calcareous concretions (4-20 feet)	
10.0						
15.0						
20.0						SB-4 @ 16-18'; 11:26, 1-4 oz
25.0						
30.0						
35.0						
40.0						
45.0						

FILTER SAND **BENTONITE SEAL** **GROUT / CONCRETE SURFACE** **WATER ENCOUNTERED**

A T L Associated Testing Laboratories, Inc.

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-5 TEMP. WELL NUMBER :
FACILITY ADDRESS: TxIOP facility/site & LPST facilities (west end of Nottingham Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 16:14-16:28.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	SB-5 @ 4-6'; 16:17, 1-4 oz
5.0				CL	Sandy clay; Light gray and light brown sandy clay, fines, moist with Fe staining (5-8 feet)	
10.0				CL	Sandy clay; Reddish-orange and light gray sandy clay, fines, moist with some calcareous concretions and caliche layer at 19.5-20 feet (8-20 feet)	
20.0					Total Depth = 20 ft	
25.0					Note: Concrete drilled at 16:11. Subsurface clearance at 16:12. No odor.	
30.0						
35.0						
40.0						
45.0						

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-6 TEMP. WELL NUMBER :
FACILITY ADDRESS: TxIOP facility/site & LPST facilities (west end of Nottingham Street)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Bobcat-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Barnaby **DATE: (START / FINISH)** 05/12/2014 @ 13:01-14:30.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Appl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	
5.0				CL	Sandy clay; Light gray and light brown sandy clay, fines, moist with Fe staining (5-8 feet)	SB-6 @ 8-10'; 13:58, 1-4 oz
10.0				CL	Sandy clay; Reddish-orange and light gray sandy clay, fines, moist with some calcareous concretions (8-20 feet)	
20.0						
					Total Depth = 20 ft	
					Note: Concrete drilled at 12:58. Subsurface clearance at 12:59. No odor.	
					Delay, refuel Bobcat	

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-7 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility/Active gas station (5415 Kirby Drive at Sunset Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 9:34-10:01.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Asphalt/Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	SB-7 @ 4-6'; 9:39, 1-4 oz
5.0				CL	Sandy clay; Light gray & light brown sandy clay, fines, moist with Fe staining (5-10 feet)	
10.0				CL	Sandy clay; Light gray, light brown & reddish-orange sandy clay, fines, moist (10-20 feet)	
15.0						
20.0						
25.0						
30.0						
35.0						
40.0						
45.0						

A **Associated Testing**
TL **Laboratories, Inc.**

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-8 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility/Active gas station (5415 Kirby Drive at Sunset Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 10:15-10:32.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Asphalt/Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	
5.0				CL	Sandy clay; Light gray & light brown sandy clay, fines, moist with Fe staining (5-11 feet)	
10.0				CL	Sandy clay; Light brown, light gray & reddish-orange sandy clay, fines, moist (11-20 feet)	SB-8 @ 14-16'; 10:26, 1-4 oz
15.0						
20.0						
25.0						
30.0						
35.0						
40.0						
45.0						
Total Depth = 20 ft						
Note: Concrete drilled at 10:10. Subsurface clearance at 10:13. No odor.						

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A Associated Testing TL Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-9 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility/Active gas station (5415 Kirby Drive at Sunset Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 10:50-11:11.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	
5.0				CL	Sandy clay; Light brown, light gray & reddish-orange sandy clay, fines, moist (5-20 feet)	SB-9 @ 6-8'; 10:56, 1-4 oz
10.0						
15.0						
20.0						
25.0						
30.0						
35.0						
40.0						
45.0						
Total Depth = 20 ft						
Note: Concrete drilled at 10:46. Subsurface clearance at 10:48. No odor.						

A T L Associated Testing Laboratories, Inc.			
TOTAL DEPTH: 20'			
SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface			
SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE			
SHEET 1 OF 1			

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-10 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility and historic gas stations (2403/2407 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 12:23-12:48.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Appl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Asphalt/Concrete (5")	
1.4				CL	Sandy clay; Gray sandy clay, fines, moist (surface to 5 feet)	
3.0				CL	Sandy clay; Light brown, light gray & reddish-orange sandy clay, fines, moist with mild to moderate hydrocarbon odor-gasoline (5-20 feet)	SB-10 @ 12-14'; 12:45, 1-4 oz
5						
38.9						
17.1.0						
771						
10						
59.3						
1186						
15						
64.5						
1156						
20						
480						
20					Total Depth = 20 ft	
25					Note: Concrete drilled at 12:19. Subsurface clearance at 12:20.	
30						
35						
40						
45						

FILTER SAND BENTONITE SEAL GROUT / CONCRETE SURFACE WATER ENCOUNTERED

A T L Associated Testing Laboratories, Inc.

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE

SHEET 1 OF 1

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-11 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility and historic gas stations (2403/2407 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 13:18-13:37.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Appl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface			
0.0				ML	Black topsoil (Surface to 2 inches) and Brown sandy loam (2 inches to 2 feet)	
5.0				CL	Sandy clay; Light brown and light gray sandy clay, fines, moist with FE staining (2-16 feet)	SB-11 @ 6-8'; 13:25, 1-4 oz
10.0						
15.0				SP	Silty sand, light gray, light brown & reddish-orange silty sand, wet (16-17 feet)	
20.0				CL	Sandy clay; Light brown and light gray sandy clay, fines, moist wit FE staining (17-20 feet)	
25.0						
30.0						
35.0						
40.0						
45.0						
Total Depth = 20 ft						
Note: Groundwater encountered to 16 feet. Subsurface clearance at 13:14. No odor.						
Groundwater sampled at 13:40.						

 FILTER SAND	 BENTONITE SEAL	 GROUT / CONCRETE SURFACE	 WATER ENCOUNTERED
A Associated Testing TL Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

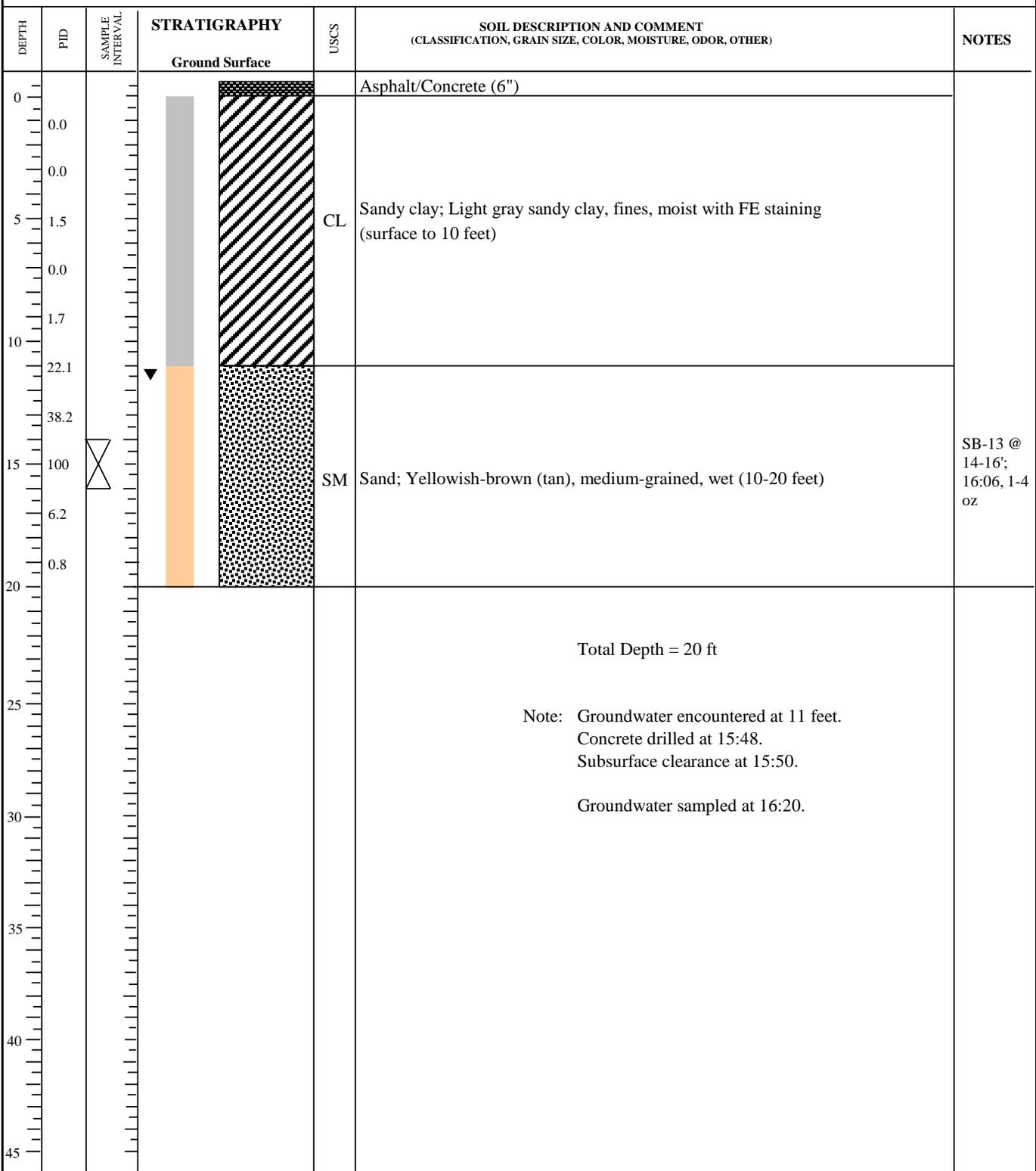
PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-12 TEMP. WELL NUMBER :
FACILITY ADDRESS: LPST facility and historic gas stations (2403/2407 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 14:21-14:34.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
Ground Surface						
0			[Solid Black]	ML	Black Topsoil (Surface to 3 feet) and Brown sandy loam (3-4 feet)	
5			[Diagonal Hatching]	CL	Sandy clay; Light gray & reddish-orange sandy clay, fines, moist with mild hydrocarbon odor (5-20 feet)	
15		X	[Diagonal Hatching]			SB-12 @ 14-16'; 14:33, 1-4 oz
20					Total Depth = 20 ft	
25					Note: Groundwater encountered to 16 feet. Subsurface clearance at 14:19.	
30						
35						
40						
45						

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

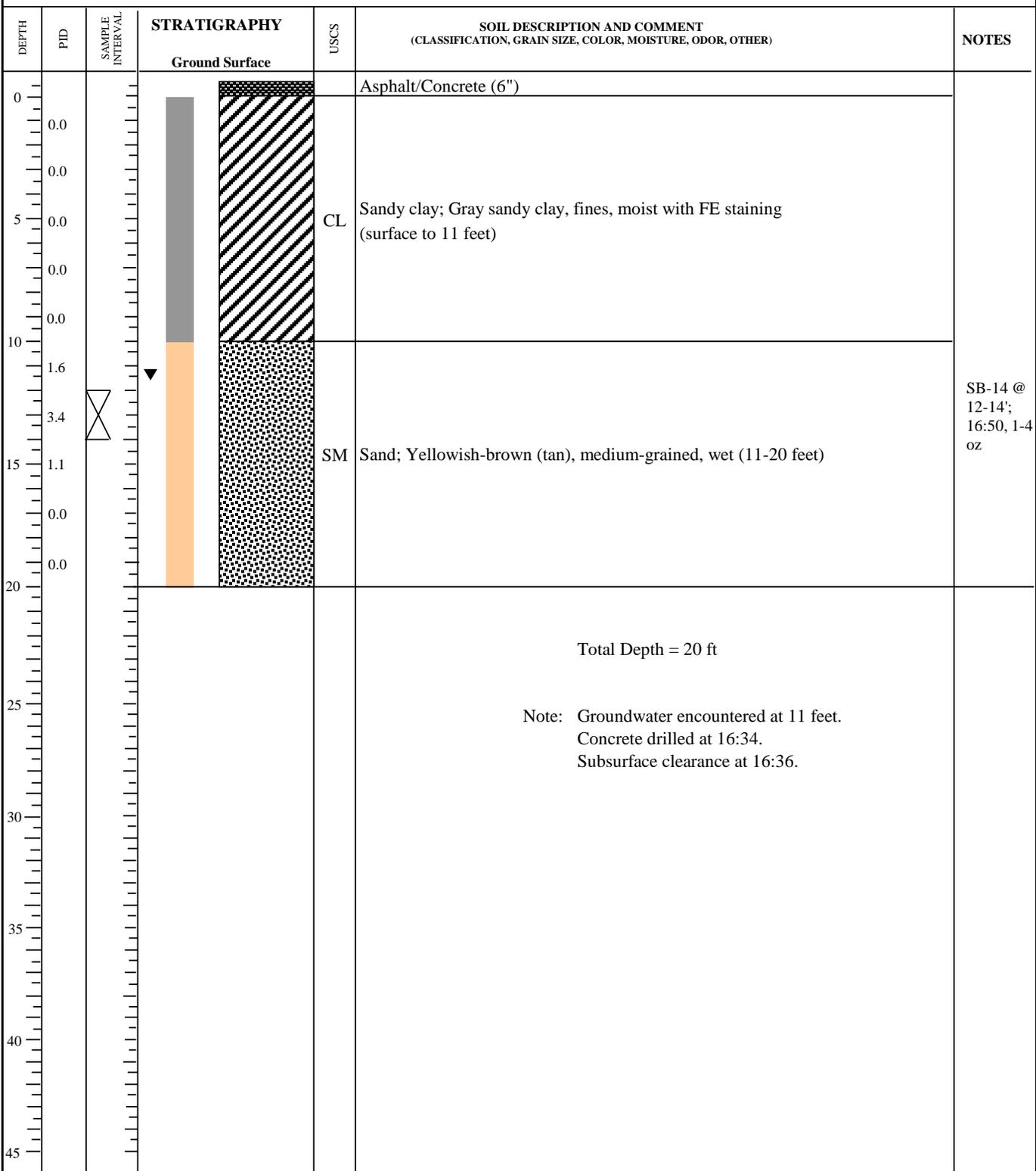
PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: Historic gas station (2540 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 15:52-16:10.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
 BORING NUMBER : SB-13 TEMP. WELL NUMBER :



FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: <u>20'</u> SEAL MATERIAL: (TYPE/INTERVAL) <u>Bentonite to surface</u> SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE SHEET <u>1</u> OF <u>1</u>	

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-14 TEMP. WELL NUMBER :
FACILITY ADDRESS: Historic gas station (2540 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 16:37-16:54.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.



