Solutions-IES
Industrial & Environmental Services

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December 14, 2016

Mr. Terry Fox, L.G.
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment**
Marvin Smith Property (Parcel #187)
5314 Raeford Road
Fayetteville, Cumberland County, North Carolina
State Project: U-4405
WBS Element 39049.1.1
SIES Project No. 2016.0054.NDOT

Dear Mr. Fox:

Solutions-IES, Inc., (SIES) has completed the Preliminary Site Assessment conducted at the above-referenced property. The work was performed in accordance with the Technical and Cost proposal dated September 26, 2016, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated September 26, 2016. Activities associated with the assessment consisted of conducting a geophysical investigation, collecting soil samples for analysis, and reviewing applicable North Carolina Department of Environmental Quality (NCDEQ) records. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The Marvin Smith Property (Parcel #187) is located at 5314 Raeford Road in Fayetteville, Cumberland County, North Carolina. The property is situated on the north side of Raeford Road approximately 230 feet east of the intersection of Raeford Road and Pompton Drive (**Figure 1**). The property consists of an active auto parts and service shop (Rocket Auto Parts and Service). According to the NCDOT information, general service automotive repairs have historically occurred at the site. No visual evidence of underground storage tanks (USTs) was noted during the assessment activities.

An asphalt parking area is located in front of the building with access to the service areas and rear of the facility on the west side of the building (**Figure 2**). The proposed easement was not marked on the date of the field work, but NCDOT plan sheets show that the easement will not affect the building.

The NCDOT requested a Preliminary Site Assessment for the right-of-way and proposed easement because the property contains an active automotive repair and salvage yard. The scope of work as

defined in the Request for Technical and Cost Proposal was to evaluate the site with respect to the presence of known and unknown USTs, and assess whether contamination exists on the right-of-way/proposed easement. Because the property contains an automotive repair facility, the NCDOT directed SIES to evaluate the right-of-way/easement for the presence of solvents in addition to petroleum. An estimate of the quantity of impacted soil was to be provided, should impacted soils be encountered.

SIES reviewed the on-line NCDEQ Incident Management database and no incident number was assigned to the site. SIES also examined the UST registration database and found no tanks registered to the property address.

Geophysical Survey

Prior to SIES' mobilization to the site, Pyramid Environmental & Engineering of Greensboro, NC (Pyramid) conducted a geophysical survey in the right-of-way/proposed easement to determine if unknown USTs were present in that area. The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, specifically USTs.

A survey grid was laid out along the right-of-way/proposed easement with the X-axis oriented approximately parallel to Raeford Road and the Y-axis oriented approximately perpendicular to Raeford Road. The grid was positioned to cover the entire right-of-way/proposed easement, as shown on **Figure 2** of the geophysical survey report in **Attachment A**.

The survey lines were spaced five feet apart and magnetic data were collected continuously along each survey line with a data logger. After collection, the data were reviewed in the field with graphical computer software.
Access was available to all areas of the study area, and several anomalies were detected with the geophysical survey. The anomalies were attributed to visible cultural features, metallic debris, underground utilities, signage, or vehicles. The data did not show evidence of metallic USTs within the right-of-way/proposed easement. For these reasons, a ground penetrating radar survey was not required to verify any unknown EM anomalies. Pyramid's detailed report of findings and interpretations is presented in **Attachment A**.

Site Assessment Activities

On October 26, 2016, SIES mobilized to the site to conduct a Geoprobe® direct-push investigation to evaluate subsurface soil conditions on the property to a depth of 10 feet below ground surface (ft bgs). Three direct-push borings (187-SB-1 through 187-SB-3) were advanced throughout the right-of-

way/proposed easement (**Figure 2**). The soil boring logs are included as **Attachment B**. Borings 187-SB-1 through 187-SB-3 were located to evaluate the subsurface conditions in the right-of-way/easement along Raeford Road (see photos in **Attachment C**).

Continuous sampling using a Geoprobe® resulted in generally good recovery of soil samples from the direct-push borings. Soil samples were collected and contained in four-foot long acetate sleeves inside the direct-push Macro-Core® sampler. Each of the sleeves was divided into two-foot long sections for soil sample screening. Soil from each two-foot interval was placed in a resealable plastic bag and the bag was set aside for volatilization of organic compounds from the soil to the bag headspace. A photoionization detector (PID) probe was inserted into the bag and the reading was recorded (**Table 1**).

If the PID concentrations in a boring were consistently low, one sample from the bottom interval was selected for analysis. Multiple samples were analyzed from borings 187-SB-1 and 187-SB-2 following the initial analysis to evaluate if detected concentrations were increasing or decreasing with depth. The PID results are summarized in **Table 1**.

The selected soil samples were submitted to an on-site mobile laboratory for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO) using ultraviolet fluorescence (UVF) methodology. To evaluate the property with respect to solvents, the soil sample with the highest DRO or GRO result from each boring was submitted to Pace Analytical in Huntersville, NC, for analysis of volatile organic compounds (VOCs) using Method 8260. Each boring was backfilled with bentonite and drill cuttings to the surface after completion.

The lithology encountered by the direct-push samples was generally consistent throughout the site. The ground surface was covered with about 0.5 feet of gravel or topsoil. Below this surface cover was a mottled light brown and red silty clay to a depth of about eight ft bgs. Below this clay was a tan silty clay. No bedrock or groundwater was noted in any of the borings.

According to the 1985 Geologic Map of North Carolina, the site is within of Coastal Plain Physiographic Province in North Carolina near the contact between the Cretaceous Black Creek and Middendorf Formations. The strata of the Black Creek Formation consist of gray to black clay, thin lenses of fine-grained sand and thick lenses of cross-bedded sand. The lithology may also include glauconite and fossils. In comparison, the Middendorf Formation consists of sand, sandstone, and mudstone that are laterally discontinuous. The soils observed at the site are consistent with the MIddendorf Formation as the parent material.

Analytical Results

The laboratory data are summarized in **Table 1** and the analytical report is presented in **Attachment D**. Six soil samples were submitted for analysis, all of which contained detectable DRO compounds ranging from 0.18 to 23 milligrams per kilogram (mg/kg). No soil sample contained detectable GRO concentrations. The action levels are 50 mg/kg for GRO and 100 mg/kg for DRO[1]. None of the soil samples analyzed for this site contained DRO or GRO concentrations above their respective action levels.

The soil sample with the highest UVF DRO concentration from each boring was submitted for laboratory analysis for VOCs using Method 8260. As presented in **Attachment D**, no compounds were detected above the method reporting limit. However, the reporting limit was set at a concentration higher than the detection limit, which is the lowest concentration at which a compound can be detected and is usually below applicable action levels for solvents. If a concentration was detected above the detection limit, but below the reporting limit, it was assigned an estimated, or "J", value. No J flagged values were reported.

Conclusions and Recommendations

A Preliminary Site Assessment was conducted to evaluate the Marvin Smith Property (Parcel #187) at 5314 Raeford Road in Fayetteville, Cumberland County, North Carolina. A geophysical survey conducted at the site indicated that no metallic USTs were detected within the right-of-way/proposed easement on the site. Three soil borings were advanced to evaluate the subsurface soil conditions along the right-of-way/proposed easement. None of the six soil samples analyzed had a GRO or DRO concentration above the action level. Analysis of three soil samples for VOCs indicated that no compounds were detected; therefore, none were present above applicable action levels.

The UVF analytical results (**Table 1**) of the soil samples collected on October 26, 2016 indicate that none of the soil samples contained DRO or GRO concentrations above the action level. Therefore, no estimate of the volume of soil requiring possible remediation was made.

[1] NCDEQ, *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons (TPH)*, July 26, 2016.

SIES appreciates the opportunity to work with the NCDOT on this project. Because DRO compounds were detected in the soil samples, SIES recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Fayetteville Regional Office. If you have any questions, please contact us at (919) 873-1060.

Sincerely,

Michael W. Branson, P.G.
Project Manager

John Palmer, P.G.
Senior Hydrogeologist

Attachments

TABLE 1
SOIL FIELD SCREENING AND ANALYTICAL RESULTS
SMITH PROPERTY (PARCEL #187)
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA
STATE PROJECT: U-4405
WBS ELEMENT 39049.1.1
SIES PROJECT NO. 2016.0054.NDOT

SAMPLE ID	DEPTH (ft)	PID READING (ppm)	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)	
				UVF GRO	UVF DRO
	Action Level (mg/kg)			50	100
187-SB-1	0 - 2	0.0			
	2 - 4	0.6			
	4 - 6	2.0	187-SB-1-4-6	<0.18	**0.18**
	6 - 8	2.1	187-SB-1-6-8	<0.6	**23**
	8 - 10	1.1	187-SB-1-8-10	<0.54	**12**
187-SB-2	0 - 2	0.8			
	2 - 4	1.0			
	4 - 6	1.2			
	6 - 8	1.8	187-SB-2-6-8	<0.15	**2.1**
	8 - 10	3.2	187-SB-2-8-10	<0.73	**8.7**
187-SB-3	0 - 2	0.0			
	2 - 4	0.3			
	4 - 6	0.0			
	6 - 8	0.1			
	8 - 10	2.5	187-SB-3-8-10	<0.64	**2.2**

1) ft - feet

2) ppm - parts per million.

3) PID - photoionization ionization detector

4) mg/kg - milligrams per kilogram.

5) UVF DRO - Diesel range organics by UVF.

6) UVF GRO - Gasoline range organics by UVF.

7) Action level based upon NCDEQ memo *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons* - July 29, 2016.

8) Soil samples were collected on October 26, 2016.

9) **Bold** values are above the detection level.

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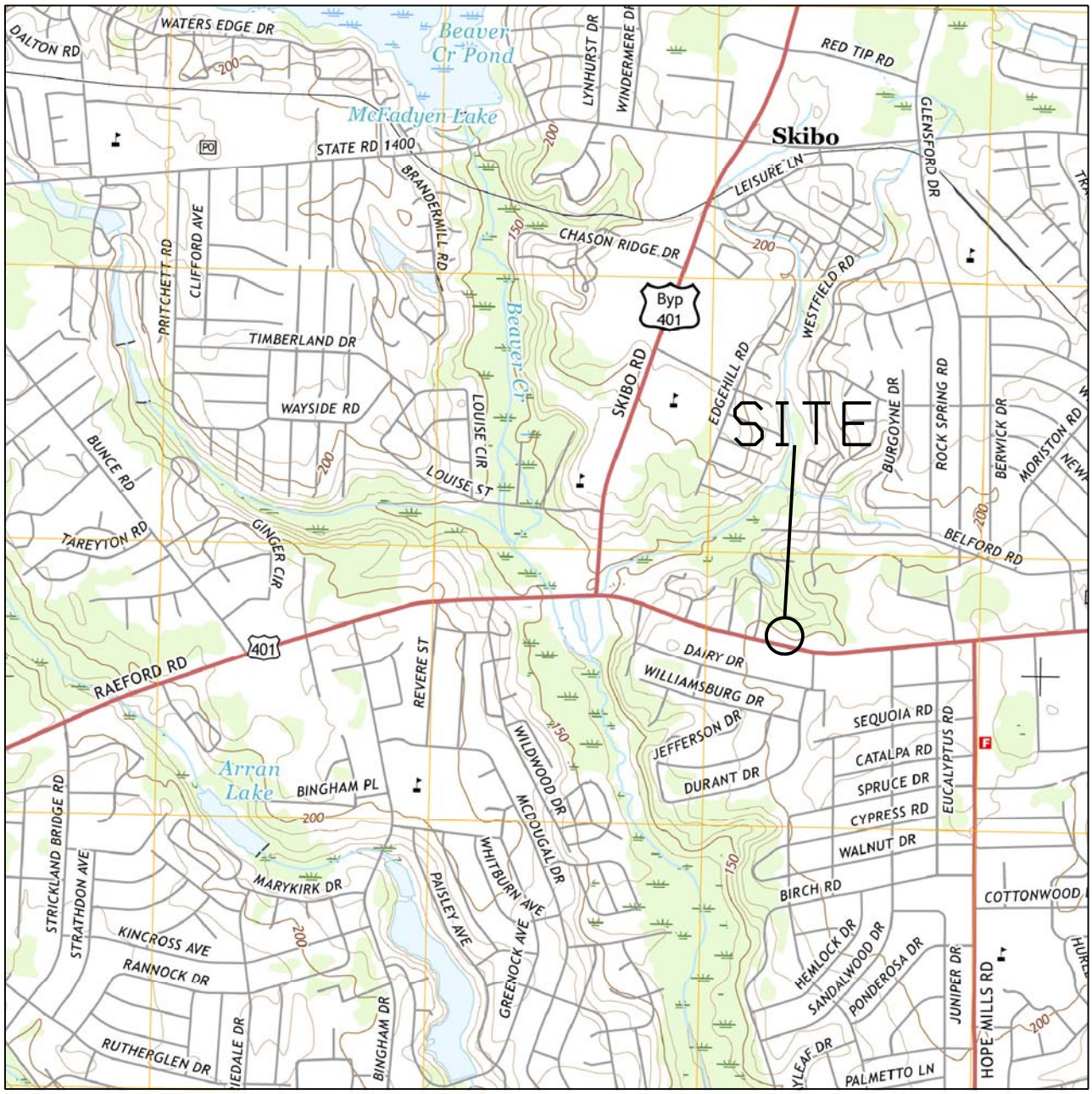
FIGURES



SCALE 1:24,000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: FAYETTEVILLE, NC (2016)

FILE: FAYETTEVILLE PSAS
DATE: NOVEMBER 2016
PROJECT MANAGER: MWB
CHECKED BY: JEP
PROJECT NUMBER: 2016.0054.NDOT

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VICINITY MAP

SMITH PROPERTY (PARCEL #187)
FAYETTEVILLE, CUMBERLAND COUNTY NORTH CAROLINA

FIGURE
1

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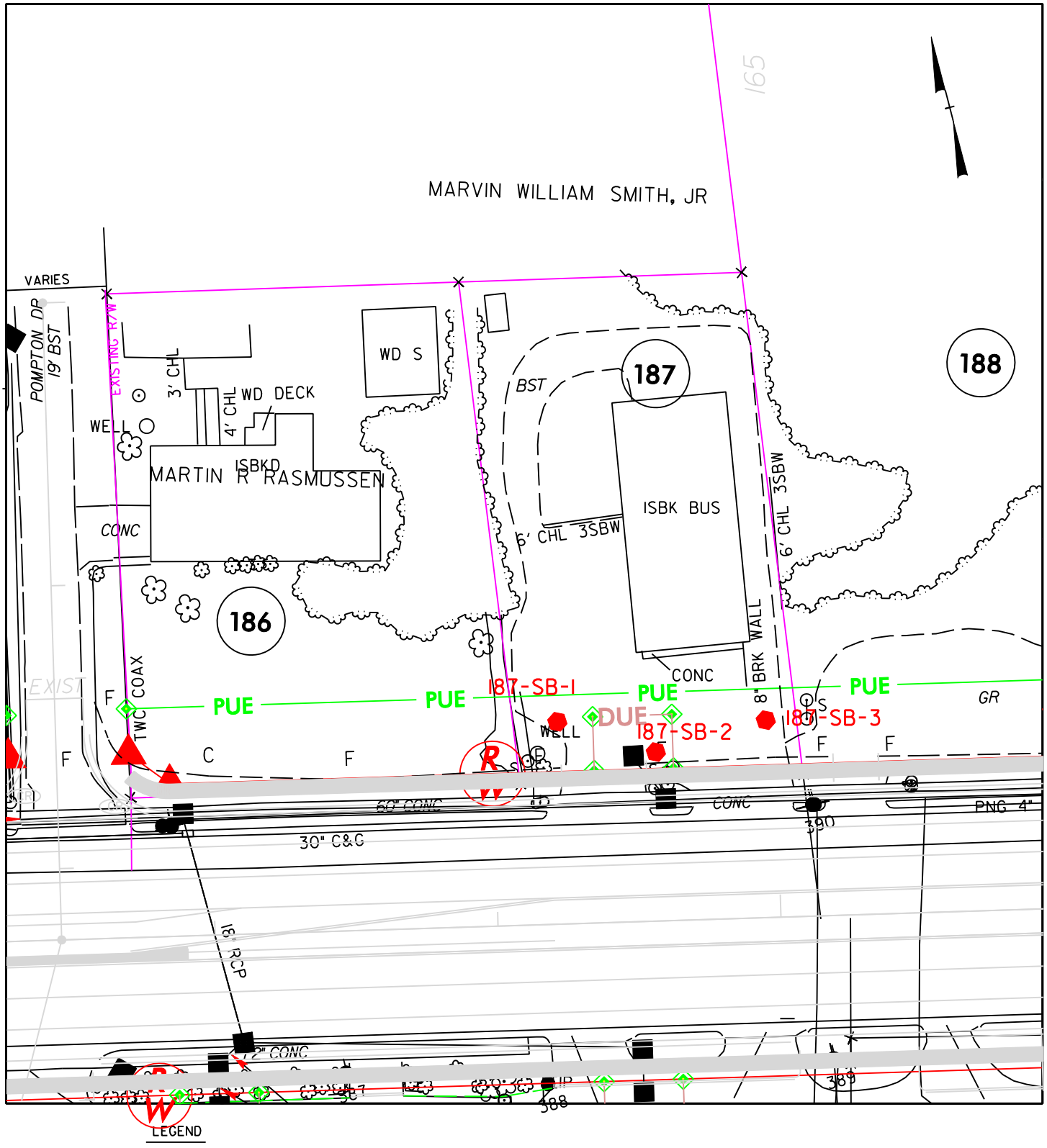
PROJECT NUMBER 2016.0054.NDOT
DRAFTER MWB
CHECKED BY JEP
PROJECT MANAGER MWB
DATE NOVEMBER 2016
FAYETTEVILLE PSAS
FILE



