

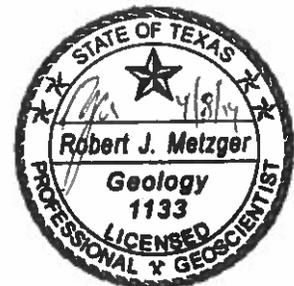
**FINAL REPORT
LIMITED PHASE II
ENVIRONMENTAL SITE ASSESSMENT
FOR WATER LINE REPLACEMENT IN
GESSNER AREA PROJECT, HOUSTON, TEXAS
CITY OF HOUSTON WBS No. S-000035-0154-04**

**Prepared for:
ESPA CORP, INC.
7120 Grand Boulevard, Suite 100
Houston, Texas 77054-3408
Phone: 713-680-0080
Fax: 713-680-0738**

**Prepared by
AVILES ENGINEERING CORPORATION
5790 Windfern
Houston, Texas 77041
Phone: 713-895-7645
Fax: 713-895-7943**

AEC Project No. E102-14

April 08, 2014



**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY	1
2.0 INTRODUCTION	2
3.0 ON-SITE INVESTIGATIONS	3
4.0 LABORATORY ANALYSES	6
5.0 WASTE DISPOSAL.....	6
6.0 SUMMARY	7
7.0 CONCLUSION AND RECOMMENDATIONS	7
8.0 LIMITATIONS.....	7
9.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL	8

APPENDICES

APPENDIX A:	FIGURES
APPENDIX B:	PHOTOGRAPHS
APPENDIX C:	SOIL BORING LOGS
APPENDIX D:	SUMMARY OF LABORATORY SAMPLE ANALYSIS RESULTS
APPENDIX E:	ANALYTICAL LABORATORY REPORTS AND QUALITY ASSURANCE AND QUALITY CONTROL DOCUMENTATION
APPENDIX F:	RESUME

1.0 EXECUTIVE SUMMARY

The City of Houston plans to replace approximately 27,780 feet of water lines in existing City of Houston street rights-of-way in the Gessner area (referred to herein as the Subject Right-of-Way). The Subject Right-of-Way (refer to Figure 1 in Appendix A) is located in a general Project Area bounded by Sands Point Drive on the north, Stroud Drive on the south, Burning Tree Drive on the east, and the City of Houston Ditch 142-00-00 just west of Pella Street on the west. The general Project Area adjoins to the northeast and southwest of the Gessner Road and Bellaire Boulevard intersection in southwest Houston, Texas. Aviles Engineering Corporation (AEC) performed a Phase I Environmental Site Assessment (refer to AEC ESA I report number E103-12 dated March 20, 2012) that identified the following recognized environmental conditions (RECs) in connection with the Subject Right-of-Way (refer to attached Figures 2 and 3):

- Shop N Go operating gasoline filling station (petroleum storage tank, PST site) adjoining the Subject Right-of-Way at 6601 South Gessner (refer to Figure 2).
- Shell leaking petroleum storage tank (LPST) site and Shop N Go 2 PST site adjoining the Subject Right-of-Way at 8540 Bellaire Boulevard (refer to Figure 3).

The ESA I recommended that limited Phase II Environmental Site Assessment (ESA II) investigations be conducted with the installation of soil borings and temporary groundwater monitor wells in the Subject Right-of-Way as close as practicable to the planned water line alignment in the area adjacent to or near each REC. AEC performed the limited ESA II in general accordance with Chapter 11 – Geotechnical and Environmental Infrastructure Requirements of the City of Houston Department of Public Works and Engineering Design Manual and ASTM Standard Practice E1903. The purpose of the ESA II was to investigate and assess if petroleum products contaminated the Subject Right-of-Way and water line alignment adjacent to or near each of the RECs. During the limited on-site ESA II investigations on March 1, 2014, six soil borings (B-1 through B-6) were installed and boring B-5 was converted to a temporary groundwater monitor well.

REC 1: Three soil borings (B-1 through B-3) were installed in the Subject Right-of-Way to investigate contamination in the area of the Shop N Go gasoline filling station located at 6601 South Gessner. Each boring was extended to a depth of 15 feet below the pavement surface and a soil sample was collected from each boring. Groundwater was not encountered during drilling of these soil borings so a temporary well casing was not installed. No petroleum product odors were detected in the soil cores.

REC 2: Three soil borings (B-4 through B-6) were installed in the Subject Right-of-Way to investigate contamination in the area of the Shell leaking petroleum storage tank (LPST) site and Shop N Go 2 petroleum storage tank (PST) site. Each boring was extended to a depth of 15 feet below the pavement surface and a soil sample was collected from each of the three borings for analysis. Damp zones indicating the possible presence of groundwater was present in borings B-4 and B-6, however, no groundwater had collected in either borehole at the end of drilling. Groundwater was encountered during the drilling of boring B-5. A temporary well casing was installed in B-5. A groundwater sample was collected for analysis however; the laboratory

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

analytical tests for groundwater had to be run on limited volumes of groundwater sample because of the very low well recharge in temporary groundwater monitor well in B-5. No petroleum product odors were detected in the groundwater.

Each soil boring was placed in the best practicable location as close as possible to the water line alignment adjacent to the two RECs considering on-site conditions and utilities. Each of the six soil samples and the groundwater sample were submitted to A&B Environmental Services, Inc. commercial analytical laboratory for analysis.

REC 1: The three soil samples collected from B-1 through B-3 were analyzed to determine the concentrations of benzene, toluene, ethylbenzene and total xylenes (collectively known as BTEX), methyl tertiary butyl ether (MTBE), and total petroleum hydrocarbons (TPH). The BTEX, MTBE, and TPH concentrations in each of the collected soil samples were less than their respective laboratory sample detection limits.

REC 2: The three soil samples collected from B-4 through B-6 and the groundwater sample from B-5 were analyzed to determine the concentrations of BTEX, MTBE, and TPH. The BTEX, MTBE, and TPH concentrations in each of the soil samples were less than their respective laboratory sample detection limits. The BTEX and MTBE concentrations in the groundwater sample were also below respective laboratory sample detection limits. TPH testing was performed but the accuracy was not low enough to compare to the Texas Commission on Environmental Quality (TCEQ) Texas Risk Reduction Program (TRRP) Tier 1 soil ^{GW}Soil_{ing} residential protective concentration levels (PCLs) (regulatory action levels) due to the small volume of groundwater collected because of very slow well recharge.

Since the laboratory analysis report indicated that the soil and wastewater concentrations did not exceed the applicable TCEQ TRRP PCLs, the composited waste soil and wastewater were appropriately disposed as solid waste.

The ESA II investigations were limited by the number and location of the soil borings and the number of soil and groundwater samples collected and the specific sample analyses. Additional ESA II investigations are not recommended in the water line alignment of the Subject Right-of-Way.

2.0 INTRODUCTION

2.1 Project Background and Location

The City of Houston plans to replace approximately 27,780 feet of water lines in existing City of Houston street rights-of-way (referred to herein as the Subject Right-of-Way). The Subject Right-of-Way (refer to Figure 1 in Appendix A) is located in a general Project Area bounded by Sands Point Drive on the north, Stroud Drive on the south, Burning Tree Drive on the east, and the City of Houston Ditch 142-00-00 just west of Pella Street on the west. The general Project Area adjoins to the northeast and southwest of the Gessner Road and Bellaire Boulevard intersection in southwest Houston, Texas. Aviles Engineering Corporation (AEC) performed a Phase I Environmental Site Assessment (refer to ESA I report dated March 20, 2012) that identified the following recognized environmental conditions (RECs) in connection with the Subject Right-of-Way (refer to attached Figures 2 and 3 in Appendix A):

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

- Shop N Go operating gasoline filling station (petroleum storage tank, PST site) adjoining the Subject Right-of-Way at 6601 South Gessner (refer to Figure 2).
- Shell leaking petroleum storage tank (LPST) site and Shop N Go 2 PST site adjoining the Subject Right-of-Way at 8540 Bellaire Boulevard (refer to Figure 3).

The ESA I recommended that limited ESA-II investigations be conducted with the installation of soil borings and temporary groundwater monitor wells in the Subject Right-of-Way as close as practicable to the planned water line alignment in the area adjacent to or near each REC. AEC submitted a proposal on February 10, 2014 to perform the limited ESA II. The purpose of the ESA II was to investigate and assess if petroleum products contaminated the Subject Right-of-Way and water line alignment near the location of each RECs. During the limited on-site ESA II investigations performed on March 1, 2014, six soil borings (B-1 through B-6) were installed and boring B-5 was converted to a temporary groundwater monitor well.

2.2 Authorization

ESPA CORP, INC. authorized the limited ESA II of the Subject Right-of-Way in an email dated February 18, 2014.

3.0 ON-SITE INVESTIGATIONS

AEC has performed limited ESA II investigations of the Subject Right-of-Way near the two RECs for the Water Line Replacement In Gessner Area Project. The limited ESA II was performed in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Infrastructure Design Manual and ASTM Standard Practice E1903. Prior to conducting the limited ESA II on-site investigations, City of Houston maps were reviewed to determine the location of water and sewer utilities and coordination was conducted with Texas811 utility locate service to mark other subsurface utilities in the project area.

Following site preparation activities, six soil borings (B-1 through B-6) were installed on March 1, 2014 in the Subject Right-of-Way. Each soil boring was placed in the best practicable location, considering the location of utilities and other site-specific conditions.

REC 1: Three soil borings were installed in the Subject Right-of-Way near REC 1 to investigate contamination in the area of Shop N Go operating gasoline filling station (petroleum storage tank, PST site) adjoining the Subject Right-of-Way at 6601 South Gessner (refer to soil boring locations on Figure 2 in Appendix A). Each of the borings was installed on the northern side of Clarewood Drive to 15 feet below the pavement surface.

- **B-1** was installed near the western boundary of the Shop N Go property (approximately Station 2+14, refer to Figure 2 in Appendix A and Photograph 1 in Appendix B).
- **B-2** was installed near the eastern side of the Shop N Go property, approximately 85 feet east of B-1 (approximately Station 3+00, refer to Figure 2 in Appendix A and Photograph 2 in Appendix B).
- **B-3** was installed approximately 80 feet east of B-2 (approximately Station 3+79, refer to Figure 2 in Appendix A and Photograph 3 in Appendix B).

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

REC 2: Three soil borings (B-4 through B-6) were installed in the Subject Right-of-Way near REC 2 to investigate contamination in the area of the Shell leaking petroleum storage tank (LPST) site and Shop N Go 2 PST site adjoining the Subject Right-of-Way at 8540 Bellaire Boulevard (refer to soil boring locations on Figure 2 in Appendix A). Each of the borings was installed on the western side of Redding Drive to a depth of 15 feet below the pavement surface.

