Kenall Inc.
Geotechnical, Environmental & Material Engineers

October 29, 2013

JONES & CARTER, INC.
16800 Greens point Park Drive, Suite 160 S
Houston, Texas

Attention: Mr. David Warner, P.E.

Subject: **Phase II Environmental Site Assessment**
Water Line Replacement in Kickerillo Area
City of Houston, Texas
WBS No.: S-000035-0185-3
Kenall Report No. 1757

Dear Mr. Warner:

Kenall is pleased to submit this report of our findings, conclusions and recommendations of a Phase II Environmental Site Assessment (ESA), for the above subject project. This study was authorized by Jones & Carter, Inc., on June 24, 2013.

This report briefly describes the methodology, testing procedures employed in our investigation and presents the results of laboratory tests. Also, presented are our conclusions and recommendations based on the results from laboratory tests. This Phase II ESA was conducted in general conformance within the scope and limitations of Environmental Site Assessment process ASTM E 1903 - 97 (2002) as modified in Chapter 11 of the current City of Houston's Public Works & Engineering Infrastructure Design Manual.

We appreciate the opportunity to work with you on this project. If you have any questions or require further information, please do not hesitate to contact our office.

Very Truly Yours,

Rajesh Tolikonda, E.I.T.
Staff Engineer

STATE OF TEXAS
KRISHNA D. PRASAD
91952
LICENSED
PROFESSIONAL ENGINEER

Kris D. Prasad, P.E.
Principal Engineer

Report Distribution: Client-(1) Copy and (1) email.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Kenall has completed a Phase II ESA for the proposed Water Line Replacement Project in Kickerillo area in City of Houston, Texas. The project involves the water line replacement along approximately 23 street segments within the Kickerillo area. We understand that the invert depth of the proposed water lines will be about seven (7) to eleven (11) feet below the existing grade.

Kenall identified one (1) recognized environmental condition (REC) site in the project area during the preparation of our Phase I ESA report No. 1592 "Phase I Environmental Site Assessment, Water Line Replacement (WLR) in Kickerillo Area". The purpose of this study was to determine if soil and/or groundwater contamination from this one (1) site might impact the design and construction of the proposed project. This study was performed in general accordance with current ASTM Standard Practice ASTM E 1903 - 97 (2002) "Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process" as modified in Chapter 11 of the current City of Houston's Public Works & Engineering Infrastructure Design Manual.

The available information for this Project Area and subsurface investigation are summarized below:

- Three (3) borings were installed at one (1) location using direct push (Geoprobe) drilling method. The borings were drilled at the site of environmental concern along Kickerillo Drive at Memorial Drive. The subsurface soils collected generally consist of light gray to tan to reddish brown fat clay and sandy clay.
- One (1) soil sample from each boring was obtained for laboratory analysis of chemicals of concern (COCs). Groundwater was not encountered in borings in sufficient quantity for sampling.
- The results; TPH, BTEX, and MTBE, were less than sample detection limit (SDL). The site therefore does not have petroleum hydrocarbon contamination. No further action is therefore necessary at the site.

It is likely that the majority of the soils will be non-hazardous and soil excavated during construction along the Subject Project Area will not require special handling. No potentially petroleum contaminated areas (PPCA) were identified at/near the location of environmental concern. In our opinion, no areas along the Subject Project Area will require engineering design considerations or environmental protocols.

Based on the results of this study, we recommend no further ESA in the Subject Project Area. This executive summary does not fully summarize our findings and opinions. Those findings and opinions are related through the full report only.

1 INTRODUCTION

1.1 Project Objective and Rationale

Kenall identified one (1) site with REC along the Subject Project Area during the preparation of our Phase I ESA report number 1592 "Phase I Environmental Site Assessment, Water Line Replacement (WLR) in Kickerillo Area" (see Appendix A Site Vicinity Plan for project location). The locations, type of concern, etc. were provided in the Phase I ESA report. The objective of this investigation is to determine the nature of possible environmental contamination associated with the location of potential concern and the effect on the design, construction and operation of the proposed facilities. Prior to drilling, it was decided that impacts (if any) to the project can be assessed with three borings at one (1) location of environmental concern (3 borings total). The locations, type of concern, and the required analysis etc., are provided in Table 1.

Table 1: Kickerillo Area Water Line Replacement Project Environmental Issues

Name and Location of Concern	Type of Concern	Concern Documentation/Comment	Sample Analysis and Boring Number
Texaco Service Station 14403 Memorial Drive	toluene, benzene, ethylbenzene, total xylenes and MTBE	Spill from PST with limited information	TPH, BTEX+MTBE **B1, B2** & **B3**

Based on Chapter 11 of The City of Houston Public Works and Engineering Infrastructure Design Manual- July 2012, one (1) groundwater sample shall be collected from each REC location. However, groundwater was not encountered in sufficient quantity for sampling in any of the soil borings.

1.2 Project Scope

The following tasks were performed:

1. Obtained environmental drilling location concurrence via utility "mark outs" from pipeline owners and others.
2. Drilled three (3) borings to 12 ft. below ground surface. All borings were installed using direct push (Geoprobe) techniques. The boring depth was based on invert depth at REC location which is seven (7) feet.
3. Performed soil screening with a Photo Ionization Detector (PID) meter and selected samples for subsequent laboratory analyses.
4. Prepared boring logs (copies of these logs are provided in Appendix C).
5. Submitted selected samples to A&B Laboratory for analysis. See Table 1 above for borings location/number, type of concern, concern documentation and analysis conducted (laboratory data sheets, QA/QC documentation and

chain-of-custody form are provided in Appendix D).
6. Disposed drill cuttings and related drummed non-hazardous waste.
7. Prepared this report summarizing our findings with conclusions and recommendations.

