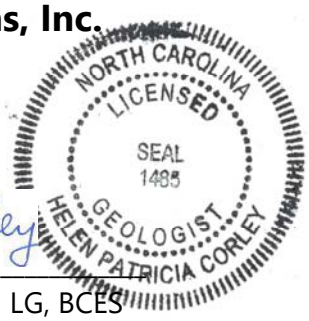
North Carolina Department of Transportation

Phase II Investigation
State Project: R-5709
WBS Element: 50205.1.1
Moore County

Parcel 123
Karlton Oates Property
9849 NC 211 Hwy
Aberdeen, North Carolina
October 21, 2021

Wood Environment & Infrastructure Solutions, Inc.
Project: 20478R5709



Andrew Frantz, REM
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Principal Hydrogeologist

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1.0 INTRODUCTION

In response to the North Carolina Department of Transportation (NCDOT) Request for Proposal, dated June 2, 2021, Wood Environment & Infrastructure Solutions, Inc. (Wood) has performed a Phase II Investigation for Parcel 123 (Site). The investigation was conducted in accordance with Wood's Technical and Cost proposal dated June 18, 2021, and NCDOT's July 6, 2021, Notice to Proceed. NCDOT contracted Wood to perform the Phase II Investigation at the parcel, within areas that will be affected by the proposed widening of NC 211 Hwy from US 15-501 in Aberdeen, North Carolina to SR 1244 (West Palmer Street)/SR 1311 (Mockingbird Hill Road) in Raeford, North Carolina.

The Site is located along the northern side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The Site, which is located at 9849 NC 211 Hwy, is currently vacant. The Site is identified as Parcel 123, Karlton Oates property, within the NCDOT MicroStation survey file and is in Aberdeen of Moore County, North Carolina. The area of investigation at Parcel 123 is approximately 0.413-acres as shown on **Figure 2**.

The Site was reported as a possible former gasoline station in the 2019 NCDOT Phase I Report. In addition, a concrete pad was observed on the southern portion of the parcel. A metal pipe was observed protruding up from the concrete pad. Based on the presence of the metal pipe, it is suspected that the pad is a former dispenser island. Wood reviewed the North Carolina Laserfiche online database and NCDEQ documentation for Parcel 123 was not present. In addition, Wood reviewed the NCDOT Historical Aerial Imagery Index and a photograph from 1990 was available for review. A building is visible on the southern portion of the parcel. Due to the quality of the aerial photograph, other Site features were not discernable.

The following report describes a geophysical survey and subsurface field investigation at the Site, with results from our ultraviolet fluorescence (UVF) soil analyses and evaluation for potential soil contamination within the Site.

2.0 GEOLOGY

2.1 Regional Geology

The Site is located within the Coastal Plain Physiographic Province of North Carolina. According to the 1985 State Geologic Map of North Carolina, the area is within the Middendorf Formation and is underlain by sand, sandstone, and mudstone.

2.2 Site Geology

Site geology was observed through the advancement of 13 shallow soil borings (P123-B1 to P123-B13). The borings were advanced to an approximate depth of 10 feet below ground surface (bgs). Groundwater was not encountered during boring advancement. Figure 2 presents the boring locations and Site layout. Soils encountered in the borings consisted mostly of gray clay overlying white to tan medium-grained sand. Staining and petroleum odors were not observed in the borings. Based on observations of topography of the Site vicinity, the groundwater flow direction is inferred to be generally toward the southwest. Boring logs are presented in **Appendix A**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the Site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was created with the Site-specific health and safety information necessary for the field activities, including protocol for COVID-19. North Carolina 811 was contacted on August 24, 2021, for the parcel.

Eastern Solutions, LLC of Charlotte, North Carolina (Eastern Solutions) was retained to perform vegetation clearing at the parcel to facilitate access for geophysical survey equipment. Pyramid Geophysical Services of Greensboro, North Carolina (Pyramid) was retained to conduct a geophysical investigation. Probe Utility Locating (PUL) was retained to perform utility locating activities at the Site. Innovative Environmental Technologies, Inc. (IET) of Concord, North Carolina was retained by Wood to perform the direct push sampling

for soil borings, and UVF instrumentation was rented from Red Lab, LLC (Red Lab) of Wilmington, North Carolina.

Boring locations were strategically placed within the parcel to maximize the opportunity to encounter potential contaminated soil and evaluate areas of subsurface design features.

3.2 Site Reconnaissance and Vegetation Clearing

Wood personnel visited the parcel on June 8, 2021, and observed that the Site was vacant with a suspected dispenser island located on the southern portion of the parcel. In addition, two flush mount groundwater monitoring wells were observed on the western portion of the parcel and identified as MW-1 and MW-2. According to the well tags located at each well, MW-1 has a total depth of 54 feet bgs with a screened interval of 39 – 54 feet bgs while MW-2 has a total depth of 29 feet bgs with a screened interval of 14 – 29 feet bgs. Wood personnel measured the depth to water in each well with an electronic water level meter. The depth to water in MW-1 was measured at 40.70 below top of casing (btoc) and was 21.95 btoc in MW-2. A photographic log is included in **Appendix B**.

The vegetation clearing was conducted by Eastern Solutions personnel on August 4, 2021. Eastern Solutions used a brush hog to mow the tall grass on the southern portion of the parcel.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel between August 10 and 12, 2021. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys on the southern portion of the parcel as this area is suspected to have been occupied by a former gasoline station. A total of two EM anomalies were identified. One EM anomaly was associated with a known monitoring well, and the other anomaly consisted of two isolated metallic features that were associated with unknown buried metal. The GPR survey confirmed the absence of buried structures in the areas of the metallic interference. The geophysical survey did not identify evidence of USTs within the investigation area. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 24, 2021. The utility locating effort identified a buried water line, several buried telephone and communication lines and buried a natural gas line. The telephone and communications lines traverse the southern and northern portions of the parcel parallel to both East Main Street and NC 211 Hwy. In addition, a telephone line was identified traversing the northwestern corner of the Site, between East Main Street and the western adjacent property. The water and natural gas lines were identified on the northern portion of the parcel parallel to East Main Street. Overhead high-voltage power lines were identified along the southern parcel boundary parallel to NC 211 Hwy.