- **B-4** was installed near the southern boundary of the Shell property (approximately Station 2+65, refer to Figure 3 in Appendix A and Photograph 4 in Appendix B).
- **B-5** was installed near the northern boundary of the Shell property, approximately 105 feet north of B-4 (approximately Station 3+71, refer to Figure 3 in Appendix A and Photograph 5 in Appendix B). A temporary well casing was installed in B-5.
- **B-6** was installed approximately 100 feet north of B-5 (approximately Station 4+74, refer to Figure 3 in Appendix A and Photograph 6 in Appendix B).

At each soil boring location a continuous direct-push soil boring machine was used first to vibrate through the concrete pavement. The pavement ranged in thickness from 6 inches in B-6 to 9 inches in B-5 (refer to Table 1 on the next page). Below the pavement, crushed limestone, gravel and/or sand fill or base material was encountered and ranged in thickness from 0.5 inch in B-2 to 5 inches in B-3 (refer to Table 1). The direct-push soil boring machine was then used to obtain a soil core from the ground surface to the total depth of the boring (refer to Table 1). Soil cores were collected in 4-foot long acetate liners within the 2-inch diameter direct push sampler. The majority of the soil encountered during drilling was sandy clay (refer to the soil borings in Appendix C and Table 1). The recovered core was logged and screened on-site for volatile organic vapors using a calibrated photoionization detector (PID) (refer to the boring logs in Appendix C). The on-site screening was conducted by cutting a sub-sample from each 1-foot interval of core with a decontaminated knife. Each subsample was sealed in a zip-lock-type sandwich bag for a minimum of 10 minutes. The headspace concentration of volatile organic vapors from the sample was then analyzed by inserting the probe tip of the calibrated PID into a narrow opening of the bag seal (refer to Photograph 7 in Appendix B). The volatile organic vapor concentrations detected by the PID meter of each subsample except the 0 to 1 foot sample from boring B-1 was equal to the background air PID readings of 0.0 to 0.2 parts per million (ppm). The PID reading of the soil in the 0 to 1 foot interval of boring B-1 was 0.3 ppm, just slightly above background concentrations (refer to the boring logs in Appendix C for the specific PID readings). No petroleum product odors were detected in the soil cores during the limited ESA II investigations.

As shown in Table 1 and the boring logs of Appendix C, samples of the core from B-1 through B-6 were collected for laboratory analyses from the interval either exhibiting the highest PID reading (B-1), at the total depth of the boring (B-2 and B-3) or just above where groundwater was encountered or the dampness of the soil indicated the likelihood of the presence of groundwater (B-4, B-5, and B-6). Each soil sample was placed into a clean, laboratory-provided sample container, labeled with the date and time of sample collection, the soil boring number and the interval that was sampled, the requested analyses, and the initials of the sample collector.

Damp zones indicating the possible presence of groundwater was encountered in borings B-4 and B-6 (refer to Table 1). However at the end of drilling, no groundwater was present in either borehole. Groundwater was encountered during drilling of B-5 at 10.6 feet below pavement

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

surface. The depth to groundwater was measured at 14.2 feet below pavement surface in the borehole of boring B-5 after completion of the borehole and so the boring was converted into a temporary groundwater monitor well. The well consisted of 10 feet of new 1-inch diameter polyvinyl chloride (PVC) casing and 5 feet of new 1-inch diameter PVC screen that was inserted into the boring (refer to Photograph 8 in Appendix B). The groundwater in the temporary groundwater monitor well was purged prior to sampling but the well went dry after only approximately 4 ounces of water was retrieved from the temporary well. The well was allowed to recharge and then a groundwater sample was collected from the temporary well for analysis however, only enough water to fill one 40 milliliter vial (compared to the usual three vials) and about 10 milliliters of an 80 milliliter vial (compared to the usual three vials) could be collected due to the presence of insufficient volume of water in the temporary well. The groundwater sample did not exhibit any petroleum product odor. The groundwater sample was placed into clean, laboratory-provided sample containers, labeled with the date and time of sample collection, the well number, the requested analyses, and the initials of the sample collector. Each soil sample and groundwater sample were preserved on ice and transported to A&B Environmental Services, Inc. commercial analytical laboratory with a completed chain-of-custody form (refer to the analytical laboratory report in Appendix E).

Table 1 – Soil Boring, Sampling and Sample Analysis Information

Boring No.	Surface Pavement and Fill	Total Depth, feet*	Soil Sample Interval, feet*	Predominant Soil Type	Damp Zones, feet *	Ground-water Sampled	Analyses
B-1	7 inches of concrete & 1 inches of sand	15	0 to 1 (zone with highest PID reading)	Sandy Clay	None	Not Applicable	BTEX, MTBE, and TPH
B-2	7 inches of concrete & 0.5 inches of sand and gravel	15	13 to 14 (the deepest retrieved sample)	Sandy Clay	None	Not Applicable	BTEX, MTBE, and TPH
B-3	7 inches of concrete & 5 inches of crushed limestone	15	13 to 15 (total depth of boring)	Clay and Sandy Clay	None	Not Applicable	BTEX, MTBE, and TPH
B-4	7 ½ inches of concrete	15	5 to 6 (zone above the damp zone)	Sandy Clay	6'1" to 8' and 8'10" to 9'2"	No	BTEX, MTBE, and TPH
B-5	9 inches of concrete & 1 inch of sand and	15	10 to 11 (zone above the damp zone)	Sandy Clay	10'6" to 11'5"	Yes	BTEX, MTBE, and TPH (limited

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

Boring No.	Surface Pavement and Fill	Total Depth, feet*	Soil Sample Interval, feet*	Predominant Soil Type	Damp Zones, feet *	Ground-water Sampled	Analyses
	gravel						volume for water sample
B-6	6 inches of concrete & 3 ½ inches of sand and crushed limestone	15	10 to 11 (zone above the damp zone)	Sandy Clay	11' to 12'	No	BTEX, MTBE, and TPH

*below pavement surface

Following groundwater sampling, the temporary well casing was removed from B-5 and each of the six boreholes was grouted from the total depth to the base of the street pavement. The pavement at each soil boring location was patched with concrete.

4.0 LABORATORY ANALYSES

Each of the six soil samples and the groundwater sample was submitted to A&B Environmental Services, Inc. laboratory for analysis. Each of the soil samples collected was analyzed to determine BTEX and MTBE concentrations by EPA Method SW-846 8021 and TPH concentrations by TCEQ TX Method 1005. Only enough groundwater could be collected from the temporary well due to very slow recharge to fill one (instead of the usual three) 40 milliliter vial for the BTEX and MTBE analyses and only approximately 10 milliliters of an 80 milliliter vial (instead of the normal three) for the TPH analysis. The moisture content of each of the soil samples was also determined as required for the analyses. The results of the soil and groundwater sample analyses are respectively summarized in Table 2 in Appendix D. Appendix E contains the laboratory analysis report, quality control certificate, and chain-of-custody.

As shown in Table 2 in Appendix D, the BTEX, MTBE and TPH concentrations in the soil samples from B-1 through B-6 were less than their respective sample detection limits. The BTEX and MTBE concentrations in the groundwater sample from B-5 were less than their respective sample detection limits. The TPH testing was performed but the accuracy was not low enough to compare to the TCEQ TRRP Tier 1 soil ^{GW}Soil_{ing} residential protective concentration levels (PCLs) (regulatory action levels) due to the small volume of groundwater collected.

5.0 WASTE DISPOSAL

Waste soil and wastewater generated during the limited ESA II on-site investigations were composited in separate 5-gallon plastic buckets and capped with a lid manufactured to fit the container. Each bucket of waste was properly transported to and stored at AEC's property at 5790 Windfern in Houston until sample analyses were completed. Since the laboratory analysis report indicated that the soil and wastewater concentrations did not exceed the applicable TCEQ

**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

TRRP PCLs, the composited waste soil and wastewater will be appropriately disposed of as solid waste.

6.0 SUMMARY

AEC performed the limited ESA II in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Infrastructure Design Manual and ASTM Standard Practice E 1903 to investigate and assess if petroleum products contaminated the Subject Right-of-Way and water line alignment in the area of each of two RECs identified in the ESA-I report.

Six soil borings, B-1 through B-6, were drilled to a depth of 15 feet below pavement surface in the Subject Right-of-Way as close as practicable to the planned water line alignment in the area adjacent to or near each of the two RECs. The majority of the soil encountered during drilling was sandy clay. PID readings of a section of each foot of each soil core, except for the 0 to 1 foot interval in B-1, were equal to the background air PID readings of 0.0 to 0.2 ppm. The PID reading for the 0 to 1 foot interval of boring B-1 was 0.3 ppm which was just slightly above background concentrations. No petroleum odors were detected in any of the soil cores in the borings. No evidence of groundwater was encountered in the soils of borings B-1 through B-3. Damp zones signifying the possibility of groundwater were encountered in borings B-4 through B-6, however, no groundwater was present in the borehole at the end of drilling in either B-4 or B-6. Limited amounts of groundwater were present in the borehole of B-5 at the end of drilling and a temporary groundwater monitor well was installed. No petroleum odors were detected in the groundwater. Soil and groundwater samples were collected and analyzed for BTEX, MTBE, and TPH.

The BTEX, MTBE and TPH concentrations in the soil samples from B-1 through B-6 were below the respective sample detection limits. The BTEX and MTBE concentrations from the groundwater sample from B-5 were also below their respective sample detection limits. The TPH testing was performed but the accuracy was not low enough to compare to the TCEQ TRRP Tier 1 soil ^{GW}Soil_{ing} residential protective concentration levels (PCLs) (regulatory action levels) due to the limited volume of groundwater which recharged into the well.

7.0 CONCLUSION AND RECOMMENDATIONS

Based on the field and laboratory analysis results, additional Phase II Environmental Site Assessment investigations are not recommended for the Subject Right-of-Way.

8.0 LIMITATIONS

The information and conclusions provided in this report are based on a general knowledge of the Subject Right-of-Way in the Gessner Area and water line alignment, and the limited ESA II investigations. This report documents the concentrations of petroleum products detected in the respective soil and groundwater sample collected and analyzed during the limited ESA II investigations near the two RECs identified in the ESA I report. There is a possibility that soil and/or groundwater contaminated by hazardous substances or petroleum products may exist in

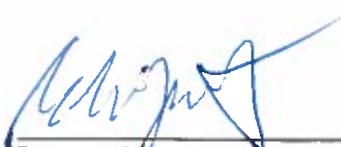
**Draft Limited Phase II Environmental Site Assessment for Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

the Subject Right-of-Way and water line alignment that were not detected during the limited ESA II investigations due to the limited number and location of the soil borings and temporary groundwater sampling wells, samples collected, contaminants analyzed, and the cost and time constraints of the project.