TOTAL DEPTH: 20'			
A T L Associated Testing Laboratories, Inc.			
SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE			
SHEET 1 OF 1			

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: Historic gas station (2540 University Blvd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Tractor-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/14/2014 @ 14:50-15:38.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
 BORING NUMBER : SB-15 TEMP. WELL NUMBER :

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Asphalt/Concrete (6")	
0.0						
0.0						
5						
0.0				CL	Sandy clay; Light gray sandy clay, fines, moist with FE staining (surface to 12 feet)	SB-14 @ 6-8'; 14:57, 1-4 oz
0.0						
0.0						
10						
0.0						
0.0						
15						
0.0				SM	Sand; Yellowish-brown (tan), medium-grained, wet (12-20 feet)	
0.0						
20						
0.0						
0.0						
25						
0.0						
0.0						
30						
0.0						
0.0						
35						
0.0						
0.0						
40						
0.0						
0.0						
45						

FILTER SAND BENTONITE SEAL GROUT / CONCRETE SURFACE WATER ENCOUNTERED

A **Associated Testing**
TL **Laboratories, Inc.**

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-16 TEMP. WELL NUMBER :
FACILITY ADDRESS: Former Exxon gas station (2821 S. Post Oak Blvd at Westheimer Rd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Truck-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Isidro **DATE: (START / FINISH)** 05/18/2014 @ 9:41-9:59.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Gray sandy clay, fines, moist with some fill layers (surface to 11 feet)	
5.0						
10.0				SP	Silty sand and sand; Brown, light brown & reddish-orange, moist to wet moderate hydrocarbon odor-gasoline (11-20 feet)	SB-16 @ 14-16'; 9:54, 1-4 oz
15.0						
20.0			Total Depth = 20 ft			
25.0			Note: Groundwater encountered at 16 feet. Concrete drilled at 9:33. Subsurface clearance at 9:39.			
30.0			Groundwater sampled at 10:30.			
35.0						
40.0						
45.0						

A T L Associated Testing Laboratories, Inc.			
TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE			
			SHEET 1 OF 1

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: Former Exxon gas station (2821 S. Post Oak Blvd at Westheimer Rd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Truck-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Brandon **DATE: (START / FINISH)** 05/18/2014 @ 10:55-11:09.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

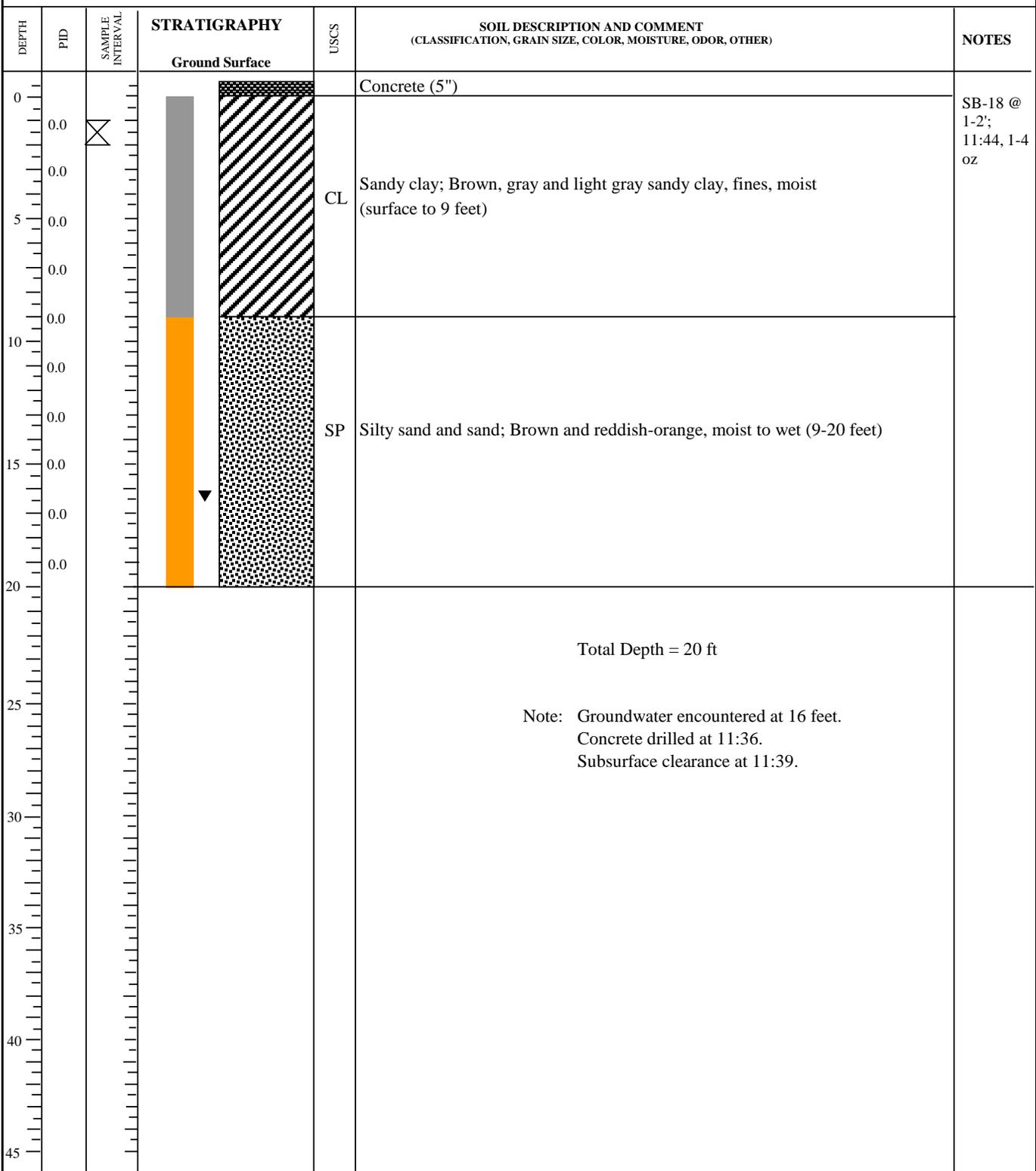
BOREHOLE MONITOR WELL
 BORING NUMBER : SB-17 TEMP. WELL NUMBER :

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Brown, gray and light gray sandy clay, fines, moist (surface to 9 feet)	SB-17 @ 4-6'; 11:00, 1-4 oz
5.0				SP	Silty sand and sand; Brown and reddish-orange, moist to wet (9-20 feet)	
10.0						
15.0						
20.0						
25.0						
30.0						
35.0						
40.0						
45.0						
Total Depth = 20 ft						
Note: Groundwater encountered at 16 feet. Concrete drilled at 10:42. Subsurface clearance at 10:51.						

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE SHEET 1 OF 1	

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: Former Exxon gas station (2821 S. Post Oak Blvd at Westheimer Rd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Truck-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Brandon **DATE: (START / FINISH)** 05/18/2014 @ 11:43-12:16.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
 BORING NUMBER : SB-18 TEMP. WELL NUMBER :



FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A T L Associated Testing Laboratories, Inc.		TOTAL DEPTH: 20'	
SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface		SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

PROJECT NO: E14-105 BOREHOLE MONITOR WELL
SITE NAME: Neighborhood Sewer Systems Improvements BORING NUMBER : SB-19 TEMP. WELL NUMBER :
FACILITY ADDRESS: Hotel Derek (2525 W. Loop 610 S. at Westheimer Rd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Truck-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Brandon **DATE: (START / FINISH)** 05/18/2014 @ 8:08-8:25.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Brown, gray and light gray sandy clay, fines, moist (surface to 9 feet)	SB-19 @ 6-8'; 8:16, 1-4 oz
5.0				SP	Silty sand and sand; Brown and reddish-orange, moist to slightly wet with sand lenses (9-20 feet)	
10.0						
15.0						
20.0						
25.0					Total Depth = 20 ft	
30.0						
35.0						
40.0						
45.0						

FILTER SAND	BENTONITE SEAL	GROUT / CONCRETE SURFACE	WATER ENCOUNTERED
A Associated Testing TL Laboratories, Inc.		TOTAL DEPTH: 20' SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface SURFACE COMPLETION: <input type="checkbox"/> FLUSH W/CONCRETE <input type="checkbox"/> RISER W/CONCRETE	
		SHEET 1 OF 1	

PROJECT NO: E14-105
SITE NAME: Neighborhood Sewer Systems Improvements
FACILITY ADDRESS: Hotel Derek (2525 W. Loop 610 S. at Westheimer Rd.)
DRILLING COMPANY / METHOD / RIG: EnviroTech Drilling/Truck-mounted hydraulically-driven drill rig with sampling sleeve
DRILLER: Brandon **DATE: (START / FINISH)** 05/18/2014 @ 9:01-9:27.
LOGGED BY: T. Murphy **TOP OF CASING ELEVATION:** N/Apl.

BOREHOLE MONITOR WELL
 BORING NUMBER : SB-21 TEMP. WELL NUMBER :

DEPTH	PID	SAMPLE INTERVAL	STRATIGRAPHY	USCS	SOIL DESCRIPTION AND COMMENT (CLASSIFICATION, GRAIN SIZE, COLOR, MOISTURE, ODOR, OTHER)	NOTES
0			Ground Surface		Concrete (5")	
0.0				CL	Sandy clay; Brown, gray and light gray sandy clay, fines, moist (surface to 9 feet)	
5.0				SP	Silty sand and sand; Brown and reddish-orange, moist to slightly wet with sand lenses (9-20 feet)	
10.0						SB-21 @ 8-10'; 9:17, 1-4 oz
15.0						
20.0						
25.0						
30.0						
35.0						
40.0						
45.0						
Total Depth = 20 ft						

FILTER SAND BENTONITE SEAL GROUT / CONCRETE SURFACE WATER ENCOUNTERED

A T L Associated Testing Laboratories, Inc.

TOTAL DEPTH: 20'
 SEAL MATERIAL: (TYPE/INTERVAL) Bentonite to surface
 SURFACE COMPLETION: FLUSH W/CONCRETE RISER W/CONCRETE SHEET 1 OF 1

APPENDIX B

Laboratory Analytical Results

Laboratory Analysis Report

Total Number of Pages: 89

Job ID : 14050918



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

Client Project Name :

E14-105 / Sewer Line Replacement (Various Street)

Report To : Client Name: Associated Testing Lab
Attn: Tom Murphy
Client Address: 3143 Yellowstone Blvd.
City, State, Zip: Houston, Texas, 77054

P.O.#.:
Sample Collected By: Tom Murphy
Date Collected: 05/12/14 - 05/18/14

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
SB-1 @ 6'-8'	Soil	14050918.01
SB-2 @ 10'-12'	Soil	14050918.02
SB-3 @ 4'-6'	Soil	14050918.03
SB-4 @ 16'-18'	Soil	14050918.04
SB-5 @ W 4'-6'	Soil	14050918.05
SB-6 @ W 8'-10'	Soil	14050918.06
SB-7 @ W 4'-6'	Soil	14050918.07
SB-8 @ W 14'-16'	Soil	14050918.08
SB-9 @ 6'-8'	Soil	14050918.09
SB-10 @ 12'-14'	Soil	14050918.10
SB-11 @ 6'-8'	Soil	14050918.11
SB-12 @ 14'-16'	Soil	14050918.12
SB-13 @ 14'-16'	Soil	14050918.13
SB-14 @ 12'-14'	Soil	14050918.14
SB-15 @ 6'-8'	Soil	14050918.15
SB-16 @ 14'-16'	Soil	14050918.16
SB-17 @ W 4'-6'	Soil	14050918.17
SB-18 @ 1'-2'	Soil	14050918.18
SB-19 @ 6'-8'	Soil	14050918.19

A handwritten signature in black ink, appearing to read 'Senthilkumar Sevukan'.

Released By: Senthilkumar Sevukan
Title: Assistant Lab Manager
Date: 05/23/2014



This Laboratory is NELAP (T104704213-14-11) accredited. Effective: 04/01/2014; Expires: 03/31/2015

Scope: Non-Potable Water, Drinking Water, Air, Solid, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

Date Received : 05/19/2014 10:59

Laboratory Analysis Report

Total Number of Pages: 89

Job ID : 14050918



10100 East Freeway, Suite 100, Houston, TX 77029 tel: 713-453-6060, fax: 713-453-6091, <http://www.ablabs.com>

A&B Labs has analyzed the following samples...

Client Sample ID	Matrix	A&B Sample ID
SB-20 @ 4-'6'	Soil	14050918.20
SB-21 @ 8-'10'	Soil	14050918.21
SB-2 / TWP-2	Water	14050918.22
SB-11 / TWP-11	Water	14050918.23
SB-13 / TWP-13	Water	14050918.24
SB-16 / TWP-16	Water	14050918.25

A handwritten signature in black ink, appearing to read 'Senthilkumar Sevukan'.