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SITE MAP

MARVIN SMITH, JR. PROPERTY (PARCEL #187)

FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA

FIGURE 2

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ATTACHMENT A

Pyramid Geophysics

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2016-265)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 187 – MARVIN WILLIAM SMITH, JR. NCDOT PROJECT U-4405

5314 RAEFORD RD., FAYETTEVILLE, CUMBERLAND COUNTY, NC

NOVEMBER 4, 2016

Report prepared for: Mike Branson
Solutions, IES
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GEOPHYSICAL INVESTIGATION REPORT
Parcel 187 – 5314 Raeford Road
Fayetteville, Cumberland County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD	Computer Assisted Drafting and Design
DF	Dual Frequency
EM	Electromagnetic
GPR	Ground Penetrating Radar
GPS	Global Positioning System
NCDOT	North Carolina Department of Transportation
ROW	Right-of-Way
SVE	Soil Vapor Extraction
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 187, located at 5314 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: All EM anomalies were directly attributed to visible cultural features and known utilities. A GPR survey was not required. Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 187.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 187, located at 5314 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an automotive repair facility surrounded by asphalt parking areas and grass medians. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection survey. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8 foot intervals along north-south trending or east-west trending, generally

parallel survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 11.0 software programs.

GPR data were not required at this property due to all EM anomalies being directly attributed to visible cultural features at the ground surface or known utilities (see Discussion of Results below).

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Vehicles	
2	Vehicles	
3	Sign	
4	Sign and Bollards	
5	Suspected Utilities	
6	Sign	

All of the EM anomalies recorded by the survey are directly attributed to visible cultural features such as vehicles, signs, bollards, and utilities. For this reason, a GPR survey was not required to verify any unknown anomalies.

Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 187.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 data collected at Parcel 187 in Fayetteville, Cumberland County, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All EM anomalies were directly attributed to visible cultural features and known utilities. A GPR survey was not required.
- Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 187.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Solutions, IES in accordance with generally accepted guidelines for EM61 surveys. It is generally recognized that the results of the EM61 surveys are non-unique and may not represent actual subsurface conditions. The EM61 results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

N↑

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately North)

View of Survey Area
(Facing Approximately West)

TITLE
PARCEL 187 - GEOPHYSICAL SURVEY
BOUNDARIES AND SITE PHOTOGRAPHS

PROJECT
5314 RAEFORD ROAD
FAYETTEVILLE, NORTH CAROLINA
NCDOT PROJECT U-4405

Pyramid Geophysics
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GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE	10/19/16	CLIENT	SOLUTIONS, IES
PYRAMID PROJECT #:	2016-265		**FIGURE 1**

N↑

EM61 METAL DETECTION RESULTS

NC STATE PLANE, EASTING (NAD83, FEET)

NUMBERS IN BLUE (x) CORRESPOND TO ANOMALY TABLE INCLUDED IN THE REPORT

NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on October 13, 2016, using a Geonics EM61 instrument. Verification GPR data were not required due to all anomalies being directly attributed to visible cultural features.

EM61 Metal Detection Response (millivolts)

TITLE: PARCEL 187 - EM61 RESULTS CONTOUR MAP

PROJECT: 5314 RAEFORD ROAD
FAYETTEVILLE, NORTH CAROLINA
NCDOT PROJECT U-265

Pyramid Geophysics
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE: 10/19/2016	CLIENT: SOLUTIONS, IES
PYRAMID PROJECT #: 2016-265	**FIGURE 2**

ATTACHMENT B

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Log of Boring 187-SB-1

BORING LOCATION: Parcel #187, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 — DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0		100%	0.0	Light brown and red mottled silty clay. Dry	0
1					1
2			0.6		2
3					3
4	187-SB-1-4-6	100%	2.0		4
5					5
6	187-SB-1-6-8		2.1		6
7					7
8	187-SB-1-8-10	100%	1.1	Tan silty clay. Dry	8
9					9
10					10

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 187-SB-2

BORING LOCATION: Parcel #187, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 — DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.8, 1.0	Light brown and red mottled silty clay. Dry	0–4
4–8	187-SB-2-6-8	100%	1.2, 1.8	Light brown and red mottled silty clay. Dry	4–8
8–10	187-SB-2-8-10	100%	3.2	Tan silty clay. Dry	8–10

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 187-SB-3

BORING LOCATION: Parcel #187, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 — DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.0 0.3	Light brown and red mottled silty clay. Dry	0–4
4–8		100%	0.0 0.1	Light brown and red mottled silty clay. Dry	4–8
8–10	187-SB-3-8-10	100%	2.5	Tan silty clay. Dry	8–10

End of Boring

ATTACHMENT C

PHOTO 1- VIEW OF SOIL BORING LOOKING NORTH

PHOTO 2 - VIEW OF SOIL BORING LOOKING EAST

PHOTO 3 - VIEW OF SOIL BORING LOOKING SOUTH

PHOTO 4 - VIEW OF SOIL BORING LOOKING WEST

ATTACHMENT D

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: NCDOT
Address: Parcel 187: 5314 Raeford Road
Fayetteville, NC

Samples taken 10/26/2016
Samples extracted 10/26/2016
Samples analysed 10/26/2016

Contact:

Operator Candy Elliott

Project: 2016.0054.NDOT

U04049

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	187-SB-1-8-10	21.8	<1.1	<0.54	12	12	6.8	0.31	0.003	0	89.3	10.7	V.Deg.PHC (FCM) 75.8%
s	187-SB-1-4-6	7.2	<0.18	<0.18	0.18	0.18	0.09	0.01	<0.001	0	97.3	2.7	Residual.PHC (FCM)
s	187-SB-1-6-8	23.9	<0.6	<0.6	23	23	13.8	0.61	0.006	0	88.1	11.9	V.Deg.PHC (FCM) 57.1%
s	187-SB-2-8-10	29.4	<1.5	<0.73	8.7	8.7	4.1	0.18	0.003	0	85.9	14.1	V.Deg.PHC (FCM) 70.5%
s	187-SB-2-6-8	6.0	<0.15	<0.15	2.1	2.1	0.95	0.05	<0.001	0	86.1	13.9	Deg Fuel (FCM) 90.7%
s	187-SB-3-8-10	25.6	<1.3	<0.64	2.2	2.2	1.3	0.05	<0.003	0	86.5	13.5	V.Deg.PHC (FCM) 58.1%
	Initial Calibrator QC check			OK									

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

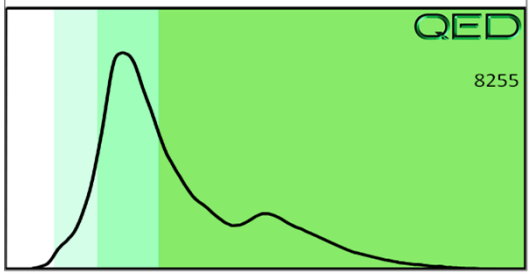
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

QED Hydrocarbon Fingerprints

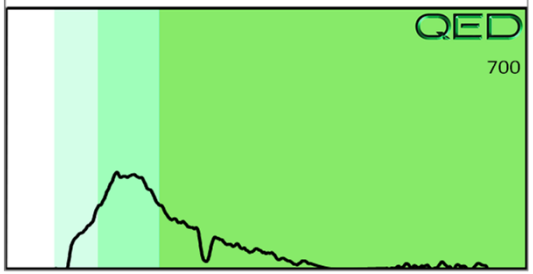
Project: 2016.0054.NDOT

October 26, 2016

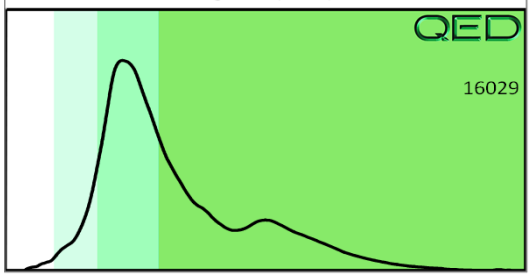
187-SB-1-8-10 : V.Deg.PHC (FCM) 75.8%



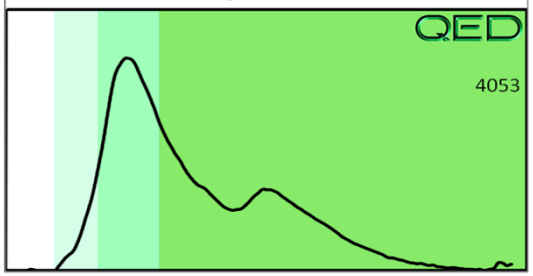
187-SB-1-4-6 : Residual.PHC (FCM)



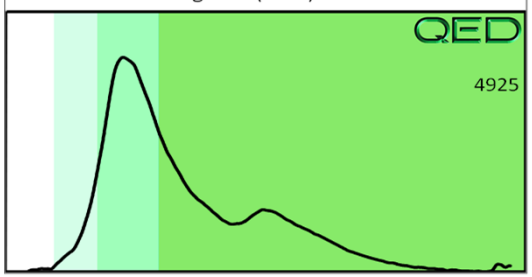
187-SB-1-6-8 : V.Deg.PHC (FCM) 57.1%



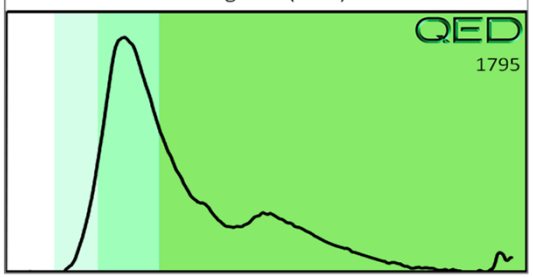
187-SB-2-8-10 : V.Deg.PHC (FCM) 70.5%



187-SB-2-6-8 : Deg Fuel (FCM) 90.7%



187-SB-3-8-10 : V.Deg.PHC (FCM) 58.1%



Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 04, 2016

Mike Branson
Solutions-IES
1101 Nowell Road
Raleigh, NC 27607

RE: Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Dear Mike Branson:
Enclosed are the analytical results for sample(s) received by the laboratory on October 31, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Taylor Ezell
taylor.ezell@pacelabs.com
Project Manager

Enclosures

cc: Chemical Testing Engineer, Materials and Tests Unit
Samuel McIntyre, Solutions-IES

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92317874001	**187-SB-1-6-8**	EPA 8260	DLK	70	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92317874002	**187-SB-2-8-10**	EPA 8260	DLK	70	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92317874003	**187-SB-3-8-10**	EPA 8260	DLK	70	PASI-C
		ASTM D2974-87	KDF	1	PASI-C