1.3 Basis of Report

Although this study has been a reasonably thorough attempt to identify soil and groundwater contamination at the proposed location, there is a possibility that contamination may have escaped detection due to the limitations of this study, or the presence of undetected and unreported environmental releases. Kenall, reserves the right to alter our conclusions and recommendations based on our review of any information obtained after the date of this report.

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar conditions, by environmental consultants practicing in this or similar localities. No warranty, express or implied, is made as to the professional information included in this report.

1.4 Qualifications of Personnel

Rajesh Tolikonda, E.I.T.
The primary investigator for this Phase II ESA is Mr. Rajesh Tolikonda, E.I.T. Mr. Tolikonda holds Masters Degree in geotechnical engineering from West Virginia University. Mr. Tolikonda has two years of experience in providing geotechnical engineering, material testing services, and Environmental Site Assessments. Mr. Tolikonda has been responsible for Phase I ESA preparation, environmental impact statement preparation, Phase II ESA sampling / analysis and reporting.

Kris D. Prasad, P.E.
Kenall Principal Engineer Kris D. Prasad, P.E., has over 15 years of experience in providing geotechnical engineering, material testing services, and Environmental Site Assessments. Mr. Prasad conducted numerous technical reviews of environmental management systems, environmental compliance audits, environmental site assessments which includes Phase I and Phase II ESA sampling / analysis and reporting. Mr. Prasad is Registered Professional Engineer in the State of Texas (91952) and is a member of American Society of Civil Engineers, Texas Council of Engineering Companies, American Council of Engineering Companies, and Texas Council of Engineering Laboratories.

2 BACKGROUND

2.1 Results of Previous Environmental Studies

The available information from Kenall Phase I ESA report No. 1592 "Phase I Environmental Site Assessment, Water Line Replacement (WLR) in Kickerillo Area" is summarized below:

1. The review of aerial photographs from years 1944, 1953, 1969, 1979, 1989, 1999, and 2009, conclude that no unusual changes in vegetation or suspect surface features of the project area or surrounding properties were identified except general developmental process. The aerial photos depict the growth of the surrounding properties to be essentially residential, farmland and commercial.
2. According to the ASTM Standard E 1527-05; regulatory data indicate 56 locatable mapped environmental database entries at multiple sites within the Subject Project area. Most of the properties listed have multiple database entries.
3. After a site reconnaissance and our review of historical data, maps and the Texas Commission on Environmental Quality (TCEQ) online records, we found that one (1) site adjoining the Subject Project Area has recognized environmental condition (REC) that could pose a concern to project construction. The following site with REC was identified in connection with Subject Project Area while performing the Phase I ESA:
    - Texaco Service Station located at 14403 Memorial Drive

Kenall concluded that there is a potential for environmental contamination to impact the Subject Project Area from the REC site listed above. Based on recommendations contained in the Phase I ESA, Kenall at the request of Jones & Carter, Inc., proposed this Phase II ESA study in the vicinity of the REC in the Subject Project Area.

2.2 Planned Construction Description

We understand that the project will involve the replacement of 32,870 linear feet of 6 to 10-inch diameter water lines in Kickerillo area. We understand that the invert depth of the proposed utilities will be about seven (7) to eleven (11) feet below the existing grade. The invert depth at the REC location is seven (7) feet, so the borings are drilled to a depth of 12 feet.

2.3 Physical Setting

From a review of the 1995 Alief- United States Geological Survey (USGS) topographic quadrangle map, the Subject Project Area lies at an elevation of approximately 75 to 80 feet above mean sea level.

The project area is surrounded by North Kirkwood Road on the east, Buffalo Bayou on the south, Winter Oaks Drive on the west, and Memorial Drive on the north. The project

area is mostly a residential subdivision, but the surrounding area near the intersection of Memorial drive and Winter Oaks is occupied by commercial properties, retail and service oriented businesses.

3 INVESTIGATIVE METHODOLOGY

3.1 Soil Boring and Soil/Groundwater Sampling Activities

Prior to commencing field activities, a site-specific health and safety plan was prepared in accordance with 29 CFR 1910.120. All environmental soil borings were conducted using direct push techniques. A track-mounted, Geoprobe Sampling System provided by Mathers Environmental Drilling company was used to advance the soil probe apparatus. Investigation was performed in general accordance with current ASTM Standard Practice ASTM E 1903 - 97 (2002) "Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process" as modified in Chapter 11 of the current City of Houston's Public Works & Engineering Infrastructure Design Manual

The location of the soil borings/probes is shown on the Plan of Borings (Appendix B). At the start of drilling, all sampling tools were decontaminated with a phosphate-free Liquid-Nox detergent, followed by a Freon rinse and a final deionized water rinse to reduce possible sample cross-contamination. The sampling tools were once again decontaminated after sample recovery. All the soil borings were advanced to 12 ft. Soil samples obtained were continuously examined for impact using visual and olfactory methods. Samples were also screened for organic vapors with a properly calibrated Photo Ionization Detectors (PID) Meter. Descriptions of the materials encountered are presented on the Boring Logs (Appendix C).

Soil samples were placed in airtight containers (sealable plastic bags) and held for approximately twenty minutes to allow the volatilization of organic vapors. At the end of this period, the headspace air inside the container was screened with the PID. Following PID screening, one soil sample from each borehole was selected for laboratory analyses (PID readings are presented on the boring logs). Samples were selected for analysis based on criteria contained in the project proposal as follows: 1) zone of the highest PID readings; 2) if there were no PID readings, the soil sample was obtained from the top of the soil-groundwater interface (water table); 3) if no groundwater was encountered, the soil sample was obtained from the bottom of the boring. The samples selected were placed into pre-labeled laboratory-supplies glass jars, placed on water ice in an insulated cooler and shipped under chain-of-custody to A & B Labs for analysis.