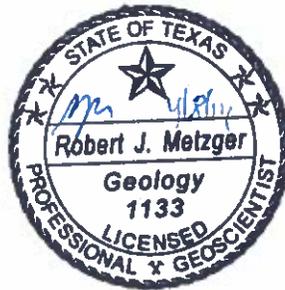
This investigation was performed using the standard level of care and diligence normally practiced by recognized professional environmental and engineering firms in this area, presently performing similar services under similar circumstances. This report has been prepared specifically to investigate potential contamination of the Subject Right-of-Way and water line alignment near the two RECs and is intended to be used in its entirety. The conclusions presented in this report should not be relied upon for other sites without additional evaluation and/or investigation. This document is not intended to constitute or substitute for legal counsel or guidance in connection with contamination in the Subject Right-of-Way, nor does it constitute a toxicological report on health effects from potential exposure to contamination during construction in the Subject Right-of-Way.

9.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL

Robert J. Metzger, CAPM, P.G., AEC Senior Geologist, conducted the limited ESA II investigations in general accordance with in general accordance with Chapter 11 – Geotechnical and Environmental Requirements of the City of Houston Department of Public Works and Engineering Design Manual (07-01-2011) and ASTM Standard Practice E1903 and prepared this report. He has conducted ESA IIs for numerous City of Houston Department of Public Works and Engineering projects. His qualifications are further described in his resume in Appendix F.



Prepared by:
Robert J. Metzger, CAPM, P.G.



**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

APPENDIX A

FIGURES

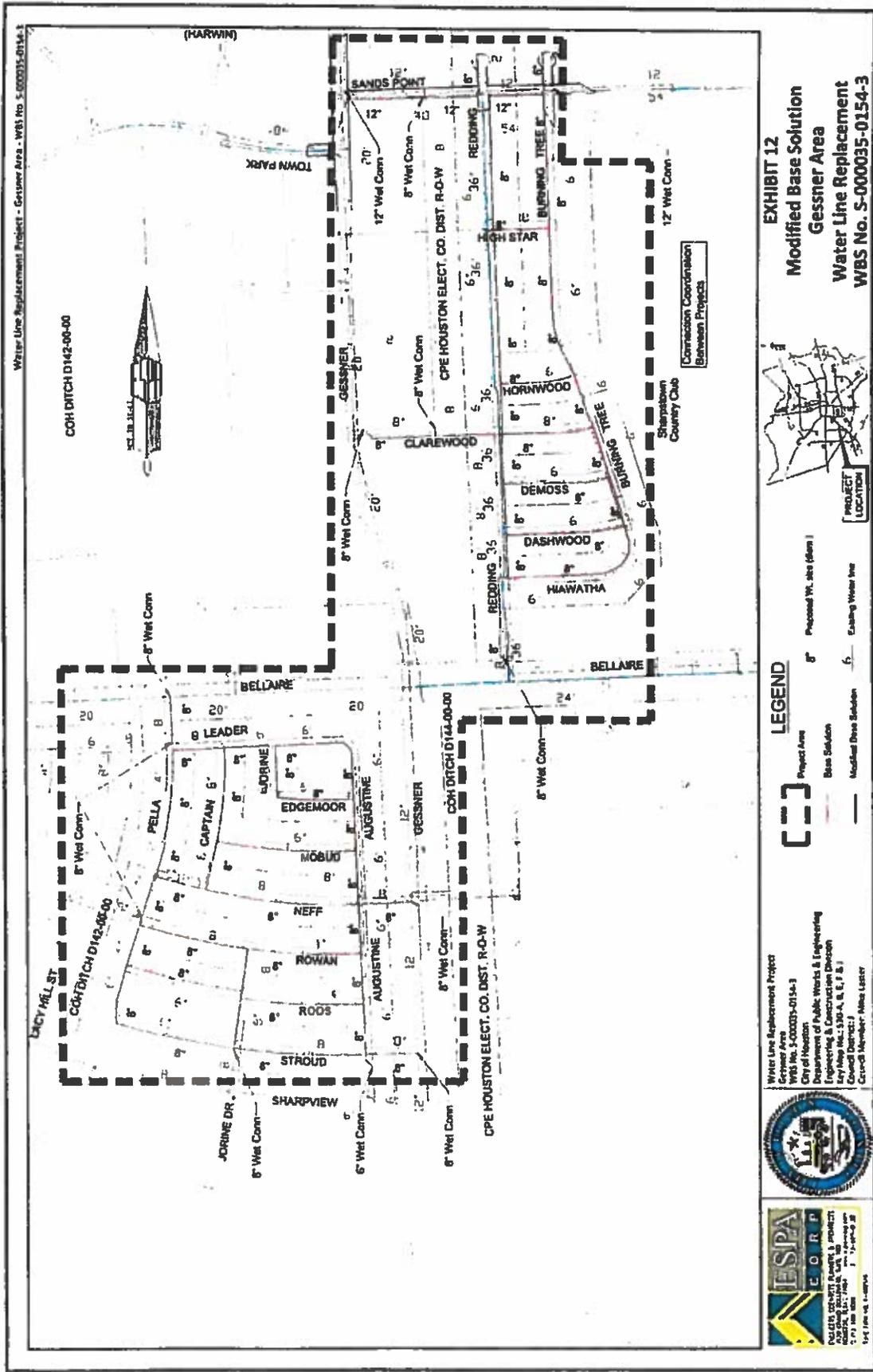


FIGURE 1

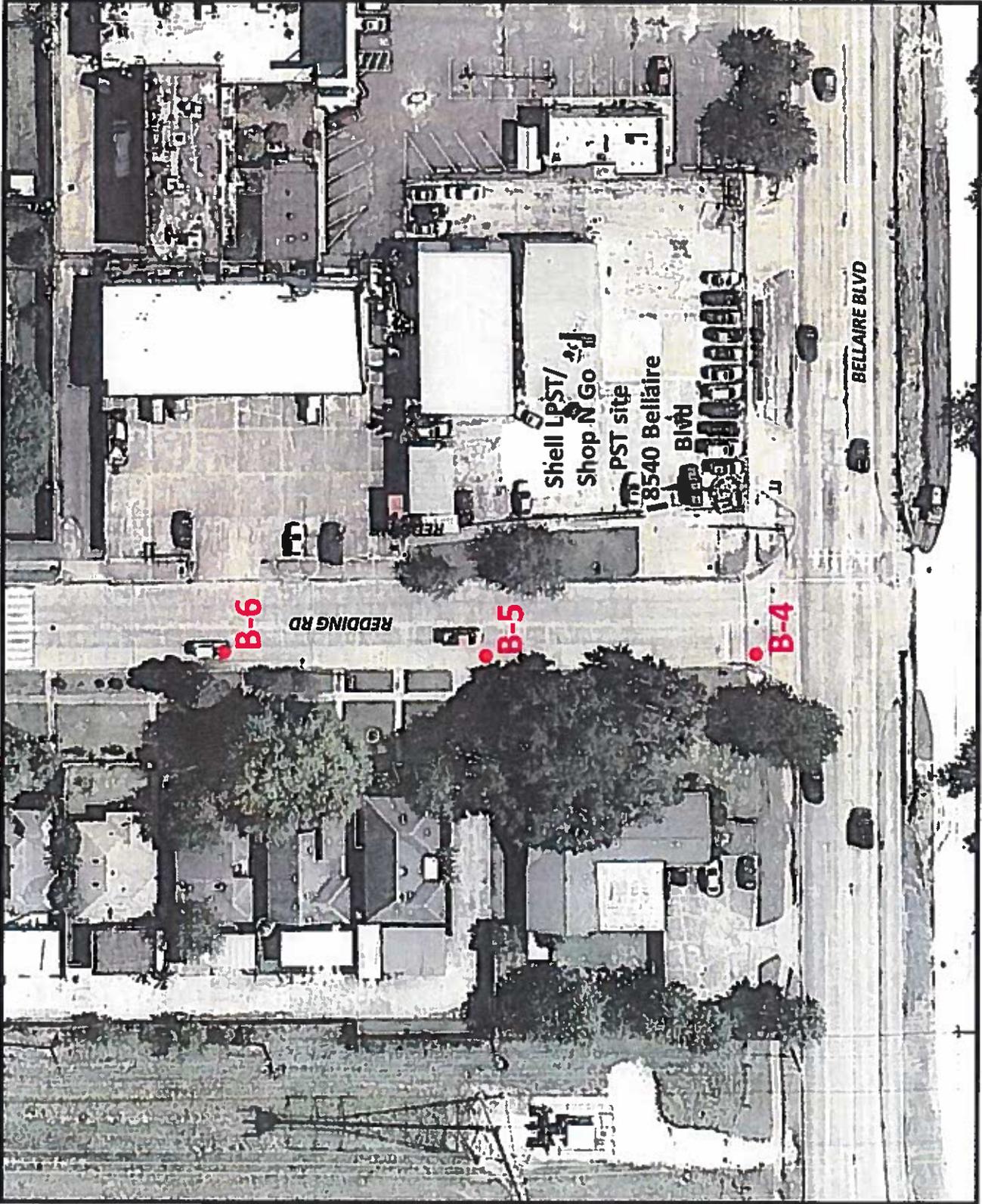


LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT

GESSNER WATER MAIN REPLACEMENT

Approximate Soil Boring Location: ●

FIGURE 2



LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT
GESSNER WATER MAIN REPLACEMENT

Approximate Soil Boring Location: ●

**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

**APPENDIX B
PHOTOGRAPHS**

**Phase II Environmental Site Assessment
Water Line Replacement in Gessner Area, Houston, Texas**



Photograph 1: View to the southeast of drilling B-1, Clarewood near Gessner.



Photograph 2: View to the south southwest of drilling of B-2, Clarewood near Gessner.

**Phase II Environmental Site Assessment
Water Line Replacement in Gessner Area, Houston, Texas**



Photograph 3: View to the southwest of drilling of B-3, Clarewood near Gessner.



Photograph 4: View to the south of drilling of B-4, Redding near Bellaire Boulevard.