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-1-6-8 **Lab ID: 92317874001** Collected: 10/26/16 14:00 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	103	1		11/02/16 17:36	67-64-1	
Benzene	ND	ug/kg	5.1	1		11/02/16 17:36	71-43-2	
Bromobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	108-86-1	
Bromochloromethane	ND	ug/kg	5.1	1		11/02/16 17:36	74-97-5	
Bromodichloromethane	ND	ug/kg	5.1	1		11/02/16 17:36	75-27-4	
Bromoform	ND	ug/kg	5.1	1		11/02/16 17:36	75-25-2	
Bromomethane	ND	ug/kg	10.3	1		11/02/16 17:36	74-83-9	
2-Butanone (MEK)	ND	ug/kg	103	1		11/02/16 17:36	78-93-3	
n-Butylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	98-06-6	
Carbon tetrachloride	ND	ug/kg	5.1	1		11/02/16 17:36	56-23-5	
Chlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	108-90-7	
Chloroethane	ND	ug/kg	10.3	1		11/02/16 17:36	75-00-3	
Chloroform	ND	ug/kg	5.1	1		11/02/16 17:36	67-66-3	
Chloromethane	ND	ug/kg	10.3	1		11/02/16 17:36	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.1	1		11/02/16 17:36	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.1	1		11/02/16 17:36	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.1	1		11/02/16 17:36	96-12-8	
Dibromochloromethane	ND	ug/kg	5.1	1		11/02/16 17:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.1	1		11/02/16 17:36	106-93-4	
Dibromomethane	ND	ug/kg	5.1	1		11/02/16 17:36	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	10.3	1		11/02/16 17:36	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.1	1		11/02/16 17:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.1	1		11/02/16 17:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.1	1		11/02/16 17:36	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.1	1		11/02/16 17:36	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.1	1		11/02/16 17:36	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.1	1		11/02/16 17:36	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.1	1		11/02/16 17:36	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.1	1		11/02/16 17:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.1	1		11/02/16 17:36	10061-02-6	
Diisopropyl ether	ND	ug/kg	5.1	1		11/02/16 17:36	108-20-3	
Ethylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	5.1	1		11/02/16 17:36	87-68-3	
2-Hexanone	ND	ug/kg	51.3	1		11/02/16 17:36	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/kg	5.1	1		11/02/16 17:36	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.1	1		11/02/16 17:36	99-87-6	
Methylene Chloride	ND	ug/kg	20.5	1		11/02/16 17:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	51.3	1		11/02/16 17:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.1	1		11/02/16 17:36	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-1-6-8 **Lab ID: 92317874001** Collected: 10/26/16 14:00 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Naphthalene	ND	ug/kg	5.1	1		11/02/16 17:36	91-20-3	
n-Propylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	103-65-1	
Styrene	ND	ug/kg	5.1	1		11/02/16 17:36	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	79-34-5	
Tetrachloroethene	ND	ug/kg	5.1	1		11/02/16 17:36	127-18-4	
Toluene	ND	ug/kg	5.1	1		11/02/16 17:36	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.1	1		11/02/16 17:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.1	1		11/02/16 17:36	79-00-5	
Trichloroethene	ND	ug/kg	5.1	1		11/02/16 17:36	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.1	1		11/02/16 17:36	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.1	1		11/02/16 17:36	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.1	1		11/02/16 17:36	108-67-8	
Vinyl acetate	ND	ug/kg	51.3	1		11/02/16 17:36	108-05-4	
Vinyl chloride	ND	ug/kg	10.3	1		11/02/16 17:36	75-01-4	
Xylene (Total)	ND	ug/kg	10.3	1		11/02/16 17:36	1330-20-7	
m&p-Xylene	ND	ug/kg	10.3	1		11/02/16 17:36	179601-23-1	
o-Xylene	ND	ug/kg	5.1	1		11/02/16 17:36	95-47-6	
Surrogates								
Toluene-d8 (S)	100	%	70-130	1		11/02/16 17:36	2037-26-5	
4-Bromofluorobenzene (S)	95	%	70-130	1		11/02/16 17:36	460-00-4	
1,2-Dichloroethane-d4 (S)	119	%	70-132	1		11/02/16 17:36	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**13.8**	%	0.10	1		11/01/16 11:50		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-2-8-10 **Lab ID: 92317874002** Collected: 10/26/16 14:05 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	119	1		11/01/16 19:09	67-64-1	
Benzene	ND	ug/kg	5.9	1		11/01/16 19:09	71-43-2	
Bromobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	108-86-1	
Bromochloromethane	ND	ug/kg	5.9	1		11/01/16 19:09	74-97-5	
Bromodichloromethane	ND	ug/kg	5.9	1		11/01/16 19:09	75-27-4	
Bromoform	ND	ug/kg	5.9	1		11/01/16 19:09	75-25-2	
Bromomethane	ND	ug/kg	11.9	1		11/01/16 19:09	74-83-9	
2-Butanone (MEK)	ND	ug/kg	119	1		11/01/16 19:09	78-93-3	
n-Butylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	98-06-6	
Carbon tetrachloride	ND	ug/kg	5.9	1		11/01/16 19:09	56-23-5	
Chlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	108-90-7	
Chloroethane	ND	ug/kg	11.9	1		11/01/16 19:09	75-00-3	
Chloroform	ND	ug/kg	5.9	1		11/01/16 19:09	67-66-3	
Chloromethane	ND	ug/kg	11.9	1		11/01/16 19:09	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.9	1		11/01/16 19:09	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.9	1		11/01/16 19:09	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.9	1		11/01/16 19:09	96-12-8	
Dibromochloromethane	ND	ug/kg	5.9	1		11/01/16 19:09	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.9	1		11/01/16 19:09	106-93-4	
Dibromomethane	ND	ug/kg	5.9	1		11/01/16 19:09	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	11.9	1		11/01/16 19:09	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.9	1		11/01/16 19:09	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.9	1		11/01/16 19:09	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.9	1		11/01/16 19:09	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.9	1		11/01/16 19:09	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.9	1		11/01/16 19:09	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.9	1		11/01/16 19:09	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.9	1		11/01/16 19:09	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.9	1		11/01/16 19:09	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.9	1		11/01/16 19:09	10061-02-6	
Diisopropyl ether	ND	ug/kg	5.9	1		11/01/16 19:09	108-20-3	
Ethylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	5.9	1		11/01/16 19:09	87-68-3	
2-Hexanone	ND	ug/kg	59.4	1		11/01/16 19:09	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/kg	5.9	1		11/01/16 19:09	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.9	1		11/01/16 19:09	99-87-6	
Methylene Chloride	ND	ug/kg	23.8	1		11/01/16 19:09	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	59.4	1		11/01/16 19:09	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.9	1		11/01/16 19:09	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-2-8-10 **Lab ID: 92317874002** Collected: 10/26/16 14:05 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Naphthalene	ND	ug/kg	5.9	1		11/01/16 19:09	91-20-3	
n-Propylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	103-65-1	
Styrene	ND	ug/kg	5.9	1		11/01/16 19:09	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	79-34-5	
Tetrachloroethene	ND	ug/kg	5.9	1		11/01/16 19:09	127-18-4	
Toluene	ND	ug/kg	5.9	1		11/01/16 19:09	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.9	1		11/01/16 19:09	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.9	1		11/01/16 19:09	79-00-5	
Trichloroethene	ND	ug/kg	5.9	1		11/01/16 19:09	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.9	1		11/01/16 19:09	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.9	1		11/01/16 19:09	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.9	1		11/01/16 19:09	108-67-8	
Vinyl acetate	ND	ug/kg	59.4	1		11/01/16 19:09	108-05-4	
Vinyl chloride	ND	ug/kg	11.9	1		11/01/16 19:09	75-01-4	
Xylene (Total)	ND	ug/kg	11.9	1		11/01/16 19:09	1330-20-7	
m&p-Xylene	ND	ug/kg	11.9	1		11/01/16 19:09	179601-23-1	
o-Xylene	ND	ug/kg	5.9	1		11/01/16 19:09	95-47-6	
Surrogates								
Toluene-d8 (S)	103	%	70-130	1		11/01/16 19:09	2037-26-5	
4-Bromofluorobenzene (S)	96	%	70-130	1		11/01/16 19:09	460-00-4	
1,2-Dichloroethane-d4 (S)	117	%	70-132	1		11/01/16 19:09	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**19.0**	%	0.10	1		11/01/16 11:50		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-3-8-10 **Lab ID: 92317874003** Collected: 10/26/16 14:10 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Acetone	ND	ug/kg	109	1		11/01/16 19:28	67-64-1	
Benzene	ND	ug/kg	5.4	1		11/01/16 19:28	71-43-2	
Bromobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	108-86-1	
Bromochloromethane	ND	ug/kg	5.4	1		11/01/16 19:28	74-97-5	
Bromodichloromethane	ND	ug/kg	5.4	1		11/01/16 19:28	75-27-4	
Bromoform	ND	ug/kg	5.4	1		11/01/16 19:28	75-25-2	
Bromomethane	ND	ug/kg	10.9	1		11/01/16 19:28	74-83-9	
2-Butanone (MEK)	ND	ug/kg	109	1		11/01/16 19:28	78-93-3	
n-Butylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	104-51-8	
sec-Butylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	135-98-8	
tert-Butylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	98-06-6	
Carbon tetrachloride	ND	ug/kg	5.4	1		11/01/16 19:28	56-23-5	
Chlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	108-90-7	
Chloroethane	ND	ug/kg	10.9	1		11/01/16 19:28	75-00-3	
Chloroform	ND	ug/kg	5.4	1		11/01/16 19:28	67-66-3	
Chloromethane	ND	ug/kg	10.9	1		11/01/16 19:28	74-87-3	
2-Chlorotoluene	ND	ug/kg	5.4	1		11/01/16 19:28	95-49-8	
4-Chlorotoluene	ND	ug/kg	5.4	1		11/01/16 19:28	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/kg	5.4	1		11/01/16 19:28	96-12-8	
Dibromochloromethane	ND	ug/kg	5.4	1		11/01/16 19:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/kg	5.4	1		11/01/16 19:28	106-93-4	
Dibromomethane	ND	ug/kg	5.4	1		11/01/16 19:28	74-95-3	
1,2-Dichlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	106-46-7	
Dichlorodifluoromethane	ND	ug/kg	10.9	1		11/01/16 19:28	75-71-8	
1,1-Dichloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	75-34-3	
1,2-Dichloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	107-06-2	
1,1-Dichloroethene	ND	ug/kg	5.4	1		11/01/16 19:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/kg	5.4	1		11/01/16 19:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/kg	5.4	1		11/01/16 19:28	156-60-5	
1,2-Dichloropropane	ND	ug/kg	5.4	1		11/01/16 19:28	78-87-5	
1,3-Dichloropropane	ND	ug/kg	5.4	1		11/01/16 19:28	142-28-9	
2,2-Dichloropropane	ND	ug/kg	5.4	1		11/01/16 19:28	594-20-7	
1,1-Dichloropropene	ND	ug/kg	5.4	1		11/01/16 19:28	563-58-6	
cis-1,3-Dichloropropene	ND	ug/kg	5.4	1		11/01/16 19:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/kg	5.4	1		11/01/16 19:28	10061-02-6	
Diisopropyl ether	ND	ug/kg	5.4	1		11/01/16 19:28	108-20-3	
Ethylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/kg	5.4	1		11/01/16 19:28	87-68-3	
2-Hexanone	ND	ug/kg	54.4	1		11/01/16 19:28	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/kg	5.4	1		11/01/16 19:28	98-82-8	
p-Isopropyltoluene	ND	ug/kg	5.4	1		11/01/16 19:28	99-87-6	
Methylene Chloride	ND	ug/kg	21.8	1		11/01/16 19:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/kg	54.4	1		11/01/16 19:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/kg	5.4	1		11/01/16 19:28	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Sample: 187-SB-3-8-10 **Lab ID: 92317874003** Collected: 10/26/16 14:10 Received: 10/31/16 08:52 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260/5035A Volatile Organics	Analytical Method: EPA 8260							
Naphthalene	ND	ug/kg	5.4	1		11/01/16 19:28	91-20-3	
n-Propylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	103-65-1	
Styrene	ND	ug/kg	5.4	1		11/01/16 19:28	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	79-34-5	
Tetrachloroethene	ND	ug/kg	5.4	1		11/01/16 19:28	127-18-4	
Toluene	ND	ug/kg	5.4	1		11/01/16 19:28	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/kg	5.4	1		11/01/16 19:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/kg	5.4	1		11/01/16 19:28	79-00-5	
Trichloroethene	ND	ug/kg	5.4	1		11/01/16 19:28	79-01-6	
Trichlorofluoromethane	ND	ug/kg	5.4	1		11/01/16 19:28	75-69-4	
1,2,3-Trichloropropane	ND	ug/kg	5.4	1		11/01/16 19:28	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/kg	5.4	1		11/01/16 19:28	108-67-8	
Vinyl acetate	ND	ug/kg	54.4	1		11/01/16 19:28	108-05-4	
Vinyl chloride	ND	ug/kg	10.9	1		11/01/16 19:28	75-01-4	
Xylene (Total)	ND	ug/kg	10.9	1		11/01/16 19:28	1330-20-7	
m&p-Xylene	ND	ug/kg	10.9	1		11/01/16 19:28	179601-23-1	
o-Xylene	ND	ug/kg	5.4	1		11/01/16 19:28	95-47-6	
Surrogates								
Toluene-d8 (S)	101	%	70-130	1		11/01/16 19:28	2037-26-5	
4-Bromofluorobenzene (S)	97	%	70-130	1		11/01/16 19:28	460-00-4	
1,2-Dichloroethane-d4 (S)	120	%	70-132	1		11/01/16 19:28	17060-07-0	
Percent Moisture	Analytical Method: ASTM D2974-87							
Percent Moisture	**17.6**	%	0.10	1		11/01/16 11:51		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

QC Batch: 335217 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 92317874002, 92317874003

METHOD BLANK: 1858123 Matrix: Solid
Associated Lab Samples: 92317874002, 92317874003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,1,1-Trichloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,1,2,2-Tetrachloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,1,2-Trichloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,1-Dichloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,1-Dichloroethene	ug/kg	ND	5.1	11/01/16 11:53	
1,1-Dichloropropene	ug/kg	ND	5.1	11/01/16 11:53	
1,2,3-Trichlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,2,3-Trichloropropane	ug/kg	ND	5.1	11/01/16 11:53	
1,2,4-Trichlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,2,4-Trimethylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,2-Dibromo-3-chloropropane	ug/kg	ND	5.1	11/01/16 11:53	
1,2-Dibromoethane (EDB)	ug/kg	ND	5.1	11/01/16 11:53	
1,2-Dichlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,2-Dichloroethane	ug/kg	ND	5.1	11/01/16 11:53	
1,2-Dichloropropane	ug/kg	ND	5.1	11/01/16 11:53	
1,3,5-Trimethylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,3-Dichlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
1,3-Dichloropropane	ug/kg	ND	5.1	11/01/16 11:53	
1,4-Dichlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
2,2-Dichloropropane	ug/kg	ND	5.1	11/01/16 11:53	
2-Butanone (MEK)	ug/kg	ND	102	11/01/16 11:53	
2-Chlorotoluene	ug/kg	ND	5.1	11/01/16 11:53	
2-Hexanone	ug/kg	ND	51.1	11/01/16 11:53	
4-Chlorotoluene	ug/kg	ND	5.1	11/01/16 11:53	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	51.1	11/01/16 11:53	
Acetone	ug/kg	ND	102	11/01/16 11:53	
Benzene	ug/kg	ND	5.1	11/01/16 11:53	
Bromobenzene	ug/kg	ND	5.1	11/01/16 11:53	
Bromochloromethane	ug/kg	ND	5.1	11/01/16 11:53	
Bromodichloromethane	ug/kg	ND	5.1	11/01/16 11:53	
Bromoform	ug/kg	ND	5.1	11/01/16 11:53	
Bromomethane	ug/kg	ND	10.2	11/01/16 11:53	
Carbon tetrachloride	ug/kg	ND	5.1	11/01/16 11:53	
Chlorobenzene	ug/kg	ND	5.1	11/01/16 11:53	
Chloroethane	ug/kg	ND	10.2	11/01/16 11:53	
Chloroform	ug/kg	ND	5.1	11/01/16 11:53	
Chloromethane	ug/kg	ND	10.2	11/01/16 11:53	
cis-1,2-Dichloroethene	ug/kg	ND	5.1	11/01/16 11:53	
cis-1,3-Dichloropropene	ug/kg	ND	5.1	11/01/16 11:53	
Dibromochloromethane	ug/kg	ND	5.1	11/01/16 11:53	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

METHOD BLANK: 1858123 Matrix: Solid
Associated Lab Samples: 92317874002, 92317874003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromomethane	ug/kg	ND	5.1	11/01/16 11:53	
Dichlorodifluoromethane	ug/kg	ND	10.2	11/01/16 11:53	
Diisopropyl ether	ug/kg	ND	5.1	11/01/16 11:53	
Ethylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
Hexachloro-1,3-butadiene	ug/kg	ND	5.1	11/01/16 11:53	
Isopropylbenzene (Cumene)	ug/kg	ND	5.1	11/01/16 11:53	
m&p-Xylene	ug/kg	ND	10.2	11/01/16 11:53	
Methyl-tert-butyl ether	ug/kg	ND	5.1	11/01/16 11:53	
Methylene Chloride	ug/kg	ND	20.4	11/01/16 11:53	
n-Butylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
n-Propylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
Naphthalene	ug/kg	ND	5.1	11/01/16 11:53	
o-Xylene	ug/kg	ND	5.1	11/01/16 11:53	
p-Isopropyltoluene	ug/kg	ND	5.1	11/01/16 11:53	
sec-Butylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
Styrene	ug/kg	ND	5.1	11/01/16 11:53	
tert-Butylbenzene	ug/kg	ND	5.1	11/01/16 11:53	
Tetrachloroethene	ug/kg	ND	5.1	11/01/16 11:53	
Toluene	ug/kg	ND	5.1	11/01/16 11:53	
trans-1,2-Dichloroethene	ug/kg	ND	5.1	11/01/16 11:53	
trans-1,3-Dichloropropene	ug/kg	ND	5.1	11/01/16 11:53	
Trichloroethene	ug/kg	ND	5.1	11/01/16 11:53	
Trichlorofluoromethane	ug/kg	ND	5.1	11/01/16 11:53	
Vinyl acetate	ug/kg	ND	51.1	11/01/16 11:53	
Vinyl chloride	ug/kg	ND	10.2	11/01/16 11:53	
Xylene (Total)	ug/kg	ND	10.2	11/01/16 11:53	
1,2-Dichloroethane-d4 (S)	%	125	70-132	11/01/16 11:53	
4-Bromofluorobenzene (S)	%	95	70-130	11/01/16 11:53	
Toluene-d8 (S)	%	102	70-130	11/01/16 11:53	

LABORATORY CONTROL SAMPLE: 1858124

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	54.2	59.3	109	74-137	
1,1,1-Trichloroethane	ug/kg	54.2	60.8	112	67-140	
1,1,2,2-Tetrachloroethane	ug/kg	54.2	59.6	110	72-141	
1,1,2-Trichloroethane	ug/kg	54.2	63.7	117	78-138	
1,1-Dichloroethane	ug/kg	54.2	61.4	113	69-134	
1,1-Dichloroethene	ug/kg	54.2	62.2	115	67-138	
1,1-Dichloropropene	ug/kg	54.2	59.5	110	69-139	
1,2,3-Trichlorobenzene	ug/kg	54.2	63.7	118	70-146	
1,2,3-Trichloropropane	ug/kg	54.2	66.4	122	69-144	
1,2,4-Trichlorobenzene	ug/kg	54.2	60.1	111	68-148	
1,2,4-Trimethylbenzene	ug/kg	54.2	59.8	110	74-137	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