Released By: Senthilkumar Sevukan
Title: Assistant Lab Manager
Date: 05/23/2014



This Laboratory is NELAP (T104704213-14-11) accredited. Effective: 04/01/2014; Expires: 03/31/2015

Scope: Non-Potable Water, Drinking Water, Air, Solid, Hazardous Waste

I am the laboratory manager, or his/her designee, and I am responsible for the release of this data package. This laboratory data package has been reviewed and is complete and technically compliant with the requirements of the methods used, except where noted in the attached exception reports. I affirm, to the best of my knowledge that all problems/anomalies observed by this laboratory (and if applicable, any and all laboratories subcontracted through this laboratory) that might affect the quality of the data, have been identified in the Laboratory Review Checklist, and that no information or data have been knowingly withheld that would affect the quality of the data.

This report cannot be reproduced, except in full, without prior written permission of A&B Labs. Results shown relate only to the items tested. Samples are assumed to be in acceptable condition unless otherwise noted. Blank correction is not made unless otherwise noted. Air concentrations reported are based on field sampling information provided by client. Soil samples are reported on a wet weight basis unless otherwise noted. Uncertainty estimates are available on request.

Date Received : 05/19/2014 10:59



LABORATORY TEST RESULTS

Client Sample ID: SB-1 @ 6'-8'
 A&B Job Sample ID: 14050918.01

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14051985
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14051967
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/12/2014 09:55
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 17:40

% Moisture: 18.5

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	18.5					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-1 @ 6'-8'
 A&B Job Sample ID: 14050918.01

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 09:55
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 18.5

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 03:05
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 03:05
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 03:05
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.01	05/20/14 03:05
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.01	05/20/14 03:05
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.01	05/20/14 03:05
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.01	05/20/14 03:05
98-08-8	Trifluorotoluene(surr)	97.5						81 111	%	1.01	05/20/14 03:05

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-1 @ 6'-8'
 A&B Job Sample ID: 14050918.01

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 09:55
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 18.5

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 29.1	Q18,U	29.1	30.7	23.7	25	1000	mg/Kg	1	05/20/14 12:34
TPH-1005-2	>C12-C28 ¹	< 24.9	U	24.9	30.7	20.3	25	1000	mg/Kg	1	05/20/14 12:34
TPH-1005-4	>C28-C35 ¹	< 21.7	U	21.7	30.7	17.7	25	1000	mg/Kg	1	05/20/14 12:34
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 12:34
111-85-3	1-Chlorooctane(surr)	110					60	143	%	1	05/20/14 12:34
3386-33-2	Chlorooctadecane(sur	104					60	150	%	1	05/20/14 12:34

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-2 @ 10'-12'
 A&B Job Sample ID: 14050918.02

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14051985
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14051967
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/12/2014 11:00
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 17:40

% Moisture: 14.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	14.7					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-2 @ 10'-12'
 A&B Job Sample ID: 14050918.02

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 11:00
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 14.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 02:13
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 02:13
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 02:13
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.02	05/20/14 02:13
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.02	05/20/14 02:13
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.02	05/20/14 02:13
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.02	05/20/14 02:13
98-08-8	Trifluorotoluene(surr)	96						81 111	%	1.02	05/20/14 02:13

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-2 @ 10'-12'
 A&B Job Sample ID: 14050918.02

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 11:00
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 14.7

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 27.8	Q18,U	27.8	29.3	23.7	25	1000	mg/Kg	1	05/20/14 12:57
TPH-1005-2	>C12-C28 ¹	< 23.8	U	23.8	29.3	20.3	25	1000	mg/Kg	1	05/20/14 12:57
TPH-1005-4	>C28-C35 ¹	< 20.8	U	20.8	29.3	17.7	25	1000	mg/Kg	1	05/20/14 12:57
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 12:57
111-85-3	1-Chlorooctane(surr)	91.8					60	143	%	1	05/20/14 12:57
3386-33-2	Chlorooctadecane(sur)	94.5					60	150	%	1	05/20/14 12:57

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-3 @ 4'-6'
A&B Job Sample ID: 14050918.03

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
Analytical Method: SM 2540G
QC Batch ID: Qb14051985
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14051967
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/12/2014 11:26
Date Received: 05/19/2014 10:59
Date Prepared: 05/19/2014 17:40

% Moisture: 15.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	15.8					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-3 @ 4'-6'
 A&B Job Sample ID: 14050918.03

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 11:26
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 15.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:23
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:23
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:23
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.01	05/20/14 04:23
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.01	05/20/14 04:23
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.01	05/20/14 04:23
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.01	05/20/14 04:23
98-08-8	Trifluorotoluene(surr)	98						81	111	%	1.01 05/20/14 04:23

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-3 @ 4'-6'
 A&B Job Sample ID: 14050918.03

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 11:26
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 15.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.1	Q18,U	28.1	29.7	23.7	25	1000	mg/Kg	1	05/20/14 13:21
TPH-1005-2	>C12-C28 ¹	< 24.1	U	24.1	29.7	20.3	25	1000	mg/Kg	1	05/20/14 13:21
TPH-1005-4	>C28-C35 ¹	< 21	U	21	29.7	17.7	25	1000	mg/Kg	1	05/20/14 13:21
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 13:21
111-85-3	1-Chlorooctane(surr)	99					60	143	%	1	05/20/14 13:21
3386-33-2	Chlorooctadecane(sur)	107					60	150	%	1	05/20/14 13:21

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-4 @ 16'-18'
A&B Job Sample ID: 14050918.04

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
Analytical Method: SM 2540G
QC Batch ID: Qb14051985
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14051967
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/12/2014 15:56
Date Received: 05/19/2014 10:59
Date Prepared: 05/19/2014 17:40

% Moisture: 18.9

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	18.9					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-4 @ 16'-18'
 A&B Job Sample ID: 14050918.04

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 15:56
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 18.9

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time	
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:48	
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:48	
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.01	05/20/14 04:48	
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.01	05/20/14 04:48	
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.01	05/20/14 04:48	
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.01	05/20/14 04:48	
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.01	05/20/14 04:48	
98-08-8	Trifluorotoluene(surr)	98						81	111	%	1.01	05/20/14 04:48

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-4 @ 16'-18'
 A&B Job Sample ID: 14050918.04

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 15:56
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 18.9

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 29.2	Q18,U	29.2	30.8	23.7	25	1000	mg/Kg	1	05/20/14 13:52
TPH-1005-2	>C12-C28 ¹	< 25	U	25	30.8	20.3	25	1000	mg/Kg	1	05/20/14 13:52
TPH-1005-4	>C28-C35 ¹	< 21.8	U	21.8	30.8	17.7	25	1000	mg/Kg	1	05/20/14 13:52
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 13:52
111-85-3	1-Chlorooctane(surr)	111					60	143	%	1	05/20/14 13:52
3386-33-2	Chlorooctadecane(sur)	106					60	150	%	1	05/20/14 13:52

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-5 @ W 4'-6'
 A&B Job Sample ID: 14050918.05

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14051985
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14051967
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/12/2014 16:17
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 17:40

% Moisture: 18.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	18.1					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-5 @ W 4'-6'
 A&B Job Sample ID: 14050918.05

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 16:17
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 18.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 05:14
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 05:14
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 05:14
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 05:14
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 05:14
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 05:14
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 05:14
98-08-8	Trifluorotoluene(surr)	98.5						81 111	%	1	05/20/14 05:14

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-5 @ W 4'-6'
 A&B Job Sample ID: 14050918.05

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 16:17
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 18.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.9	Q18,U	28.9	30.5	23.7	25	1000	mg/Kg	1	05/20/14 14:24
TPH-1005-2	>C12-C28 ¹	< 24.8	U	24.8	30.5	20.3	25	1000	mg/Kg	1	05/20/14 14:24
TPH-1005-4	>C28-C35 ¹	< 21.6	U	21.6	30.5	17.7	25	1000	mg/Kg	1	05/20/14 14:24
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 14:24
111-85-3	1-Chlorooctane(surr)	112					60	143	%	1	05/20/14 14:24
3386-33-2	Chlorooctadecane(sur	104					60	150	%	1	05/20/14 14:24

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-6 @ W 8'-10'
 A&B Job Sample ID: 14050918.06

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14051985
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14051967
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/12/2014 13:58
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 17:40

% Moisture: 17.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	17.3					----	----	%	1	05/19/14 17:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-6 @ W 8'-10'
 A&B Job Sample ID: 14050918.06

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/12/2014 13:58
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 17.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 05:40
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 05:40
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 05:40
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.00	05/20/14 05:40
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.00	05/20/14 05:40
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.00	05/20/14 05:40
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.00	05/20/14 05:40
98-08-8	Trifluorotoluene(surr)	99					81	111	%	1.00	05/20/14 05:40

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-6 @ W 8'-10'
 A&B Job Sample ID: 14050918.06

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/12/2014 13:58
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 17.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.7	Q18,U	28.7	30.2	23.7	25	1000	mg/Kg	1	05/20/14 14:48
TPH-1005-2	>C12-C28 ¹	< 24.5	U	24.5	30.2	20.3	25	1000	mg/Kg	1	05/20/14 14:48
TPH-1005-4	>C28-C35 ¹	< 21.4	U	21.4	30.2	17.7	25	1000	mg/Kg	1	05/20/14 14:48
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 14:48
111-85-3	1-Chlorooctane(surr)	92.1					60	143	%	1	05/20/14 14:48
3386-33-2	Chlorooctadecane(sur	97.4					60	150	%	1	05/20/14 14:48

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-7 @ W 4'-6'
 A&B Job Sample ID: 14050918.07

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052179
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/14/2014 09:39
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 18.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	18.4					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-7 @ W 4'-6'
 A&B Job Sample ID: 14050918.07

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 09:39
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 18.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 06:06
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 06:06
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.00	05/20/14 06:06
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1.00	05/20/14 06:06
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1.00	05/20/14 06:06
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1.00	05/20/14 06:06
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1.00	05/20/14 06:06
98-08-8	Trifluorotoluene(surr)	97						81 111	%	1.00	05/20/14 06:06

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-7 @ W 4'-6'
 A&B Job Sample ID: 14050918.07

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 09:39
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 18.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 29	Q18,U	29	30.6	23.7	25	1000	mg/Kg	1	05/20/14 15:11
TPH-1005-2	>C12-C28 ¹	< 24.9	U	24.9	30.6	20.3	25	1000	mg/Kg	1	05/20/14 15:11
TPH-1005-4	>C28-C35 ¹	< 21.7	U	21.7	30.6	17.7	25	1000	mg/Kg	1	05/20/14 15:11
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 15:11
111-85-3	1-Chlorooctane(surr)	96.5					60	143	%	1	05/20/14 15:11
3386-33-2	Chlorooctadecane(sur	102					60	150	%	1	05/20/14 15:11

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-8 @ W 14'-16'
 A&B Job Sample ID: 14050918.08

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052179
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:26
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 21.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	21.3					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-8 @ W 14'-16'
 A&B Job Sample ID: 14050918.08

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:26
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 21.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 06:32
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 06:32
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 06:32
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	0.99	05/20/14 06:32
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.013	0.005	0.01	0.8	mg/Kg	0.99	05/20/14 06:32
95-47-6	o-Xylene	< 0.003	U,V6	0.003	0.006	0.002	0.005	0.4	mg/Kg	0.99	05/20/14 06:32
1330-20-7	Xylenes	< 0.003	U	0.003	0.006	0.002	0.005	1.2	mg/Kg	0.99	05/20/14 06:32
98-08-8	Trifluorotoluene(surr)	96.5						81	111	%	0.99 05/20/14 06:32

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-8 @ W 14'-16'
 A&B Job Sample ID: 14050918.08

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:26
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 21.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 30.1	Q18,U	30.1	31.8	23.7	25	1000	mg/Kg	1	05/20/14 16:47
TPH-1005-2	>C12-C28 ¹	< 25.8	U	25.8	31.8	20.3	25	1000	mg/Kg	1	05/20/14 16:47
TPH-1005-4	>C28-C35 ¹	< 22.5	U	22.5	31.8	17.7	25	1000	mg/Kg	1	05/20/14 16:47
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 16:47
111-85-3	1-Chlorooctane(surr)	96.8					60	143	%	1	05/20/14 16:47
3386-33-2	Chlorooctadecane(sur)	101					60	150	%	1	05/20/14 16:47

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-9 @ 6'-8'
 A&B Job Sample ID: 14050918.09

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052179
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:56
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 19.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	19.8					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-9 @ 6'-8'
 A&B Job Sample ID: 14050918.09

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:56
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 19.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 06:57
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 06:57
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 06:57
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 06:57
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 06:57
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 06:57
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 06:57
98-08-8	Trifluorotoluene(surr)	98						81 111	%	1	05/20/14 06:57

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-9 @ 6'-8'
 A&B Job Sample ID: 14050918.09

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 10:56
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 19.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 29.6	Q18,U	29.6	31.2	23.7	25	1000	mg/Kg	1	05/20/14 17:11
TPH-1005-2	>C12-C28 ¹	< 25.3	U	25.3	31.2	20.3	25	1000	mg/Kg	1	05/20/14 17:11
TPH-1005-4	>C28-C35 ¹	< 22.1	U	22.1	31.2	17.7	25	1000	mg/Kg	1	05/20/14 17:11
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 17:11
111-85-3	1-Chlorooctane(surr)	99.4					60	143	%	1	05/20/14 17:11
3386-33-2	Chlorooctadecane(sur	102					60	150	%	1	05/20/14 17:11