Groundwater in sufficient quantity for sampling was not encountered in any of the borings. No groundwater samples were collected as part of this study. Subsequent to the drilling and sampling activities, each borehole was plugged from total depth to the surface using bentonite plugging material and capped with concrete in accordance with standard drilling practice.

3.2 Laboratory Analysis Performed

A & B Labs performed analyses on selected soil samples based on possible chemicals of concern information developed during our Phase II ESA for the Subject Project Area. Samples from the environmental borings installed along the Subject Project Area were analyzed for the following parameters:

- Total Petroleum Hydrocarbons (TPH) using TCEQ Method 1005 (samples B1-B3);
- Benzene, toluene, ethylbenzene and xylene (BTEX) and methyl-tert butyl ether (MTBE) using U.S. EPA Method 8260B (samples B1-B3);

Copies of laboratory reports by A & B Labs as well as the standard chain-of-custody documentation are included in Appendix D.

3.3 Waste Management

Investigation derived wastes (primarily soil cuttings) were generated in a small amount (approximately two kilograms of soil cuttings were generated per boring). These materials were containerized, analyzed and because of their lack of levels of COCs, were treated as ordinary uncontaminated soil waste and disposed.

4 ASSESSMENT RESULTS

4.1 Site Specific Soil Conditions

The subsurface soils generally consist of light gray, tan and reddish brown, fat clay and sandy clay. No petroleum (or other) odors were detected by olfactory means during the installation of the borings. The lack of odors is documented on the boring logs. Specific soil descriptions and field observations for the soil borings are included on the boring logs contained in Appendix C. Soil classifications presented on the boring logs are based on visual field classification and have not been verified by geotechnical laboratory tests. Actual soil conditions may differ from those presented on the boring logs.

4.2 Analytical Findings — Soil

Lab analyses reports are presented in Appendix D. The results are summarized in the Table 2 shown below, which also provides the Texas Commission on Environmental Quality (TCEQ) TRRP Tier 1 Soil PCLs (mg/kg) limits.

No levels of BTEX/MTBE by EPA Method 8260B, and TPH by Texas Commission on Environmental Quality (TCEQ) Method 1005 were found above the sample detection limit in any of the soil samples collected for this study. No petroleum contaminated areas (PPCA) were identified along the Subject Project Area at/near the LPST location.

Table 2: Sample Analysis Test Results

Boring #	Sample Depth (ft)	Sample Date	TPH by Tx 1005 (mg/kg)			BTEX by EPA 8620/8021 B (mg/kg)				MTBE (mg/kg)
			C_6-C_{12} (TPH-1005-1)	C_{12}-C_{28} (TPH-1005-2)	C_{28}-C_{35} (TPH-1005-4)	Benzene	Toluene	Ethyl Benzene	Total Xylenes	
B-1	4-6	8/2/13	<26.8	<22.9	<20	<0.001	<0.001	<0.006	<0.002	<0.001
B-2	0-2	8/2/13	<28.4	<24.3	<21.2	<0.001	<0.001	<0.006	<0.002	<0.001
B-3	4-6	8/2/13	<26.5	<22.7	<19.8	<0.001	<0.001	<0.006	<0.002	<0.001
TCEQ TRRP TIER 1 SOIL PCLs (mg/kg)[1]			**65**	**200**	**200**	**0.026**	**8.2**	**7.6**	**120**	**0.62**
TCEQ TRRP TIER 1 SOIL PCLs (mg/kg)[2]			**1600**	**2300**	**2300**	**120**	**5900**	**6400**	**6000**	**800**

[1] TCEQ TRRP TIER 1 PCLs for 0.5 acre source area and $^{GW}soil_{ing}$ exposure pathway

[2] TCEQ TRRP TIER 1 PCLs for 0.5 acre source area and $^{Tot}soil_{comb}$ exposure pathway

5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary and Conclusions

The subsurface soils collected consist of light gray to gray to tan to reddish brown fat clay and tan to reddish brown sandy clay. We conclude that COCs (BTEX, MTBE, and TPH) are not above the TCEQ TRRP Tier 1 Soil PCLs levels (Table 2) and that it is unlikely that any of the soil excavated during construction along the Subject Project Area will require special handling. We do not anticipate that groundwater will be present at any of the boring locations above 12 feet depth along the Subject Project Area. It should be noted that the groundwater table may fluctuate due to seasonal variations in rainfall and local stratigraphic and/or underground (manmade) features and groundwater may be present at these locations at other times in the year or at nearby locations. We conclude that there are no petroleum contaminated areas (PPCA) along the Subject Project Area.

5.2 Recommendations

Based on a comparison of analytical results detailed in this report with TCEQ TRRP Action Levels and other information, we recommend no further environmental studies adjacent to or near the Subject Project Area. Based on the results of our study, soils generated during construction can be handled as normal spoils associated with the construction and disposed as such. We recommend no environmental design considerations or protocols for the proposed construction activity.

6 LIMITATIONS

This report is an instrument of service of Kenall. The report was prepared for and is intended for the exclusive use of the City of Houston and Jones & Carter, Inc. The report's contents may not be relied upon by any other party without the express written

permission of Kenall. With the written permission of the Charles Gooden Consulting Engineers, Inc., Kenall will meet with a third patty to help identify the additional services required, if any, to permit such third party to rely on the information contained in this report, but only to the same extent of Jones & Carter, Inc., and subject to the same contractual, technological, and other limitations to which Jones & Carter Inc., has agreed.