LABORATORY CONTROL SAMPLE: 1858124

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromo-3-chloropropane	ug/kg	54.2	69.7	129	65-140	
1,2-Dibromoethane (EDB)	ug/kg	54.2	63.8	118	77-135	
1,2-Dichlorobenzene	ug/kg	54.2	62.6	115	77-141	
1,2-Dichloroethane	ug/kg	54.2	65.5	121	65-137	
1,2-Dichloropropane	ug/kg	54.2	59.8	110	72-136	
1,3,5-Trimethylbenzene	ug/kg	54.2	58.5	108	76-133	
1,3-Dichlorobenzene	ug/kg	54.2	60.2	111	74-138	
1,3-Dichloropropane	ug/kg	54.2	60.7	112	71-139	
1,4-Dichlorobenzene	ug/kg	54.2	59.8	110	76-138	
2,2-Dichloropropane	ug/kg	54.2	63.0	116	68-137	
2-Butanone (MEK)	ug/kg	108	138	127	58-147	
2-Chlorotoluene	ug/kg	54.2	61.1	113	73-139	
2-Hexanone	ug/kg	108	140	129	62-145	
4-Chlorotoluene	ug/kg	54.2	59.7	110	76-141	
4-Methyl-2-pentanone (MIBK)	ug/kg	108	146	135	64-149	
Acetone	ug/kg	108	150	138	53-153	
Benzene	ug/kg	54.2	61.3	113	73-135	
Bromobenzene	ug/kg	54.2	61.5	113	75-133	
Bromochloromethane	ug/kg	54.2	67.2	124	73-134	
Bromodichloromethane	ug/kg	54.2	64.1	118	71-135	
Bromoform	ug/kg	54.2	61.7	114	66-141	
Bromomethane	ug/kg	54.2	63.2	116	53-160	
Carbon tetrachloride	ug/kg	54.2	59.1	109	60-145	
Chlorobenzene	ug/kg	54.2	58.0	107	78-130	
Chloroethane	ug/kg	54.2	62.4	115	64-149	
Chloroform	ug/kg	54.2	63.4	117	70-134	
Chloromethane	ug/kg	54.2	65.4	121	52-150	
cis-1,2-Dichloroethene	ug/kg	54.2	67.2	124	70-133	
cis-1,3-Dichloropropene	ug/kg	54.2	61.6	114	68-134	
Dibromochloromethane	ug/kg	54.2	64.8	120	71-138	
Dibromomethane	ug/kg	54.2	61.8	114	74-130	
Dichlorodifluoromethane	ug/kg	54.2	65.0	120	40-160	
Diisopropyl ether	ug/kg	54.2	67.5	124	69-141	
Ethylbenzene	ug/kg	54.2	58.1	107	75-133	
Hexachloro-1,3-butadiene	ug/kg	54.2	56.2	104	68-143	
Isopropylbenzene (Cumene)	ug/kg	54.2	58.2	107	76-143	
m&p-Xylene	ug/kg	108	119	110	75-136	
Methyl-tert-butyl ether	ug/kg	54.2	66.5	123	68-144	
Methylene Chloride	ug/kg	54.2	68.5	126	45-154	
n-Butylbenzene	ug/kg	54.2	59.0	109	72-137	
n-Propylbenzene	ug/kg	54.2	58.5	108	76-136	
Naphthalene	ug/kg	54.2	67.0	124	68-151	
o-Xylene	ug/kg	54.2	59.2	109	76-141	
p-Isopropyltoluene	ug/kg	54.2	58.2	107	76-140	
sec-Butylbenzene	ug/kg	54.2	58.5	108	79-139	
Styrene	ug/kg	54.2	59.3	109	79-137	
tert-Butylbenzene	ug/kg	54.2	52.8	97	74-143	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

LABORATORY CONTROL SAMPLE: 1858124

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	ug/kg	54.2	49.5	91	71-138	
Toluene	ug/kg	54.2	59.8	110	74-131	
trans-1,2-Dichloroethene	ug/kg	54.2	61.3	113	67-135	
trans-1,3-Dichloropropene	ug/kg	54.2	62.8	116	65-146	
Trichloroethene	ug/kg	54.2	61.2	113	67-135	
Trichlorofluoromethane	ug/kg	54.2	63.4	117	59-144	
Vinyl acetate	ug/kg	108	103	95	40-160	
Vinyl chloride	ug/kg	54.2	59.0	109	56-141	
Xylene (Total)	ug/kg	163	178	110	76-137	
1,2-Dichloroethane-d4 (S)	%			118	70-132	
4-Bromofluorobenzene (S)	%			98	70-130	
Toluene-d8 (S)	%			101	70-130	

MATRIX SPIKE SAMPLE: 1858924

Parameter	Units	92317912001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	18.6	15.8	85	70-130	
1,1,1-Trichloroethane	ug/kg	ND	18.6	18.1	98	70-130	
1,1,2,2-Tetrachloroethane	ug/kg	ND	18.6	16.9	91	70-130	
1,1,2-Trichloroethane	ug/kg	ND	18.6	17.4	94	70-130	
1,1-Dichloroethane	ug/kg	ND	18.6	18.7	101	70-130	
1,1-Dichloroethene	ug/kg	ND	18.6	19.5	105	49-180	
1,1-Dichloropropene	ug/kg	ND	18.6	18.0	97	70-130	
1,2,3-Trichlorobenzene	ug/kg	ND	18.6	14.4	78	70-130	
1,2,3-Trichloropropane	ug/kg	ND	18.6	18.0	97	70-130	
1,2,4-Trichlorobenzene	ug/kg	ND	18.6	14.2	77	70-130	
1,2,4-Trimethylbenzene	ug/kg	ND	18.6	17.8	96	70-130	
1,2-Dibromo-3-chloropropane	ug/kg	ND	18.6	15.2	82	70-130	
1,2-Dibromoethane (EDB)	ug/kg	ND	18.6	17.9	97	70-130	
1,2-Dichlorobenzene	ug/kg	ND	18.6	17.3	93	70-130	
1,2-Dichloroethane	ug/kg	ND	18.6	19.5	105	70-130	
1,2-Dichloropropane	ug/kg	ND	18.6	17.1	92	70-130	
1,3,5-Trimethylbenzene	ug/kg	ND	18.6	17.8	96	70-130	
1,3-Dichlorobenzene	ug/kg	ND	18.6	16.5	89	70-130	
1,3-Dichloropropane	ug/kg	ND	18.6	17.0	92	70-130	
1,4-Dichlorobenzene	ug/kg	ND	18.6	16.5	89	70-130	
2,2-Dichloropropane	ug/kg	ND	18.6	18.3	99	70-130	
2-Butanone (MEK)	ug/kg	ND	37.1	38.2J	103	70-130	
2-Chlorotoluene	ug/kg	ND	18.6	16.5	89	70-130	
2-Hexanone	ug/kg	ND	37.1	32.1J	86	70-130	
4-Chlorotoluene	ug/kg	ND	18.6	17.4	94	70-130	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	37.1	36.6J	99	70-130	
Acetone	ug/kg	ND	37.1	40.4J	109	70-130	
Benzene	ug/kg	ND	18.6	18.5	100	50-166	
Bromobenzene	ug/kg	ND	18.6	18.0	97	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

MATRIX SPIKE SAMPLE: 1858924

Parameter	Units	92317912001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromochloromethane	ug/kg	ND	18.6	19.5	105	70-130	
Bromodichloromethane	ug/kg	ND	18.6	17.8	96	70-130	
Bromoform	ug/kg	ND	18.6	14.1	76	70-130	
Bromomethane	ug/kg	ND	18.6	17.1	92	70-130	
Carbon tetrachloride	ug/kg	ND	18.6	17.0	92	70-130	
Chlorobenzene	ug/kg	ND	18.6	17.2	93	43-169	
Chloroethane	ug/kg	ND	18.6	20.4	110	70-130	
Chloroform	ug/kg	ND	18.6	18.8	102	70-130	
Chloromethane	ug/kg	ND	18.6	19.5	105	70-130	
cis-1,2-Dichloroethene	ug/kg	ND	18.6	18.3	99	70-130	
cis-1,3-Dichloropropene	ug/kg	ND	18.6	16.5	89	70-130	
Dibromochloromethane	ug/kg	ND	18.6	16.6	90	70-130	
Dibromomethane	ug/kg	ND	18.6	18.1	97	70-130	
Dichlorodifluoromethane	ug/kg	ND	18.6	21.2	114	70-130	
Diisopropyl ether	ug/kg	ND	18.6	20.3	109	70-130	
Ethylbenzene	ug/kg	ND	18.6	18.0	97	70-130	
Hexachloro-1,3-butadiene	ug/kg	ND	18.6	14.1	76	70-130	
Isopropylbenzene (Cumene)	ug/kg	ND	18.6	17.8	96	70-130	
m&p-Xylene	ug/kg	ND	37.1	36.2	98	70-130	
Methyl-tert-butyl ether	ug/kg	ND	18.6	20.0	108	70-130	
Methylene Chloride	ug/kg	ND	18.6	23.6	69	70-130	M1
n-Butylbenzene	ug/kg	ND	18.6	17.3	93	70-130	
n-Propylbenzene	ug/kg	ND	18.6	18.4	99	70-130	
Naphthalene	ug/kg	ND	18.6	16.4	88	70-130	
o-Xylene	ug/kg	ND	18.6	17.7	95	70-130	
p-Isopropyltoluene	ug/kg	ND	18.6	17.4	94	70-130	
sec-Butylbenzene	ug/kg	ND	18.6	18.2	98	70-130	
Styrene	ug/kg	ND	18.6	17.3	93	70-130	
tert-Butylbenzene	ug/kg	ND	18.6	16.3	88	70-130	
Tetrachloroethene	ug/kg	ND	18.6	14.9	81	70-130	
Toluene	ug/kg	ND	18.6	18.4	99	52-163	
trans-1,2-Dichloroethene	ug/kg	ND	18.6	19.4	104	70-130	
trans-1,3-Dichloropropene	ug/kg	ND	18.6	15.9	86	70-130	
Trichloroethene	ug/kg	ND	18.6	16.9	91	49-167	
Trichlorofluoromethane	ug/kg	ND	18.6	20.9	113	70-130	
Vinyl acetate	ug/kg	ND	37.1	20.9J	56	70-130	M1
Vinyl chloride	ug/kg	ND	18.6	18.9	102	70-130	
1,2-Dichloroethane-d4 (S)	%				114	70-132	
4-Bromofluorobenzene (S)	%				98	70-130	
Toluene-d8 (S)	%				100	70-130	

SAMPLE DUPLICATE: 1858923

Parameter	Units	92317874002 Result	Dup Result	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

SAMPLE DUPLICATE: 1858923

Parameter	Units	92317874002 Result	Dup Result	RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	ND		
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		
1,1,2-Trichloroethane	ug/kg	ND	ND		
1,1-Dichloroethane	ug/kg	ND	ND		
1,1-Dichloroethene	ug/kg	ND	ND		
1,1-Dichloropropene	ug/kg	ND	ND		
1,2,3-Trichlorobenzene	ug/kg	ND	ND		
1,2,3-Trichloropropane	ug/kg	ND	ND		
1,2,4-Trichlorobenzene	ug/kg	ND	ND		
1,2,4-Trimethylbenzene	ug/kg	ND	ND		
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		
1,2-Dichlorobenzene	ug/kg	ND	ND		
1,2-Dichloroethane	ug/kg	ND	ND		
1,2-Dichloropropane	ug/kg	ND	ND		
1,3,5-Trimethylbenzene	ug/kg	ND	ND		
1,3-Dichlorobenzene	ug/kg	ND	ND		
1,3-Dichloropropane	ug/kg	ND	ND		
1,4-Dichlorobenzene	ug/kg	ND	ND		
2,2-Dichloropropane	ug/kg	ND	ND		
2-Butanone (MEK)	ug/kg	ND	ND		
2-Chlorotoluene	ug/kg	ND	ND		
2-Hexanone	ug/kg	ND	ND		
4-Chlorotoluene	ug/kg	ND	ND		
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		
Acetone	ug/kg	ND	ND		
Benzene	ug/kg	ND	ND		
Bromobenzene	ug/kg	ND	ND		
Bromochloromethane	ug/kg	ND	ND		
Bromodichloromethane	ug/kg	ND	ND		
Bromoform	ug/kg	ND	ND		
Bromomethane	ug/kg	ND	ND		
Carbon tetrachloride	ug/kg	ND	ND		
Chlorobenzene	ug/kg	ND	ND		
Chloroethane	ug/kg	ND	ND		
Chloroform	ug/kg	ND	ND		
Chloromethane	ug/kg	ND	ND		
cis-1,2-Dichloroethene	ug/kg	ND	ND		
cis-1,3-Dichloropropene	ug/kg	ND	ND		
Dibromochloromethane	ug/kg	ND	ND		
Dibromomethane	ug/kg	ND	ND		
Dichlorodifluoromethane	ug/kg	ND	ND		
Diisopropyl ether	ug/kg	ND	ND		
Ethylbenzene	ug/kg	ND	ND		
Hexachloro-1,3-butadiene	ug/kg	ND	ND		
Isopropylbenzene (Cumene)	ug/kg	ND	ND		
m&p-Xylene	ug/kg	ND	ND		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

SAMPLE DUPLICATE: 1858923

Parameter	Units	92317874002 Result	Dup Result	RPD	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	ND		
Methylene Chloride	ug/kg	ND	ND		
n-Butylbenzene	ug/kg	ND	ND		
n-Propylbenzene	ug/kg	ND	ND		
Naphthalene	ug/kg	ND	ND		
o-Xylene	ug/kg	ND	ND		
p-Isopropyltoluene	ug/kg	ND	ND		
sec-Butylbenzene	ug/kg	ND	ND		
Styrene	ug/kg	ND	ND		
tert-Butylbenzene	ug/kg	ND	ND		
Tetrachloroethene	ug/kg	ND	ND		
Toluene	ug/kg	ND	ND		
trans-1,2-Dichloroethene	ug/kg	ND	ND		
trans-1,3-Dichloropropene	ug/kg	ND	ND		
Trichloroethene	ug/kg	ND	ND		
Trichlorofluoromethane	ug/kg	ND	ND		
Vinyl acetate	ug/kg	ND	ND		
Vinyl chloride	ug/kg	ND	ND		
Xylene (Total)	ug/kg	ND	ND		
1,2-Dichloroethane-d4 (S)	%	117	110	26	
4-Bromofluorobenzene (S)	%	96	95	20	
Toluene-d8 (S)	%	103	101	22	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

QC Batch: 335373
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV 5035A Volatile Organics
Associated Lab Samples: 92317874001

METHOD BLANK: 1859105
Matrix: Solid
Associated Lab Samples: 92317874001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,1,1-Trichloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,1,2,2-Tetrachloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,1,2-Trichloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,1-Dichloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,1-Dichloroethene	ug/kg	ND	4.7	11/02/16 12:39	
1,1-Dichloropropene	ug/kg	ND	4.7	11/02/16 12:39	
1,2,3-Trichlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,2,3-Trichloropropane	ug/kg	ND	4.7	11/02/16 12:39	
1,2,4-Trichlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,2,4-Trimethylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,2-Dibromo-3-chloropropane	ug/kg	ND	4.7	11/02/16 12:39	
1,2-Dibromoethane (EDB)	ug/kg	ND	4.7	11/02/16 12:39	
1,2-Dichlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,2-Dichloroethane	ug/kg	ND	4.7	11/02/16 12:39	
1,2-Dichloropropane	ug/kg	ND	4.7	11/02/16 12:39	
1,3,5-Trimethylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,3-Dichlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
1,3-Dichloropropane	ug/kg	ND	4.7	11/02/16 12:39	
1,4-Dichlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
2,2-Dichloropropane	ug/kg	ND	4.7	11/02/16 12:39	
2-Butanone (MEK)	ug/kg	ND	94.3	11/02/16 12:39	
2-Chlorotoluene	ug/kg	ND	4.7	11/02/16 12:39	
2-Hexanone	ug/kg	ND	47.2	11/02/16 12:39	
4-Chlorotoluene	ug/kg	ND	4.7	11/02/16 12:39	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	47.2	11/02/16 12:39	
Acetone	ug/kg	ND	94.3	11/02/16 12:39	
Benzene	ug/kg	ND	4.7	11/02/16 12:39	
Bromobenzene	ug/kg	ND	4.7	11/02/16 12:39	
Bromochloromethane	ug/kg	ND	4.7	11/02/16 12:39	
Bromodichloromethane	ug/kg	ND	4.7	11/02/16 12:39	
Bromoform	ug/kg	ND	4.7	11/02/16 12:39	
Bromomethane	ug/kg	ND	9.4	11/02/16 12:39	
Carbon tetrachloride	ug/kg	ND	4.7	11/02/16 12:39	
Chlorobenzene	ug/kg	ND	4.7	11/02/16 12:39	
Chloroethane	ug/kg	ND	9.4	11/02/16 12:39	
Chloroform	ug/kg	ND	4.7	11/02/16 12:39	
Chloromethane	ug/kg	ND	9.4	11/02/16 12:39	
cis-1,2-Dichloroethene	ug/kg	ND	4.7	11/02/16 12:39	
cis-1,3-Dichloropropene	ug/kg	ND	4.7	11/02/16 12:39	
Dibromochloromethane	ug/kg	ND	4.7	11/02/16 12:39	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