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-10 @ 12-'14'
A&B Job Sample ID: 14050918.10

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14052179
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/14/2014 12:45
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 12.8

Table with 12 columns: CAS Number, Parameter, Result, Flag, SDL, SQL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 12.8, ----, ----, %, 1, 05/21/14 09:51



LABORATORY TEST RESULTS

Client Sample ID: SB-10 @ 12-'14'
 A&B Job Sample ID: 14050918.10

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 12:45
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 12.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.023	U	0.023	0.115	0.001	0.005	0.4	mg/Kg	20.06	05/20/14 12:36
71-43-2	Benzene	< 0.023	Q18,U	0.023	0.115	0.001	0.005	0.4	mg/Kg	20.06	05/20/14 12:36
108-88-3	Toluene	5.20		0.023	0.115	0.001	0.005	0.4	mg/Kg	20.06	05/20/14 12:36
100-41-4	Ethylbenzene	7.14		0.115	0.115	0.005	0.005	0.4	mg/Kg	20.06	05/20/14 12:36
108-38-3&106-4	m- & p-Xylenes	24.5	E	0.115	0.230	0.005	0.01	0.8	mg/Kg	20.06	05/20/14 12:36
95-47-6	o-Xylene	8.98		0.046	0.115	0.002	0.005	0.4	mg/Kg	20.06	05/20/14 12:36
1330-20-7	Xylenes	33.5	E	0.046	0.115	0.002	0.005	1.2	mg/Kg	20.06	05/20/14 12:36
98-08-8	Trifluorotoluene(surr)	107						81	111	%	20.06 05/20/14 12:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-10 @ 12-'14'
 A&B Job Sample ID: 14050918.10

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 12:45
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 12.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	503	Q18	27.2	28.7	23.7	25	1000	mg/Kg	1	05/20/14 17:35
TPH-1005-2	>C12-C28 ¹	26.8	J	23.3	28.7	20.3	25	1000	mg/Kg	1	05/20/14 17:35
TPH-1005-4	>C28-C35 ¹	< 20.3	U	20.3	28.7	17.7	25	1000	mg/Kg	1	05/20/14 17:35
	Total C6-C35	529.8					----	----	mg/Kg	1	05/20/14 17:35
111-85-3	1-Chlorooctane(surr)	N/A	S5				60	143	%	1	05/20/14 17:35
3386-33-2	Chlorooctadecane(sur)	108					60	150	%	1	05/20/14 17:35

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-11 @ 6-'8'
 A&B Job Sample ID: 14050918.11

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052180
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/14/2014 13:25
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 13.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	13.8					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-11 @ 6-'8'
 A&B Job Sample ID: 14050918.11

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 13:25
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 13.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:14
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:14
108-88-3	Toluene	0.006		0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:14
100-41-4	Ethylbenzene	0.019		0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 08:14
108-38-3&106-4	m- & p-Xylenes	0.041		0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 08:14
95-47-6	o-Xylene	0.019	V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 08:14
1330-20-7	Xylenes	0.059		0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 08:14
98-08-8	Trifluorotoluene(surr)	102					81	111	%	1	05/20/14 08:14

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-11 @ 6-'8'
 A&B Job Sample ID: 14050918.11

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 13:25
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 13.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 27.5	Q18,U	27.5	29	23.7	25	1000	mg/Kg	1	05/20/14 17:59
TPH-1005-2	>C12-C28 ¹	< 23.5	U	23.5	29	20.3	25	1000	mg/Kg	1	05/20/14 17:59
TPH-1005-4	>C28-C35 ¹	< 20.5	U	20.5	29	17.7	25	1000	mg/Kg	1	05/20/14 17:59
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 17:59
111-85-3	1-Chlorooctane(surr)	78.7					60	143	%	1	05/20/14 17:59
3386-33-2	Chlorooctadecane(sur	90.9					60	150	%	1	05/20/14 17:59

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-12 @ 14-'16'
A&B Job Sample ID: 14050918.12

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/14/2014 14:33
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 13.0

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, SQL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 13, ----, ----, %, 1, 05/21/14 09:51



LABORATORY TEST RESULTS

Client Sample ID: SB-12 @ 14-'16'
 A&B Job Sample ID: 14050918.12

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052371
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 14:33
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 13.0

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:39
71-43-2	Benzene	0.014		0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:39
108-88-3	Toluene	0.07		0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 08:39
100-41-4	Ethylbenzene	0.085		0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 08:39
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.011	0.005	0.01	0.8	mg/Kg	1	05/20/14 08:39
95-47-6	o-Xylene	< 0.002	U,V6	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 08:39
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 08:39
98-08-8	Trifluorotoluene(surr)	145	S6					81 111	%	1	05/20/14 08:39

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-12 @ 14-'16'
 A&B Job Sample ID: 14050918.12

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 14:33
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 13.0

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 27.2	Q18,U	27.2	28.7	23.7	25	1000	mg/Kg	1	05/20/14 18:23
TPH-1005-2	>C12-C28 ¹	< 23.3	U	23.3	28.7	20.3	25	1000	mg/Kg	1	05/20/14 18:23
TPH-1005-4	>C28-C35 ¹	< 20.3	U	20.3	28.7	17.7	25	1000	mg/Kg	1	05/20/14 18:23
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 18:23
111-85-3	1-Chlorooctane(surr)	110					60	143	%	1	05/20/14 18:23
3386-33-2	Chlorooctadecane(sur)	104					60	150	%	1	05/20/14 18:23

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-13 @ 14-'16'
A&B Job Sample ID: 14050918.13

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/14/2014 16:06
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 14.2

Table with 12 columns: CAS Number, Parameter, Result, Flag, SDL, SQL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 14.2, ----, ----, %, 1, 05/21/14 09:51



LABORATORY TEST RESULTS

Client Sample ID: SB-13 @ 14-'16'
 A&B Job Sample ID: 14050918.13

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 16:06
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 14.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:02
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:02
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:02
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 13:02
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 13:02
95-47-6	o-Xylene	< 0.002	U	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 13:02
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 13:02
98-08-8	Trifluorotoluene(surr)	101					81	111	%	1	05/20/14 13:02

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-13 @ 14-'16'
 A&B Job Sample ID: 14050918.13

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 16:06
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 14.2

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 27.6	Q18,U	27.6	29.1	23.7	25	1000	mg/Kg	1	05/20/14 18:47
TPH-1005-2	>C12-C28 ¹	< 23.7	U	23.7	29.1	20.3	25	1000	mg/Kg	1	05/20/14 18:47
TPH-1005-4	>C28-C35 ¹	< 20.6	U	20.6	29.1	17.7	25	1000	mg/Kg	1	05/20/14 18:47
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 18:47
111-85-3	1-Chlorooctane(surr)	99					60	143	%	1	05/20/14 18:47
3386-33-2	Chlorooctadecane(sur)	103					60	150	%	1	05/20/14 18:47

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-14 @ 12-'14'
 A&B Job Sample ID: 14050918.14

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052180
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/14/2014 16:50
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 5.79

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	5.79					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-14 @ 12-'14'
 A&B Job Sample ID: 14050918.14

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 16:50
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 5.79

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.005	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 13:27
71-43-2	Benzene	< 0.001	U	0.001	0.005	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 13:27
108-88-3	Toluene	< 0.001	U	0.001	0.005	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 13:27
100-41-4	Ethylbenzene	< 0.005	U	0.005	0.005	0.005	0.005	0.4	mg/Kg	0.99	05/20/14 13:27
108-38-3&106-4	m- & p-Xylenes	< 0.005	U	0.005	0.011	0.005	0.01	0.8	mg/Kg	0.99	05/20/14 13:27
95-47-6	o-Xylene	< 0.002	U	0.002	0.005	0.002	0.005	0.4	mg/Kg	0.99	05/20/14 13:27
1330-20-7	Xylenes	< 0.002	U	0.002	0.005	0.002	0.005	1.2	mg/Kg	0.99	05/20/14 13:27
98-08-8	Trifluorotoluene(surr)	97						81 111	%	0.99	05/20/14 13:27

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-14 @ 12-'14'
 A&B Job Sample ID: 14050918.14

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 16:50
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 5.79

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 25.2	Q18,U	25.2	26.5	23.7	25	1000	mg/Kg	1	05/20/14 19:11
TPH-1005-2	>C12-C28 ¹	< 21.5	U	21.5	26.5	20.3	25	1000	mg/Kg	1	05/20/14 19:11
TPH-1005-4	>C28-C35 ¹	< 18.8	U	18.8	26.5	17.7	25	1000	mg/Kg	1	05/20/14 19:11
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 19:11
111-85-3	1-Chlorooctane(surr)	86.8					60	143	%	1	05/20/14 19:11
3386-33-2	Chlorooctadecane(sur)	88.8					60	150	%	1	05/20/14 19:11

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-15 @ 6-'8'
A&B Job Sample ID: 14050918.15

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/14/2014 14:57
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 16.3

Table with 12 columns: CAS Number, Parameter, Result, Flag, SDL, SQL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 16.3, ----, ----, %, 1, 05/21/14 09:51



LABORATORY TEST RESULTS

Client Sample ID: SB-15 @ 6-'8'
 A&B Job Sample ID: 14050918.15

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/14/2014 14:57
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 16.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time	
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:53	
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:53	
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 13:53	
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 13:53	
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 13:53	
95-47-6	o-Xylene	< 0.002	U	0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 13:53	
1330-20-7	Xylenes	< 0.002	U	0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 13:53	
98-08-8	Trifluorotoluene(surr)	97						81	111	%	1	05/20/14 13:53

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-15 @ 6-'8'
 A&B Job Sample ID: 14050918.15

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/14/2014 14:57
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 16.3

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.3	Q18,U	28.3	29.9	23.7	25	1000	mg/Kg	1	05/20/14 19:36
TPH-1005-2	>C12-C28 ¹	< 24.3	U	24.3	29.9	20.3	25	1000	mg/Kg	1	05/20/14 19:36
TPH-1005-4	>C28-C35 ¹	< 21.1	U	21.1	29.9	17.7	25	1000	mg/Kg	1	05/20/14 19:36
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 19:36
111-85-3	1-Chlorooctane(surr)	84.9					60	143	%	1	05/20/14 19:36
3386-33-2	Chlorooctadecane(sur	84.5					60	150	%	1	05/20/14 19:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-16 @ 14-'16'
A&B Job Sample ID: 14050918.16

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/18/2014 09:59
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 20.8

Table with 12 columns: CAS Number, Parameter, Result, Flag, SDL, SQL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 20.8, ----, ----, %, 1, 05/21/14 09:51



LABORATORY TEST RESULTS

Client Sample ID: SB-16 @ 14-'16'
 A&B Job Sample ID: 14050918.16

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052261
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052254

Sample Matrix: Soil
 Date Collected: 05/18/2014 09:59
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 18:00

Analyst Initial: SRB

% Moisture: 20.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 1.26	U	1.26	6.30	0.001	0.005	0.4	mg/Kg	998	05/22/14 05:14
71-43-2	Benzene	< 1.26	U	1.26	6.30	0.001	0.005	0.4	mg/Kg	998	05/22/14 05:14
108-88-3	Toluene	264		1.26	6.30	0.001	0.005	0.4	mg/Kg	998	05/22/14 05:14
100-41-4	Ethylbenzene	172		6.30	6.30	0.005	0.005	0.4	mg/Kg	998	05/22/14 05:14
108-38-3&106-4	m- & p-Xylenes	636		6.30	12.6	0.005	0.01	0.8	mg/Kg	998	05/22/14 05:14
95-47-6	o-Xylene	264		2.52	6.30	0.002	0.005	0.4	mg/Kg	998	05/22/14 05:14
1330-20-7	Xylenes	900		2.52	6.30	0.002	0.005	1.2	mg/Kg	998	05/22/14 05:14
98-08-8	Trifluorotoluene(surr)	98.5						81 111	%	998	05/22/14 05:14

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-16 @ 14-'16'
 A&B Job Sample ID: 14050918.16

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/18/2014 09:59
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 20.8

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	1984		59.8	63.1	23.7	25	1000	mg/Kg	2	05/21/14 09:34
TPH-1005-2	>C12-C28 ¹	130		51.3	63.1	20.3	25	1000	mg/Kg	2	05/21/14 09:34
TPH-1005-4	>C28-C35 ¹	< 22.3	U	22.3	31.6	17.7	25	1000	mg/Kg	1	05/20/14 20:01
	Total C6-C35	2114					----	----	mg/Kg	2	05/21/14 09:34
111-85-3	1-Chlorooctane(surr)	N/A	S5				60	143	%	2	05/20/14 20:01
3386-33-2	Chlorooctadecane(sur	81					60	150	%	1	05/20/14 20:01

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-17 @ W 4-'6'
A&B Job Sample ID: 14050918.17

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/18/2014 11:00
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 12.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	12.4					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-17 @ W 4-'6'
 A&B Job Sample ID: 14050918.17

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/18/2014 11:00
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 12.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 15:09
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 15:09
108-88-3	Toluene	0.158		0.001	0.006	0.001	0.005	0.4	mg/Kg	1.02	05/20/14 15:09
100-41-4	Ethylbenzene	0.185		0.006	0.006	0.005	0.005	0.4	mg/Kg	1.02	05/20/14 15:09
108-38-3&106-4	m- & p-Xylenes	0.716		0.006	0.012	0.005	0.01	0.8	mg/Kg	1.02	05/20/14 15:09
95-47-6	o-Xylene	0.308		0.002	0.006	0.002	0.005	0.4	mg/Kg	1.02	05/20/14 15:09
1330-20-7	Xylenes	1.02		0.002	0.006	0.002	0.005	1.2	mg/Kg	1.02	05/20/14 15:09
98-08-8	Trifluorotoluene(surr)	98					81	111	%	1.02	05/20/14 15:09