**Phase II Environmental Site Assessment
Water Line Replacement in Gessner Area, Houston, Texas**

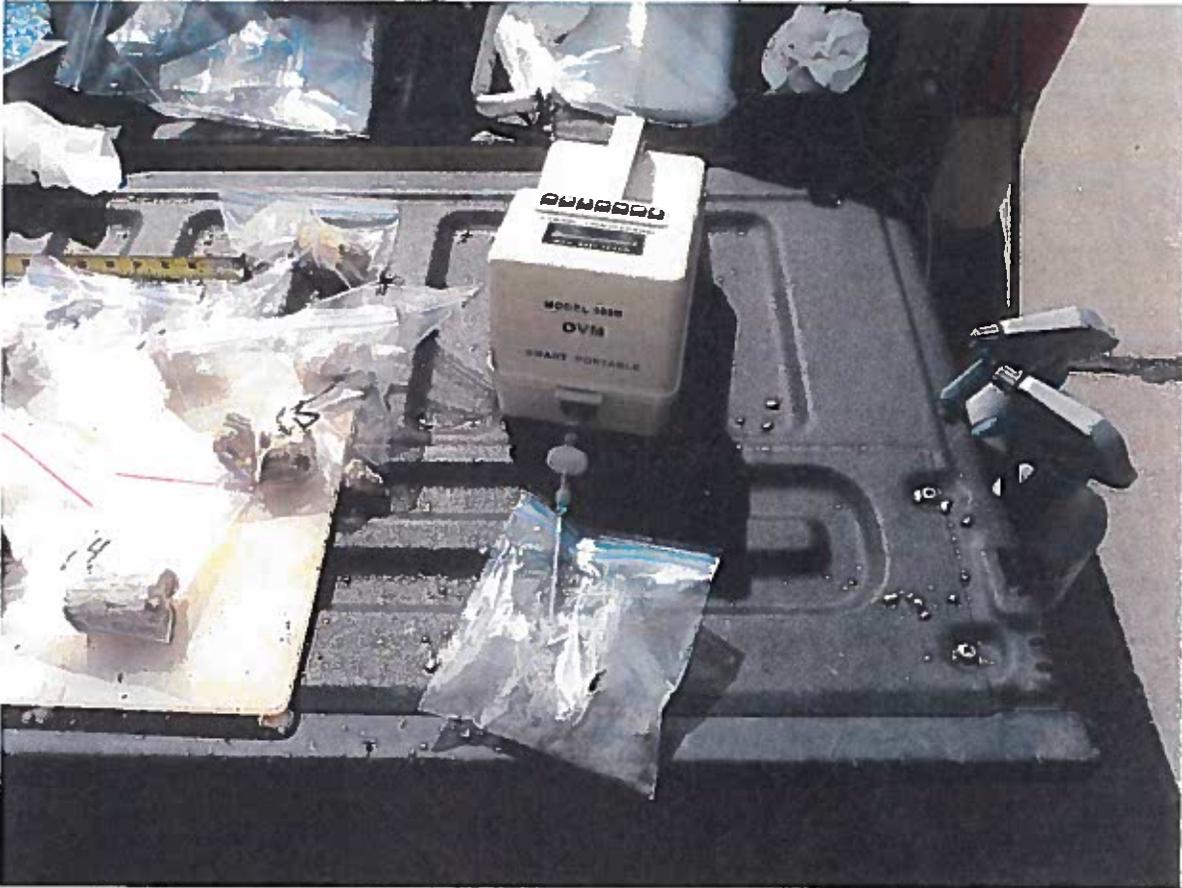


Photograph 5: View to the east of drilling of B-5, Redding near Bellaire Boulevard.



Photograph 6: View to the east northeast of drilling of B-6, Redding near Bellaire Boulevard.

**Phase II Environmental Site Assessment
Water Line Replacement in Gessner Area, Houston, Texas**



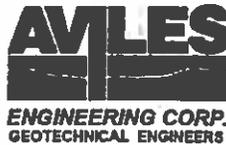
Photograph 7: Set up to measure PID readings.



Photograph 8: Installing temporary water well at B-5. View to the west.

**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

**APPENDIX C
SOIL BORING LOGS**



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-1

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 2

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 2" concrete + 7" crushed limestone		0
1					Fill: 1" sand, light gray	0.3	1
2					Light to medium gray Clay w/Sand (CL), with roots and calcareous nodules	0.1	2
3		39	44*			0.1	3
4					Light gray to orange-brown Clay w/Sand to Sandy Clay (CL), with calcareous nodules	0.1	4
5						0.1	5
6		48	33		- with ferrous nodules 6'-8'	0.0	6
7						0.0	7
8					Light gray and orange-brown Sandy Lean Clay (CL), with ferrous nodules and stains	0.0	8
9						0.0	9
10		48	44			0.0	10
11						0.0	11
12					Light gray Sandy Clay (CL), with calcareous nodules and ferrous stains	0.0	12
13						0.0	13
14		36	44*		Red-brown and gray Clay (CH), with calcareous nodules, and ferrous nodules and stains	0.0	14
15					Light gray Sandy Clay (CL), with calcareous nodules	0.0	15
16					Termination depth = 15 feet. * (recovery longer than push due to swelling)		16
17							17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT N/A FEET WHILE DRILLING

WATER LEVEL AT N/A FEET AFTER DRILLING

DRILLED BY Alliance CHECKED BY RJM LOGGED BY RJM



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-2

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 2

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 7" concrete		0
1					Fill: 0.5" sand and gravel	0.2	1
2					Medium gray Clay w/Sand (CL), with calcareous nodules	0.1	2
3					Gray Sandy Clay (CL), with sand seams and partings, and calcareous nodules	0.1	3
4					Gray Clay (CH), with calcareous nodules and ferrous stains, soft	0.0	4
5					Gray Sandy Clay (CL), with ferrous stains and abundant calcareous nodules	0.0	5
6					Gray and orange-brown Clay (CH), with ferrous stains	0.0	6
7					Gray and orange-brown Sandy Clay (CL), with calcareous nodules, and ferrous nodules and stains	0.0	7
8					Light gray and orange-brown Sandy Clay (CL), with calcareous nodules, and ferrous nodules and stains	0.0	8
9						0.0	9
10						0.0	10
11						0.0	11
12					Gray and orange-brown Sandy Clay (CL), with abundant calcareous nodules in spots	0.0	12
13					- with red-brown 13'-14'	0.0	13
14						0.0	14
15					Termination depth = 15 feet. * (recovery longer than push due to swelling)	0.0	15
16							16
17							17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT N/A FEET WHILE DRILLING

WATER LEVEL AT N/A FEET AFTER DRILLING

DRILLED BY Alliance CHECKED BY RJM LOGGED BY RJM

PROJECT NO. E102-14



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-3

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 2

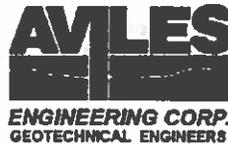
DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 7" concrete + 5" crushed limestone		0
1					Fill: 1" sand, light gray		1
2					Light gray Clay (CH), sticky	0.0	2
3		36	32		Light gray and light tan Clay w/Sand (CH), sticky	0.0	3
4					- with ferrous nodules 4'-5'	0.0	4
5					- 1.5" silty sand seam at 4'7"	0.0	5
6		48	44		Gray and orange-brown Sandy Clay (CL), with ferrous stains and abundant calcareous nodules	0.0	6
7						0.0	7
8					Gray and orange-brown Sandy Clay (CL), with heavy ferrous stains in spots	0.0	8
9						0.0	9
10		48	43			0.0	10
11						0.0	11
12						0.0	12
13						0.0	13
14		36	**			0.0	14
15					Light gray and orange-brown Sand & Clayey Sand (SC), with calcareous nodules, damp	0.0	15
16					Termination depth = 15 feet.		16
17					** (not measured)		17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT N/A FEET WHILE DRILLING

WATER LEVEL AT N/A FEET AFTER DRILLING

DRILLED BY Alliance CHECKED BY RJM LOGGED BY RJM



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-4

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 3

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 7.5" concrete		0
1					Medium to light gray and orange-brown Sandy Clay (CL), with ferrous nodules and stains	0.0	1
2			40.5	32		0.0	2
3					- with calcareous nodules 3'-4'	0.0	3
4					Light gray and orange-brown Sandy Clay (CL), with ferrous nodules and stains	0.0	4
5						0.0	5
6			48	42	Gray Silty Clay & Clayey Silt (CL-ML), with ferrous nodules and stains, very soft, damp	0.0	6
7						0.0	7
8					Light gray and orange-brown Sandy Clay (CL), with ferrous stains	0.0	8
9					Light gray Silty Clay & Clayey Silt (CL-ML), very soft, damp	0.0	9
10			48	30	Light gray and orange-brown Sandy Clay (CL), with ferrous stains	0.0	10
11						0.0	11
12					Tan and orange-brown Sandy Clay (CL), with sand partings and ferrous stains	0.0	12
13						0.0	13
14			36	31		0.0	14
15					Termination depth = 15 feet.	0.0	15
16							16
17							17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT N/A FEET WHILE DRILLING

WATER LEVEL AT N/A FEET AFTER DRILLING

DRILLED BY Alliance

CHECKED BY RJM

LOGGED BY RJM

PROJECT NO. E102-14



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-5

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 3

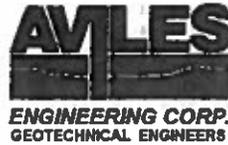
DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 9" concrete		0
1					Fill: 1" sand and gravel	0.0	1
2					Medium to dark gray Clay (CH), with calcareous nodules, and ferrous nodules and stains	0.0	2
3						0.0	3
4					Gray Sandy Clay (CL), with ferrous nodules and stains - gray and orange-brown 4'-10'6", with sand partings 4'-8'	0.0	4
5						0.0	5
6						0.0	6
7						0.0	7
8						0.0	8
9						0.0	9
10						0.0	10
11					Light gray and orange-brown Silt & Clayey Silt (ML), with ferrous stains, very soft, damp	0.0	11
12					Light gray and orange-brown Sandy Clay (CL)	0.0	12
13						0.0	13
14						0.0	14
15					- with sand pockets and ferrous stains 14'6"-15'	0.0	15
16					Termination depth = 15 feet. * (recovery longer than push due to swelling)		16
17							17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID

WATER ENCOUNTERED AT 10.6 FEET WHILE DRILLING

WATER LEVEL AT 14.2 FEET AFTER 1.5 HRS

DRILLED BY Alliance CHECKED BY RJM LOGGED BY RJM



PROJECT: Ltd Phs.II ESA, W/L Replacement in Gessner Area

BORING B-6

DATE 3/1/14

TYPE Direct Push

LOCATION see Site Plan, Figure 3

DEPTH IN FEET	SYMBOL	PUSHED INTERVAL (IN.)	PUSH RECOVERY (IN.)	SAMPLE INTERVAL	SOIL DESCRIPTION	P.I.D. READING	DEPTH IN FEET
0					Pavement: 6" concrete + 3.5" crushed limestone and sand		0
1	X				Fill: 2.5" sand, gravel and clay, brown	0.0	1
2	Diagonal lines	38.5	33		Medium grayish brown Clay (CH), with sand and silt partings, calcareous nodules, ferrous nodules and stains, and roots	0.0	2
3	Diagonal lines					0.0	3
4	Diagonal lines				Gray and orange-brown Sandy Clay (CL)	0.0	4
5	Diagonal lines				- with calcareous nodules 4'-5'1"	0.0	5
6	Diagonal lines	43.5	48		- with ferrous nodules and stains 4'-8'	0.0	6
7	Diagonal lines				- with silt partings and zones of abundant calcareous nodules 5'1"-8'	0.0	7
8	Diagonal lines				- with ferrous stains 8'-12'	0.0	8
9	Diagonal lines				- light gray and orange-brown 8'-15'	0.0	9
10	Diagonal lines	48	44			0.0	10
11	Diagonal lines				- damp silt zone, very soft 11'-12'	0.0	11
12	Diagonal lines				- damp silty zones, very soft, with sand partings 12'-13'	0.0	12
13	Diagonal lines					0.0	13
14	Diagonal lines	36	39			0.0	14
15					Termination depth = 15 feet. * (recovery longer than push due to swelling)	0.0	15
16							16
17							17
18							18
19							19