METHOD BLANK: 1859105 Matrix: Solid
Associated Lab Samples: 92317874001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dibromomethane	ug/kg	ND	4.7	11/02/16 12:39	
Dichlorodifluoromethane	ug/kg	ND	9.4	11/02/16 12:39	
Diisopropyl ether	ug/kg	ND	4.7	11/02/16 12:39	
Ethylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
Hexachloro-1,3-butadiene	ug/kg	ND	4.7	11/02/16 12:39	
Isopropylbenzene (Cumene)	ug/kg	ND	4.7	11/02/16 12:39	
m&p-Xylene	ug/kg	ND	9.4	11/02/16 12:39	
Methyl-tert-butyl ether	ug/kg	ND	4.7	11/02/16 12:39	
Methylene Chloride	ug/kg	ND	18.9	11/02/16 12:39	
n-Butylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
n-Propylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
Naphthalene	ug/kg	ND	4.7	11/02/16 12:39	
o-Xylene	ug/kg	ND	4.7	11/02/16 12:39	
p-Isopropyltoluene	ug/kg	ND	4.7	11/02/16 12:39	
sec-Butylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
Styrene	ug/kg	ND	4.7	11/02/16 12:39	
tert-Butylbenzene	ug/kg	ND	4.7	11/02/16 12:39	
Tetrachloroethene	ug/kg	ND	4.7	11/02/16 12:39	
Toluene	ug/kg	ND	4.7	11/02/16 12:39	
trans-1,2-Dichloroethene	ug/kg	ND	4.7	11/02/16 12:39	
trans-1,3-Dichloropropene	ug/kg	ND	4.7	11/02/16 12:39	
Trichloroethene	ug/kg	ND	4.7	11/02/16 12:39	
Trichlorofluoromethane	ug/kg	ND	4.7	11/02/16 12:39	
Vinyl acetate	ug/kg	ND	47.2	11/02/16 12:39	
Vinyl chloride	ug/kg	ND	9.4	11/02/16 12:39	
Xylene (Total)	ug/kg	ND	9.4	11/02/16 12:39	
1,2-Dichloroethane-d4 (S)	%	117	70-132	11/02/16 12:39	
4-Bromofluorobenzene (S)	%	96	70-130	11/02/16 12:39	
Toluene-d8 (S)	%	101	70-130	11/02/16 12:39	

LABORATORY CONTROL SAMPLE: 1859106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	51.8	56.4	109	74-137	
1,1,1-Trichloroethane	ug/kg	51.8	54.6	105	67-140	
1,1,2,2-Tetrachloroethane	ug/kg	51.8	56.7	110	72-141	
1,1,2-Trichloroethane	ug/kg	51.8	58.9	114	78-138	
1,1-Dichloroethane	ug/kg	51.8	55.0	106	69-134	
1,1-Dichloroethene	ug/kg	51.8	56.6	109	67-138	
1,1-Dichloropropene	ug/kg	51.8	52.6	102	69-139	
1,2,3-Trichlorobenzene	ug/kg	51.8	58.6	113	70-146	
1,2,3-Trichloropropane	ug/kg	51.8	60.9	118	69-144	
1,2,4-Trichlorobenzene	ug/kg	51.8	56.9	110	68-148	
1,2,4-Trimethylbenzene	ug/kg	51.8	56.2	109	74-137	

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REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

LABORATORY CONTROL SAMPLE: 1859106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dibromo-3-chloropropane	ug/kg	51.8	59.1	114	65-140	
1,2-Dibromoethane (EDB)	ug/kg	51.8	59.1	114	77-135	
1,2-Dichlorobenzene	ug/kg	51.8	60.1	116	77-141	
1,2-Dichloroethane	ug/kg	51.8	61.0	118	65-137	
1,2-Dichloropropane	ug/kg	51.8	54.0	104	72-136	
1,3,5-Trimethylbenzene	ug/kg	51.8	55.1	106	76-133	
1,3-Dichlorobenzene	ug/kg	51.8	56.3	109	74-138	
1,3-Dichloropropane	ug/kg	51.8	56.6	109	71-139	
1,4-Dichlorobenzene	ug/kg	51.8	57.0	110	76-138	
2,2-Dichloropropane	ug/kg	51.8	55.9	108	68-137	
2-Butanone (MEK)	ug/kg	104	119	115	58-147	
2-Chlorotoluene	ug/kg	51.8	57.3	111	73-139	
2-Hexanone	ug/kg	104	128	123	62-145	
4-Chlorotoluene	ug/kg	51.8	56.5	109	76-141	
4-Methyl-2-pentanone (MIBK)	ug/kg	104	130	126	64-149	
Acetone	ug/kg	104	142	137	53-153	
Benzene	ug/kg	51.8	56.3	109	73-135	
Bromobenzene	ug/kg	51.8	59.0	114	75-133	
Bromochloromethane	ug/kg	51.8	60.9	118	73-134	
Bromodichloromethane	ug/kg	51.8	60.1	116	71-135	
Bromoform	ug/kg	51.8	58.9	114	66-141	
Bromomethane	ug/kg	51.8	63.1	122	53-160	
Carbon tetrachloride	ug/kg	51.8	54.4	105	60-145	
Chlorobenzene	ug/kg	51.8	55.2	107	78-130	
Chloroethane	ug/kg	51.8	58.2	112	64-149	
Chloroform	ug/kg	51.8	57.2	111	70-134	
Chloromethane	ug/kg	51.8	56.8	110	52-150	
cis-1,2-Dichloroethene	ug/kg	51.8	56.0	108	70-133	
cis-1,3-Dichloropropene	ug/kg	51.8	56.5	109	68-134	
Dibromochloromethane	ug/kg	51.8	61.3	118	71-138	
Dibromomethane	ug/kg	51.8	59.1	114	74-130	
Dichlorodifluoromethane	ug/kg	51.8	56.4	109	40-160	
Diisopropyl ether	ug/kg	51.8	59.2	114	69-141	
Ethylbenzene	ug/kg	51.8	55.6	107	75-133	
Hexachloro-1,3-butadiene	ug/kg	51.8	53.3	103	68-143	
Isopropylbenzene (Cumene)	ug/kg	51.8	55.6	107	76-143	
m&p-Xylene	ug/kg	104	112	109	75-136	
Methyl-tert-butyl ether	ug/kg	51.8	60.3	117	68-144	
Methylene Chloride	ug/kg	51.8	62.5	121	45-154	
n-Butylbenzene	ug/kg	51.8	55.9	108	72-137	
n-Propylbenzene	ug/kg	51.8	55.8	108	76-136	
Naphthalene	ug/kg	51.8	60.9	118	68-151	
o-Xylene	ug/kg	51.8	55.9	108	76-141	
p-Isopropyltoluene	ug/kg	51.8	55.0	106	76-140	
sec-Butylbenzene	ug/kg	51.8	55.7	108	79-139	
Styrene	ug/kg	51.8	57.4	111	79-137	
tert-Butylbenzene	ug/kg	51.8	50.3	97	74-143	

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QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

LABORATORY CONTROL SAMPLE: 1859106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Tetrachloroethene	ug/kg	51.8	45.8	88	71-138	
Toluene	ug/kg	51.8	55.7	108	74-131	
trans-1,2-Dichloroethene	ug/kg	51.8	55.6	107	67-135	
trans-1,3-Dichloropropene	ug/kg	51.8	58.0	112	65-146	
Trichloroethene	ug/kg	51.8	56.4	109	67-135	
Trichlorofluoromethane	ug/kg	51.8	59.3	114	59-144	
Vinyl acetate	ug/kg	104	103	99	40-160	
Vinyl chloride	ug/kg	51.8	50.8	98	56-141	
Xylene (Total)	ug/kg	155	168	108	76-137	
1,2-Dichloroethane-d4 (S)	%			114	70-132	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE SAMPLE: 1859928

Parameter	Units	92318065004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	23.6	16.7	70	70-130	
1,1,1-Trichloroethane	ug/kg	ND	23.6	21.7	92	70-130	
1,1,2,2-Tetrachloroethane	ug/kg	ND	23.6	20.5	87	70-130	
1,1,2-Trichloroethane	ug/kg	ND	23.6	21.2	89	70-130	
1,1-Dichloroethane	ug/kg	ND	23.6	22.3	94	70-130	
1,1-Dichloroethene	ug/kg	ND	23.6	22.9	97	49-180	
1,1-Dichloropropene	ug/kg	ND	23.6	22.2	94	70-130	
1,2,3-Trichlorobenzene	ug/kg	ND	23.6	15.9	67	70-130	M1
1,2,3-Trichloropropane	ug/kg	ND	23.6	20.6	87	70-130	
1,2,4-Trichlorobenzene	ug/kg	ND	23.6	15.4	65	70-130	M1
1,2,4-Trimethylbenzene	ug/kg	ND	23.6	20.0	84	70-130	
1,2-Dibromo-3-chloropropane	ug/kg	ND	23.6	17.1	72	70-130	
1,2-Dibromoethane (EDB)	ug/kg	ND	23.6	19.5	82	70-130	
1,2-Dichlorobenzene	ug/kg	ND	23.6	19.7	83	70-130	
1,2-Dichloroethane	ug/kg	ND	23.6	23.5	99	70-130	
1,2-Dichloropropane	ug/kg	ND	23.6	21.4	91	70-130	
1,3,5-Trimethylbenzene	ug/kg	ND	23.6	20.0	85	70-130	
1,3-Dichlorobenzene	ug/kg	ND	23.6	18.6	79	70-130	
1,3-Dichloropropane	ug/kg	ND	23.6	20.9	88	70-130	
1,4-Dichlorobenzene	ug/kg	ND	23.6	18.4	78	70-130	
2,2-Dichloropropane	ug/kg	ND	23.6	21.7	92	70-130	
2-Butanone (MEK)	ug/kg	ND	47.4	47.3J	100	70-130	
2-Chlorotoluene	ug/kg	ND	23.6	19.2	81	70-130	
2-Hexanone	ug/kg	ND	47.4	39.1J	83	70-130	
4-Chlorotoluene	ug/kg	ND	23.6	20.1	85	70-130	
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	47.4	46.1J	97	70-130	
Acetone	ug/kg	ND	47.4	60.1J	122	70-130	
Benzene	ug/kg	ND	23.6	22.7	96	50-166	
Bromobenzene	ug/kg	ND	23.6	21.1	89	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

MATRIX SPIKE SAMPLE: 1859928

Parameter	Units	92318065004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromochloromethane	ug/kg	ND	23.6	24.7	104	70-130	
Bromodichloromethane	ug/kg	ND	23.6	19.6	83	70-130	
Bromoform	ug/kg	ND	23.6	13.8	58	70-130	M1
Bromomethane	ug/kg	ND	23.6	20.8	88	70-130	
Carbon tetrachloride	ug/kg	ND	23.6	18.6	79	70-130	
Chlorobenzene	ug/kg	ND	23.6	20.4	86	43-169	
Chloroethane	ug/kg	ND	23.6	23.5	99	70-130	
Chloroform	ug/kg	ND	23.6	22.4	95	70-130	
Chloromethane	ug/kg	ND	23.6	26.3	111	70-130	
cis-1,2-Dichloroethene	ug/kg	ND	23.6	23.4	99	70-130	
cis-1,3-Dichloropropene	ug/kg	ND	23.6	18.8	79	70-130	
Dibromochloromethane	ug/kg	ND	23.6	16.9	71	70-130	
Dibromomethane	ug/kg	ND	23.6	21.0	89	70-130	
Dichlorodifluoromethane	ug/kg	ND	23.6	28.1	119	70-130	
Diisopropyl ether	ug/kg	ND	23.6	24.1	102	70-130	
Ethylbenzene	ug/kg	ND	23.6	20.8	88	70-130	
Hexachloro-1,3-butadiene	ug/kg	ND	23.6	14.6	62	70-130	M1
Isopropylbenzene (Cumene)	ug/kg	ND	23.6	20.2	85	70-130	
m&p-Xylene	ug/kg	ND	47.4	42.1	89	70-130	
Methyl-tert-butyl ether	ug/kg	ND	23.6	23.1	97	70-130	
Methylene Chloride	ug/kg	ND	23.6	29.9	93	70-130	
n-Butylbenzene	ug/kg	ND	23.6	18.9	80	70-130	
n-Propylbenzene	ug/kg	ND	23.6	21.3	90	70-130	
Naphthalene	ug/kg	ND	23.6	20.4	86	70-130	
o-Xylene	ug/kg	ND	23.6	20.6	87	70-130	
p-Isopropyltoluene	ug/kg	ND	23.6	19.2	81	70-130	
sec-Butylbenzene	ug/kg	ND	23.6	20.0	85	70-130	
Styrene	ug/kg	ND	23.6	18.8	80	70-130	
tert-Butylbenzene	ug/kg	ND	23.6	18.1	76	70-130	
Tetrachloroethene	ug/kg	ND	23.6	17.0	72	70-130	
Toluene	ug/kg	ND	23.6	21.9	92	52-163	
trans-1,2-Dichloroethene	ug/kg	ND	23.6	22.8	96	70-130	
trans-1,3-Dichloropropene	ug/kg	ND	23.6	17.8	75	70-130	
Trichloroethene	ug/kg	ND	23.6	19.9	84	49-167	
Trichlorofluoromethane	ug/kg	ND	23.6	23.8	101	70-130	
Vinyl acetate	ug/kg	ND	47.4	18.5J	39	70-130	M1
Vinyl chloride	ug/kg	ND	23.6	24.0	101	70-130	
1,2-Dichloroethane-d4 (S)	%				120	70-132	
4-Bromofluorobenzene (S)	%				96	70-130	
Toluene-d8 (S)	%				103	70-130	

SAMPLE DUPLICATE: 1859927

Parameter	Units	92318065001 Result	Dup Result	RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/kg	ND	ND		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

SAMPLE DUPLICATE: 1859927

Parameter	Units	92318065001 Result	Dup Result	RPD	Qualifiers
1,1,1-Trichloroethane	ug/kg	ND	ND		
1,1,2,2-Tetrachloroethane	ug/kg	ND	ND		
1,1,2-Trichloroethane	ug/kg	ND	ND		
1,1-Dichloroethane	ug/kg	ND	ND		
1,1-Dichloroethene	ug/kg	ND	ND		
1,1-Dichloropropene	ug/kg	ND	ND		
1,2,3-Trichlorobenzene	ug/kg	ND	ND		
1,2,3-Trichloropropane	ug/kg	ND	ND		
1,2,4-Trichlorobenzene	ug/kg	ND	ND		
1,2,4-Trimethylbenzene	ug/kg	ND	ND		
1,2-Dibromo-3-chloropropane	ug/kg	ND	ND		
1,2-Dibromoethane (EDB)	ug/kg	ND	ND		
1,2-Dichlorobenzene	ug/kg	ND	ND		
1,2-Dichloroethane	ug/kg	ND	ND		
1,2-Dichloropropane	ug/kg	ND	ND		
1,3,5-Trimethylbenzene	ug/kg	ND	ND		
1,3-Dichlorobenzene	ug/kg	ND	ND		
1,3-Dichloropropane	ug/kg	ND	ND		
1,4-Dichlorobenzene	ug/kg	ND	ND		
2,2-Dichloropropane	ug/kg	ND	ND		
2-Butanone (MEK)	ug/kg	ND	ND		
2-Chlorotoluene	ug/kg	ND	ND		
2-Hexanone	ug/kg	ND	ND		
4-Chlorotoluene	ug/kg	ND	ND		
4-Methyl-2-pentanone (MIBK)	ug/kg	ND	ND		
Acetone	ug/kg	ND	ND		
Benzene	ug/kg	ND	ND		
Bromobenzene	ug/kg	ND	ND		
Bromochloromethane	ug/kg	ND	ND		
Bromodichloromethane	ug/kg	ND	ND		
Bromoform	ug/kg	ND	ND		
Bromomethane	ug/kg	ND	ND		
Carbon tetrachloride	ug/kg	ND	ND		
Chlorobenzene	ug/kg	ND	ND		
Chloroethane	ug/kg	ND	ND		
Chloroform	ug/kg	ND	ND		
Chloromethane	ug/kg	ND	ND		
cis-1,2-Dichloroethene	ug/kg	ND	ND		
cis-1,3-Dichloropropene	ug/kg	ND	ND		
Dibromochloromethane	ug/kg	ND	ND		
Dibromomethane	ug/kg	ND	ND		
Dichlorodifluoromethane	ug/kg	ND	ND		
Diisopropyl ether	ug/kg	ND	ND		
Ethylbenzene	ug/kg	ND	ND		
Hexachloro-1,3-butadiene	ug/kg	ND	ND		
Isopropylbenzene (Cumene)	ug/kg	ND	ND		
m&p-Xylene	ug/kg	ND	ND		