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-17 @ W 4-'6'
 A&B Job Sample ID: 14050918.17

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/18/2014 11:00
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 12.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 27.1	Q18,U	27.1	28.5	23.7	25	1000	mg/Kg	1	05/20/14 20:26
TPH-1005-2	>C12-C28 ¹	< 23.2	U	23.2	28.5	20.3	25	1000	mg/Kg	1	05/20/14 20:26
TPH-1005-4	>C28-C35 ¹	< 20.2	U	20.2	28.5	17.7	25	1000	mg/Kg	1	05/20/14 20:26
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 20:26
111-85-3	1-Chlorooctane(surr)	82.4					60	143	%	1	05/20/14 20:26
3386-33-2	Chlorooctadecane(sur	79.7					60	150	%	1	05/20/14 20:26

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-18 @ 1'-2'
A&B Job Sample ID: 14050918.18

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
Analytical Method: SM 2540G
QC Batch ID: Qb14052180
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/18/2014 11:44
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 16.0

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	16					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-18 @ 1'-2'
 A&B Job Sample ID: 14050918.18

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/18/2014 11:44
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 16.0

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	0.017	Q18	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 15:35
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 15:35
108-88-3	Toluene	0.033		0.001	0.006	0.001	0.005	0.4	mg/Kg	1	05/20/14 15:35
100-41-4	Ethylbenzene	0.033		0.006	0.006	0.005	0.005	0.4	mg/Kg	1	05/20/14 15:35
108-38-3&106-4	m- & p-Xylenes	0.171		0.006	0.012	0.005	0.01	0.8	mg/Kg	1	05/20/14 15:35
95-47-6	o-Xylene	0.087		0.002	0.006	0.002	0.005	0.4	mg/Kg	1	05/20/14 15:35
1330-20-7	Xylenes	0.258		0.002	0.006	0.002	0.005	1.2	mg/Kg	1	05/20/14 15:35
98-08-8	Trifluorotoluene(surr)	105						81 111	%	1	05/20/14 15:35

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-18 @ 1-'2'
 A&B Job Sample ID: 14050918.18

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/18/2014 11:44
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 16.0

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.2	Q18,U	28.2	29.8	23.7	25	1000	mg/Kg	1	05/20/14 21:15
TPH-1005-2	>C12-C28 ¹	< 24.2	U	24.2	29.8	20.3	25	1000	mg/Kg	1	05/20/14 21:15
TPH-1005-4	>C28-C35 ¹	< 21.1	U	21.1	29.8	17.7	25	1000	mg/Kg	1	05/20/14 21:15
	Total C6-C35	<					----	----	mg/Kg	1	05/20/14 21:15
111-85-3	1-Chlorooctane(surr)	88.5					60	143	%	1	05/20/14 21:15
3386-33-2	Chlorooctadecane(sur	83.5					60	150	%	1	05/20/14 21:15

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-19 @ 6-'8'
 A&B Job Sample ID: 14050918.19

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052180
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:16
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 21.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	21.1					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-19 @ 6-'8'
 A&B Job Sample ID: 14050918.19

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:16
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 21.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:32
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:32
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:32
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	0.99	05/20/14 17:32
108-38-3&106-4	m- & p-Xylenes	0.02		0.006	0.013	0.005	0.01	0.8	mg/Kg	0.99	05/20/14 17:32
95-47-6	o-Xylene	0.008		0.003	0.006	0.002	0.005	0.4	mg/Kg	0.99	05/20/14 17:32
1330-20-7	Xylenes	0.029		0.003	0.006	0.002	0.005	1.2	mg/Kg	0.99	05/20/14 17:32
98-08-8	Trifluorotoluene(surr)	98					81	111	%	0.99	05/20/14 17:32

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-19 @ 6-'8'
 A&B Job Sample ID: 14050918.19

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:16
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 21.1

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 30	Q18,U	30	31.7	23.7	25	1000	mg/Kg	1	05/20/14 21:40
TPH-1005-2	>C12-C28 ¹	30.8	J	25.7	31.7	20.3	25	1000	mg/Kg	1	05/20/14 21:40
TPH-1005-4	>C28-C35 ¹	< 22.4	U	22.4	31.7	17.7	25	1000	mg/Kg	1	05/20/14 21:40
	Total C6-C35	30.8					----	----	mg/Kg	1	05/20/14 21:40
111-85-3	1-Chlorooctane(surr)	107					60	143	%	1	05/20/14 21:40
3386-33-2	Chlorooctadecane(sur	109					60	150	%	1	05/20/14 21:40

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-20 @ 4'-6'
 A&B Job Sample ID: 14050918.20

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
 Analytical Method: SM 2540G
 QC Batch ID: Qb14052180
 Prep Method: SM 2540G
 Prepared By: MMaldonado
 Prep Batch ID: PB14052104
 Analyst Initial: MAM

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:32
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/21/2014 08:50

% Moisture: 23.6

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	23.6					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-20 @ 4'-6'
 A&B Job Sample ID: 14050918.20

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:32
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 23.6

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.007	0.001	0.005	0.4	mg/Kg	1	05/20/14 16:00
71-43-2	Benzene	< 0.001	U	0.001	0.007	0.001	0.005	0.4	mg/Kg	1	05/20/14 16:00
108-88-3	Toluene	0.013		0.001	0.007	0.001	0.005	0.4	mg/Kg	1	05/20/14 16:00
100-41-4	Ethylbenzene	0.009		0.007	0.007	0.005	0.005	0.4	mg/Kg	1	05/20/14 16:00
108-38-3&106-4	m- & p-Xylenes	0.048		0.007	0.013	0.005	0.01	0.8	mg/Kg	1	05/20/14 16:00
95-47-6	o-Xylene	0.021		0.003	0.007	0.002	0.005	0.4	mg/Kg	1	05/20/14 16:00
1330-20-7	Xylenes	0.069		0.003	0.007	0.002	0.005	1.2	mg/Kg	1	05/20/14 16:00
98-08-8	Trifluorotoluene(surr)	99					81	111	%	1	05/20/14 16:00

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-20 @ 4'-6'
 A&B Job Sample ID: 14050918.20

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052115
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052123

Sample Matrix: Soil
 Date Collected: 05/18/2014 08:32
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 10:00

Analyst Initial: AVB

% Moisture: 23.6

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 31	Q18,U	31	32.7	23.7	25	1000	mg/Kg	1	05/20/14 22:05
TPH-1005-2	>C12-C28 ¹	< 26.6	U	26.6	32.7	20.3	25	1000	mg/Kg	1	05/20/14 22:05
TPH-1005-4	>C28-C35 ¹	31.9	J	23.2	32.7	17.7	25	1000	mg/Kg	1	05/20/14 22:05
	Total C6-C35	31.9					----	----	mg/Kg	1	05/20/14 22:05
111-85-3	1-Chlorooctane(surr)	60.3					60	143	%	1	05/20/14 22:05
3386-33-2	Chlorooctadecane(sur	66.9					60	150	%	1	05/20/14 22:05

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-21 @ 8-'10'
A&B Job Sample ID: 14050918.21

Date: 5/23/2014

Client Name: Associated Testing Lab
Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **% Moisture**
Analytical Method: SM 2540G
QC Batch ID: Qb14052181
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14052104
Analyst Initial: MAM

Sample Matrix: Soil
Date Collected: 05/18/2014 09:17
Date Received: 05/19/2014 10:59
Date Prepared: 05/21/2014 08:50

% Moisture: 23.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	23.4					----	----	%	1	05/21/14 09:51

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-21 @ 8-'10'
 A&B Job Sample ID: 14050918.21

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052045
 Prep Method: SW-846 5035A
 Prepared By: Spabba
 Prep Batch ID: PB14052355

Sample Matrix: Soil
 Date Collected: 05/18/2014 09:17
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture: 23.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:58
71-43-2	Benzene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:58
108-88-3	Toluene	< 0.001	U	0.001	0.006	0.001	0.005	0.4	mg/Kg	0.99	05/20/14 17:58
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.006	0.005	0.005	0.4	mg/Kg	0.99	05/20/14 17:58
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.013	0.005	0.01	0.8	mg/Kg	0.99	05/20/14 17:58
95-47-6	o-Xylene	< 0.003	U	0.003	0.006	0.002	0.005	0.4	mg/Kg	0.99	05/20/14 17:58
1330-20-7	Xylenes	< 0.003	U	0.003	0.006	0.002	0.005	1.2	mg/Kg	0.99	05/20/14 17:58
98-08-8	Trifluorotoluene(surr)	98						81 111	%	0.99	05/20/14 17:58

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-21 @ 8-'10'
 A&B Job Sample ID: 14050918.21

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052260
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052257

Sample Matrix: Soil
 Date Collected: 05/18/2014 09:17
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/20/2014 15:00

Analyst Initial: AVB

% Moisture: 23.4

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 30.9	Q18,U	30.9	32.6	23.7	25	1000	mg/Kg	1	05/22/14 11:38
TPH-1005-2	>C12-C28 ¹	29.8	J	26.5	32.6	20.3	25	1000	mg/Kg	1	05/22/14 11:38
TPH-1005-4	>C28-C35 ¹	32.4	J	23.1	32.6	17.7	25	1000	mg/Kg	1	05/22/14 11:38
	Total C6-C35	62.2					----	----	mg/Kg	1	05/22/14 11:38
111-85-3	1-Chlorooctane(surr)	117					60	143	%	1	05/22/14 11:38
3386-33-2	Chlorooctadecane(sur	118					60	150	%	1	05/22/14 11:38

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-2 / TWP-2
 A&B Job Sample ID: 14050918.22

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052343
 Prep Method: SW-846 5030C
 Prepared By: Spabba
 Prep Batch ID: PB14052356

Sample Matrix: Water
 Date Collected: 05/12/2014 12:33
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	0.002	.0014	0.002	0.16	mg/L	1	05/21/14 05:10
71-43-2	Benzene	< 0.0008	U	0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 05:10
108-88-3	Toluene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 05:10
100-41-4	Ethylbenzene	< 0.0008	U	0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 05:10
108-38-3&106-4	m- & p-Xylenes	< 0.002	U	0.002	0.004	.0016	0.004	0.32	mg/L	1	05/21/14 05:10
95-47-6	o-Xylene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 05:10
1330-20-7	Xylenes	< 0.003	U	0.003	0.002	.0025	0.002	0.48	mg/L	1	05/21/14 05:10
98-08-8	Trifluorotoluene(surr)	80						75 125	%	1	05/21/14 05:10

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-2 / TWP-2
 A&B Job Sample ID: 14050918.22

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052127
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052125

Sample Matrix: Water
 Date Collected: 05/12/2014 12:33
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 16:00

Analyst Initial: AVB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 0.849	U	0.849	1.93	0.66	1.5	60	mg/L	1.286	05/20/14 23:19
TPH-1005-2	>C12-C28 ¹	< 1.11	U	1.11	1.93	0.86	1.5	60	mg/L	1.286	05/20/14 23:19
TPH-1005-4	>C28-C35 ¹	< 0.965	U	0.965	1.93	0.75	1.5	60	mg/L	1.286	05/20/14 23:19
	Total C6-C35	<					----	----	mg/L	1.286	05/20/14 23:19
111-85-3	1-Chlorooctane(surr)	72.4					59	122	%	1.286	05/20/14 23:19
3386-33-2	Chlorooctadecane(sur	97.8					48	123	%	1.286	05/20/14 23:19

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-11 / TWP-11
 A&B Job Sample ID: 14050918.23

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052343
 Prep Method: SW-846 5030C
 Prepared By: Spabba
 Prep Batch ID: PB14052356

Sample Matrix: Water
 Date Collected: 05/14/2014 13:40
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	0.002	.0014	0.002	0.16	mg/L	1	05/21/14 02:34
71-43-2	Benzene	< 0.0008	U	0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 02:34
108-88-3	Toluene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 02:34
100-41-4	Ethylbenzene	< 0.0008	U	0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 02:34
108-38-3&106-4	m- & p-Xylenes	< 0.002	U	0.002	0.004	.0016	0.004	0.32	mg/L	1	05/21/14 02:34
95-47-6	o-Xylene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 02:34
1330-20-7	Xylenes	< 0.003	U	0.003	0.002	.0025	0.002	0.48	mg/L	1	05/21/14 02:34
98-08-8	Trifluorotoluene(surr)	97.5						75 125	%	1	05/21/14 02:34

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-11 / TWP-11
 A&B Job Sample ID: 14050918.23

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052127
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052125

Sample Matrix: Water
 Date Collected: 05/14/2014 13:40
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 16:00

Analyst Initial: AVB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 0.904	U	0.904	2.05	0.66	1.5	60	mg/L	1.369	05/20/14 23:43
TPH-1005-2	>C12-C28 ¹	< 1.18	U	1.18	2.05	0.86	1.5	60	mg/L	1.369	05/20/14 23:43
TPH-1005-4	>C28-C35 ¹	< 1.03	U	1.03	2.05	0.75	1.5	60	mg/L	1.369	05/20/14 23:43
	Total C6-C35	<					----	----	mg/L	1.369	05/20/14 23:43
111-85-3	1-Chlorooctane(surr)	41.4	S2				59	122	%	1.369	05/20/14 23:43
3386-33-2	Chlorooctadecane(sur	59					48	123	%	1.369	05/20/14 23:43