The report's findings are based on conditions that existed on the date of Kenall site visit and field investigations and should not be relied upon to precisely represent conditions at any other time. The scope of service executed for this project is not equivalent to the scope of service needed to provide the information to completely establish the quantities and distribution of the petroleum hydrocarbon and other compounds affected soils present at these sites. Kenall, has based the conclusions included in this report on its observation of existing site conditions, its interpretation of site history, its interpretation of site usage information it was able to access and the results of a limited program of subsurface exploration, sample screening and chemical analysis. We cannot guarantee that the locations assessed are the only REC sites requiring assessment along the Subject Project Area. The concentration of contaminants Kenall measured may not be representative of conditions between locations sampled. Be aware that conditions may change at any sampled or unsampled location as a function of time, in response to natural conditions, chemical reactions, and/or other events.

Conclusions about site conditions under no circumstances comprise a warranty that conditions in all areas within the site and study area (and below existing grade) are of the same quality as the area sampled. Recognize, too, that contamination might exist in forms not indicated by the limited exploration Kenall conducted.

The scope of service Kenall implemented was based, in part, on the rules and regulations for assessment at industrial/commercial facilities and LPST locations as promulgated by the TCEQ and others. The rules, regulations and guidelines by which this investigation was conducted were understood to be current or expected at the time Kenall developed its proposal. Changes in regulations, rules, guidelines, interpretations, and/or enforcement policies may occur at any time and such changes could affect the extent of remediation required for the subject sites. Any additional information about these sites that becomes available should be provided to Kenall for its review, so Kenall can modify its recommendations as necessary.

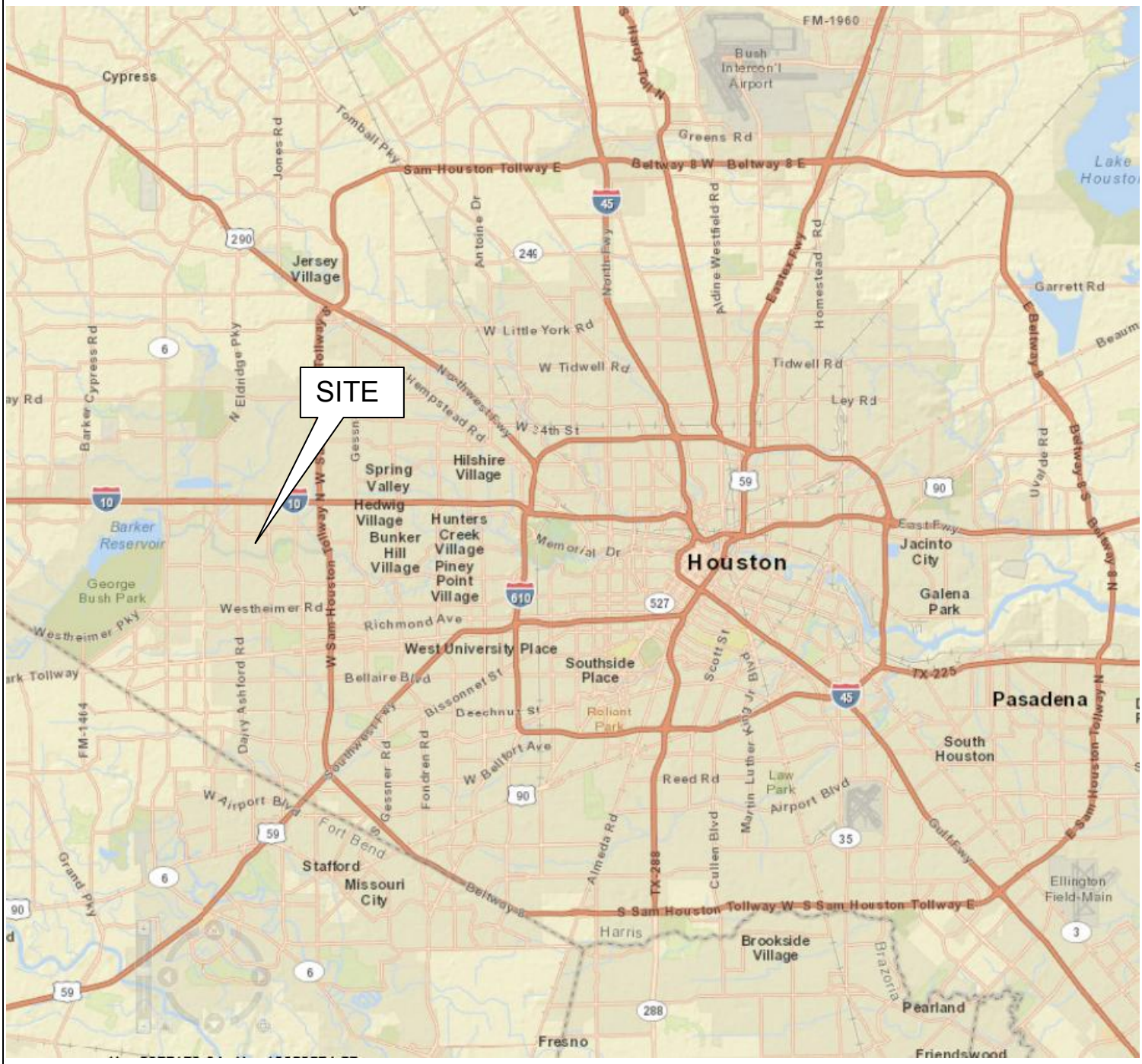
7 REFERENCES

The following references were used to compile this report:

- American Society for Testing and Materials (ASTM) E 1903 - 97 (2002) "Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process".
- Google Maps

- City of Houston Department of Public Works and Engineering, Infrastructure Design Manual- July 2012
- Kenall ESA report number 1592 "Phase I Environmental Site Assessment, Water Line Replacement (WLR) in Kickerillo Area"
- TCEQ Remediation RG-366/TRRP-23, June 29, 2012 regulatory guidance document TIER 1 PCLs for residential and commercial sites guidelines

Appendix A- Site Vicinity Map



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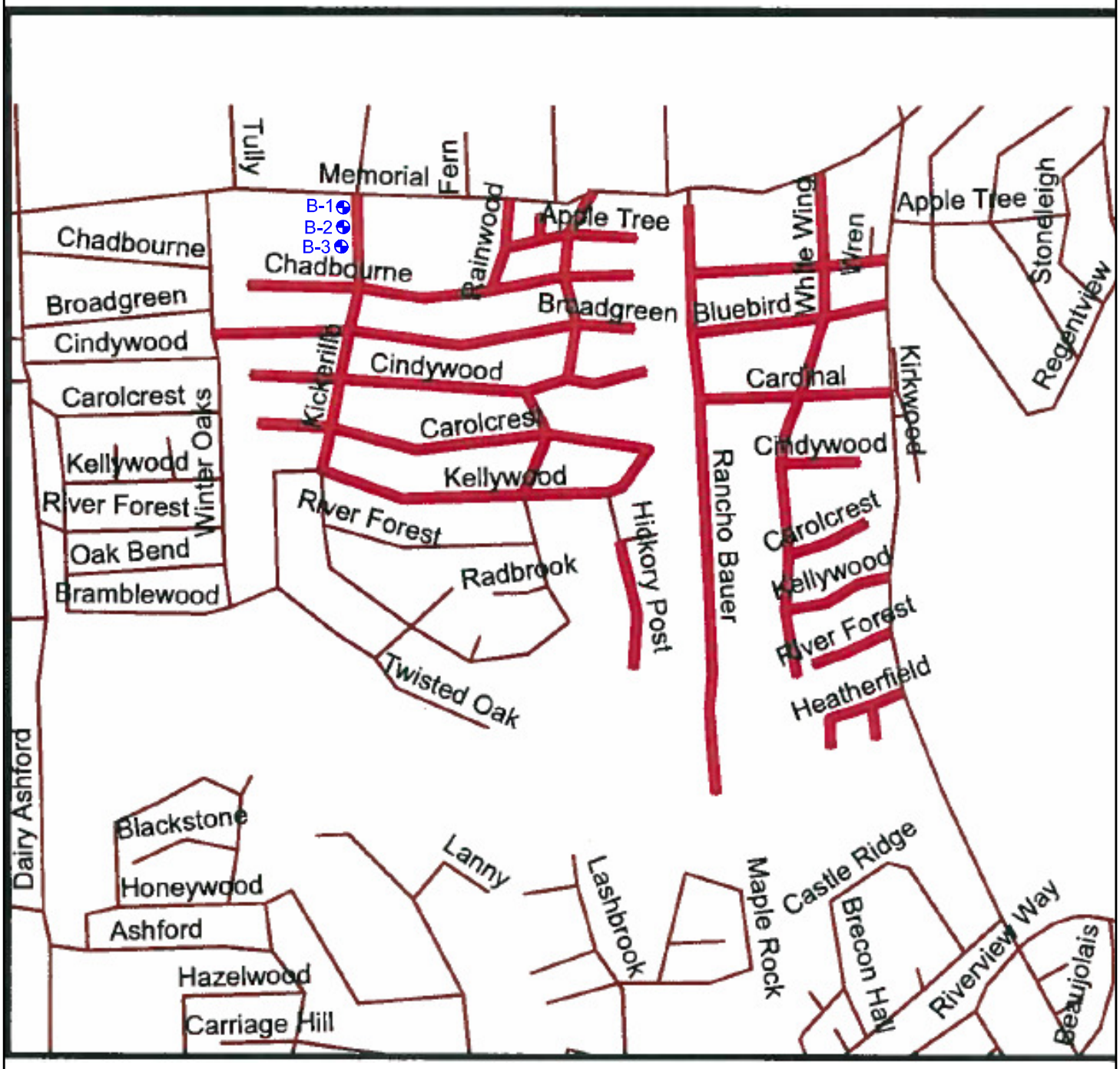
Geotechnical, Environmental & Material Engineers

Scale: Not to Scale	Approved By: KP	Prepared By: RT

PROJECT AREA VICINITY MAP
Kickerillo Area
(http://www.gims.houstontx.gov/PortalWS/R.aspx?M.aspx&app=GIMS)

WBS No.: S-000035-0185-3	Project No.: 1757	Appendix A

Appendix B- Plan of Borings



Kenall Inc.
Geotechnical, Environmental & Material Engineers

Scale:	Approved By:	Prepared By:
Not to Scale	KP	RT

PLAN OF BORINGS
Water Line Replacement in Kickerillo Area
City of Houston, Texas

WBS No.	
S-000035-0185-3	Appendix B

Appendix C- Boring Logs

Hole No. B-1

BORING LOG	WBS No. S-000035-0185-3	INSTALLATION ESA Phase II at Kickerillo Area	SHEET 1 OF 1 SHEETS