3.4 Soil Sampling

On September 3 and 7, 2021, Wood and IET mobilized to the Site to advance 13 shallow soil borings (P123-B1 to P123-B13). The borings were advanced via direct-push technology to an approximate depth of 10 feet bgs. Boring locations targeted potential environmental sources at the Site and future drainage features.

The purpose of soil sampling was to assess if a petroleum release had impacted the Site and if so, to estimate the volume of impacted soil that might require special handling during NCDOT construction activities. IET advanced a soil sampler to the target depth at each boring location using an AMS PowerProbe. To minimize the potential for cross-contamination between samples, a new polyvinyl chloride (PVC) sleeve (tube) was inserted into the sampler for each soil interval. Visual and olfactory observations relative to the soil cores were recorded by Wood personnel. The soil types encountered in the borings were recorded to prepare soil boring logs. Wood conducted field screening for volatile organic compounds (VOCs) of the soil borings with a photoionization detector (PID). The portion of each soil core with the highest PID reading was selected from the 0–5 foot interval and the 5-10 foot interval for analysis of total petroleum hydrocarbons (TPH), diesel range organics (DRO), gasoline range organics (GRO), benzene, toluene, ethylbenzene, and xylene (BTEX), total aromatics, and polycyclic aromatic hydrocarbons (PAH) by UVF. Neither groundwater nor bedrock were encountered in the borings. Twenty-six soil samples were collected from the 13 borings at the Site for onsite UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on September 3 and 7, 2021 PID screening and UVF hydrocarbon analysis, evidence of petroleum hydrocarbon impacts was not identified. The NCDEQ Action Levels of 100 milligrams per kilogram (mg/kg) for DRO and 50 mg/kg for GRO were not exceeded in the 13 borings advanced at the Site.

PID readings for the 26 soil samples ranged from 0.1 parts per million (ppm) in sample P123-B2-4-6 collected from 4 to 6 feet bgs, to 32.0 ppm in sample B123-B13-0-2 collected from 0 to 2 feet bgs. The PID field screening results for samples selected for UVF analysis are summarized in **Table 1** and the full list of PID readings are provided on the boring logs in Appendix A.

Results from the on-Site UVF petroleum soil analyses are presented in **Table 2**, with instrument generated tables in **Appendix D**. Several categories of analyses were measured such as: DRO, GRO, TPH, PAHs, and total aromatics. **Figure 3** presents the GRO and DRO results for the September 2021 investigation.

GRO or DRO detections in the 26 soil samples collected at the Site did not exceed their respective NCDEQ Action Levels. The hydrocarbon results from the QED QROS Hydrocarbon Analyzer are provided in Appendix D.

5.0 CONCLUSIONS

Based on the Site observations and UVF analysis, petroleum-impacted soil contamination was not identified as defined by localized exceedances of the NCDEQ Action Levels of 50 mg/kg for GRO and 100 mg/kg for DRO.

The following bulleted summary is based upon Wood's evaluation of field observations and on-Site quantitative analyses of samples collected from the Site September 3 to 7, 2021.

- The Site is vacant, and USTs were not identified during the geophysical survey or field activities. Subsurface piping was not identified beneath the visible concrete pad on the southern portion of the parcel.

- Thirteen soil borings were advanced to roughly 10 ft bgs in the NCDOT ROW investigation area to collect soil samples for on-Site UVF analysis. Twenty-six soil samples were collected for on-Site UVF analysis.

- UVF analysis of the 26 soil samples collected did not identify petroleum-impacted soil.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood recommends no further action.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 123 - Karlton Oates Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P123-B1	0-2	0.3
	6-8	0.5
P123-B2	0-2	0.3
	4-6	0.1
P123-B3	0-2	0.2
	4-6	0.3
P123-B4	2-4	0.4
	6-8	0.4
P123-B5	2-4	1.0
	6-8	0.8
P123-B6	2-4	14.4
	8-10	4.4
P123-B7	0-2	1.2
	4-6	0.6
P123-B8	2-4	0.5
	8-10	0.5
P123-B9	2-4	0.6
	8-10	8.2
P123-B10	2-4	9.6
	8-10	10.4
P123-B11	0-2	19.1
	4-6	14.2
P123-B12	0-2	18.7
	4-6	16.4
P123-B13	0-2	32.0
	6-8	10.7

Notes:

1. Samples collected on 9/3/21
2. Depths shown in feet below ground surface (bgs)
3. PID = Photoionization Detector
4. PID readings shown in parts per million (ppm)

Prepared By/Date: AJF 9/8/21

Checked By/Date: DRH 10/4/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 123 - Karlton Oates Property
Aberdeen, North Carolina
Wood Project: 20478R5709