BORING DRILLED TO 15 FEET WITHOUT DRILLING FLUID
 WATER ENCOUNTERED AT N/A FEET WHILE DRILLING
 WATER LEVEL AT N/A FEET AFTER DRILLING
 DRILLED BY Alliance CHECKED BY RJM

LOGGED BY RJM

**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

APPENDIX D

SUMMARY OF LABORATORY SAMPLE ANALYSIS RESULTS

Limited Phase II Environmental Site Assessment
 Water Line Replacement in Gessner Area
 WBS No. S-000035-0154-04

TABLE 2
 Summary of B-1 through B-6 Soil Sample Analyses

SOIL BORING ¹	Sample interval, feet below pavement surface	CONTAMINANT CONCENTRATIONS IN SOIL SAMPLES							
		BENZENE mg/kg ²	TOLUENE mg/kg	ETHYL-BENZENE mg/kg	TOTAL XYLENES mg/kg	MTBE mg/kg	TPH C6-C12 mg/kg	TPH >C12-C28 mg/kg	TPH >C28-C35 mg/kg
B-1 (REC #1)	0-1	U ³ , <0.001	U, <0.001	U, <0.006	U, <0.003	U, <0.001	U, <31	U, <26.6	U, <23.2
B-2 (REC #1)	13-14	U, <0.001	U, <0.001	U, <0.006	U, <0.002	U, <0.001	U, <28.6	U, <24.5	U, <21.4
B-3 (REC #1)	13-15	U, <0.001	U, <0.001	U, <0.006	U, <0.003	U, <0.001	U, <30.4	U, <26	U, <22.7
B-4 (REC #2)	5-6	U, <0.001	U, <0.001	U, <0.006	U, <0.002	U, <0.001	U, <28.1	U, <24.1	U, <21
B-5 (REC #2)	10-11	U, <0.001	U, <0.001	U, <0.006	U, <0.002	U, <0.001	U, <28.5	U, <24.4	U, <21.3
B-6 (REC #2)	10-11	U, <0.001	U, <0.001	U, <0.006	U, <0.002	U, <0.001	U, <27.4	U, <23.5	U, <20.5
TCEQ TRRP Tier 1 Residential GW _{Soil,ing} Soil PCLs		0.026	8.2	7.6	120	0.62	65	200	200

¹Refer to Boring Location Map in Figure 2

²mg/kg = milligrams per kilogram or parts per million.

³U = Undetected at Sample Detection Limit Shown

Summary of B-5 Groundwater Sample Analyses

SOIL BORING/ TEMPORARY WELL ¹	Measured Depth to Groundwater feet below pavement surface	CONTAMINANT CONCENTRATIONS IN GROUNDWATER SAMPLE							
		BENZENE mg/L ²	TOLUENE mg/L	ETHYL-BENZENE mg/L	TOTAL XYLENES mg/L	MTBE mg/L	TPH C6-C12 mg/L	TPH >C12-C28 mg/L	TPH >C28-C35 mg/L
B-5 (REC #2)	14.2	U ³ , <0.0008	U, <0.001	U, <0.0008	U, <0.003	U, <0.001	U, <2.35	U, <3.06	U, <2.67
TCEQ TRRP Tier 1 Residential GW _{ing} Groundwater PCLs		0.005	1.0	0.7	10	0.24	0.98	0.98	0.98

¹Refer to Boring Location Map in Figure 2

²mg/L = milligrams per liter or parts per million.

³U = Undetected at Sample Detection Limit Shown

**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

APPENDIX E

**ANALYTICAL LABORATORY REPORTS AND QUALITY ASSURANCE AND
QUALITY CONTROL DOCUMENTATION**

Laboratory Analysis Report

Total Number of Pages: 38

Job ID : 14030007



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

Client Project Name :

E102-14 / Water Line Replacement Gessner Area Houston, TX

Report To : Client Name: Aviles Engineering
Attn: Bob Metzger
Client Address: 5790 Windfern
City, State, Zip: Houston, Texas, 77041

P.O.#.:
Sample Collected By: Robert J. Metzger
Date Collected: 03/01/14

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

Client Sample ID	Matrix	A&B Sample ID
B-1 0-1	Soil	14030007.01
B-2 13-14	Soil	14030007.02
B-3 13-15	Soil	14030007.03
B-4 5-6	Soil	14030007.04
B-5 10-11	Soil	14030007.05
B-6 10-11	Soil	14030007.06
B-5 Water	Water	14030007.07

Alisha Hughes

Released By: Alisha Hughes
Title: Project Manager
Date: 3/12/2014



This Laboratory is NELAP (T104704213-13-B) accredited. Effective: 04/01/2013; Expires: 03/31/2014

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: 03/03/2014 08:13

LABORATORY TERM AND QUALIFIER DEFINITION REPORT



Job ID : 14030007

Date: 3/12/2014

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

D3	Sample dilution required due to insufficient sample.
M2	Matrix Spike and/or Matrix Spike Duplicate recovery is below laboratory control limits due to matrix interference."The sample randomly selected as QC for this batch was not part of your project. Therefore, this sample matrix is not applicable to your project samples."
Q18	Soils not collected in a hermetically sealed container may lose low-level VOCs.
Q8	Insufficient sample received to meet method requirements. Test was scaled down based on the amount of sample received.
R1	RPD exceeds control limits."The sample randomly selected as QC for this batch was not part of your project. Therefore, this sample matrix is not applicable to your project samples."
U	Undetected at SDL (Sample Detection Limit).



LABORATORY TEST RESULTS

Client Sample ID: B-1 0-1
A&B Job Sample ID: 14030007.01

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14030424
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14030413

Sample Matrix: Soil
Date Collected: 03/01/2014 09:12
Date Received: 03/03/2014 08:13
Date Prepared: 03/04/2014 13:35

Analyst Initial: MAM

% Moisture: 23.6

Table with 10 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture, 23.6, ---, ---, %, 1, 03/04/14 13:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-1 0-1
A&B Job Sample ID: 14030007.01

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: Purgeable Aromatics
Analytical Method: SW-846 8021B
QC Batch ID: Qb14030540
Prep Method: SW-846 5035A
Prepared By: SBojja
Prep Batch ID: PB14030533

Sample Matrix: Soil
Date Collected: 03/01/2014 09:12
Date Received: 03/03/2014 08:13
Date Prepared: 03/03/2014 12:20

Analyst Initial: SRB

% Moisture: 23.6

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-1 0-1
A&B Job Sample ID: 14030007.01

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Total Petroleum Hydrocarbons

Sample Matrix: Soil

Analytical Method: TX 1005

Date Collected: 03/01/2014 09:12

QC Batch ID: Qb14030427

Date Received: 03/03/2014 08:13

Prep Method: TX 1005

Date Prepared: 03/03/2014 11:35

Prepared By: AVBembde

Prep Batch ID: PB14030416

Analyst Initial: AVB

% Moisture: 23.6

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include TPH-1005-1 (C6-C12), TPH-1005-2 (>C12-C28), TPH-1005-4 (>C28-C35), Total C6-C35, 111-85-3 (1-Chlorooctane), and 3386-33-2 (Chlorooctadecane).

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-2 13-14
A&B Job Sample ID: 14030007.02

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14030424
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14030413

Sample Matrix: Soil
Date Collected: 03/01/2014 09:56
Date Received: 03/03/2014 08:13
Date Prepared: 03/04/2014 13:35

Analyst Initial: MAM

% Moisture: 17.2

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture ¹	17.2				----	----	%	1	03/04/14 13:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-2 13-14
A&B Job Sample ID: 14030007.02

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: Purgeable Aromatics
Analytical Method: SW-846 8021B
QC Batch ID: Qb14030540
Prep Method: SW-846 5035A
Prepared By: SBojja
Prep Batch ID: PB14030533
Analyst Initial: SRB

Sample Matrix: Soil
Date Collected: 03/01/2014 09:56
Date Received: 03/03/2014 08:13
Date Prepared: 03/03/2014 12:20

% Moisture: 17.2

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).



LABORATORY TEST RESULTS

Client Sample ID: B-2 13-14
A&B Job Sample ID: 14030007.02

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: Total Petroleum Hydrocarbons
Analytical Method: TX 1005
QC Batch ID: Qb14030427
Prep Method: TX 1005
Prepared By: AVBembde
Prep Batch ID: PB14030416
Analyst Initial: AVB

Sample Matrix: Soil
Date Collected: 03/01/2014 09:56
Date Received: 03/03/2014 08:13
Date Prepared: 03/03/2014 11:35

% Moisture: 17.2

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include TPH-1005-1 through TPH-1005-4, 111-85-3, and 3386-33-2.



LABORATORY TEST RESULTS

Client Sample ID: B-3 13-15
A&B Job Sample ID: 14030007.03

Date: 3/12/2014

Client Name: Aviles Engineering

Attr: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: % Moisture

Sample Matrix: Soil

Analytical Method: SM 2540G

Date Collected: 03/01/2014 10:46

QC Batch ID: Qb14030424

Date Received: 03/03/2014 08:13

Prep Method: SM 2540G

Date Prepared: 03/04/2014 13:35

Prepared By: MMaldonado

Prep Batch ID: PB14030413

Analyst Initial: MAM

% Moisture: 22.0

CAS Number	Parameter	Result	Flag	SDL	MDL	ML	UQL	Units	DF	Date/Time
	% Moisture ¹	22				----	----	%	1	03/04/14 13:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-3 13-15
A&B Job Sample ID: 14030007.03

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Purgeable Aromatics

Sample Matrix: Soil

Analytical Method: SW-846 8021B

Date Collected: 03/01/2014 10:46

QC Batch ID: Qb14030540

Date Received: 03/03/2014 08:13

Prep Method: SW-846 5035A

Date Prepared: 03/03/2014 12:20

Prepared By: SBojja

Prep Batch ID: PB14030533

Analyst Initial: SRB

% Moisture: 22.0

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-4 5-6
A&B Job Sample ID: 14030007.04

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14030424
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14030413

Sample Matrix: Soil
Date Collected: 03/01/2014 13:42
Date Received: 03/03/2014 08:13
Date Prepared: 03/04/2014 13:35

Analyst Initial: MAM

% Moisture: 15.8

CAS Number	Parameter	Result	Flag	SDL	MDL	MLQ	UQL	Units	DF	Date/Time
	% Moisture ¹	15.8				---	---	%	1	03/04/14 13:36



LABORATORY TEST RESULTS

Client Sample ID: B-4 5-6
A&B Job Sample ID: 14030007.04

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: Purgeable Aromatics
Analytical Method: SW-846 8021B
QC Batch ID: Qb14030540
Prep Method: SW-846 5035A
Prepared By: SBojja
Prep Batch ID: PB14030533

Sample Matrix: Soil
Date Collected: 03/01/2014 13:42
Date Received: 03/03/2014 08:13
Date Prepared: 03/03/2014 12:20

Analyst Initial: SRB

% Moisture: 15.8

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).