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

SAMPLE DUPLICATE: 1859927

Parameter	Units	92318065001 Result	Dup Result	RPD	Qualifiers
Methyl-tert-butyl ether	ug/kg	ND	ND		
Methylene Chloride	ug/kg	ND	ND		
n-Butylbenzene	ug/kg	ND	ND		
n-Propylbenzene	ug/kg	ND	ND		
Naphthalene	ug/kg	ND	2.1J		
o-Xylene	ug/kg	ND	ND		
p-Isopropyltoluene	ug/kg	ND	ND		
sec-Butylbenzene	ug/kg	ND	ND		
Styrene	ug/kg	ND	ND		
tert-Butylbenzene	ug/kg	ND	ND		
Tetrachloroethene	ug/kg	ND	ND		
Toluene	ug/kg	ND	ND		
trans-1,2-Dichloroethene	ug/kg	ND	ND		
trans-1,3-Dichloropropene	ug/kg	ND	ND		
Trichloroethene	ug/kg	ND	ND		
Trichlorofluoromethane	ug/kg	ND	ND		
Vinyl acetate	ug/kg	ND	ND		
Vinyl chloride	ug/kg	ND	ND		
Xylene (Total)	ug/kg	ND	ND		
1,2-Dichloroethane-d4 (S)	%	115	118	2	
4-Bromofluorobenzene (S)	%	97	92	10	
Toluene-d8 (S)	%	101	101	4	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

QC Batch: 335136 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92317874001, 92317874002, 92317874003

SAMPLE DUPLICATE: 1857839

Parameter	Units	92317879001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	14.4	15.2	5	

SAMPLE DUPLICATE: 1857840

Parameter	Units	92317874003 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	17.6	18.0	2	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Parcel 187 39049.1.1
Pace Project No.: 92317874

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92317874001	**187-SB-1-6-8**	EPA 8260	335373		
92317874002	**187-SB-2-8-10**	EPA 8260	335217		
92317874003	**187-SB-3-8-10**	EPA 8260	335217		
92317874001	**187-SB-1-6-8**	ASTM D2974-87	335136		
92317874002	**187-SB-2-8-10**	ASTM D2974-87	335136		
92317874003	**187-SB-3-8-10**	ASTM D2974-87	335136		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: Sept. 21, 2016 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.01	Issuing Authority: Pace Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☒ Raleigh ☐ Mechanicsville ☐

WO#: 92317874

92317874

Sample Condition Upon Receipt

Client Name: Solutions IES **Projec**

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☒ Pace ☐ Other:____

Custody Seal Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Date/Initials Person Examining Contents: PP 10/31/16

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☒ None ☐ Other:____

Thermometer: ☑ IR Gun ID: T1505 **Type of Ice:** ☒ Wet ☐ Blue ☐ None ☐ Samples on ice, cooling process has begun

Correction Factor: **Cooler Temp Corrected (°C):** 4.2c **Biological Tissue Frozen?** ☐ Yes ☒ No ☐ N/A

Temp should be above freezing to 6°C

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☒ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☒ No

				Comments/Discrepancy:
Chain of Custody Present?	☒ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☒ Yes	☐ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	4.
Sufficient Volume?	☒ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	7.
Samples Field Filtered?	☐ Yes	☒ No	☐ N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: Soil	☒ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☒ No	☐ N/A	10.
Trip Blank Present?	☐ Yes	☒ No	☐ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☒ No	☐ N/A	

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: _____ Date/Time: _____

Comments/Sample Discrepancy: _____

Project Manager SCURF Review: AMB **Date:** 11-1-16

Project Manager SRF Review: AMB **Date:** 11-1-16

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers)

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

**Bottom half of box is to list number of bottles

Project # WO# : 92317874

PM: PTE Due Date: 11/09/16

CLIENT: 92-SOLUTIONS

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP3S-250 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP3Z-250 mL Plastic ZN Acetate & NaOH (>9)	BP3C-250 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1	\				\	\	\	\			\		\	\	\						6				\	\			
2	\				\	\	\	\			\		\	\	\						6				\	\			
3	\				\	\	\	\			\		\	\	\						6				\	\			
4	\				\	\	\	\			\		\	\	\										\	\			
5	\				\	\	\	\			\		\	\	\										\	\			
6	\				\	\	\	\			\		\	\	\										\	\			
7	\				\	\	\	\			\		\	\	\										\	\			
8	\				\	\	\	\			\		\	\	\										\	\			
9	\				\	\	\	\			\		\	\	\										\	\			
10	\				\	\	\	\			\		\	\	\										\	\			
11	\				\	\	\	\			\		\	\	\										\	\			
12	\				\	\	\	\			\		\	\	\										\	\			

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2035089

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: SOLUTIONS-IES	Report To: MIKE BRANSON	Attention: NCDOT : WBS 39649.1.1
Address: 1101 NOWELL RD	Copy To:	Company Name:
RALEIGH NC 27607		Address:
Email To: MBRANSON@SOLUTIONS-IES.COM	Purchase Order No.:	Pace Quote Reference:
Phone: 919-873-1060 Fax:	Project Name: NCDOT : FAYETTEVILLE DARLOK 187	Pace Project Manager: TAYLOR EZELL
Requested Due Date/TAT: STD	Project Number: 2016.0054.NDOT	Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location
STATE: NC

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes MATRIX / CODE

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other DI H_2O / NaHSO4	Y/N	Analysis Test: VOCs 8260	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	187-SB-1-6-8	SL	G			10/26/16	1400		6	X						X	X		X		92317477
2	187-SB-2-8-10	"	"			"	1405		6	X						X	X		X		92317478
3	187-SB-3-8-10	"	"			"	1410		6	X						X	X		X		92317479
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] SIES	10/31/2016		[signature] Pace	10/31/16	0852		Y	N	Y
	[signature]	10/31/16		[signature] Pace	10/31/16	0900				
				RP Pace HVL	10/31/16	1500	4.2	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Samuel McIntyre

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 10/31/2016

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Solutions-IES
Industrial & Environmental Services

1101 Nowell Rd. ■ Raleigh, NC 27607
(919) 873-1060 ■ Fax (919) 873-1074
www.solutions-ies.com

December 21, 2016

Mr. Terry Fox, L.G.
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment**
John Taylor Property (Parcel #198)
5201 Raeford Road
Fayetteville, Cumberland County, North Carolina
State Project: U-4405
WBS Element 39049.1.1
SIES Project No. 2016.0054.NDOT

Dear Mr. Fox:

Solutions-IES, Inc., (SIES) has completed the Preliminary Site Assessment conducted at the above-referenced property. The work was performed in accordance with the Technical and Cost proposal dated September 26, 2016, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated September 26, 2016. Activities associated with the assessment consisted of conducting a geophysical investigation, collecting soil samples for analysis, and reviewing applicable North Carolina Department of Environmental Quality (NCDEQ) records. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The John Taylor Property (Parcel #198) is located at 5201 Raeford Road in Fayetteville, Cumberland County, North Carolina. The property is situated on the south side of Raeford Road in the southwest quadrant of the intersection of Raeford Road and Sandalwood Drive (**Figure 1**). The property consists of an active gas station and convenience store (Circle K 2723034). Based on a review of on-line UST registry information, three gasoline underground storage tanks (USTs) were reportedly installed on the property in 1987.

An asphalt parking area surrounds the building and extends almost to the property boundaries. A detached canopy with three dispensers is located in front of the building. The canopy is on a concrete pad that extends to the west of the canopy where the USTs are located (**Figure 2**). The proposed easement has not been marked at the site on the date of the field work, but NCDOT plan sheets show that the easement will affect the canopy.

The NCDOT requested a Preliminary Site Assessment for the right-of-way and proposed easement because of the site use as a gas station. The scope of work as defined in the Request for Technical and Cost Proposal was to evaluate the site with respect to the presence of known and unknown USTs and assess where contamination exists on the right-of-way/proposed easement. An estimate of the quantity of impacted soil was to be provided, should impacted soils be encountered.

SIES reviewed the on-line NCDEQ Incident Management database and no incident number was assigned to the site. SIES also examined the UST registration database to obtain UST ownership information. According to the database, the USTs on the property are operated under Facility Number 00-0-0000028887. The active USTs include three gasoline tanks, the sizes of which are not indicated. The owner and operator of the tanks are listed as follows:

Owner
Circle K Stores Inc.
2440 Whitehall Park Drive, Ste 800
Charlotte, NC 28273

Operator
Circle K 2723034
5201 Raeford Road
Fayetteville, NC 28304

Geophysical Survey

Prior to SIES' mobilization to the site, Pyramid Environmental & Engineering of Greensboro, NC (Pyramid) conducted a geophysical survey to confirm the presence of the known USTs and determine if additional USTs were present in in the area of the right-of-way/proposed easement. The geophysical survey consisted of an electromagnetic (EM) survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, and specifically looking for USTs.

A survey grid was laid out along the right-of-way/proposed easement with the X-axis oriented approximately parallel to Raeford Road and the Y-axis oriented approximately perpendicular to Raeford Road. The grid was positioned to cover the entire right-of-way/proposed easement.

The survey lines were spaced five feet apart and magnetic data were collected continuously along each survey line with a data logger. After collection, the EM data were reviewed in the field with graphical computer software. Several anomalies were detected and all were directly attributed to visible cultural features and known utilities. For these reasons, a ground penetrating radar survey was not required to verify any unknown EM anomalies.

Access was available to all areas of the study area and several EM anomalies were detected with the geophysical survey. No unknown metallic USTs were detected within the geophysical survey area. Pyramid's detailed report of findings and interpretations is presented in **Attachment A**.

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Site Assessment Activities

On October 25, 2016, SIES mobilized to the site to conduct a Geoprobe® direct-push investigation to evaluate subsurface soil conditions on the property. Eight direct-push holes (198-SB-1 through 198-SB-8) were drilled in the right-of-way/proposed easement (**Figure 2**). As directed by the NCDOT, the Geoprobe® borings were terminated at 10 feet below ground surface (ft bgs) unless the location was in the vicinity of a known or suspected UST, which resulted in a boring terminated at 12 ft bgs. Borings 198-SB-1, 198-SB-2, and 198-SB-3 were advanced to 12 ft bgs and borings 198-SB-4 through 198-SB-8 were advanced to ten ft bgs. The soil boring logs are included as **Attachment B**. Borings 198-SB-1 through 198-SB-3 were located to evaluate the subsurface conditions near the existing USTs. Borings 198-SB-5 and 198-SB-6 were placed to assess the conditions at the canopy and dispensers. Borings 198-SB-4, 198-SB-7, and 198-SB-8 were located to evaluate the subsurface along the proposed drainage structures within the right-of-way/proposed easement (see photos in **Attachment C**).

Continuous sampling using a Geoprobe® resulted in good recovery of soil samples from the direct-push holes. Soil samples were collected and contained in four-foot long acetate sleeves inside the direct-push Macro-Core® sampler. Each of the sleeves was divided into two-foot long sections for soil sample screening. Soil from each two-foot interval was placed in a resealable plastic bag and the bag was set aside for volatilization of organic compounds from the soil to the bag headspace. A photoionization detector (PID) probe was inserted into the bag and the reading was recorded.

If the PID concentrations in a boring were consistently low, one sample from the bottom interval was selected for analysis. If the PID concentrations were elevated, the sample from the interval with the highest field screening reading was selected for analyses. The PID results are summarized in **Table 1**.

The selected soil samples were submitted to an on-site mobile laboratory for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO) using ultraviolet fluorescence (UVF) methodology. Each boring was backfilled with bentonite and drill cuttings to the surface after completion.

The lithology encountered by the direct-push samples indicated the presence of two different lithologic units. One unit was present in borings 198-SB-3, 198-SB-5, and 198-SB-6, and described as a tab silty sand throughout the boring. The remaining borings encountered a mottled light brown and red silty clay to a depth of about four to nine ft bgs. Below this silty clay was a light brown soft clay. No groundwater or bedrock was noted in any of the borings. From the limited number of borings at the site, it is unclear as to whether the sand is lenticular and laterally discontinuous or a distinctly different stratigraphic unit.

According to the 1985 Geologic Map of North Carolina, the site is within of Coastal Plain Physiographic Province in North Carolina near the contact between the Cretaceous Black Creek and Middendorf Formations. The strata of the Black Creek Formation consist of gray to black clay, thin lenses of fine-grained sand and thick lenses of cross-bedded sand. The lithology may also include glauconite and fossils. In comparison, the Middendorf Formation consists of sand, sandstone, and mudstone that are laterally discontinuous. The soils observed at the site are consistent with the Middendorf Formation as the parent material.

Analytical Results

The laboratory data are summarized in **Table 1** and the complete report is presented in **Attachment D**. Eight soil samples, one from each soil bring, were submitted for analysis. Of these samples, three contained detectable GRO compounds and seven contained detectable DRO compounds. Detected GRO concentrations ranged from 0.40 to 2.0 milligrams per kilogram (mg/kg). Detected DRO concentrations ranged from 0.31 to 18.6 mg/kg. The action levels are 50 mg/kg for GRO and 100 mg/kg for DRO[1]. None of the soil samples analyzed for this site contained DRO or GRO concentrations above their respective action levels.

Conclusions and Recommendations

A Preliminary Site Assessment was conducted to evaluate the John Taylor Property (Parcel #198) located at 5201 Raeford Road in Fayetteville, Cumberland County, North Carolina. A geophysical survey conducted at the site indicated that no unknown metallic USTs were present within the geophysical survey area of the site. Eight soil borings were advanced to evaluate the subsurface soil conditions along the right-of-way/proposed easement, from which eight soil samples were collected. Three of the eight soil samples analyzed had a GRO concentration above the detection limit, and seven of the eight soil samples had DRO concentrations were present above the detection limit. However, none of the DRO or GRO concentrations were above their respective action limits.

None of the soil samples had contaminant concentrations above applicable action levels (**Table 1**). Therefore, no estimate of the volume of soil requiring possible remediation was made.

[1] NCDEQ, *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons (TPH)*, July 26, 2016,

SIES appreciates the opportunity to work with the NCDOT on this project. Because compounds were detected above the method detection limit in the soil samples, SIES recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Fayetteville Regional Office. If you have any questions, please contact us at (919) 873-1060.

Sincerely,

Michael W. Branson, P.G.
Project Manager

John Palmer, P.G.
Senior Hydrogeologist

Attachments

TABLE 1
SOIL FIELD SCREENING AND ANALYTICAL RESULTS
TAYLOR PROPERTY (PARCEL #198)
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA
STATE PROJECT: U-4405
WBS ELEMENT 39049.1.1
SIES PROJECT NO. 2016.0054.NDOT

SAMPLE ID	DEPTH (ft)	PID READING (ppm)	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)	
				UVF GRO	UVF DRO
	Action Level (mg/kg)			50	100
198-SB-1	0 - 2	0.7			
	2 - 4	19.3			
	4 - 6	25.8			
	6 - 8	31.7	198-SB-1-6-8	<0.7	**18.6**
	8 - 10	0.9			
	10 - 12	8.2			
198-SB-2	0 - 2	0.0			
	2 - 4	0.3			
	4 - 6	28.7	198-SB-2-4-6	<0.65	**1.3**
	6 - 8	10.1			
	8 - 10	3.8			
	10 - 12	5.1			
198-SB-3	0 - 2	5.1			
	2 - 4	14.1			
	4 - 6	8.2			
	6 - 8	1.7			
	8 - 10	1.7			
	10 - 12	20.8	198-SB-3-10-12	<0.57	<0.57
198-SB-4	0 - 2	0.0			
	2 - 4	0.1			
	4 - 6	0.0			
	6 - 8	0.2			
	8 - 10	0.0	198-SB-4-8-10	**0.46**	**0.33**
198-SB-5	0 - 2	0.0			
	2 - 4	0.1			
	4 - 6	0.0			
	6 - 8	0.3			
	8 - 10	56.4	198-SB-5-8-10	**0.40**	**0.31**
198-SB-6	0 - 2	0.0			
	2 - 4	0.1			
	4 - 6	0.3			
	6 - 8	0.3			
	8 - 10	20.3	198-SB-6-8-10	<0.58	**0.89**
198-SB-7	0 - 2	0.1			
	2 - 4	0.0			
	4 - 6	0.1			
	6 - 8	0.0			
	8 - 10	0.2	198-SB-7-8-10	<0.15	**0.66**
198-SB-8	0 - 2	0.1			
	2 - 4	0.0			
	4 - 6	0.1			
	6 - 8	0.2			
	8 - 10	0.1	198-SB-8-8-10	**2.0**	**4.2**

1) ft - feet

2) ppm - parts per million

3) PID - photoionization ionization detector.