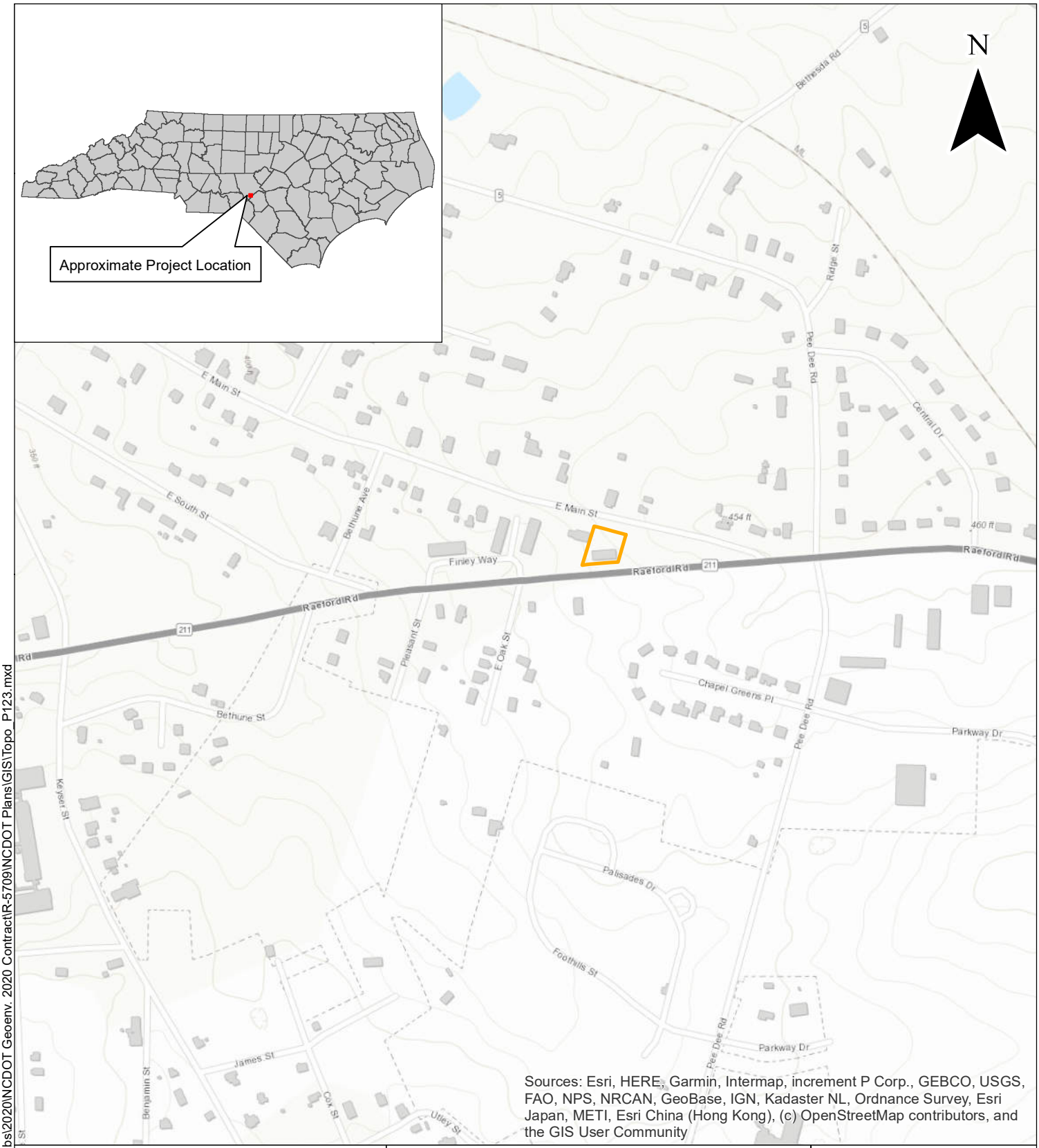
Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P123-B1-0-2	0-2	<0.3	<0.3	<0.14	0.003
P123-B1-6-8	6-8	<0.3	<0.3	<0.12	<0.006
P123-B2-0-2	0-2	<0.3	<0.3	<0.13	<0.007
P123-B2-4-6	4-6	<0.25	<0.25	0.17	0.004
P123-B3-0-2	0-2	<0.22	<0.22	<0.09	<0.005
P123-B3-4-6	4-6	<0.22	<0.22	0.9	0.016
P123-B4-2-4	2-4	<0.22	<0.22	<0.09	<0.005
P123-B4-6-8	6-8	<0.12	<0.12	0.08	0.01
P123-B5-2-4	2-4	<0.27	<0.27	5.7	0.08
P123-B5-6-8	6-8	<0.3	<0.3	<0.13	0.001
P123-B6-2-4	2-4	<0.25	<0.25	0.029	0.002
P123-B6-8-10	8-10	<0.27	<0.27	<0.11	0.001
P123-B7-0-2	0-2	<0.3	<0.3	0.5	0.012
P123-B7-4-6	4-6	<0.25	<0.25	<0.1	<0.005
P123-B8-2-4	2-4	<0.3	39.2	0.3	0.009
P123-B8-8-10	8-10	<0.25	<0.25	<0.1	<0.005
P123-B9-2-4	2-4	<0.25	<0.25	<0.1	0.002
P123-B9-8-10	8-10	<0.2	<0.2	<0.08	<0.004
P123-B10-2-4	2-4	<0.25	<0.25	0.8	0.011
P123-B10-8-10	8-10	<0.27	<0.27	0.11	0.002
P123-B11-0-2	0-2	<0.25	<0.25	0.04	0.002
P123-B11-4-6	4-6	<0.25	<0.25	0.15	0.005
P123-B12-0-2	0-2	<0.25	<0.25	9.6	0.025
P123-B12-4-6	4-6	<0.3	<0.3	0.4	0.008
P123-B13-0-2	0-2	<0.22	<0.22	1.3	0.03
P123-B13-6-8	6-8	<0.3	<0.3	<0.13	0.001
NC State Action Level		**N/A**	**50**	**100**	**N/A**

Notes:

1. Samples collected on September 3 and 7, 2021
2. Depths shown in feet below ground surface (bgs)
3. Concentrations shown in milligrams per kilogram (mg/kg)
4. BTEX = Benzene, toluene, ethylbenzene, xylene
5. GRO = Gasoline Range Organics
6. DRO = Diesel Range Organics
7. PAHs = Polycyclic aromatic hydrocarbons
8. N/A = Not applicable
9. Bold values exceed respective NC State Action Level