LABORATORY TEST RESULTS

Client Sample ID: B-3 13-15
A&B Job Sample ID: 14030007.03

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Total Petroleum Hydrocarbons

Sample Matrix: Soil

Analytical Method: TX 1005

Date Collected: 03/01/2014 10:46

QC Batch ID: Qb14030427

Date Received: 03/03/2014 08:13

Prep Method: TX 1005

Date Prepared: 03/03/2014 11:35

Prepared By: AVBembde

Prep Batch ID: PB14030416

Analyst Initial: AVB

% Moisture: 22.0

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include TPH-1005-1, TPH-1005-2, TPH-1005-4, 111-85-3, and 3386-33-2.

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-4 5-6
A&B Job Sample ID: 14030007.04

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: **Total Petroleum Hydrocarbons**

Sample Matrix: Soil

Analytical Method: TX 1005

Date Collected: 03/01/2014 13:42

QC Batch ID: Qb14030427

Date Received: 03/03/2014 08:13

Prep Method: TX 1005

Date Prepared: 03/03/2014 11:35

Prepared By: AVBembde

Prep Batch ID: PB14030416

Analyst Initial: AVB

% Moisture: 15.8

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.1	Q18,U	28.1	23.7	25	1000	mg/Kg	1	03/03/14 18:41
TPH-1005-2	>C12-C28 ¹	< 24.1	U	24.1	20.3	25	1000	mg/Kg	1	03/03/14 18:41
TPH-1005-4	>C28-C35 ¹	< 21	U	21	17.7	25	1000	mg/Kg	1	03/03/14 18:41
	Total C6-C35	<28.1				---	---	mg/Kg	1	03/03/14 18:41
111-85-3	1-Chlorooctane(surr)	73.4				60	143	%	1	03/03/14 18:41
3386-33-2	Chlorooctadecane(surr)	73.2				60	150	%	1	03/03/14 18:41

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-5 10-11
A&B Job Sample ID: 14030007.05

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: % Moisture
Analytical Method: SM 2540G
QC Batch ID: Qb14030424
Prep Method: SM 2540G
Prepared By: MMaldonado
Prep Batch ID: PB14030413

Sample Matrix: Soil
Date Collected: 03/01/2014 12:44
Date Received: 03/03/2014 08:13
Date Prepared: 03/04/2014 13:35

Analyst Initial: MAM

% Moisture: 16.9

CAS Number	Parameter	Result	Flag	SDL	MDL	MLQ	UQL	Units	DF	Date/Time
	% Moisture ¹	16.9				---	---	%	1	03/04/14 13:36

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-5 10-11
A&B Job Sample ID: 14030007.05

Date: 3/12/2014

Client Name: Aviles Engineering
Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: Purgeable Aromatics
Analytical Method: SW-846 8021B
QC Batch ID: Qb14030540
Prep Method: SW-846 5035A
Prepared By: SBojja
Prep Batch ID: PB14030533

Sample Matrix: Soil
Date Collected: 03/01/2014 12:44
Date Received: 03/03/2014 08:13
Date Prepared: 03/03/2014 12:20

Analyst Initial: SRB

% Moisture: 16.9

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).



LABORATORY TEST RESULTS

Client Sample ID: B-5 10-11
 A&B Job Sample ID: 14030007.05

Date: 3/12/2014

Client Name: Aviles Engineering
 Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Attn: Bob Metzger

Test Description: **Total Petroleum Hydrocarbons**

Sample Matrix: Soil

Analytical Method: TX 1005

Date Collected: 03/01/2014 12:44

QC Batch ID: Qb14030427

Date Received: 03/03/2014 08:13

Prep Method: TX 1005

Date Prepared: 03/03/2014 11:35

Prepared By: AVBembde

Prep Batch ID: PB14030416

Analyst Initial: AVB

% Moisture: 16.9

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 28.5	Q18,U	28.5	23.7	25	1000	mg/Kg	1	03/03/14 19:04
TPH-1005-2	>C12-C28 ¹	< 24.4	U	24.4	20.3	25	1000	mg/Kg	1	03/03/14 19:04
TPH-1005-4	>C28-C35 ¹	< 21.3	U	21.3	17.7	25	1000	mg/Kg	1	03/03/14 19:04
	Total C6-C35	<28.5				—	—	mg/Kg	1	03/03/14 19:04
111-85-3	1-Chlorooctane(surr)	67.1				60	143	%	1	03/03/14 19:04
3386-33-2	Chlorooctadecane(surr)	84.9				60	150	%	1	03/03/14 19:04

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-6 10-11
A&B Job Sample ID: 14030007.06

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: % Moisture

Sample Matrix: Soil

Analytical Method: SM 2540G

Date Collected: 03/01/2014 11:44

QC Batch ID: Qb14030424

Date Received: 03/03/2014 08:13

Prep Method: SM 2540G

Date Prepared: 03/04/2014 13:35

Prepared By: MMaldonado

Prep Batch ID: PB14030413

Analyst Initial: MAM

% Moisture: 13.5

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Row 1: % Moisture^1, 13.5, ---, ---, %, 1, 03/04/14 13:36



LABORATORY TEST RESULTS

Client Sample ID: B-6 10-11
A&B Job Sample ID: 14030007.06

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Purgeable Aromatics

Sample Matrix: Soil

Analytical Method: SW-846 8021B

Date Collected: 03/01/2014 11:44

QC Batch ID: Qb14030540

Date Received: 03/03/2014 08:13

Prep Method: SW-846 5035A

Date Prepared: 03/03/2014 12:20

Prepared By: SBojja

Prep Batch ID: PB14030533

Analyst Initial: SRB

% Moisture: 13.5

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include MTBE, Benzene, Toluene, Ethylbenzene, m- & p-Xylenes, o-Xylene, Xylenes, and Trifluorotoluene(surr).

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-6 10-11
A&B Job Sample ID: 14030007.06

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Total Petroleum Hydrocarbons

Sample Matrix: Soil

Analytical Method: TX 1005

Date Collected: 03/01/2014 11:44

QC Batch ID: Qb14030427

Date Received: 03/03/2014 08:13

Prep Method: TX 1005

Date Prepared: 03/03/2014 11:35

Prepared By: AVBembde

Prep Batch ID: PB14030416

Analyst Initial: AVB

% Moisture: 13.5

Table with 11 columns: CAS Number, Parameter, Result, Flag, SDL, MDL, MQL, UQL, Units, DF, Date/Time. Rows include TPH-1005-1, TPH-1005-2, TPH-1005-4, 111-85-3, and 3386-33-2.

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-5 Water
A&B Job Sample ID: 14030007.07

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description: Purgeable Aromatics

Sample Matrix: Water

Analytical Method: SW-846 8021B

Date Collected: 03/01/2014 15:15

QC Batch ID: Qb14030612

Date Received: 03/03/2014 08:13

Prep Method: SW-846 5030C

Date Prepared: 03/03/2014 17:00

Prepared By: SBojja

Prep Batch ID: PB14030615

Analyst Initial: SRB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	U	0.001	.0014	0.002	0.16	mg/L	1	03/04/14 03:01
71-43-2	Benzene	< 0.0008	U	0.0008	.0008	0.002	0.16	mg/L	1	03/04/14 03:01
108-88-3	Toluene	< 0.001	U	0.001	.0010	0.002	0.16	mg/L	1	03/04/14 03:01
100-41-4	Ethylbenzene	< 0.0008	U	0.0008	.0008	0.002	0.16	mg/L	1	03/04/14 03:01
108-38-3&106-4	m- & p-Xylenes	< 0.002	U	0.002	.0016	0.004	0.32	mg/L	1	03/04/14 03:01
95-47-6	o-Xylene	< 0.001	U	0.001	.0010	0.002	0.16	mg/L	1	03/04/14 03:01
1330-20-7	Xylenes	< 0.003	U	0.003	.0025	0.002	0.48	mg/L	1	03/04/14 03:01
98-08-8	Trifluorotoluene(surr)	92.5				75	125	%	1	03/04/14 03:01

Soil results reported on dry weight basis



LABORATORY TEST RESULTS

Client Sample ID: B-5 Water
 A&B Job Sample ID: 14030007.07

Date: 3/12/2014

Client Name: Aviles Engineering

Attn: Bob Metzger

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Test Description:

Analytical Method: TX 1005
 QC Batch ID: Qb14030414
 Prep Method: TX 1005
 Prepared By: AVBembde
 Prep Batch ID: PB14030406

Sample Matrix: Water
 Date Collected: 03/01/2014 15:15
 Date Received: 03/03/2014 08:13
 Date Prepared: 03/03/2014 10:10

Analyst Initial: AVB

% Moisture

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12 ¹	< 2.35	D3, Q8, U	2.35	0.66	1.5	60	mg/L	3.556	03/03/14 17:20
TPH-1005-2	>C12-C28 ¹	< 3.06	U	3.06	0.86	1.5	60	mg/L	3.556	03/03/14 17:20
TPH-1005-4	>C28-C35 ¹	< 2.67	U	2.67	0.75	1.5	60	mg/L	3.556	03/03/14 17:20
	Total C6-C35	<3.06				---	---	mg/L	3.556	03/03/14 17:20
111-85-3	1-Chlorooctane(surr)	101				59	122	%	3.556	03/03/14 17:20
3386-33-2	Chlorooctadecane(surr)	95.2				48	123	%	3.556	03/03/14 17:20

Soil results reported on dry weight basis
¹-Parameter not available for accreditation

QUALITY CONTROL CERTIFICATE



Job ID : 14030007

Date : 3/12/2014

Analysis : **Method :** TX 1005 **Reporting Units :** mg/L

QC Batch ID : Qb14030414 **Created Date :** 03/04/14 **Created By :** AVBembde

Samples in This QC Batch : 14030007.07

Sample Preparation : PB14030406 **Prep Method :** TX 1005 **Prep Date :** 03/03/14 10:10 **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	80.7	%	1			
Chlorooctadecane(surr)	3386-33-2	76.4	%	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	32.1	107	30	33.9	113	5.4	20	75-125	
>C12-C28	30	29.8	99.3	30	32.5	108	8.7	20	75-125	
>C28-C35	30	29.3	97.7	30	30.6	102	4.3	20	75-125	

QC Type: MS and MSD											
QC Sample ID: 14021214.02											
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	25.6	29.7	114	25.6	25.5	97.8	15.5	20	75-125	
>C12-C28	BRL	25.6	29.2	112	25.6	24.1	91.6	19.6	20	75-125	
>C28-C35	BRL	25.6	26	99.1	25.6	25.3	96.3	2.8	20	75-125	

Refer to the Definition page for terms.