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-13 / TWP-13
 A&B Job Sample ID: 14050918.24

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052343
 Prep Method: SW-846 5030C
 Prepared By: Spabba
 Prep Batch ID: PB14052356

Sample Matrix: Water
 Date Collected: 05/14/2014 16:20
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	0.002	.0014	0.002	0.16	mg/L	1	05/21/14 03:52
71-43-2	Benzene	< 0.0008	U	0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 03:52
108-88-3	Toluene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 03:52
100-41-4	Ethylbenzene	0.006		0.0008	0.002	.0008	0.002	0.16	mg/L	1	05/21/14 03:52
108-38-3&106-4	m- & p-Xylenes	< 0.002	U	0.002	0.004	.0016	0.004	0.32	mg/L	1	05/21/14 03:52
95-47-6	o-Xylene	< 0.001	U	0.001	0.002	.0010	0.002	0.16	mg/L	1	05/21/14 03:52
1330-20-7	Xylenes	< 0.003	U	0.003	0.002	.0025	0.002	0.48	mg/L	1	05/21/14 03:52
98-08-8	Trifluorotoluene(surr)	101						75 125	%	1	05/21/14 03:52

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-13 / TWP-13
 A&B Job Sample ID: 14050918.24

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Analytical Method: TX 1005
 QC Batch ID: Qb14052127
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14052125

Sample Matrix: Water
 Date Collected: 05/14/2014 16:20
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 16:00

Analyst Initial: AVB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 0.936	U	0.936	2.13	0.66	1.5	60	mg/L	1.418	05/21/14 00:07
TPH-1005-2	>C12-C28 ¹	< 1.22	U	1.22	2.13	0.86	1.5	60	mg/L	1.418	05/21/14 00:07
TPH-1005-4	>C28-C35 ¹	< 1.06	U	1.06	2.13	0.75	1.5	60	mg/L	1.418	05/21/14 00:07
	Total C6-C35	<					----	----	mg/L	1.418	05/21/14 00:07
111-85-3	1-Chlorooctane(surr)	47.8	S2				59	122	%	1.418	05/21/14 00:07
3386-33-2	Chlorooctadecane(sur	83.7					48	123	%	1.418	05/21/14 00:07

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-16 / TWP-16
 A&B Job Sample ID: 14050918.25

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Purgeable Aromatics**

Analytical Method: SW-846 8021B
 QC Batch ID: Qb14052343
 Prep Method: SW-846 5030C
 Prepared By: Spabba
 Prep Batch ID: PB14052356

Sample Matrix: Water
 Date Collected: 05/18/2014 10:30
 Date Received: 05/19/2014 10:59
 Date Prepared: 05/19/2014 18:00

Analyst Initial: SRB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.700	U	0.700	1.000	.0014	0.002	0.16	mg/L	500	05/21/14 04:18
71-43-2	Benzene	< 0.400	U	0.400	1.000	.0008	0.002	0.16	mg/L	500	05/21/14 04:18
108-88-3	Toluene	33.4		1.25	2.50	.0010	0.002	0.16	mg/L	1250	05/21/14 04:44
100-41-4	Ethylbenzene	86.4		1.000	2.50	.0008	0.002	0.16	mg/L	1250	05/21/14 04:44
108-38-3&106-4	m- & p-Xylenes	372		2.00	5.00	.0016	0.004	0.32	mg/L	1250	05/21/14 04:18
95-47-6	o-Xylene	182		1.25	2.50	.0010	0.002	0.16	mg/L	1250	05/21/14 04:18
1330-20-7	Xylenes	554		3.13	2.50	.0025	0.002	0.48	mg/L	1250	05/21/14 04:18
98-08-8	Trifluorotoluene(surr)	95					75	125	%	500	05/21/14 04:18

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: SB-16 / TWP-16
 A&B Job Sample ID: 14050918.25

Date: 5/23/2014

Client Name: Associated Testing Lab
 Project Name: E14-105 / Sewer Line Replacement (Various Street)

Attn: Tom Murphy

Test Description: **Total Petroleum Hydrocarbons**

Sample Matrix: Water

Analytical Method: TX 1005

Date Collected: 05/18/2014 10:30

QC Batch ID: Qb14052127

Date Received: 05/19/2014 10:59

Prep Method: TX 1005

Date Prepared: 05/19/2014 16:00

Prepared By: AVBembde

Prep Batch ID: PB14052125

Analyst Initial: AVB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	SQL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	344		4.63	10.5	0.66	1.5	60	mg/L	7.02	05/21/14 10:22
TPH-1005-2	>C12-C28 ¹	17		1.21	2.11	0.86	1.5	60	mg/L	1.404	05/21/14 00:32
TPH-1005-4	>C28-C35 ¹	< 1.05	U	1.05	2.11	0.75	1.5	60	mg/L	1.404	05/21/14 00:32
	Total C6-C35	361					----	----	mg/L	7.02	05/21/14 10:22
111-85-3	1-Chlorooctane(surr)	N/A	S5				59	122	%	1.404	05/21/14 00:32
3386-33-2	Chlorooctadecane(sur	80					48	123	%	1.404	05/21/14 00:32

Soil results reported on dry weight basis

¹-Parameter not available for accreditation

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Total Petroleum Hydrocarbons **Method :** TX 1005 **Reporting Units :** mg/Kg

QC Batch ID : Qb14052115 **Created Date :** 05/21/14 **Created By :** AVBembde

Samples in This QC Batch : 14050918.01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20

Sample Preparation : PB14052123 **Prep Method :** TX 1005 **Prep Date :** 05/20/14 10:00 **Prep By :** AVBembde

QC Type: Method Blank									
Parameter	CAS #	Result	Units	D.F.	MQL	MDL			Qual
C6-C12	TPH-1005-1	< MDL	mg/Kg	1	25	23.7			
>C12-C28	TPH-1005-2	< MDL	mg/Kg	1	25	20.3			
>C28-C35	TPH-1005-4	< MDL	mg/Kg	1	25	17.7			
Total C6-C35		< MDL	mg/Kg	1	----				
Chlorooctadecane(surr)	3386-33-2	105	%	1					
1-Chlorooctane(surr)	111-85-3	115	%	1					

QC Type: LCS and LCSD										
Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	500	561	112	500	522	104	7.2	20	75-125	
>C12-C28	500	493	98.6	500	487	97.4	1.2	20	75-125	
>C28-C35	500	619	124	500	615	123	0.6	20	75-125	

QC Type: MS and MSD											
QC Sample ID: 14050918.01											
Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
C6-C12	BRL	500	465	91.1	500	470	92.1	1.1	20	75-125	
>C12-C28	BRL	500	447	85.6	500	449	86	0.5	20	75-125	
>C28-C35	BRL	500	612	122	500	597	119	2.5	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Total Petroleum Hydrocarbons **Method :** TX 1005 **Reporting Units :** mg/L

QC Batch ID : Qb14052127 **Created Date :** 05/21/14 **Created By :** AVBembde

Samples in This QC Batch : 14050918.22,23,24,25

Sample Preparation : PB14052125 **Prep Method :** TX 1005 **Prep Date :** 05/19/14 16:00 **Prep By :** AVBembde

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	MQL	MDL	Qual
C6-C12	TPH-1005-1	< MDL	mg/L	1	1.5	0.66	
>C12-C28	TPH-1005-2	< MDL	mg/L	1	1.5	0.86	
>C28-C35	TPH-1005-4	< MDL	mg/L	1	1.5	0.75	
Total C6-C35		< MDL	mg/L	1	---		
1-Chlorooctane(surr)	111-85-3	106	%	1			
Chlorooctadecane(surr)	3386-33-2	107	%	1			

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	30	31.5	105	30	29.9	99.7	5.2	20	75-125	
>C12-C28	30	28.6	95.3	30	28.8	96	0.7	20	75-125	
>C28-C35	30	28.9	96.3	30	30.1	100	4.1	20	75-125	

QC Type: MS and MSD

QC Sample ID: 14050844.01

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
C6-C12	BRL	26.2	24.2	90.8	26.2	22.3	83.6	8.3	20	75-125	
>C12-C28	BRL	26.2	24.4	92	26.2	21.8	82	11.4	20	75-125	
>C28-C35	BRL	26.2	24.3	92.7	26.2	24.3	92.7	0	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Total Petroleum Hydrocarbons **Method :** TX 1005 **Reporting Units :** mg/Kg

QC Batch ID : Qb14052260 **Created Date :** 05/22/14 **Created By :** AVBembde

Samples in This QC Batch : 14050918.21

Sample Preparation : PB14052257 **Prep Method :** TX 1005 **Prep Date :** 05/20/14 15:00 **Prep By :** AVBembde

QC Type: Method Blank

Parameter	CAS #	Result	Units	D.F.	ML	MDL		Qual
C6-C12	TPH-1005-1	< MDL	mg/Kg	1	25	23.7		
>C12-C28	TPH-1005-2	< MDL	mg/Kg	1	25	20.3		
>C28-C35	TPH-1005-4	< MDL	mg/Kg	1	25	17.7		
Total C6-C35		< MDL	mg/Kg	1	---			
Chlorooctadecane(surr)	3386-33-2	95.3	%	1				
1-Chlorooctane(surr)	111-85-3	92.6	%	1				

QC Type: LCS and LCSD

Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
C6-C12	500	457	91.4	500	420	84	8.4	20	75-125	
>C12-C28	500	430	86	500	409	81.8	5	20	75-125	
>C28-C35	500	556	111	500	411	82.2	30	20	75-125	R4

QC Type: MS and MSD

QC Sample ID: 14050918.21

Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
C6-C12	BRL	500	521	101	500	515	100	1.2	20	75-125	
>C12-C28	22.8	500	504	96.2	500	501	95.6	0.6	20	75-125	
>C28-C35	24.8	500	510	97	500	544	104	6.8	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Purgeable Aromatics **Method :** SW-846 8021B **Reporting Units :** mg/Kg

QC Batch ID : Qb14052261 **Created Date :** 05/21/14 **Created By :** Spabba

Samples in This QC Batch : 14050918.16

Sample Preparation : PB14052254 **Prep Method :** SW-846 5035A **Prep Date :** 05/21/14 18:00 **Prep By :** Spabba

QC Type: Method Blank								
Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
MTBE	1634-04-4	< MDL	mg/Kg	1	0.005	0.001		
Benzene	71-43-2	< MDL	mg/Kg	1	0.005	0.001		
Toluene	108-88-3	< MDL	mg/Kg	1	0.005	0.001		
Ethylbenzene	100-41-4	< MDL	mg/Kg	1	0.005	0.005		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/Kg	1	0.01	0.005		
o-Xylene	95-47-6	< MDL	mg/Kg	1	0.005	0.002		
Xylenes	1330-20-7	< MDL	mg/Kg	1	0.005	0.002		
Trifluorotoluene(surr)	98-08-8	97	%	1				

QC Type: LCS and LCSD										
Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.05	0.059	118	0.05	0.051	102	14.6	20	67.2-132	
Benzene	0.05	0.058	116	0.05	0.051	102	12.8	20	76.2-128	
Toluene	0.05	0.058	116	0.05	0.051	102	12.8	20	74.2-126	
Ethylbenzene	0.05	0.058	116	0.05	0.05	100	14.8	20	79.4-125	
m- & p-Xylenes	0.1	0.116	116	0.1	0.102	102	12.8	20	76.3-126	
o-Xylene	0.05	0.058	116	0.05	0.051	102	12.8	20	77.1-123	
Xylenes	0.15	0.174	116	0.15	0.153	102	12.8	20	77.2-125	

QC Type: MS and MSD											
QC Sample ID: 14050990.22											
Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
MTBE	BRL	0.049	0.063	129	0.049	0.053	108	17.2	26	76-134	
Benzene	BRL	0.049	0.044	89.8	0.049	0.039	79.6	12	19	68-138	
Toluene	BRL	0.049	0.041	83.7	0.049	0.038	77.6	7.6	19	67-135	
Ethylbenzene	BRL	0.049	0.035	71.4	0.049	0.035	71.4	0	20	71-127	
m- & p-Xylenes	BRL	0.099	0.069	69.7	0.099	0.068	68.7	1.5	27	56-135	
o-Xylene	BRL	0.049	0.035	71.4	0.049	0.035	71.4	0	24	56-134	
Xylenes	BRL	0.148	0.104	70.3	0.148	0.103	69.6	1	25	59-134	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Purgeable Aromatics **Method :** SW-846 8021B **Reporting Units :** mg/L

QC Batch ID : Qb14052343 **Created Date :** 05/20/14 **Created By :** Spabba

Samples in This QC Batch : 14050918.22,23,24,25

Sample Preparation : PB14052356 **Prep Method :** SW-846 5030C **Prep Date :** 05/19/14 18:00 **Prep By :** Spabba

QC Type: Method Blank								
Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
Benzene	71-43-2	< MDL	mg/L	1	0.002	.0008		
Toluene	108-88-3	< MDL	mg/L	1	0.002	.0010		
Ethylbenzene	100-41-4	< MDL	mg/L	1	0.002	.0008		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/L	1	0.004	.0016		
o-Xylene	95-47-6	< MDL	mg/L	1	0.002	.0010		
Xylenes	1330-20-7	< MDL	mg/L	1	0.002	.0025		
Trifluorotoluene(surr)	98-08-8	100	%	1				