Prepared By/Date: DRH 9/9/21
Checked By/Date: AJF 9/24/21

FIGURES



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VICINITY MAP
R5709-PARCEL 123
9849 NC 221 HWY
ABERDEEN, NORTH CAROLINA

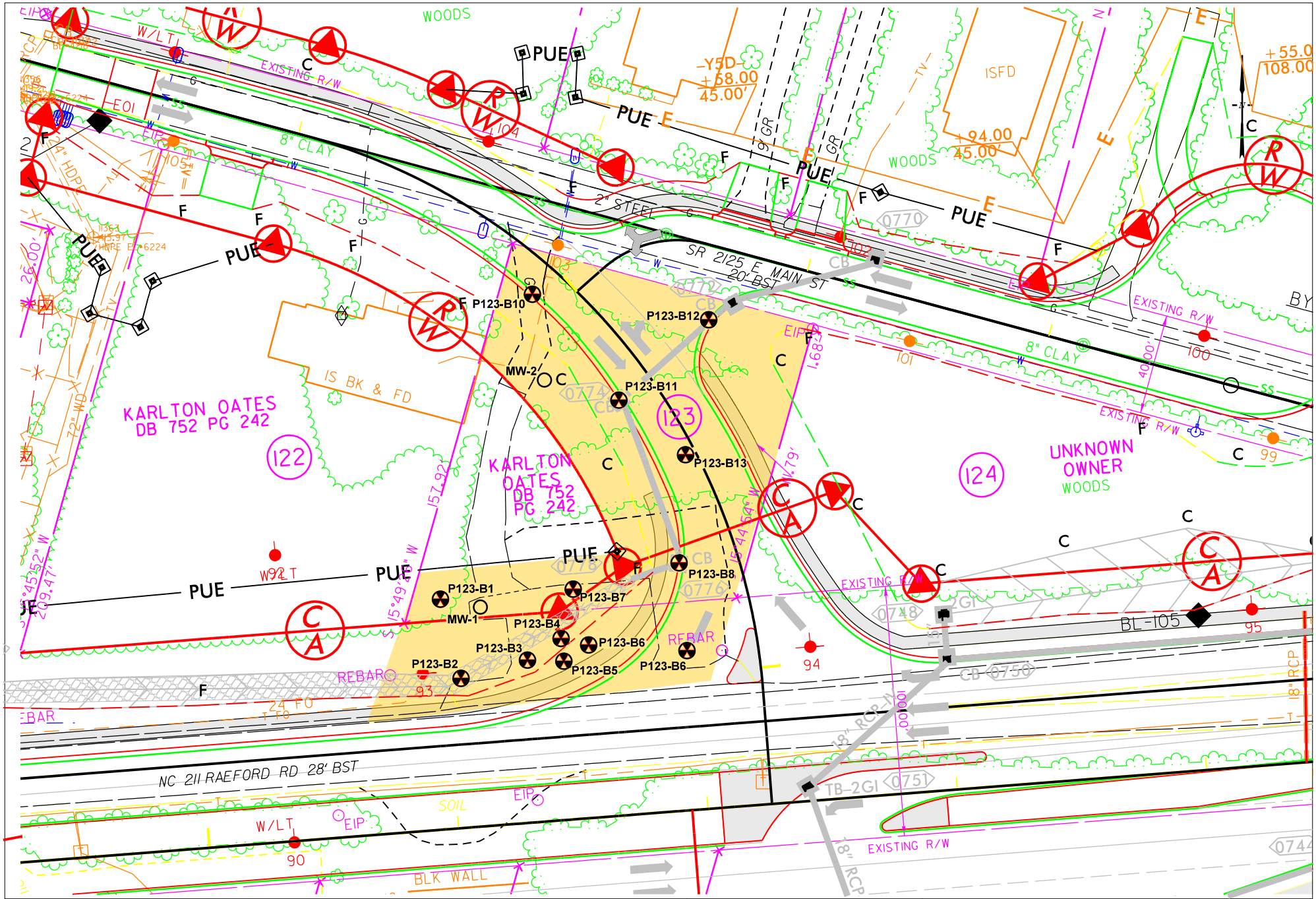
PREPARED BY:	LMM
DATE:	10/14/2021
CHECKED BY:	HPC
DATE:	10/14/2021
PROJECT NO:	20478R5709
FIGURE:	1