4) mg/kg - milligrams per kilogram

5) UVF DRO - Diesel range organics by UVF.

6) UVF GRO - Gasoline range organics by UVF.

7) Action level based upon NCDEQ memo *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons* - July 29, 2016.

8) Soil samples were collected on October 25, 2016.

9) **Bold** values are above the detection level.

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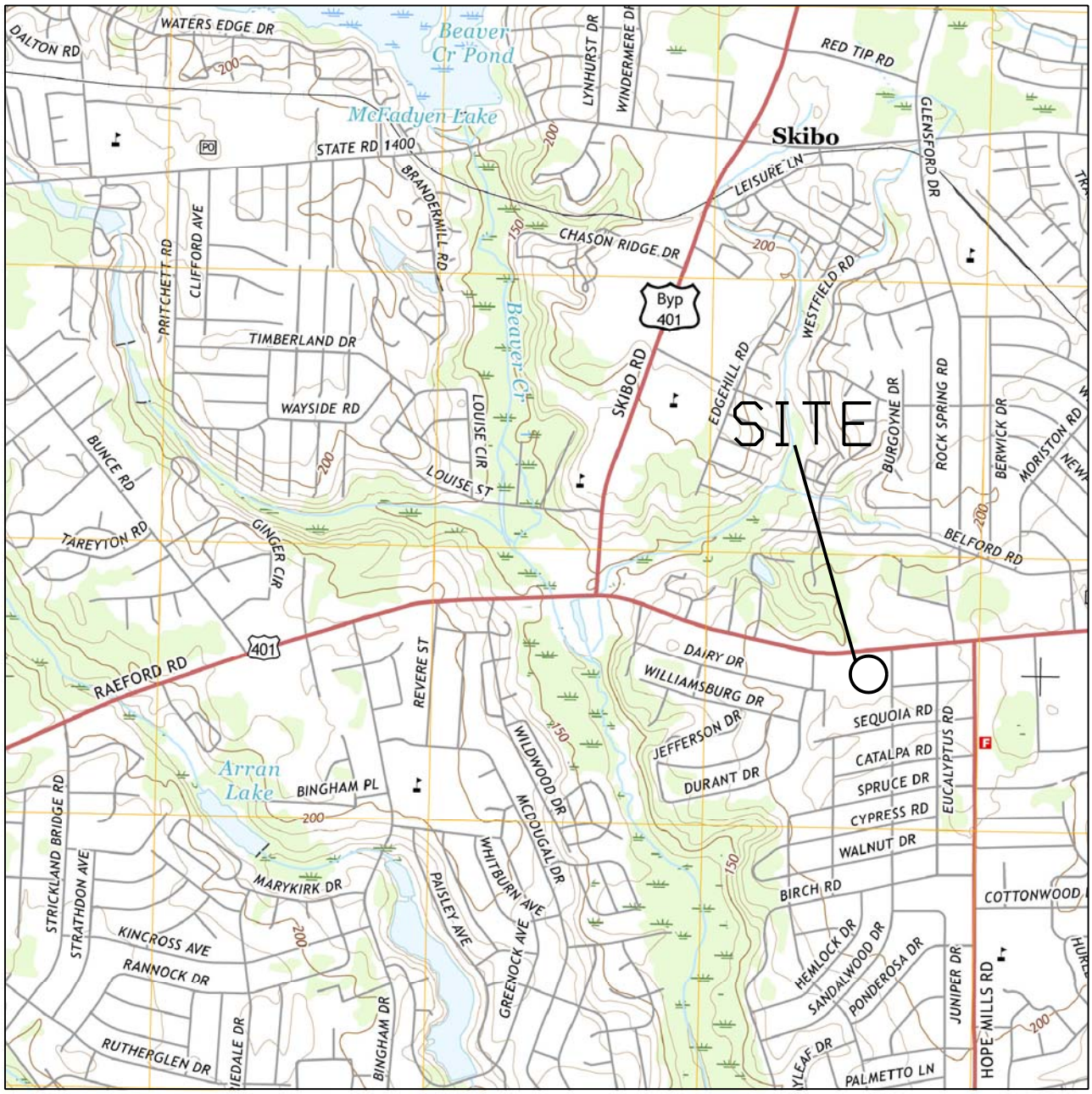
FIGURES



SCALE 1:24,000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: FAYETTEVILLE, NC (2016)

FILE: FAYETTEVILLE PSAS
DATE: NOVEMBER 2016
PROJECT MANAGER: MWB
CHECKED BY: JEP
PROJECT NUMBER: 2016.0054.NDOT

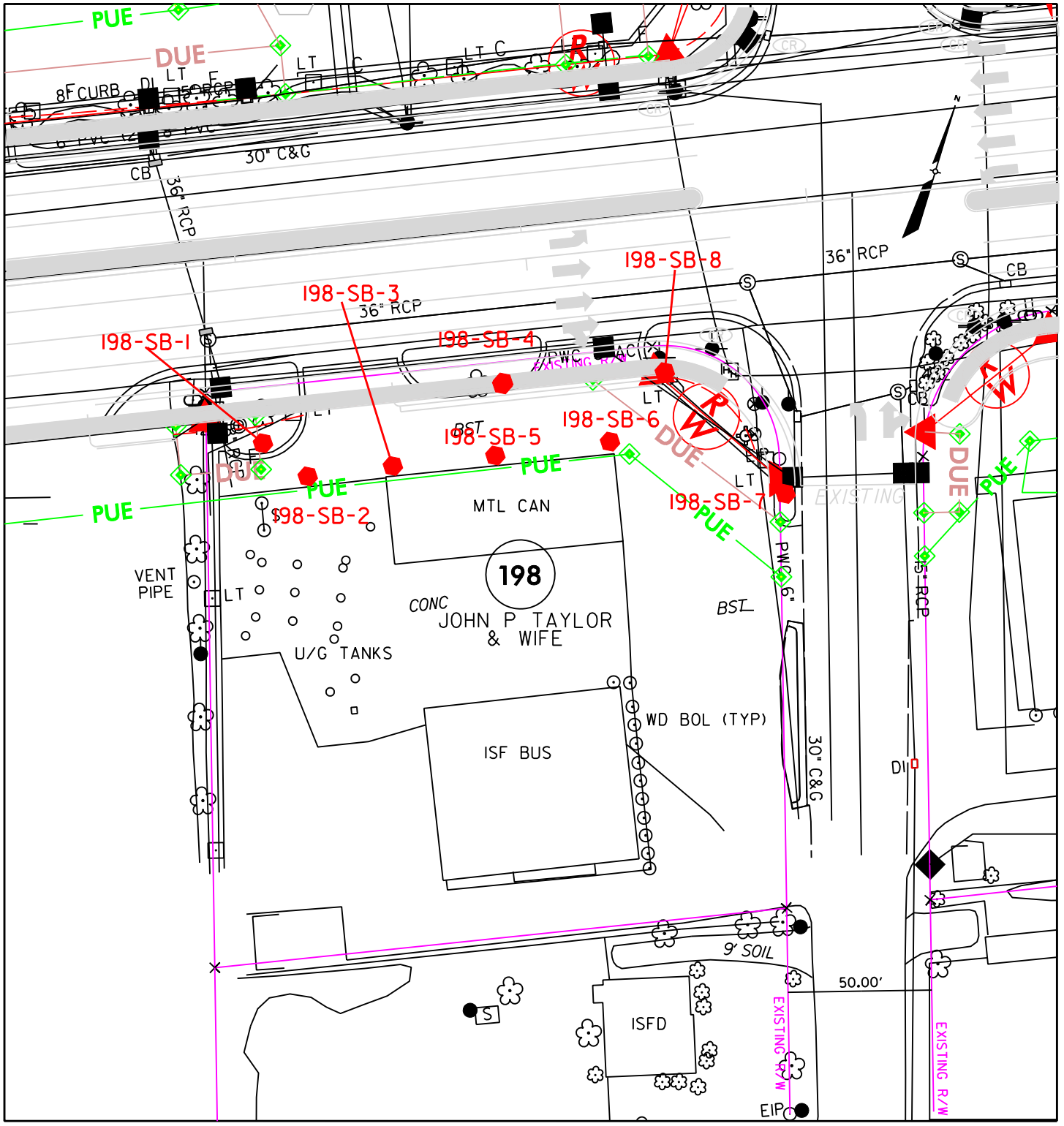
Solutions-IES
Industrial & Environmental Services
1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
TEL: (919) 873-1060 FAX: (919) 873-1074

VICINITY MAP

TAYLOR PROPERTY (PARCEL #198)
FAYETTEVILLE, CUMBERLAND COUNTY NORTH CAROLINA

FIGURE 1

PROJECT NUMBER 2016.0054.NDOT
MWB
DRAFTER
JEP
CHECKED BY
MWB
PROJECT MANAGER
NOVEMBER 2016
DATE
FAYETTEVILLE PSAS
FILE



LEGEND

198-SB-1

SOIL SAMPLE LOCATION AND IDENTIFICATION

0 25 50
GRAPHIC SCALE (FEET)

Solutions-IES
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1101 NOWELL ROAD
RALEIGH, NORTH CAROLINA 27607
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SITE MAP

TAYLOR PROPERTY (PARCEL #198)

FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA

FIGURE 2

...\reports\FIGURES\198.dgn 12/21/2016 12:02:11 PM

ATTACHMENT A

Pyramid Geophysics

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2016-265)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 198 – JOHN TAYLOR
NCDOT PROJECT U-4405

5201 RAEFORD RD., FAYETTEVILLE, CUMBERLAND COUNTY, NC

NOVEMBER 4, 2016

Report prepared for: **Mike Branson**
Solutions, IES
1101 Nowell Road
Raleigh, North Carolina 27607

Prepared by: _____

Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____

Douglas A. Canavello, P.G.
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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 198 – 5201 Raeford Road
Fayetteville, Cumberland County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD	Computer Assisted Drafting and Design
DF	Dual Frequency
EM	Electromagnetic
GPR	Ground Penetrating Radar
GPS	Global Positioning System
NCDOT	North Carolina Department of Transportation
ROW	Right-of-Way
SVE	Soil Vapor Extraction
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 198, located at 5201 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: All EM anomalies were directly attributed to visible cultural features and known utilities. A GPR survey was not required. Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 198.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 198, located at 5201 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active service station with a pump island and canopy surrounded by asphalt parking areas and grass medians. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection survey. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8 foot intervals along north-south trending or east-west trending, generally

parallel survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 11.0 software programs.

GPR data were not required at this property due to all EM anomalies being directly attributed to visible cultural features at the ground surface or known utilities (see Discussion of Results below).

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Storm Drains	
2	Manhole	
3	Telephone Pole and Utility Box	
4	Storm Drain	
5	Water Meter	
6	Light Pole	
7	Guy Wire	
8	Fire Hydrant	
9	Vehicle	
10	Sign	

All of the EM anomalies recorded by the survey are directly attributed to visible cultural features such as storm drains, a manhole, utility poles, known utilities, a water meter, guy wires, a fire hydrant, vehicles and signs. For this reason, a GPR survey was not required to verify any unknown anomalies.

Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 198.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 data collected at Parcel 198 in Fayetteville, Cumberland County, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All EM anomalies were directly attributed to visible cultural features and known utilities. A GPR survey was not required.

- Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 198.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Solutions, IES in accordance with generally accepted guidelines for EM61 surveys. It is generally recognized that the results of the EM61 surveys are non-unique and may not represent actual subsurface conditions. The EM61 results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

N↑

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately East)

View of Northeast Survey Area
(Facing Approximately West)

TITLE
PARCEL 198 - GEOPHYSICAL SURVEY
BOUNDARIES AND SITE PHOTOGRAPHS

PROJECT
5201 RAEFORD ROAD
FAYETTEVILLE, NORTH CAROLINA
NCDOT PROJECT U-4405

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License # C1251 Eng. / License # C257 Geology

DATE 10/19/16	CLIENT SOLUTIONS, IES
PYRAMID PROJECT #: 2016-265	**FIGURE 1**

N↑

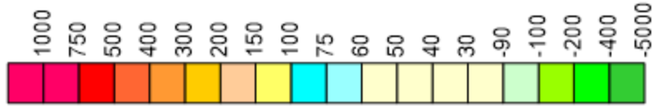
EM61 METAL DETECTION RESULTS

NUMBERS IN BLUE (x) CORRESPOND TO ANOMALY TABLE INCLUDED IN THE REPORT

NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on October 12, 2016, using a Geonics EM61 instrument. GPR verification data were not required due to all EM anomalies being directly attributed to visible cultural features.

EM61 Metal Detection Response (millivolts)



TITLE	PARCEL 198 - EM61 RESULTS CONTOUR MAP
PROJECT	5201 RAEFORD ROAD FAYETTEVILLE, NORTH CAROLINA NCDOT PROJECT U-265

Pyramid Geophysics
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE	10/19/2016	CLIENT	SOLUTIONS, IES
PYRAMID PROJECT #:	2016-265		**FIGURE 2**

ATTACHMENT B

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Log of Boring 198-SB-1

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 12 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.7 19.3	Light brown silty clay. Dry.	0–4
4–8	198-SB-1-6-8	100%	25.8 31.7	Light brown silty clay. Dry.	4–8
8–12		100%	0.9 8.2	Light brown soft clay. Dry.	8–12

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-2

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 12 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0				Asphalt	0
1		100%	0.0		1
2			0.3		2
3					3
4	198-SB-2-4-6			Light brown and red mottled silty clay. Dry.	4
5		100%	28.7		5
6					6
7			10.1		7
8					8
9		100%	3.8		9
10				Light brown soft clay. Dry.	10
11			5.1		11
12				End of Boring	12

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-3

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 12 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0				Asphalt	0
1		100%	5.1		1
2					2
3			14.1		3
4		100%			4
5			8.2		5
6				Tan silty sand. Dry.	6
7			1.7		7
8		100%			8
9			1.7		9
10	198-SB-3-10-12				10
11			20.8		11
12				End of Boring	12

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-4

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.0, 0.1	Light brown and red mottled silty clay. Dry.	0–4
4–8		100%	0.0, 0.2	Light brown and red mottled silty clay. Dry.	4–8
8–9	198-SB-4-8-10	100%	0.0	Light brown and red mottled silty clay. Dry.	8–9
9–10				Light brown soft clay. Dry.	9–10

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-5

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

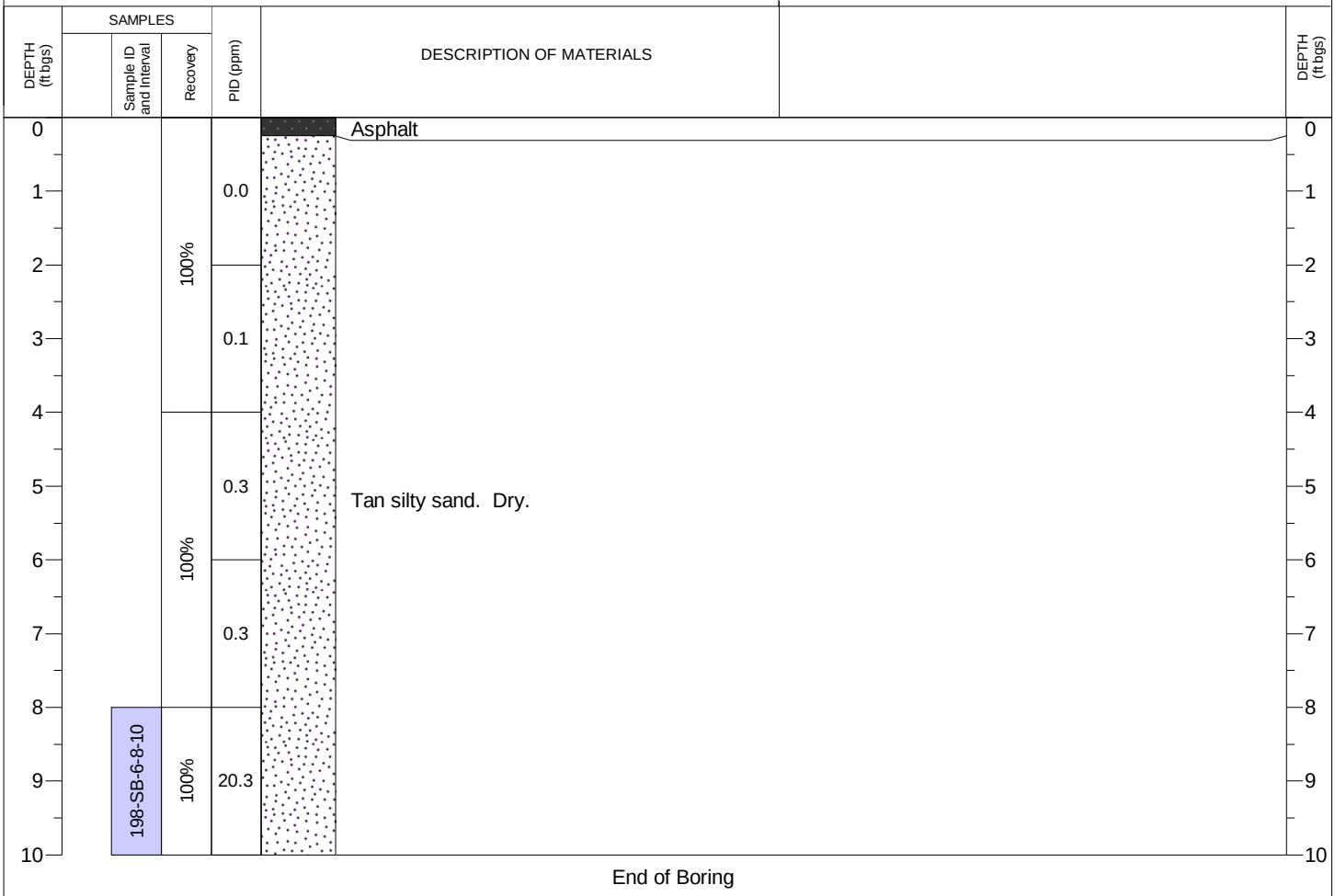
DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0				Asphalt	0
1		100%	0.0		1
2					2
3			0.1		3
4					4
5		100%	0.0	Tan silty sand. Dry.	5
6					6
7			0.3		7
8	198-SB-5-8-10	100%			8
9			56.4		9
10					10