QC Type: LCS and LCSD										
Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.02	0.019	95	0.02	0.02	100	5.1	30	69.4-124	
Benzene	0.02	0.018	90	0.02	0.02	100	10.5	30	79.1-123	
Toluene	0.02	0.019	95	0.02	0.02	100	5.1	30	72.3-117	
Ethylbenzene	0.02	0.019	95	0.02	0.02	100	5.1	30	77.4-119	
m- & p-Xylenes	0.04	0.039	97.5	0.04	0.042	105	7.4	30	77.2-127	
o-Xylene	0.02	0.019	95	0.02	0.021	105	10	30	71-114	
Xylenes	0.06	0.058	96.7	0.06	0.063	105	8.3	30	75.8-121	

QC Type: MS and MSD											
QC Sample ID: 14050918.23											
Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
MTBE	BRL	0.02	0.021	105	0.02	0.02	100	4.9	21	68-117	
Benzene	BRL	0.02	0.022	110	0.02	0.018	90	20	17	65-143	R4
Toluene	BRL	0.02	0.02	100	0.02	0.018	90	10.5	29	67-136	
Ethylbenzene	BRL	0.02	0.019	95	0.02	0.017	85	11.1	30	80-134	
m- & p-Xylenes	BRL	0.04	0.037	92.5	0.04	0.034	85	8.4	22	81-131	
o-Xylene	BRL	0.02	0.019	95	0.02	0.017	85	11.1	21	74-134	
Xylenes	BRL	0.06	0.056	93.3	0.06	0.051	85	9.4	21	80-136	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14050918

Date : 5/23/2014

Analysis : Purgeable Aromatics **Method :** SW-846 8021B **Reporting Units :** mg/Kg

QC Batch ID : Qb14052371 **Created Date :** 05/19/14 **Created By :** Spabba

Samples in This QC Batch : 14050918.01,02,03,04,05,06,07,08,09,11,12

Sample Preparation : PB14052355 **Prep Method :** SW-846 5035A **Prep Date :** 05/19/14 18:00 **Prep By :** Spabba

QC Type: Method Blank								
Parameter	CAS #	Result	Units	D.F.	MQL	MDL		Qual
MTBE	1634-04-4	< MDL	mg/Kg	1	0.005	0.001		
Benzene	71-43-2	< MDL	mg/Kg	1	0.005	0.001		
Toluene	108-88-3	< MDL	mg/Kg	1	0.005	0.001		
Ethylbenzene	100-41-4	< MDL	mg/Kg	1	0.005	0.005		
m- & p-Xylenes	108-38-3&106-42-3	< MDL	mg/Kg	1	0.01	0.005		
o-Xylene	95-47-6	< MDL	mg/Kg	1	0.005	0.002		
Xylenes	1330-20-7	< MDL	mg/Kg	1	0.005	0.002		
Trifluorotoluene(surr)	98-08-8	99	%	1				

QC Type: LCS and LCSD										
Parameter	LCS Spk Added	LCS Result	LCS % Rec	LCSD Spk Added	LCSD Result	LCSD % Rec	RPD	RPD CtrlLimit	%Recovery CtrlLimit	Qual
MTBE	0.05	0.054	108	0.05	0.044	88	20.4	20	67.2-132	R4
Benzene	0.05	0.055	110	0.05	0.047	94	15.7	20	76.2-128	
Toluene	0.05	0.055	110	0.05	0.047	94	15.7	20	74.2-126	
Ethylbenzene	0.05	0.055	110	0.05	0.048	96	13.6	20	79.4-125	
m- & p-Xylenes	0.1	0.11	110	0.1	0.095	95	14.6	20	76.3-126	
o-Xylene	0.05	0.055	110	0.05	0.047	94	15.7	20	77.1-123	
Xylenes	0.15	0.165	110	0.15	0.142	94.7	15	20	77.2-125	

QC Type: MS and MSD											
QC Sample ID: 14050918.01											
Parameter	Sample Result	MS Spk Added	MS Result	MS % Rec	MSD Spk Added	MSD Result	MSD % Rec	RPD	RPD CtrlLimit	%Rec CtrlLimit	Qual
MTBE	BRL	0.05	0.041	82	0.05	0.043	86	4.8	26	76-134	
Benzene	BRL	0.05	0.043	86	0.05	0.044	88	2.3	19	68-138	
Toluene	BRL	0.05	0.045	88.5	0.05	0.045	88.5	0	19	67-135	
Ethylbenzene	BRL	0.05	0.039	78	0.05	0.038	76	2.6	20	71-127	
m- & p-Xylenes	BRL	0.101	0.078	77.2	0.1	0.077	77	1.3	27	56-135	
o-Xylene	BRL	0.05	0.039	78	0.05	0.039	78	0	24	56-134	
Xylenes	BRL	0.151	0.117	77.5	0.149	0.116	77.9	0.9	25	59-134	

Refer to the Definition page for terms.

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 14050918

Date: 5/23/2014

General Term Definition

Back-Wt	Back Weight	Post-Wt	Post Weight
BRL	Below Reporting Limit	ppm	parts per million
cfu	colony-forming units	Pre-Wt	Previous Weight
Conc.	Concentration	Q	Qualifier
D.F.	Dilution Factor	RegLimit	Regulatory Limit
Front-Wt	Front Weight	RPD	Relative Percent Difference
LCS	Laboratory Check Standard	RptLimit	Reporting Limit
LCSD	Laboratory Check Standard Duplicate	SDL	Sample Detection Limit
MS	Matrix Spike	surr	Surrogate
MSD	Matrix Spike Duplicate	T	Time
MW	Molecular Weight	TNTC	Too numerous to count

Qualifier Definition

E	Estimation. Above calibration range.
J	Estimation. Below calibration range but above MDL.
Q18	Soils not collected in a hermetically sealed container may lose low-level VOCs.
R4	LCS/LCSD RPD exceeds control limit. Recovery meets acceptance criteria.
S2	Surrogate recovery is below control limit. Results may be biased low.
S5	Target compounds caused elevation of baseline. Surrogate not calculated
S6	Surrogate recovery is outside control limits due to matrix effects.
U	Undetected at SDL (Sample Detection Limit).
V6	CCV recovery is above the control limit for this analyte, however the average %difference for all the analytes meets method criteria.

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A&B JOB ID # 17050918
5. Project # E14-105

6. Project Name/Location

Sewer Line Replacement (Various Streets)

7. Reporting Requirement:

TRRP Limits only TRRP Rpt. Package See Attached Standard Level II PST MDL EDD

8. Sampler's Name & Company (PLEASE PRINT)

Tom Murphy / ATL

Sampler's Signature & Date

Tom Murphy

1. REPORT TO:
Company: Associated Tech Labs
Address: 3143 Yellowstar Blvd.
Houston, TX 77054
Contact: Tom Murphy
Phone: 713 748 3417
Fax: 713 748 3748
E-mail:

2. INVOICE TO:
Company:
Address:
Contact:
Phone:
Fax:
E-mail:

3. PO #
3a. A&B Quote #
4. Turnaround Time (Business Days)
 1 Day Other:
 2 Days*
 3 Days* *Surcharge applies
 7 Days - Standard

13. Containers*

15. Preservatives**

16. PH-Lab Only

17.

No. of Containers

Analyses/Methods

TPH (TK100) (col)

MIBE/BTEX

18. REMARKS

10. Sampling

11. 12. Matrix

Date

Time 24hr

Comp.

Water

Soil

Sludge

Oil

Drinking Water

Air

Other

19. REQUISITIONED BY

DATE

TIME

20. RECEIVED BY

DATE

TIME

21. KNOWN HAZARDS/COMMENTS

Temperature: 5.3-6.9 = 4.9°C

Thermometer ID 10200320

Initials TM

A&B cannot accept verbal changes

Please FAX written changes to 713-453-6091

Samples will be disposed of after 30 days

*Containers: VOA - 40 ml vial
4 oz/8 oz - glass wide mouth
P/O - Plastic/other

**Preservatives: C - Cool
OH - NaOH
H - HCl
T - NA₂S₂O₃
N - HNO₃
S - H₂SO₄
X - Other

BILL OF LADING/TRACKING #

METHOD OF SHIPMENT

LAB USE ONLY SAMPLING RENTAL PVU

10100 East Fwy (I-10)
Suite 100
Houston, TX 77029
713-453-6060
1-877-478-6060 Toll Free
713-453-6091 Fax
ablabs.com



A&B JOB ID # 17050A18
5. Project # E14-105

1. REPORT TO:
Company: Associated Testing Labs
Address: 3143 Yellow Street Blvd. Houston, TX 77054
Contact: Tom Murphy
Phone: 713 748 3714
Fax: 713 748 3748
E-mail:

2. INVOICE TO:
Company:
Address:
Contact:
Phone:
Fax:
E-mail:

3. PO #
3a. A&B Quote #
4. Turnaround Time (Business Days)
 1 Day* Other:
 2 Days*
 3 Days* *Surcharge applies
 7 Days - Standard

6. Project Name/Location
Sewerline Replacement (Various Streets)

7. Reporting Requirement:
 TRRP Limits only TRRP Rpt. Package See Attached Standard Level II PST MDL EDD
8. Sampler's Name & Company (PLEASE PRINT)
Tom Murphy / ATL
Sampler's Signature & Date
[Signature] 05/14/14

LAB USE ONLY	9. Sample ID and Description	10. Sampling		11. Matrix							13. No. of Containers	14. Containers*	15. Preservatives**	16. PH-Lab Only	17. Analytes/Methods	18. REMARKS	
		Date	Time 24hr	Comp.	Grab	Water	Soil	Sludge	Oil	Drinking Water							Air
11A	SB-11 D 6-8'	05/14/14	1325	X													
12A	SB-12 D 14-16'		1433														
13A	SB-13 D 14-16'		1606														
14A	SB-14 D 12-14'		1650														
15A	SB-15 D 6-8'		1457														
16A	SB-16 D 14-16'	05/14/14	959														
17A	SB-17 D 4-6'		1100														
18A	SB-18 D 1-2'		1144														
19A	SB-19 D 6-8'		816														
20A	SB-20 D 4-6'		832														
19. RELINQUISHED BY		DATE	TIME	20. RECEIVED BY							DATE	TIME	21. KNOWN HAZARDS/COMMENTS				
		05/14/14	0059	[Signature]							05/14/14	10:59	5.3-0.9=4.9°C Temperature: _____ °C Thermometer ID <u>102002329</u> Initials <u>AT</u>				

*Containers: VOA - 40 ml vial
4 oz/8 oz - glass wide mouth
P/O - Plastic/other

**Preservatives: C - Cool H - HCl N - HNO₃ S - H₂SO₄
OH - NaOH T - Na₂S₂O₃ X - Other

METHOD OF SHIPMENT

LAB USE ONLY SAMPLING RENTAL PU

A&B cannot accept verbal changes
Please FAX written changes to 713-453-6091

Samples will be disposed of after 30 days

1. REPORT TO:
 Company: *Assessments Testing Labs*
 Address: *3143 Yellowstone Blvd Houston, Tx 77054*
 Contact: *Tom Murphy*
 Phone: *713 748 3748*
 Fax: *713 748 3748*
 E-mail:

2. INVOICE TO:
 Company: *Same*
 Address: *Same*
 Contact: *Same*
 Phone: *Same*
 Fax:

3. PO #
3a. A&B Quote #
4. Turnaround Time (Business Days)
 1 Day* Other:
 2 Days* 3 Days* 7 Days - Standard
 *Surcharge applies

5. Project #
6. Project Name/Location
7050918
E14-105
Sewerline Replacement (Various Streets)

7. Reporting Requirement:
 TRRP Limits only TRRP Rpt. Package See Attached Standard Level II PST MDL EDD
8. Sampler's Name & Company (PLEASE PRINT)
Tom Murphy / ATL
 Sampler's Signature & Date
[Signature] D Murphy

LAB USE ONLY	9. Sample ID and Description		10. Sampling		11. Matrix							12. Contaminants*	13. No. of Containers	14. Containers*	15. Preservatives**	16. PH-Lab Only	17. Analyses/Methods	18. REMARKS
	Date	Time 24hr	Comp	Grab	Water	Soil	Sludge	Oil	Drinking Water	Air	Other							
91A	SB-21	0 8-10'	05/18/14	917	X													
92A-D	SB-2	TWP-2	05/12/14	1233														
93A-D	SB-11	TWP-11	05/14/14	1340														
94A-D	SB-13	TWP-13	05/14/14	1620														
95A-D	SB-16	TWP-16	05/18/14	1830														

19. REQUISISHED BY
[Signature] D Murphy
DATE *05/19/14* **TIME** *1159*
20. RECEIVED BY
[Signature]
DATE *5/19/14* **TIME** *1159*
21. KNOWN HAZARDS/COMMENTS
5.3-0.9 = 4.7C
 Temperature: _____ °C
 Thermometer ID: *102002570*
 Initials: *[Signature]*

*Containers: VOA - 40 ml vial
 4 oz/8 oz - glass wide mouth
 P/O - Plastics/other
 A/G - Amber/Glass 1 Liter
 **Preservatives: C - Cool
 OH - NaOH
 H - HCl
 T - Na₂S₂O₃
 N - HNO₃
 X - Other
 S - H₂SO₄

METHOD OF SHIPMENT
BILL OF LADING/TRACKING #

LAB USE ONLY **SAMPLING** **RENTAL** **P/U**

A&B cannot accept verbal changes
 Please FAX written changes to 713-453-6091
 Samples will be disposed of after 30 days



Sample Condition Checklist

A&B JobID : 14050918		Date Received : 05/19/2014		Time Received : 10:59AM								
Client Name : Associated Testing Lab												
Temperature : 5.3-0.9cf=4.4°C		Sample pH : n/a										
Thermometer ID : 102002320		pH Paper ID : n/a										
	Check Points				Yes	No	N/A					
1.	Cooler seal present and signed.					X						
2.	Sample(s) in a cooler.				X							
3.	If yes, ice in cooler.				X							
4.	Sample(s) received with chain-of-custody.				X							
5.	C-O-C signed and dated.				X							
6.	Sample(s) received with signed sample custody seal.					X						
7.	Sample containers arrived intact. (If no comment).				X							
8.	Matrix	Water	Soil	Liquid	Sludge	Solid	Cassette	Tube	Bulk	Badge	Food	Other
	:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.	Sample(s) were received in appropriate container(s).					X						
10.	Sample(s) were received with proper preservative				X							
11.	All samples were logged or labeled.				X							
12.	Sample ID labels match C-O-C ID's				X							
13.	Bottle count on C-O-C matches bottles found.				X							
14.	Sample volume is sufficient for analyses requested.				X							
15.	Samples were received within the hold time.				X							
16.	VOA vials completely filled.					X						
17.	Sample accepted.				X							
Comments : Include actions taken to resolve discrepancies/problem:						Received only 40mL VOAs. Headspace in all VOAs except 24A-D.						