Legend

Site Boundary

0 500 1,000 Feet

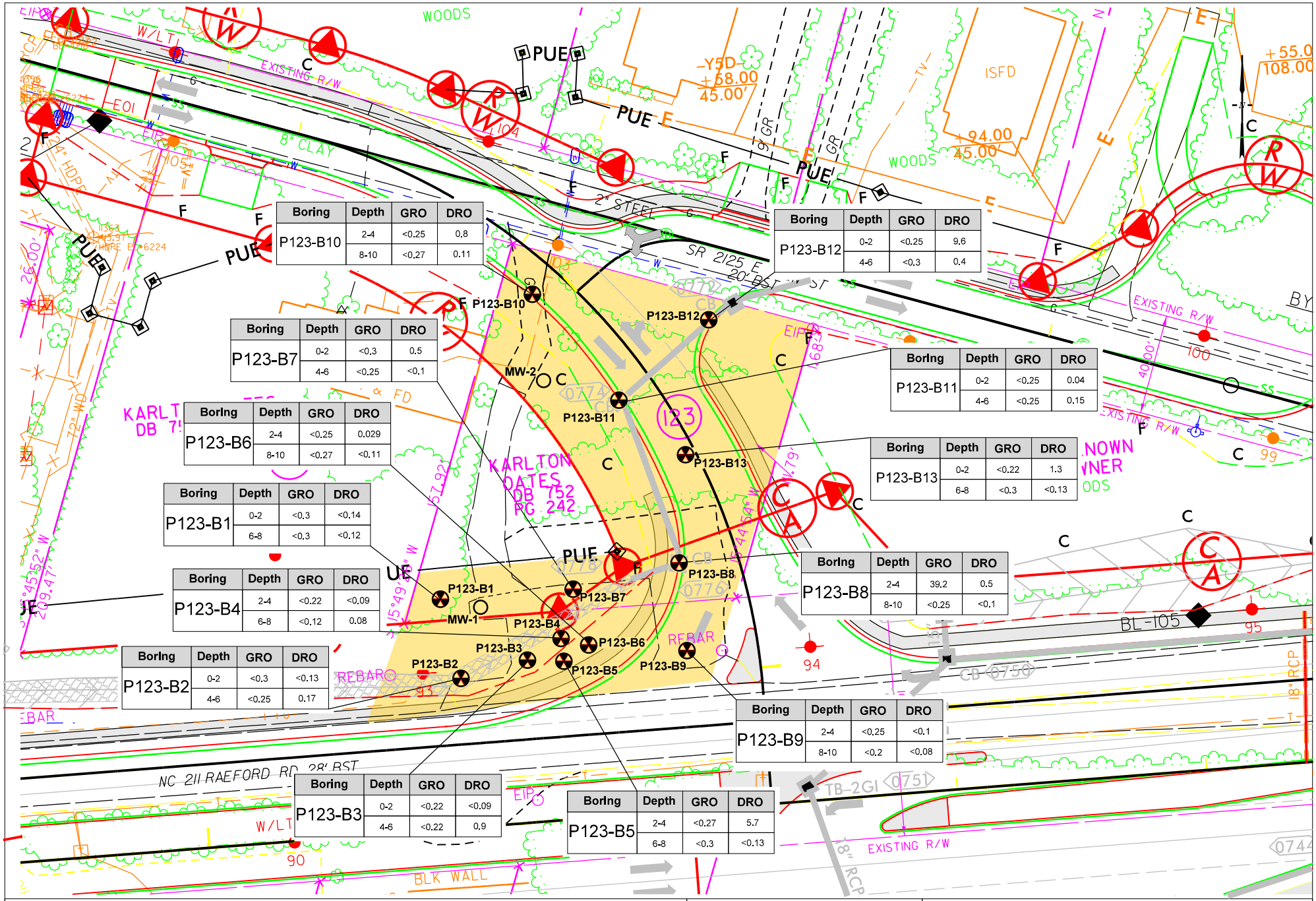
Document Path: P:\6228 Environmental\Jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P123.mxd



wood.

SITE MAP WITH BORING LOCATIONS
R-5709 - PARCEL 123
9849 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	9/29/21	AJF	9/29/21	20478R5709	2



Boring	Depth	GRO	DRO
P123-B10	2-4	<0.25	0.8
	8-10	<0.27	0.11

Boring	Depth	GRO	DRO
P123-B12	0-2	<0.25	9.6
	4-6	<0.3	0.4

Boring	Depth	GRO	DRO
P123-B7	0-2	<0.3	0.5
	4-6	<0.25	<0.1

Boring	Depth	GRO	DRO
P123-B11	0-2	<0.25	0.04
	4-6	<0.25	0.15

Boring	Depth	GRO	DRO
P123-B6	2-4	<0.25	0.029
	8-10	<0.27	<0.11

Boring	Depth	GRO	DRO
P123-B13	0-2	<0.22	1.3
	6-8	<0.3	<0.13

Boring	Depth	GRO	DRO
P123-B1	0-2	<0.3	<0.14
	6-8	<0.3	<0.12

Boring	Depth	GRO	DRO
P123-B8	2-4	39.2	0.5
	8-10	<0.25	<0.1

Boring	Depth	GRO	DRO
P123-B4	2-4	<0.22	<0.09
	6-8	<0.12	0.08

Boring	Depth	GRO	DRO
P123-B2	0-2	<0.3	<0.13
	4-6	<0.25	0.17

Boring	Depth	GRO	DRO
P123-B9	2-4	<0.25	<0.1
	8-10	<0.2	<0.08

Boring	Depth	GRO	DRO
P123-B3	0-2	<0.22	<0.09
	4-6	<0.22	0.9

Boring	Depth	GRO	DRO
P123-B5	2-4	<0.27	5.7
	6-8	<0.3	<0.13

BORING LOCATION MONITORING WELL LOCATION

AREA OF INVESTIGATION

DEPTHS SHOWN IN FEET BELOW GROUND SURFACE
CONCENTRATIONS SHOWN IN MILLIGRAMS PER KILOGRAM (mg/kg)
GRO=GASOLINE RANGE ORGANICS
DRO=DIESEL RANGE ORGANICS
GRO STATE ACTION LEVEL = 50 mg/kg
DRO STATE ACTION LEVEL = 100 mg/kg
BOLD CONCENTRATION EXCEEDS RESPECTIVE STATE ACTION LEVEL

20' 0' 20' 40'
10'
(ENGLISH)

wood.

ANALYTICAL RESULTS MAP
R-5709 - PARCEL 123
9849 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/1/21	AJF	10/1/21	20478R5709	3