QUALITY CONTROL CERTIFICATE



Job ID : 14030007

Date : 3/12/2014

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

QC Batch ID : Qb14030427 **Created Date :** 03/04/14 **Created By :** AVBembde

Samples in This QC Batch : 14030007.01,02,03,04,05,06

Sample Preparation : PB14030416 **Prep Method :** TX 1005 **Prep Date :** 03/03/14 11:35 **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	83.2	%	1			
1-Chlorooctane(surr)	111-85-3	82.3	%	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	480	96	500	459	91.8	4.5	20	75-125	
>C12-C28	500	422	84.4	500	407	81.4	3.6	20	75-125	
>C28-C35	500	477	95.4	500	459	91.8	3.8	20	75-125	

QC Type: MS and MSD

QC Sample ID: 14021273.02

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	480	96	500	544	109	12.5	20	75-125	
>C12-C28	BRL	500	424	83.4	500	482	95	13	20	75-125	
>C28-C35	BRL	500	456	91.2	500	527	105	14.4	20	75-125	

Refer to the Definition page for terms.

1. REPORT TO: **INVOICE TO:**

Company: **Axles Engineering Corp** Company: **ACE**

Address: **5790 Windstream** Address: **AS in Box 1**

Contact: **Bob Metzger** Contact: **[Signature]**

Phone: **713-895-5765** Phone: **[Signature]**

Fax: **[Signature]** Fax: **[Signature]**

E-mail: **[Signature]** E-mail: **[Signature]**

2. Turnaround Time (Business Days)

1 Day* Other

2 Days* 3 Days* 7 Days - Standard

*Surcharge applies

3. PO #

4. Containers

5. Project # **E182-14**

6. Project Name/Location **Water Line Replacement Bessner Area Houston, TX**

7. Reporting Requirement

TRAP Limit only TRRP Rpt. Package See Attached Standard Level II

8. Sampler's Name & Company (PLEASE PRINT) **Robert J Metzger Axles Engineering Corp (DEC) 3/1/14**

9. Sample ID and Description	10. Sampling		11. 12. Matrix						18. REMARKS		
	Date	Time	Comp	Grb	Water	SE	Sludge	IO		AV	Other
01A B-1 0-1	3/1/14	9:12	✓								
02A B-2 13-14	3/1/14	9:56	✓								
03A B-3 13-15	3/1/14	10:46	✓								
04A B-4 5-6	3/1/14	13:42	✓								
05A B-5 10-11	3/1/14	13:44	✓								
06A B-6 10-11	3/1/14	14:44	✓								
07A B-5 water	3/1/14	15:15	✓								

19. RELINQUISHED BY: **[Signature]** DATE: **3/3/14** TIME: **8:13**

20. RECEIVED BY: **[Signature]** DATE: **3/3/14** TIME: **08:13**

21. RECEIVED BY LABORATORY

*Preservatives: C - Cool OH - NaOH H - HCl T - Na₂S₂O₃ N - H₂O S - H₂SO₄ X - Other

Containers: VOA - 40 ml vial AIG - Amber/Glass 1 Liter
4 oz/8 oz - glass wide mouth PFO - PTFE/other

METHOD OF SHIPMENT

LAB USE ONLY SAMPLING RENTAL P/U



Sample Condition Checklist

A&B JobID : 14030007	Date Received : 03/03/2014	Time Received : 8:13AM																						
Client Name : Aviles Engineering																								
Temperature : 1.0°C	Sample pH : N/A																							
Thermometer ID : 102002320	pH Paper ID : N/A																							
Check Points																								
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 :	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Water</td> <td style="text-align: center;">Soil</td> <td style="text-align: center;">Liquid</td> <td style="text-align: center;">Sludge</td> <td style="text-align: center;">Solid</td> <td style="text-align: center;">Cassette</td> <td style="text-align: center;">Tube</td> <td style="text-align: center;">Bulk</td> <td style="text-align: center;">Badge</td> <td style="text-align: center;">Food</td> <td style="text-align: center;">Other</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	Water	Soil	Liquid	Sludge	Solid	Cassette	Tube	Bulk	Badge	Food	Other	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>									
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:																								
Approximately 20mL in TPH vial.																								

Received by : AHall

Check in by/date : AHall / 03/03/2014

DCS Summary

**A&B JobID 14030007
Aviles Engineering
E102-14 / Water Line Replacement Gessner
Area Houston, TX
Sample Collected 3/1/2014**



QCType	Method	Parameter	Result	Units	D.F.	Spike Amount	Spike Units	%Rec	EnteredDate	EnteredBy
DCS	SW-846 8021B	m- & p-Xylenes	0.012	mg/L		0.012	mg/L	100	12/28/2013	SBojja
DCS	SW-846 8021B	Toluene	0.0054	mg/L		0.006	mg/L	90	12/28/2013	SBojja
DCS	SW-846 8021B	o-Xylene	0.0057	mg/L		0.006	mg/L	95	12/28/2013	SBojja
DCS	SW-846 8021B	Ethylbenzene	0.0055	mg/L		0.006	mg/L	91.7	12/28/2013	SBojja
DCS	SW-846 8021B	Benzene	0.0057	mg/L		0.006	mg/L	95	12/28/2013	SBojja
DCS	SW-846 8021B	MTBE	0.0053	mg/L		0.006	mg/L	88.3	12/28/2013	SBojja
DCS	SW-846 8021B	Xylenes	0.0177	mg/L		0.018	mg/L	98.3	12/28/2013	SBojja



QCType	Method	Parameter	Result	Units	D.F.	Spike Amount	Spike Units	%Rec	EnteredDate	EnteredBy
DCS	TX 1005	C6-C12	35.32	mg/Kg	25	25	mg/Kg	141	02/10/2014	AVBembde
DCS	TX 1005	>C12-C28	32.80	mg/Kg	25	25	mg/Kg	131	02/10/2014	AVBembde
DCS	TX 1005	>C28-C35	26	mg/Kg	25	25	mg/Kg	104	02/10/2014	AVBembde
DCS	TX 1005	Total C6-C35	94.12	mg/Kg	75	75	mg/Kg	125	02/10/2014	AVBembde



QCType	Method	Parameter	Result	Units	D.F.	Spike Amount	Spike Units	%Rec	EnteredDate	EnteredBy
DCS	TX 1005	C6-C12	2.07	mg/L		1.5	mg/L	138	02/13/2014	AVBembde
DCS	TX 1005	>C12-C28	1.88	mg/L		1.5	mg/L	125	02/13/2014	AVBembde
DCS	TX 1005	>C28-C35	1.73	mg/L		1.5	mg/L	115	02/13/2014	AVBembde
DCS	TX 1005	Total C6-C35	5.68	mg/L		4.5	mg/L	126	02/13/2014	AVBembde



Laboratory Data Package Cover Page

This data package is for Job No. 14030007 and laboratory batch no(s).
Qb14030414, Qb14030424, Qb14030427, Qb14030540, Qb14030612 and consists of:

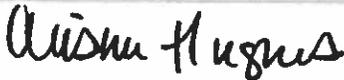
This signature page, the laboratory review checklist, and the following reportable data:

- R1 - Field chain-of-custody documentation;
- R2 - Sample identification cross-reference;
- R3 - Test reports (analytical data sheets) for each environmental sample that includes:
 - a. Items consistent with NELAC Chapter 5,
 - b. dilution factors,
 - c. preparation methods,
 - d. cleanup methods, and
 - e. If required for the project, tentatively identified compounds (TICs).
- R4 - Surrogate recovery data including:
 - a. Calculated recovery (%R), and
 - b. The laboratory's surrogate QC limits.
- R5 - Test reports/summary forms for blank samples;
- R6 - Test reports/summary forms for laboratory control samples (LCSs) including:
 - c. LCS spiking amounts,
 - d. Calculated %R for each analyte, and
 - e. The laboratory's LCS QC limits.
- R7 - Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
 - f. Samples associated with the MS/MSD clearly identified,
 - g. MS/MSD spiking amounts,
 - h. Concentration of each MS/MSD analyte measured in the parent and spiked samples,
 - i. Calculated %Rs and relative percent differences (RPDs), and
 - j. The laboratory's MS/MSD QC limits
- R8 - Laboratory analytical duplicate (if applicable) recovery and precision:
 - k. The amount of analyte measured in the duplicate,
 - l. The calculated RPD, and
 - m. The laboratory's QC limits for analytical duplicates.
- R9 - List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each method and matrix.
- R10 - Other problems or anomalies.

The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

Release Statement: I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Reports. The data have been reviewed and are technically compliant with the requirements of the methods used, except where noted by the laboratory in the Exception Reports. By my signature below, I affirm to the best of my knowledge all problems/ anomalies observed by the laboratory have been identified in the Laboratory Review Checklist, and no information affecting the quality of the data has been knowingly withheld.

Check, if applicable: This laboratory meets an exception under 30 TAC §25.6 and was last inspection by TCEQ or _____ on _____. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

Name (Printed)	Signature	Official Title (Printed)	Date
Alisha Hughes		Project Manager	03/12/2014



Laboratory Review Checklist: Reportable Data

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX
 A&B Job ID: 14030007
 Prep Batch Number(s): Qb14030414, Qb14030424, Qb14030427, Qb14030540, Qb14030612

Reviewed By: AHughes
 Date Reviewed: 03/12/2014

#	A	Description	Yes	No	NA	NR	ER#
R1	OI	Chain-of Custody					
		1) Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?		X			R1/1
		2) Were all departures from standard conditions described in an exception report?	X				
R2	OI	Sample and Quality Control (QC) Identification					
		1) Are all field sample ID numbers cross-referenced to the laboratory ID numbers?	X				
		2) Are all laboratory ID numbers cross referenced to corresponding QC data?	X				
R3	OI	Test Reports					
		1) Were all samples prepared and analyzed within holding times?	X				
		2) Other than those results <MQL, were all other reported results within calibration range?	X				
		3) Were calculations subject to appropriate checks?	X				
		4) Were all analyte identifications subject to appropriate checks?	X				
		5) Were all sample quantitation limits reported for all analytes not detected?	X				
		6) Were all results for soil and sediment samples reported on a dry weight basis?	X				
		7) Was % moisture (or solids) reported for all samples?	X				
		8) Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035		X			R3/8
		9) If required for the project, were tentatively identified compounds (TICs) reported?			X		
R4	OI	Surrogate Recovery Data					
		1) Were surrogates added prior to extraction?	X				
		2) Were surrogate percent recoveries (%R) within the laboratory QC limits?	X				
R5	OI	Test Reports/Summary Forms for Blank Samples					
		1) Were appropriate type(s) of blanks analyzed?	X				
		2) Were blanks analyzed at the appropriate frequency?	X				
		3) Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?	X				
		4) Were blanks free of detected target compounds and, if applicable, reported TICs?	X				
R6	OI	Laboratory Control Samples (LCS)					
		1) Were all COCs included in the LCS?	X				
		2) Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?	X				
		3) Were LCSs analyzed at the required frequency?	X				
		4) Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?	X				
		5) Were LCSs spiked at or below the LORP or do the detectability data document the laboratory's capability of detecting the COCs in samples spiked at the MDL?	X				
		6) Was the LCSD RPD within QC limits?	X				
R7	OI	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Data					
		1) Were the project/method specified analytes included in the MS and MSD?	X				
		2) Were MS/MSD analyzed at the appropriate frequency?	X				
		3) Were MS (and MSD, if applicable) %R within the laboratory QC limits?		X			R7/3
		4) Were MS/MSD RPDs within laboratory QC limits?		X			R7/4
R8	OI	Analytical Duplicate Data					
		1) Were appropriate analytical duplicates analyzed for each matrix?	X				
		2) Were analytical duplicates analyzed at the appropriate frequency?	X				
		3) Were RPDs or relative standard deviations within the laboratory QC limits?	X				
R9	OI	Method Quantitation Limits MQLs)					
		1) Are the MQLs for each method analyte listed and included in the laboratory data package?	X				
		2) Do the MQLs correspond to the concentration of the lowest non-zero standard?	X				
		3) Are unadjusted MQLs included in the laboratory data package?	X				