Received by : AHall

Check in by/date : AHall / 05/19/2014

APPENDIX C

Photographs



View of push drilling activity at soil boring SB-1 (Shakespeare Street).



View of drilling concrete at SB-2.



View of push drilling activity at SB-3.



View of some of the soil cores generated at Shakespeare Street.



View temporary well pint at SB-2. (TWP-2).



View of push drilling at soil boring SB-4 (Nottingham Street).



View of push drilling at SB-5.



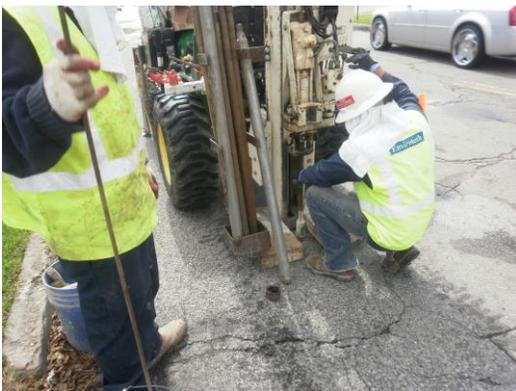
View of push drilling at soil boring SB-6.



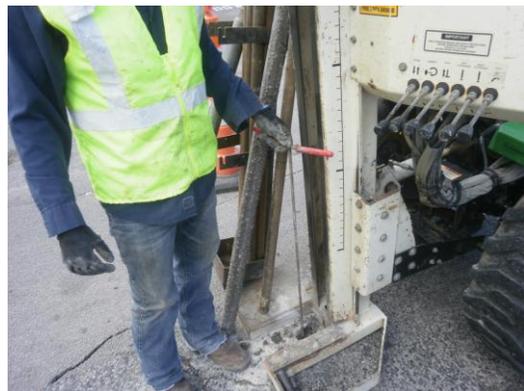
Another view of drilling activity at SB-7 (Sunset Blvd.).



Typical view of concrete patch.



Close-up view of push drilling activity at SB-8.



View probing for subsurface conflicts.



View of push drilling activity at soil boring SB-10 (east end of University Blvd.).



View of soil cores at field screening at SB-10.



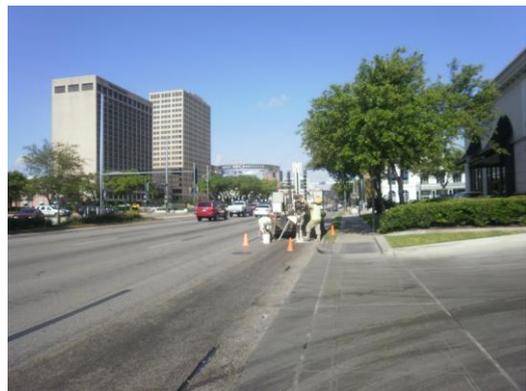
View of push drilling activity at SB-11.



View of push drilling at SB-12.



View temporary well pint at SB-13. (west end of University Blvd.).



View of push drilling at soil boring SB-16 (Westheimer Road, west of Loop 610).



View of push drilling at SB-17.



View of push drilling at soil boring SB-18.



Another view of concrete drilling.



Typical view of probing at SB-17.

APPENDIX D

Qualifications of Environmental Professional

TOM MURPHY
PROJECT MANAGER
ENVIRONMENTAL ENGINEERING SERVICES

EDUCATION

Texas State (formerly Southwest Texas State University): B. S., Geography-Resource and Environmental Studies/Biology, 1993

REGISTRATION/TRAINING

40/8-Hour CFR 1910.120, OSHA Training and Refreshers (HazWop)
40 CFR 265.16, Hazardous Waste Management Certification
49 CFR 172 & 173, DOT Hazardous Materials Training
29 CFR 1919.134, Respirator Fit Test/Training
RRC Rule 36 & API-RP 49, Hydrogen Sulfide Training
ExxonMobil LPS and OIMS Training
Facility, Client or Site-Specific Safety Training and Protocols

PROFESSIONAL EXPERIENCE

Project Manager
Project Geologist/Scientist/Manager
Field Geologist
Bioremedial Field Engineer
Specialization:
Spill response and assessment/remediation to closure
Environmental site assessments
Remediation systems installation and system design
General construction experience
Regulatory and data interpretation
Surveying/mapping/site plans

PROFESSIONAL HISTORY

Associated Testing Laboratories, Inc., Contract Environmental Professional/Project Manager, Sept. 2013 to present
Berg-Oliver Associates, Inc., Project Manager, November 2004 to present
BNC Environmental Svs., Inc. (successor CRA), Project Geologist/Scientist/Manager, Oct. 2001 to Nov. 2004.
Eco-Systems, Inc., Project Scientist, March 2001 to October 2001.
Self-Employed, Environmental Consultant/Scientist, November 2000 to March 2001.
Associated Environmental Consultants, Inc., Project Manager, August 1995 to November 2000.
Self-Employed, Environmental Consultant, April 1995 to August 1995.
Sybron Chemicals, Inc., Bioremedial Field Engineer, October 1993 to April 1995.

REPRESENTATIVE EXPERIENCE

Mr. Murphy is a mid to senior-level project manager with over 18 years of diverse environmental experience. Mr. Murphy's responsibilities include: project management activities, conducting surface and/or subsurface soil groundwater investigations, Phase II ESAs, Phase IIIs, Affected Property Assessment Reports (APARs), spill response and environmental management, conducting over twenty six hundred Phase I ESAs/due diligence, transaction screens, wetland projects (delineation, nationwide and individual permits), road (new and reconstruction) and infrastructure (waterlines, sanitary sewer and storm sewer) projects and other environmental-related tasks. Experience and preparation of cost proposals, project coordination, health and safety plans and supervisory duties of sub-contractors, bioremedial equipment project design/set-up, various remediation technology projects, equipment and design for treating petroleum-contaminated soil and groundwater, equipment set-up/construction, QA/QC, monitor well advancement, supervision of sampling discharge effluents and storm water, groundwater monitoring supervision, EPA/TCEQ & RRC protocol, expediting projects, treatability studies and contaminant plume mapping. He has project experience in field assessments and remediation projects for banks, developers, brokers, institutions, companies, corporations, engineering firms/government entities (city of Houston,

HCPID-AED and other cities) and the Texas Commission on Environmental Quality Leaking Petroleum Storage Tank (LPST) RPR Division. Mr. Murphy excels in the application of technical knowledge, site-specific factors, data analysis, report preparation to existing and potential clients. Knowledgeable in government environmental acts and regulations. Representative projects include:

- Performed numerous Subsurface Investigations and Phase II-Environmental Site Assessments for various clients to determine the presence or absence of adverse environmental conditions.
- Conducting spill response activities and delineations predominantly for pipeline-related enterprises and bulk storage facilities inclusive of: air monitoring, subcontractor supervision, excavation and over-excavation, sampling, waste disposal (waste profiling/characterization, transportation and disposal), reporting and closure under Railroad Commission of Texas or TCEQ. Representative clients:
 - ❑ ExxonMobil Pipeline Co. (EMPCo.)
 - ❑ BP Pipelines North America (NA), Inc.
 - ❑ Valero Logistics Operations, L.P.
 - ❑ Kinder Morgan
 - ❑ Shell Oil Products US, Equiva, Motiva and Equilon
 - ❑ TEPPCO
- Prepared a pilot project leading to a contracted waste water line build-up treatment plan, technical documents, cost proposal for the City of Houston (waste water line bioremediation).
- Conducted numerous new road, road reconstruction, waterline alignments, sanitary sewer alignments, storm sewer alignments and Limited Environmental Assessment projects for the City of Houston Public Works and Engineering Department, Harris County Public Infrastructure Department-Architecture and Engineering Division and Engineering Firms and other numerous linear projects (TxDOT (State CE, CE and support for LEAs).
- LPST remediation equipment set-up and design, petroleum contaminant reduction, TCEQ approved closure of several LPST sites and supervision of LPST sites.
- Experience in all phases of construction including bioremedial equipment installation, sampling protocol of water and/or soils, and closure of project site. Field Engineer for numerous site assessments throughout the Gulf Coast region. Construction of bioremediation systems to convert pump and treat contaminated ground water including recovery/treatment/microbe and nutrient injection systems. Projects:
 - ❑ Houston Lighting & Power-Spring Branch, Houston, bioreactor system; and
 - ❑ Wilburforce Road, Houston-First Interstate (successor Wells Fargo Bank), bioreactor.
- Field experience with soil injection, bioreactors, air strippers, and vacuum heaps and air sparging to treat soil/groundwater contaminants. Field Engineer for various remediation projects of oil and petroleum-contaminated soils. Field experience in soil vapor extraction equipment (SVE) including a specially designed bio-treated fluid separator. Constructed a vapor extraction system with a biological scrubber to extend carbon polishing efficiency and/or the potential for breakthrough or fugitive releases, and reduction of overall total emissions. System also included method to remove groundwater from vapor extraction wells, which tended to accumulate due to excessive rainfall and shallow groundwater effects. Constructed, maintained and operated landfarms for various clients. Provided technical and consulting services during the operation of the landfarm, including biological health analyses sampling, data interpretation, report presentation and closure. Other Environmental Projects:
 - ❑ Numerous due diligence assessments and affected property assessments for various clients.
 - ❑ Non-producing “old oilfield” asset assessments (Chevron Environmental Management Company and Chevron Business and Real Estate Services).

- ❑ Several States, Monitoring and assessments of natural gas compressor stations (El Paso Energy Corporation-Tennessee Gas Pipeline and Southern Natural Gas).
- ❑ Texas – Hydrostatic water treatment projects.
- ❑ Texas – Wastewater permitting and discharge analyses (Williams Energy-Williams Gas Pipeline and EMPCo.).
- ❑ Numerous crude oil and refined product spill delineations.
- ❑ Texas City, Texas – BP-Amoco pipeline release assessment affecting sanitary sewer system.
- ❑ Texas – Assessments of Shell Oil Products US and related enterprises-Equiva, Motiva and Equilon.
- ❑ Pasadena, Texas – Kinder Morgan Texas Pipeline, Assessment to evaluate off-site source of corrosion to pipeline.
- ❑ Remediation and landfarms (Chevron Environmental Management Co., First Interstate (successor Wells Fargo Bank), Kinder Morgan, Genesis Crude Oil, L.P., Valero Logistics Operations, L.P., TEPPCO, Specialty Lubricants and Commercial Metals).
- ❑ Angleton, Texas – First Interstate (successor Wells Fargo Bank), specialty soil vapor extraction system.
- ❑ Rockport and Marshall, Texas-First Interstate (successor Wells Fargo Bank), vacuum heap/augmented with automated microbial/nutrient additive system.
- Administrative duties, supervision, cost proposals, report preparation, regulatory document preparation, client project status reports. Supervision and field experience in soil boring/monitor well drilling advancement, logging, decommissioning and soil sampling criteria. Installation of numerous soil borings and groundwater monitoring wells at various sites.
- Field experience in groundwater monitoring, low flow sampling, flow interpretation, and contaminant plume mapping. Experience in a variety of mapping, site plan creation/surveying, geographic information systems, regulatory databases and land-use planning.
- Performed over twenty-six hundred Phase I Site Assessments, Categorical Exclusions and Limited Environmental Assessments for various clients including oil companies (Chevron Environmental Management Co., ChevronTexaco Business and Real Estate Services, Shell Oil Products US, Weatherford International, Inc., EMPCo., etc.) banks, lending agencies, private individuals and/or businesses and corporations, engineering firms, Texas Department of Transportation, City of Houston Department of Public Works and Engineering and Harris County Public Infrastructure Department-Architecture and Engineering Division. Performed site assessments on all types of properties and facilities including vacant and developing properties, office buildings, office/warehouses, machine shops, and industrial properties. Performed PCS PrimeCo., Sprint, NEXTEL, and American Tower Company pad site assessments. Project Budgets \$2,500-\$5,500: Locations: Texas, Louisiana, North Carolina, Ohio, Virginia, West Virginia.
- Performed and managed various site clean-ups (hazardous and non-hazardous materials/items). Sampling events of abandoned drums and containers with unidentified substances, laboratory supervision, obtaining waste codes, arranging pick-up by certified waste hauling enterprises and appropriate final disposal activities.

ASSOCIATIONS AND ORGANIZATIONS

The Society of Texas Environmental Professionals

National Association of Environmental Professionals