APPENDIX A

BORING LOGS

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.3	Top soil/organics Gray/tan clay	P123-B1-0-2 selected for UVF analyses
2			
3	0.3		
4			
5	0.4		
6		Gray/purple/pink clay	
7	0.5		P123-B1-6-8 selected for UVF analyses
8			
9	0.4		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.3	Broken concrete/gravel Gray/purple clay	P123-B2-0-2 selected for UVF analyses
2			
3	0.2		
4		Gray/tan clay	
5	0.1		P123-B2-4-6 selected for UVF analyses
6			
7	0.1	Gray/pink clay	
8			
9	0.1		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B3**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.2	Broken concrete/gravel Gray clay	P123-B3-0-2 selected for UVF analyses
2			
3	0.1		
4			
5	0.3	Gray/purple clay	P123-B3-4-6 selected for UVF analyses
6			
7	0.2		
8		White/gray sand	
9	0.1		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B4**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.1	Broken concrete/gravel	
2		Gray clay	
3	0.4		P123-B4-2-4 selected for UVF analyses
4			
5	0.4	Gray/purple clay	
6			
7	0.4		P123-B4-6-8 selected for UVF analyses
8		White/gray sand	
9	0.2		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B5**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.9	Broken concrete/gravel	
2		Gray clay	
3	1.0		P123-B5-2-4 selected for UVF analyses
4			
5	0.8	Gray/purple clay	
6			
7	0.8		P123-B5-6-8 selected for UVF analyses
8		White/gray sand	
9	0.7		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B6**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	1.0	Broken concrete/gravel Tan/gray clay	
2			
3	14.4		P123-B6-2-4 selected for UVF analyses
4		Gray clay	
5	13.0		
6		Gray/purple/pink clay	
7	2.4		
8			
9	4.4		P123-B6-8-10 selected for UVF analyses
10		Tan/white sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B7**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	1.2	Concrete/gravel	
2		Tan/gray clay	P123-B7-0-2 selected for UVF analyses
3	0.4		
4			
5	0.6		P123-B7-4-6 selected for UVF analyses
6			
7	0.4	Gray clay	
8			
9	0.3		
10		Tan/white sand	
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B8**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR		**IET**		DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.4	Gravel	
2		Tan/brown sand	
3	0.5		P123-B8-2-4 selected for UVF analyses
4			
5	0.4	Tan/orange clayey sand	
6			
7	0.3		
8			
9	0.5	Orange/brown clayey sand	P123-B8-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B9**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.5	Tan/brown sand	
2			
3	0.6		P123-B9-2-4 selected for UVF analyses
4			
5	1.7		
6			
7	0.4	Gray clay	
8		Gray/purple clay	
9	8.2		P123-B9-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B10**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.9	Concrete/asphalt	
2		Tan sand	
3	9.6		P123-B10-2-4 selected for UVF analyses
4			
5	9.9		
6			
7	9.3	Tan/brown sand	
8		Gray/purple clay	
9	10.4		P123-B10-8-10 selected for UVF analyses
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	19.1	Tan sand, pine tree odor	P123-B11-0-2 selected for UVF analyses
2		Tan/brown sand	
3	11.4		
4			
5	14.2		P123-B11-4-6 selected for UVF analyses
6			
7	9.6	Tan/brown clayey sand	
8			
9	10.0	Tan/white clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B12**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3 and 9/7/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	18.7	Tan sand, pine tree odor	P123-B12-0-2 selected for UVF analyses
2		Tan/brown sand	
3	14.4		
4			
5	16.4		P123-B12-4-6 selected for UVF analyses
6			
7	11.5	Tan/brown clayey sand	
8			
9	12.4	Tan/white clayey sand	
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

SOIL BORING FIELD WORKSHEET

BORING #	**P123-B13**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/3/2021**			WEATHER CONDITIONS	**Partly cloudy, 80°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	32.0	Tan sand, pine tree odor	P123-B13-0-2 selected for UVF analyses
2			
3	12.1	Tan/brown sand	
4			
5	10.9		
6			
7	10.7		P123-B13-6-8 selected for UVF analyses
8		Tan/brown clayey sand	
9	7.5		
10			
11		Boring terminated at 10 feet bgs	
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			

Log Completed By: **AJF**

APPENDIX B

PHOTOGRAPHIC LOG

Photograph 1:
Southern portion of parcel 123 prior to vegetation clearing, facing northwest.

Photograph 2:
Southern portion of parcel 123 following vegetation clearing, facing northwest.

Photograph 3:
Northern portion of parcel 123, facing east.

Photograph 4:
View of IET maneuvering direct-push rig to collect soil samples, facing southwest.

Photograph 5:
View of on-Site UVF analysis setup, photograph taken on different parcel.

Photograph 6:
MW-1 located in the southwestern portion of parcel 123, facing north.

Photograph 7:
MW-2 located on the northwestern portion of parcel 123, facing north.

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 123
NCDOT PROJECT R-5709 (50205.1.1)

906 E. MAIN STREET, ABERDEEN, NC

August 25, 2021

Report prepared for: **Helen P. Corley, LG, RSM, BCES**
Wood, PLC
2801 Yorkmont Road #100
Charlotte, NC 28208

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 123 - 906 E. Main Street
Aberdeen, Moore 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
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental (Pyramid) conducted a geophysical investigation for Wood, PLC at Parcel 123, located at 906 E. Main Street, in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey area was indicated to Pyramid by Wood, PLC, and generally extended from the existing edge of pavement into the furthest proposed ROW and/or easement. Conducted from August 10-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Two EM anomalies were identified. One EM anomaly was associated with a visible well cap, and two other EM features were associated with unknown buried metal. GPR was performed across the areas containing unknown buried metal. No evidence of significant buried structures such as USTs was observed. The features are likely associated with a combination of buried debris and/or buried former infrastructure. Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 123.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 123, located at 906 E. Main Street, in Aberdeen, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5709). The survey area was indicated to Pyramid by Wood, PLC, and generally extended from the existing edge of pavement into the furthest proposed ROW and/or easement. Conducted from August 10-12, 2021, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of a vacant lot containing grass, gravel, and dirt surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. 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 15.0 software programs.