1. PROJECT Kickerillo Area	7. ELEVATION OF HOLE 75 ft
2. LOCATION (Coordinates or Station) City of Houston, TX 29°46'11.7", 95°36'	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Mathers Environmental Drilling	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY a & b Labs	10. DRILLING DATE and TIME STARTED: 8/2/13 COMPLETED: 8/2/13
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 12 ft	12. ENGINEER Rajesh Tolikonda

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PID (ppm)	REMARKS
	74.5		6.25 inches of Concrete						
			Light gray, tan and reddish brown, FAT CLAY with sand		1			11.8	
					2			16.1	
5					3			39.2	(Sample from 4-6 ft. sent to lab)
					4			12.7	NO HYDROCARBON ODOR
					5			9.3	
10					6			5.7	
	63.0		BORING TERMINATED AT 12 FT. BELOW GROUND SURFACE						
15									

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KENALL INC. ENVIRONMENTAL FORM

Hole No. B-2

BORING LOG	WBS No. S-000035-0185-3	INSTALLATION ESA Phase II at Kickerillo Area	SHEET 1 OF 1 SHEETS

1. PROJECT Kickerillo Area	7. ELEVATION OF HOLE 80 ft
2. LOCATION (Coordinates or Station) City of Houston, TX 29°46'11.2", 95°39'59.8"	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Mathers Environmental Drilling	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY a & b Labs	10. DRILLING DATE and TIME STARTED: 8/2/13 COMPLETED: 8/2/13
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 12 ft	12. ENGINEER Rajesh Tolikonda

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PID (ppm)	REMARKS
	79.4		6.75 inches of Concrete						
			Dark gray, light gray and tan, FAT CLAY with sand and calcareous nodules		1			22.0	(Sample from 0-2 ft. sent to lab)
					2			7.6	
5					3			12.8	
					4			8.6	NO HYDROCARBON ODOR
					5			3.5	
10					6			2.5	
	68.0		BORING TERMINATED AT 12 FT. BELOW GROUND SURFACE						
15									

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Hole No. B-3

BORING LOG	WBS No. S-000035-0185-3	INSTALLATION ESA Phase II at Kickerillo Area	SHEET 1 OF 1 SHEETS

1. PROJECT Kickerillo Area	7. ELEVATION OF HOLE
2. LOCATION (Coordinates or Station) City of Houston, TX 29°46'10.6", 95°36'0.0"	8. DATUM FOR ELEVATION
3. DRILLING AGENCY Mathers Environmental Drilling	9. ELEVATION OF GROUNDWATER ▽ TOD: ▼ 24-HR:
4. LABORATORY TESTING AGENCY a & b Labs	10. DRILLING DATE and TIME STARTED: 8/2/13 COMPLETED: 8/2/13
5. DEPTH OF WATER ▽ TOD: ▼ 24-HR:	11. CLASSIFICATION REFERENCE
6. DEPTH OF HOLE 12 ft	12. ENGINEER Rajesh Tolikonda

DEPTH (ft)	ELEVATION (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	NUMBER	RECOVERY (%)	SPT (N)	PID (ppm)	REMARKS
			6.75 inches of Concrete						
			Light gray SANDY CLAY		1			8.2	NO HYDROCARBON ODOR
			Tan and gray FAT CALY with sand		2			15.0	NO HYDROCARBON ODOR
5			Tan and reddish brown SANDY CLAY		3			15.2	(Sample from 4-6 ft. sent to lab) NO HYDROCARBON ODOR
			Tan and reddish brown FAT CLAY with sand		4			7.8	
					5			4.2	NO HYDROCARBON ODOR
10					6			3.7	
			BORING TERMINATED AT 12 FT. BELOW GROUND SURFACE						
15									

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KENALL INC. ENVIRONMENTAL FORM

Appendix D- Analytical Lab Report & Chain of Custody

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 1
A&B Job Sample ID: 13080184.07
Date: 8/14/2013

Client Name: Kenall, Inc. Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	08/02/2013
QC Batch ID:	Qb13080646	Date Received	08/05/2013 14:59
Prep Method:	SM 2540G	Date Prepared	08/06/2013 15:00
Prepared By:	MMaldonado		
Prep Batch ID	PB13080625		
Analyst Initial	MAM	% Moisture	11.5

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	11.5				----	----	%	1	08/06/13 15:01

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 1
A&B Job Sample ID: 13080184.07
Date: 8/14/2013

Client Name: Kenall, Inc.
Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**Purgeable Aromatics**	Sample Matrix	Soil
Analytical Method:	SW-846 8021B	Date Collected	08/02/2013
QC Batch ID:	Qb13081435	Date Received	08/05/2013 14:59
Prep Method:	SW-846 5035A	Date Prepared	08/13/2013 14:00
Prepared By:	Xan		
Prep Batch ID	PB13081433		
Analyst Initial	XA	% Moisture	11.5

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:03
71-43-2	Benzene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:03
108-88-3	Toluene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:03
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.005	0.005	0.4	mg/Kg	1.0	08/13/13 17:03
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.005	0.01	0.8	mg/Kg	1.0	08/13/13 17:03
95-47-6	o-Xylene	< 0.002	U	0.002	0.002	0.005	0.4	mg/Kg	1.0	08/13/13 17:03
1330-20-7	Xylenes	< 0.002	U	0.002	0.002	0.005	1.2	mg/Kg	1.0	08/13/13 17:03
98-08-8	Trifluorotoluene(surr)	98				81	111	%	1.0	08/13/13 17:03

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 1
A&B Job Sample ID: 13080184.07
Date: 8/14/2013