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-6

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	



End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-7

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.1 / 0.0	Light brown silty clay. Dry.	0–4
5–8		100%	0.1 / 0.0	Light brown soft clay. Dry.	5–8
8–10	198-SB-7-8-10	100%	0.2		8–10

End of Boring

Solutions-IES
Industrial & Environmental Services

Log of Boring 198-SB-8

BORING LOCATION: Parcel #198, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/25/2016 — DATE FINISHED: 10/25/2016
DRILLING METHOD: Direct Push — BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs — SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA — EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA — FINAL DTW: NA
LOGGED BY: Samuel McIntyre — CHECKED BY:	

DEPTH (ft bgs)	SAMPLES: Sample ID and Interval	SAMPLES: Recovery	PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
0–4		100%	0.1 / 0.0	Light brown silty clay. Dry.	0–4
4–8		100%	0.1 / 0.2	Light brown soft clay. Dry.	4–8
8–10	198-SB-8-8-10	100%	0.1		8–10

End of Boring

ATTACHMENT C

PHOTO 1- VIEW OF SOIL BORING LOOKING WEST

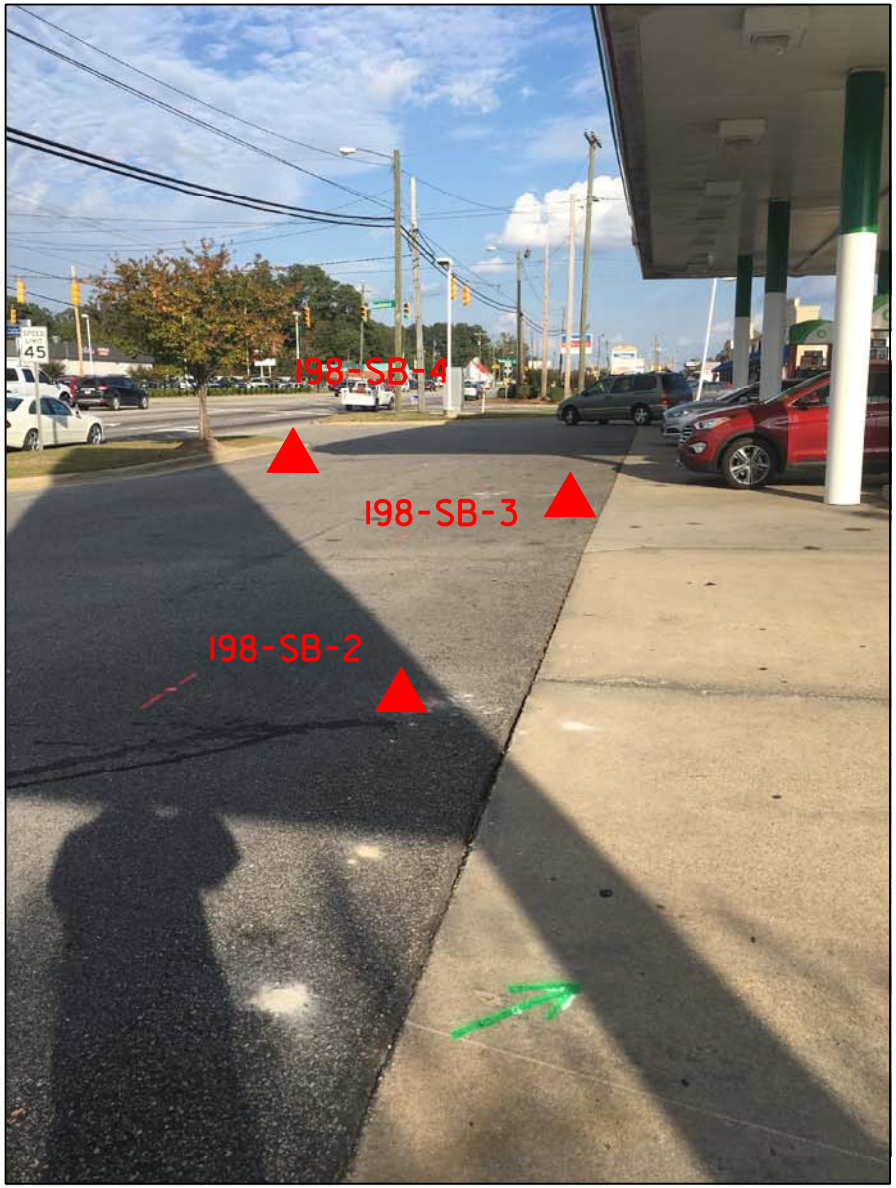


PHOTO 2 - VIEW OF SOIL BORING LOOKING EAST

PHOTO 3 - VIEW OF SOIL BORING LOOKING EAST

PHOTO 4 - VIEW OF SOIL BORING LOOKING SOUTHEAST

PHOTO 5 - VIEW OF SOIL BORING LOOKING EAST

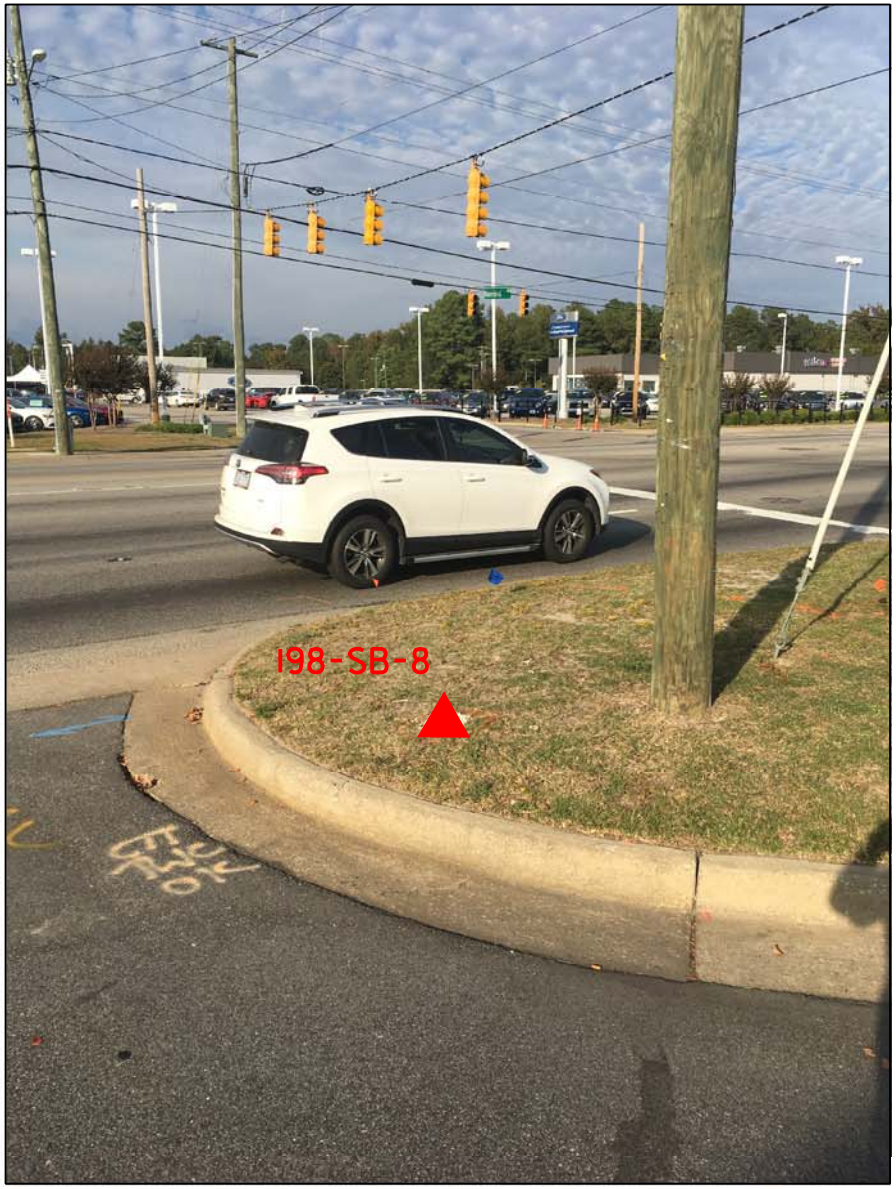


PHOTO 6 - VIEW OF SOIL BORING LOOKING NORTH

ATTACHMENT D

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: NCDOT
Address: Site 198: 5201 Raeford Road
Fayetteville, NC

Contact:

Project: 2016.0054.NDOT

Samples taken 10/25/2016
Samples extracted 10/25/2016
Samples analysed 10/25/2016

Operator Candy Elliott

U04049

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	198-SB-1-6-8	27.8	<0.7	<0.7	18.6	18.6	9.7	0.43	0.005	0	85.6	14.4	V.Deg.PHC (FCM) 65.9%
s	198-SB-2-4-6	25.8	<0.65	<0.65	1.3	1.3	0.61	<0.02	<0.003	0	88.4	11.6	(FCM) (BO) 47.2%
s	198-SB-3-10-12	22.7	<1.1	<0.57	<0.57	<0.57	<0.11	<0.02	<0.002	0	57.3	42.7	Residual.PHC
s	198-SB-4-8-10	7.5	0.46	0.46	0.33	0.79	0.26	0.08	<0.001	66.7	25.6	7.8	Pyrogenic HC (FCM) (P) 36.8% B
s	198-SB-5-8-10	5.9	<0.15	0.4	0.31	0.71	0.2	0.01	<0.001	68.7	26	5.3	Deg Gas (FCM) 65.3%
s	198-SB-6-8-10	23.2	<0.58	<0.58	0.89	0.89	0.69	0.03	<0.002	0	85.9	14.1	V.Deg.PHC (FCM) 56.5%
s	198-SB-7-8-10	5.9	<0.29	<0.15	0.66	0.66	0.32	0.02	0.001	0	73.5	26.5	V.Deg.PHC (FCM) (P) 74.2%
s	198-SB-8-8-10	24.8	<0.62	2	4.2	6.2	1.7	0.09	0.002	56.8	32.1	11.1	V.Deg.PHC (FCM) 79.4%

Initial Calibrator QC check OK

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

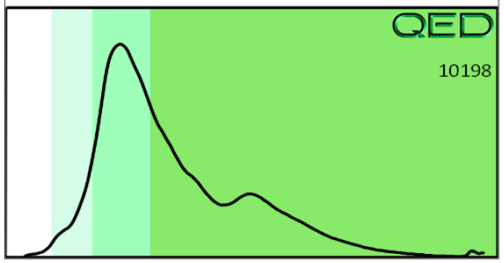
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

QED Hydrocarbon Fingerprints

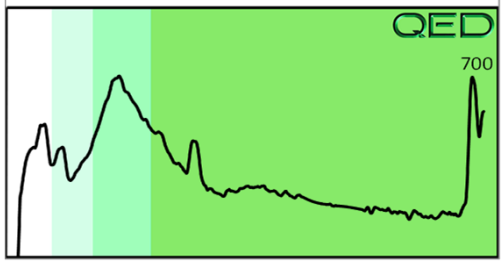
Project: 2016.0045.NDOT

10/25/2016

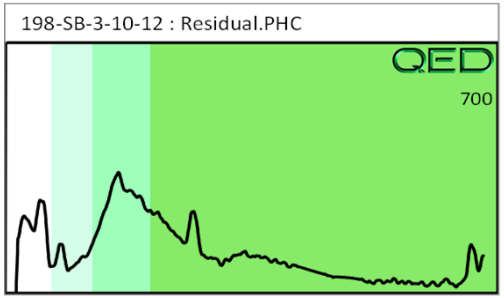
198-SB-1-6-8 : V.Deg.PHC (FCM) 65.9%



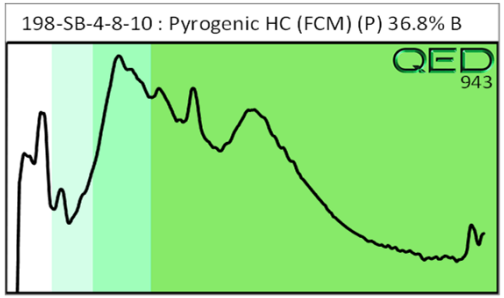
198-SB-2-4-6 : (FCM) (BO) 47.2%



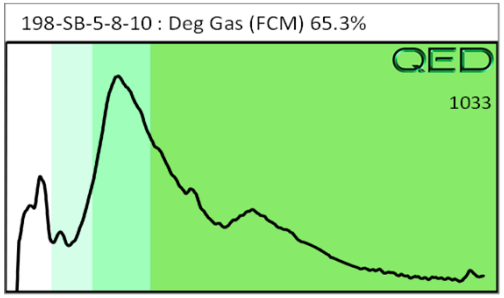
198-SB-3-10-12 : Residual.PHC



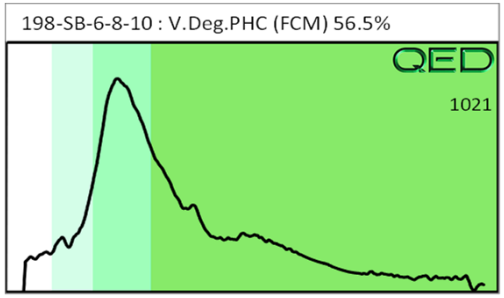
198-SB-4-8-10 : Pyrogenic HC (FCM) (P) 36.8% B

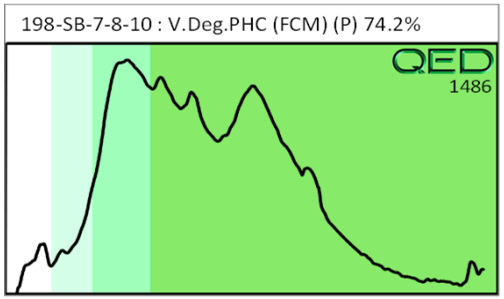


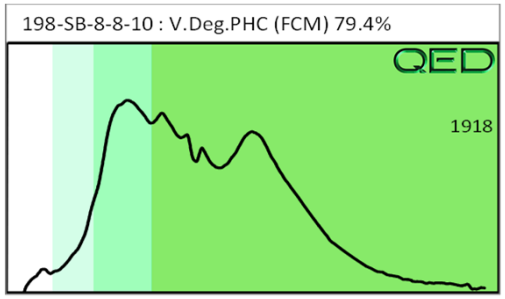
198-SB-5-8-10 : Deg Gas (FCM) 65.3%



198-SB-6-8-10 : V.Deg.PHC (FCM) 56.5%




198-SB-7-8-10 : V.Deg.PHC (FCM) (P) 74.2%
QED
1486


198-SB-8-8-10 : V.Deg.PHC (FCM) 79.4%
QED
1918