GPR data were acquired across select EM anomalies on August 12, 2021, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

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	Well	
2	Unknown Buried Metal	✓

EM Anomaly 1 was associated with a visible well cap. EM Anomaly 2 consisted of two isolated metallic features that were associated with unknown buried metal. GPR was performed across these two features to further investigate the unknown buried metal.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of four formal GPR transects were performed at the site. GPR Transects 1-2 were performed across the southern location of EM Anomaly 2 containing unknown buried metal and Transects 3-4 were performed across the northern location of EM Anomaly 2. No evidence of any significant structures such as USTs was observed. The northern feature may be associated with buried former infrastructure. The southern feature is likely associated with buried debris.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 123. **Figure 4** provides an overlay of the metal detection results on the NCDOT engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 123 in Aberdeen, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- One EM anomaly was associated with a visible well cap, and two other EM features

were associated with unknown buried metal.

- GPR was performed across the areas containing unknown buried metal. No evidence of significant buried structures such as USTs was observed. The features are likely associated with a combination of buried debris and/or buried former infrastructure.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 123.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Wood, PLC, in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR 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.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area (Facing Approximately East)

View of Survey Area (Facing Approximately West)

N

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PROJECT	PARCEL 123 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 123 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS
DATE	8/16/2021
CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201
	FIGURE 1

EM61 METAL DETECTION RESULTS

NO EVIDENCE OF METALLIC USTs WAS 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 EM data were collected on August 10, 2021, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on August 12, 2021.

EM61 Metal Detection Response (millivolts)

N

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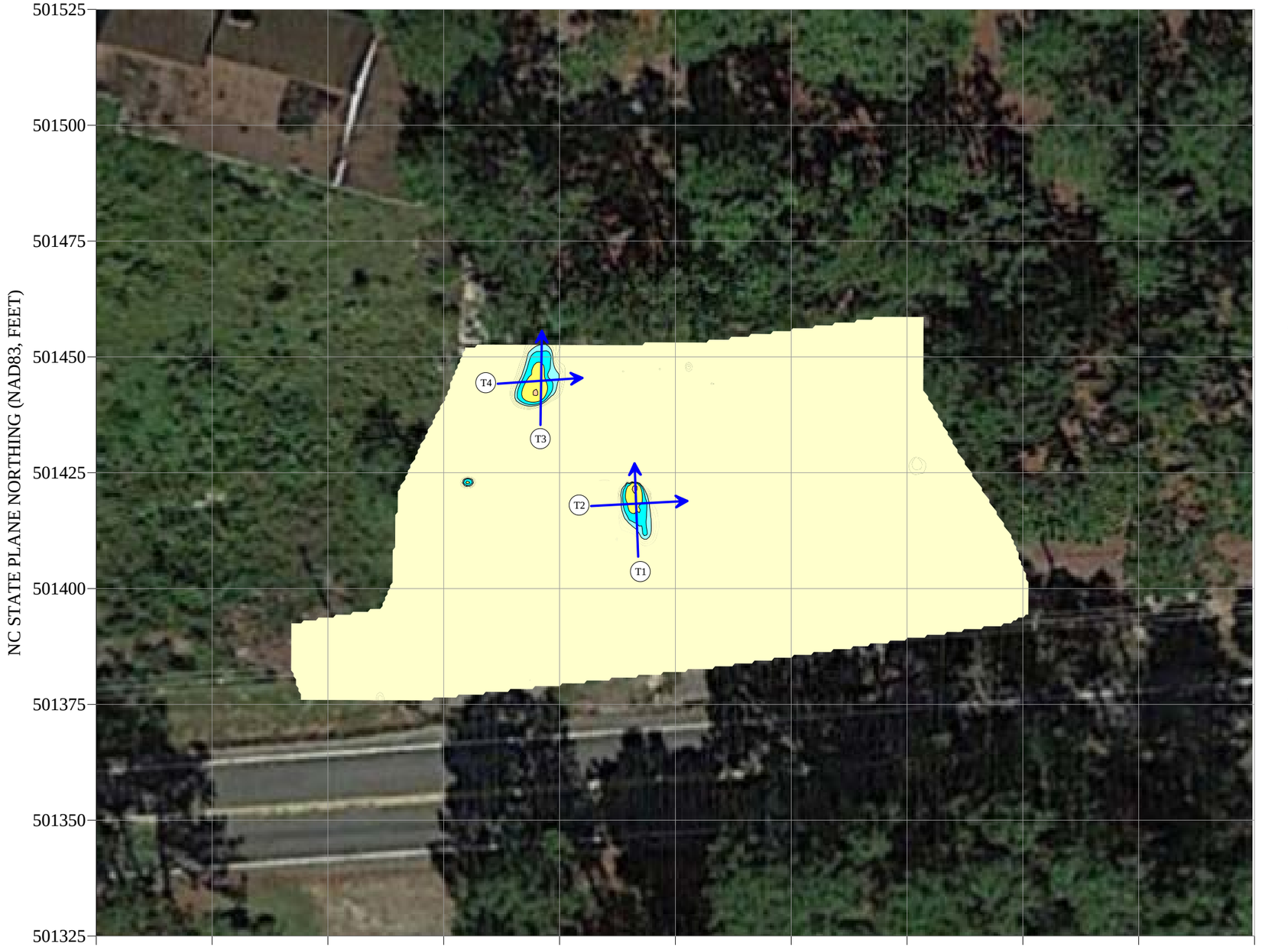
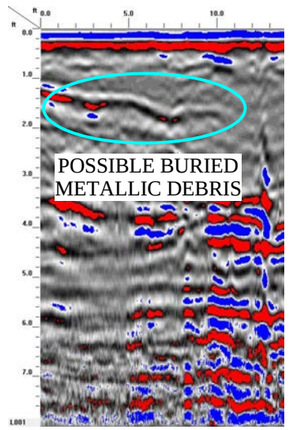
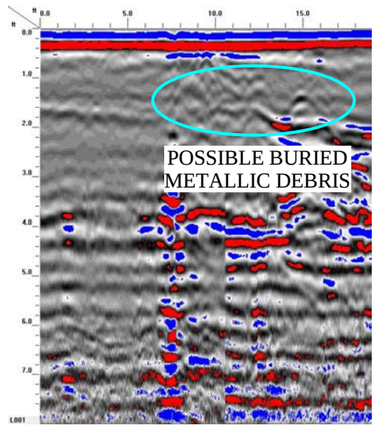
PROJECT: PARCEL 123 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE: PARCEL 123 - EM61 METAL DETECTION CONTOUR MAP	DATE: 8/16/2021	CLIENT: Wood, PLC
		PYRAMID PROJECT #: 2021-201	**FIGURE 2**