Client Name: Kenall, Inc.
Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	08/02/2013
QC Batch ID:	Qb13080917	Date Received	08/05/2013 14:59
Prep Method:	TX 1005	Date Prepared	08/08/2013 15:00
Prepared By:	AVBembde		
Prep Batch ID	PB13080912		
Analyst Initial	AVB	% Moisture	11.5

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 26.8	Q18,U	26.8	23.7	25	1000	mg/Kg	1	08/08/13 22:10
TPH-1005-2	>C12-C28[1]	< 22.9	U	22.9	20.3	25	1000	mg/Kg	1	08/08/13 22:10
TPH-1005-4	>C28-C35[1]	< 20	U	20	17.7	25	1000	mg/Kg	1	08/08/13 22:10
	Total C6-C35	< 20				----	----	mg/Kg	1	08/08/13 22:10
111-85-3	1-Chlorooctane(surr)	67				60	143	%	1	08/08/13 22:10
3386-33-2	Chlorooctadecane(surr)	74.2				60	150	%	1	08/08/13 22:10

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID:	1757 B - 2	Date:	8/14/2013
A&B Job Sample ID:	13080184.08		
Client Name:	Kenall, Inc.	Attn:	Rajesh Tolikonda
Project Name:	1756 & 1757 / Sherwood & Kickerillo		

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	08/02/2013
QC Batch ID:	Qb13080646	Date Received	08/05/2013 14:59
Prep Method:	SM 2540G	Date Prepared	08/06/2013 15:00
Prepared By:	MMaldonado		
Prep Batch ID	PB13080625		
Analyst Initial	MAM	% Moisture	16.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	16.6				----	----	%	1	08/06/13 15:01

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 2
A&B Job Sample ID: 13080184.08
Date: 8/14/2013

Client Name: Kenall, Inc. Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**Purgeable Aromatics**	Sample Matrix	Soil
Analytical Method:	SW-846 8021B	Date Collected	08/02/2013
QC Batch ID:	Qb13081435	Date Received	08/05/2013 14:59
Prep Method:	SW-846 5035A	Date Prepared	08/13/2013 14:00
Prepared By:	Xan		
Prep Batch ID	PB13081433		
Analyst Initial	XA	% Moisture	16.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:32
71-43-2	Benzene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:32
108-88-3	Toluene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 17:32
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.005	0.005	0.4	mg/Kg	1.0	08/13/13 17:32
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.005	0.01	0.8	mg/Kg	1.0	08/13/13 17:32
95-47-6	o-Xylene	< 0.002	U	0.002	0.002	0.005	0.4	mg/Kg	1.0	08/13/13 17:32
1330-20-7	Xylenes	< 0.002	U	0.002	0.002	0.005	1.2	mg/Kg	1.0	08/13/13 17:32
98-08-8	Trifluorotoluene(surr)	99.5				81	111	%	1.0	08/13/13 17:32

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 2
A&B Job Sample ID: 13080184.08
Date: 8/14/2013

Client Name: Kenall, Inc.
Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	08/02/2013
QC Batch ID:	Qb13080917	Date Received	08/05/2013 14:59
Prep Method:	TX 1005	Date Prepared	08/08/2013 15:00
Prepared By:	AVBembde		
Prep Batch ID	PB13080912		
Analyst Initial	AVB	% Moisture	16.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 28.4	Q18,U	28.4	23.7	25	1000	mg/Kg	1	08/08/13 22:43
TPH-1005-2	>C12-C28[1]	< 24.3	U	24.3	20.3	25	1000	mg/Kg	1	08/08/13 22:43
TPH-1005-4	>C28-C35[1]	< 21.2	U	21.2	17.7	25	1000	mg/Kg	1	08/08/13 22:43
	Total C6-C35	< 21.2				----	----	mg/Kg	1	08/08/13 22:43
111-85-3	1-Chlorooctane(surr)	85.8				60	143	%	1	08/08/13 22:43
3386-33-2	Chlorooctadecane(surr)	96.4				60	150	%	1	08/08/13 22:43

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 3
A&B Job Sample ID: 13080184.09
Date: 8/14/2013

Client Name: Kenall, Inc. Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**% Moisture**	Sample Matrix	Soil
Analytical Method:	SM 2540G	Date Collected	08/02/2013
QC Batch ID:	Qb13080646	Date Received	08/05/2013 14:59
Prep Method:	SM 2540G	Date Prepared	08/06/2013 15:00
Prepared By:	MMaldonado		
Prep Batch ID	PB13080625		
Analyst Initial	MAM	% Moisture	10.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
	% Moisture[1]	10.6				----	----	%	1	08/06/13 15:01

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID: 1757 B - 3
A&B Job Sample ID: 13080184.09
Date: 8/14/2013

Client Name: Kenall, Inc. Attn: Rajesh Tolikonda
Project Name: 1756 & 1757 / Sherwood & Kickerillo

Test Description:	**Purgeable Aromatics**	Sample Matrix	Soil
Analytical Method:	SW-846 8021B	Date Collected	08/02/2013
QC Batch ID:	Qb13081435	Date Received	08/05/2013 14:59
Prep Method:	SW-846 5035A	Date Prepared	08/13/2013 14:00
Prepared By:	Xan		
Prep Batch ID	PB13081433		
Analyst Initial	XA	% Moisture	10.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
1634-04-4	MTBE	< 0.001	Q18,U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 18:01
71-43-2	Benzene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 18:01
108-88-3	Toluene	< 0.001	U	0.001	0.001	0.005	0.4	mg/Kg	1.0	08/13/13 18:01
100-41-4	Ethylbenzene	< 0.006	U	0.006	0.005	0.005	0.4	mg/Kg	1.0	08/13/13 18:01
108-38-3&106-4	m- & p-Xylenes	< 0.006	U	0.006	0.005	0.01	0.8	mg/Kg	1.0	08/13/13 18:01
95-47-6	o-Xylene	< 0.002	U	0.002	0.002	0.005	0.4	mg/Kg	1.0	08/13/13 18:01
1330-20-7	Xylenes	< 0.002	U	0.002	0.002	0.005	1.2	mg/Kg	1.0	08/13/13 18:01
98-08-8	Trifluorotoluene(surr)	101				81	111	%	1.0	08/13/13 18:01