Laboratory Review Checklist: Reportable Data

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX

Reviewed By: AHughes

A&B Job ID: 14030007

Date Reviewed: 03/12/2014

Prep Batch Number(s): Qb14030414,Qb14030424,Qb14030427,Qb14030540,Qb14030612

#	A	Description	Yes	No	NA	NR	ER#
R10	OI	Other Problems/Anomalies					
		1) Are all known problems/anomalies/special conditions noted in this LRC and ER?	X				
		2) Was applicable and available technology used to lower the SDL to minimize the matrix interference effects on the sample results?		X			R10/2
		3) Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices and methods associated with this laboratory data package?	X				

S1	OI	INITIAL CALIBRATION (ICAL)					
		1) Were response factors (RFs) and/or relative response factors (RRFs) for each analyte within the QC limits?	X				
		2) Were percent RSDs or correlation coefficient criteria met?	X				
		3) Were the number of standards recommended in the method used for all analytes?	X				
		4) Were all points generated between the lowest and highest standard used to calculate the curve?	X				
		5) Are ICAL data available for instruments used?	X				
		6) Has the initial calibration curve been verified using an appropriate second source standard?	X				
S2	OI	INITIAL AND CONTINUING CALIBRATION VERIFICATION (ICCV AND CCV) AND CONTINUING CALIBRATION BLANK (CCB):					
		1) Was the CCV analyzed at the method-required frequency?	X				
		2) Were percent differences for each analyte within the method-required QC limits?	X				
		3) Was the ICAL curve verified for each analyte?	X				
		4) Was the absolute value of the analyte concentration in the inorganic CCB < MDL?	X				
S3	O	MASS SPECTRAL TUNING:					
		1) Was the appropriate compound for the method used for tuning?	X				
		2) Were ion abundance data within the method-required QC limits?	X				
S4	O	INTERNAL STANDARDS (IS):					
		Were IS area counts and retention times within the method-required QC limits?	X				
S5	OI	Raw data (NELAC Section 5.5.10)					
		1) Were the raw data (e.g., chromatograms, and spectral data) reviewed by an analyst?	X				
		2) Were data associated with manual integrations flagged on the raw data?	X				
S6	OI	DUAL COLUMN CONFIRMATION					
		Did dual column confirmation results meet the method-required QC?	X				
S7	OI	TENTATIVELY IDENTIFIED COMPOUNDS (TICS):					
		If TICS were requested, were the mass spectra and TIC data subject to appropriate checks?			X		
S8	OI	INTERFERENCE CHECK SAMPLE (ICS) RESULTS:					
		Were percent recoveries within method QC limits?			X		
S9	OI	SERIAL DILUTIONS, POST DIGESTION SPIKES, AND METHOD OF STANDARD ADDITIONS					
		Were percent differences, recoveries, and the linearity within the QC limits			X		
S10	OI	VERIFICATION/VALIDATION DOCUMENTATION FOR METHODS					
		Are all methods documented and verified and validated, where applicable, (NELAC 5.10.2 or ISO/IEC 17025 Section 5.4.5)?	X				
S11	OI	METHOD DETECTION LIMIT (MDL) STUDIES					
		1) Was a MDL study performed for each reported analyte?	X				
		2) Is the MDL either adjusted or supported by the analysis of DCSS?	X				
S12	OI	STANDARDS DOCUMENTATION					
		Are the standards used in the analyses NIST-traceable or obtained from other appropriate sources?	X				
S13	OI	COMPOUND/ANALYTE IDENTIFICATION PROCEDURES					



Laboratory Review Checklist: Reportable Data

Project Name: E102-14 / Water Line Replacement Gessner Area Houston, TX
 A&B Job ID: 14030007
 Prep Batch Number(s): Qb14030414, Qb14030424, Qb14030427, Qb14030540, Qb14030612

Reviewed By: AHughes
 Date Reviewed: 03/12/2014

#	A	Description	Yes	No	NA	NR	ER#
		Are the procedures for compound/analyte identification documented?	X				
S14	OI	DEMONSTRATION OF CAPABILITY (DOC)					
		1) Was DOC conducted generally consistent with NELAC 5C or ISO/IEC 4.2.2?	X				
		2) Is documentation of the analyst's competency up-to-date and on file?	X				
S15	OI	PROFICIENCY TEST REPORTS:					
		Are proficiency testing or inter-laboratory comparison results on file?	X				
S16	OI	LABORATORY STANDARD OPERATING PROCEDURES (SOPS):					
		Are laboratory SOPs current and on file for each method performed?	X				

ER#	EXCEPTION
R1/1	Limited volume was received for TRRP TPH analysis. This was qualified in the report.
R3/8	For volatile soils, the 5035 prep was performed from the bulk container.
R7/3	Purgeable Aromatics by Method SW-846 8021B, QC Batch ID: Qb14030540 - The MS and/or MSD recovery for one or more compounds is below laboratory control limits and was qualified accordingly.
R7/4	Purgeable Aromatics by Method SW-846 8021B, QC Batch ID: Qb14030540 - The RPD recovery for Ethylbenzene exceeds the laboratory control limits and was qualified accordingly.
R10/2	For TPH TX1005 analysis, your sample B-5 Water was reported as non detect with elevated sample detection limits because of the dilution needed due to the sample matrix interference from target analytes. This sample was qualified accordingly.

- O = organic analyses;
- I = inorganic analyses (and general chemistry, when applicable);
- NA = Not applicable;
- NR = Not Reviewed;
- ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked).

**Limited Phase II Environmental Site Assessment Water Line Replacement
In Gessner Area Project, Houston, Texas
City of Houston WBS No. S-000035-0154-04**

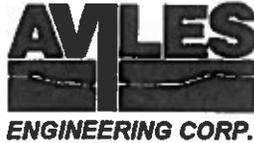
APPENDIX F

RESUME



ROBERT J. METZGER, PG, CAPM

POSITION	Senior Geologist for 12 years Aviles Engineering Corporation, Houston, Texas
EDUCATION	Bowling Green State University, Bachelor of Science in Education - Earth and Biological Sciences Bowling Green State University, Master of Science – Geology
REGISTRATIONS	Texas Registered Professional Geoscientist License No. 1133 Texas Commission on Environmental Quality Corrective Action Project Manager No. 01418 Certified with 40-Hour OSHA Hazardous Material Health and Safety Training and 8-Hour Refresher
EXPERIENCE	Conducted Phase I and Phase II ESAs for the City of Houston Department of Public Works and Engineering Projects: <ul style="list-style-type: none">• Riverwood Estates No. 1 Lift Station and Force Main• Harvey Wilson Drive and Armour Drive Reconstruction• Riverwood Estates, John Alber, and Garden Oaks Phase II Areas Water Line Replacements• Jensen Drive Pump Station Valve Box and Pipeline• Polk Street Underpass Storm Water Inlet Replacement• Park Row Road from State Highway 6 to Eldridge Parkway• Heights Area Waterline Replacement• West Little York Street Reconstruction from Deep Forest Drive to TC Jester Boulevard• Bastrop Street Sanitary Sewer Line• Northgate Regional Lift Station and Force Main• Corder Subdivision Water Main Replacement• Bennington Subdivision Water Main Replacement• Westheimer North Water Main Replacement• Lockwood Street Paving from Bennington Boulevard to Tidwell Road• Huntington Water Main Replacement• McCarty #1 Lift Station and Force Main Replacement• Parker Road Water Main Replacement• Kingspoint Road Sanitary Sewer Line• Alabonson Area Water Line Replacment• Mangum Manor Areas Water Line Replacment Phase II Environmental Site Assessment: Toyota Center, Houston, Texas: Conducted comprehensive Phase II ESA of a six-block site to assess and delineate contaminated soil and groundwater prior to construction of the Toyota Center.



EXPERIENCE,
continued

Houston Airport Systems Hobby Airport Taxiway H Phase II Environmental Site Assessment: Conducted Phase II ESA for expansion of Taxiway H at Hobby Airport, which included advancement of soil borings, installation of temporary groundwater monitoring wells and soil and groundwater sampling. Prepared Phase II ESA report.

Environmental Assessment: Houston Police Department Firing Range at George Bush Intercontinental Airport: Oversight of drilling soil borings and installation of monitor wells during decommissioning of firing range to determine soil and groundwater disposal options and site cleanup. Prepared and edited assessment report.

Environmental Soil Sampling and Analysis Woodhouse Paving Phase I and II Project Areas at Port of Houston Authority: During the Phase I Project, surface concrete was cored, a soil boring was conducted from the soil surface to 18 inches below the surface, and a soil sample was collected from each boring at 20 locations. During the Phase II Project, six soil borings were drilled to 4 feet below the ground surface (bgs), two borings were drilled to 10 feet bgs, and two borings were drilled to 30 feet bgs. One to two soil samples were collected from each boring for a total of 14 samples. Each of the soil samples collected during Phase I and Phase II was submitted to a commercial laboratory for analyses of the following potential environmental contaminants:

- Total petroleum hydrocarbons
- Total RCRA metals
- Volatile and semi volatile organic compounds
- Polychlorinated biphenyls (PCBs)
- Herbicides and Pesticides

Following analysis, a report was prepared for each project area describing the soil boring and sampling procedures, and the results of the laboratory analyses. Concentrations of contaminant in the soil samples were compared to applicable TCEQ standards.

Additional Phase II Environmental Site Assessments

- City of Pasadena Strawberry Road Improvements from Cherrybrook Lane to Spencer Highway.
- City of Pasadena Strawberry Road Improvements from State Highway 225 to Harris Avenue.
- Property at 44 Aldine Bender Road impacted by adjoining leaking underground storage tank site.