Soil results reported on dry weight basis

LABORATORY TEST RESULTS --- TRRP13

Client Sample ID:	1757 B - 3	Date:	8/14/2013
A&B Job Sample ID:	13080184.09		

Client Name:	Kenall, Inc.	Attn:	Rajesh Tolikonda
Project Name:	1756 & 1757 / Sherwood & Kickerillo		

Test Description:	**Total Petroleum Hydrocarbons**	Sample Matrix	Soil
Analytical Method:	TX 1005	Date Collected	08/02/2013
QC Batch ID:	Qb13080917	Date Received	08/05/2013 14:59
Prep Method:	TX 1005	Date Prepared	08/08/2013 15:00
Prepared By:	AVBembde		
Prep Batch ID	PB13080912		
Analyst Initial	AVB	% Moisture	10.6

CAS Number	Parameter	Result	Flag	SDL	MDL	MQL	UQL	Units	DF	Date/Time
TPH-1005-1	C6-C12[1]	< 26.5	Q18,U	26.5	23.7	25	1000	mg/Kg	1	08/08/13 23:15
TPH-1005-2	>C12-C28[1]	< 22.7	U	22.7	20.3	25	1000	mg/Kg	1	08/08/13 23:15
TPH-1005-4	>C28-C35[1]	< 19.8	U	19.8	17.7	25	1000	mg/Kg	1	08/08/13 23:15
	Total C6-C35	< 19.8				----	----	mg/Kg	1	08/08/13 23:15
111-85-3	1-Chlorooctane(surr)	65.9				60	143	%	1	08/08/13 23:15
3386-33-2	Chlorooctadecane(surr)	69.6				60	150	%	1	08/08/13 23:15

Soil results reported on dry weight basis

[1]-Parameter not available for accreditation

LABORATORY TERM AND QUALIFIER DEFINITION REPORT

Job ID : 13080184

Date: 8/14/2013

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

M9	Matrix Spike and/or Matrix Spike Duplicate recovery is below laboratory control limits.
Q18	Soils not collected in a hermetically sealed container may lose low-level VOCs.
R3	MS/MSD RPD exceeds control limit. Recovery meets acceptance criteria.
U	Undetected at SDL (Sample Detection Limit).

A & B Labs — *Chain of Custody* — The Chain of Custody is a Legal Document — Page ____ of ____

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 # 1308018-4

5. Project # 1757

1. REPORT TO:
Company: KENALL INC.
Address: 8101 Westglen Dr. Houston, TX 77063
Contact: RAJESH TALIKONDA
Phone: 832.251.8200
Fax: ☐ 832.251.8201
E-mail: ☐ rajesh.talikonda@kenallinc.com

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: & Kickapoo.

7. Reporting Requirement:
☑ TRRP Limits only ☑ TRRP Rpt. Package ☐ See Attached ☐ Standard Level II ☐ PST ☐ MDL ☐ EDD

8. Sampler's Name & Company (PLEASE PRINT): RAJESH / KENALL INC
Sampler's Signature & Date: 8/2/13

13. No. of Containers
14. Containers*
15. Preservatives**
16. PH-Lab Only
17. Analyses/Methods: TPH, BTEX, MTBE, VOC
18. REMARKS

LAB USE ONLY	9. Sample ID and Description	10. Sampling Date	10. Sampling Time 24hr	11. Comp.	11. Grab	12. Matrix: Water	Soil	Sludge	Oil	Drinking Water	Air	Other	No. of Containers	Analyses/Methods: TPH, BTEX, MTBE, VOC	18. REMARKS
		8/2/13													
		"													
		"													
		"													
		"													
		"													
07A	1757	B-1													
08A	1757	B-2													
09A	1757	B-3													
		"													

19. RELINQUISHED BY	DATE	TIME	20. RECEIVED BY	DATE	TIME
1	8/5/13	13:46	Allison Diamond	8/5/13	13:46
2	8/5/13	14:59			
3					

21. KNOWN HAZARDS/COMMENTS

Temperature: 3.1 °C
Thermometer ID 100012320
Intact: Y or N, Initials F.P.

*Containers: VOA - 40 ml vial; A/G - Amber/Glass 1 Liter; 4 oz/8 oz - glass wide mouth; P/O - Plastic/other ____
**Preservatives: C - Cool; H - HCl; N - HNO_3; S - H_2SO_4; OH - NaOH; T - $NA_2S_2O_3$; X - Other ____

METHOD OF SHIPMENT
BILL OF LADING/TRACKING #

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

Samples will be disposed of after 30 days

LAB USE ONLY SAMPLING RENTAL PAL

Sample Condition Checklist

A&B JobID : **13080184**	Date Received : **08/05/2013**	Time Received : **2:59PM**
Client Name : **Kenall, Inc.**		
Temperature : **3.1°C**	Sample pH : **na**	
Thermometer ID : **102002320**	pH Paper ID : **na**	

	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** ☐			
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 by : MAcontreras

Check in by/date : MAcontreras / 08/05/2013