GPR TRANSECT LOCATIONS

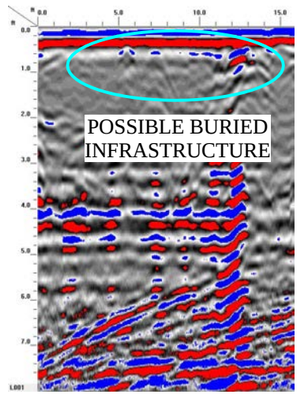




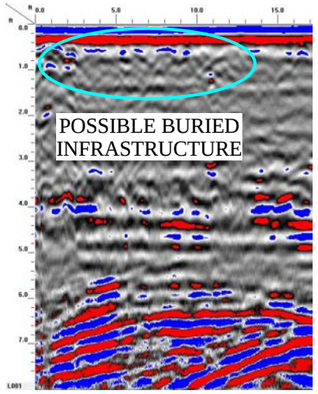
GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)

N

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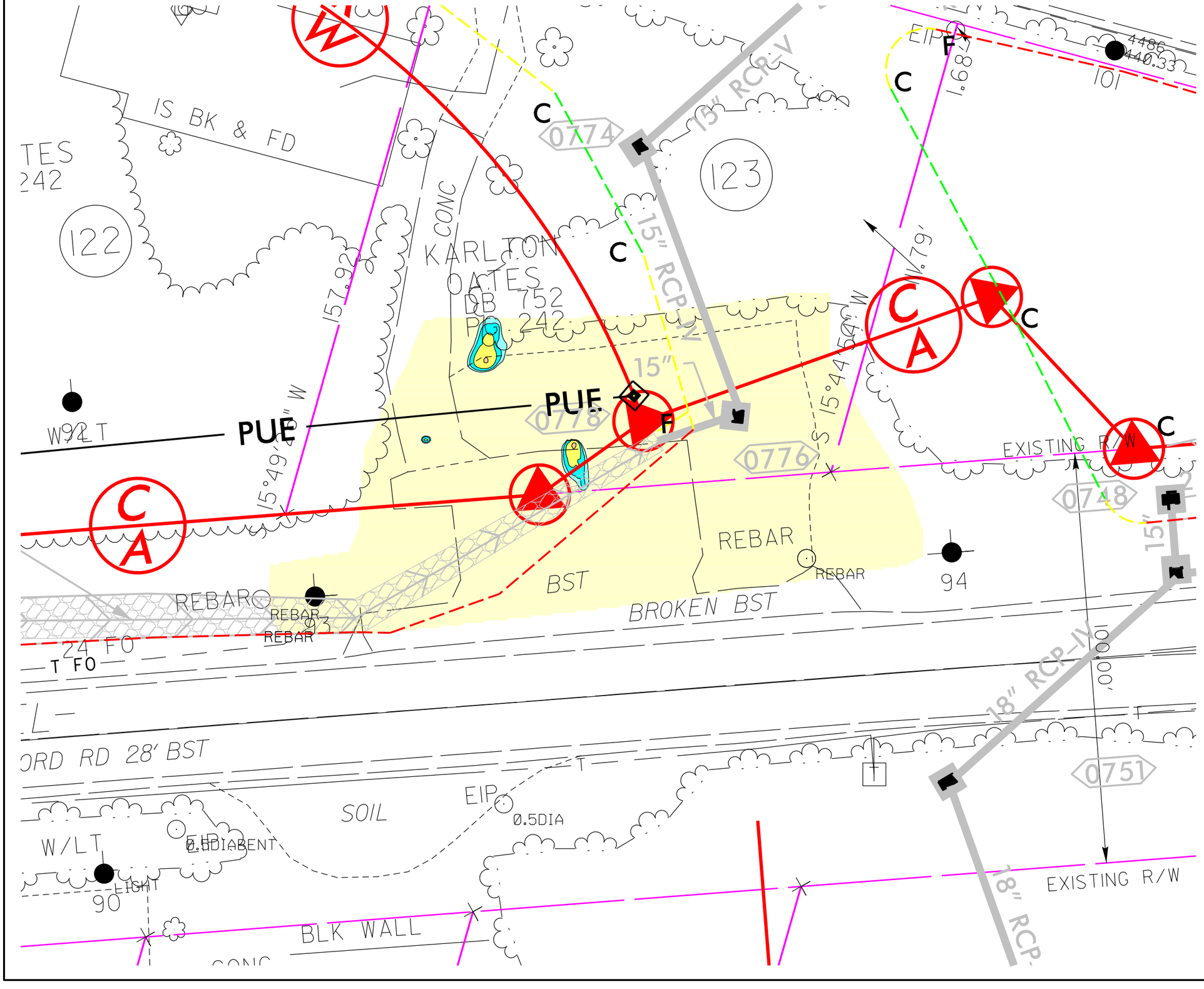
PROJECT	PARCEL 123 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 123 - GPR TRANSECT LOCATIONS AND IMAGES
DATE	8/16/2021
CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201
	FIGURE 3



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE

MILLIVOLTS (mV)

1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

N

0 10 20
FEET

TITLE
OVERLAY OF METAL DETECTION RESULTS
ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 123
ABERDEEN, NORTH CAROLINA
NCDOT PROJECT R-5709

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DATE: 08-18-2021	REVISION NO. 0
PYRAMID PROJECT NO. 2021-201	FIGURE NO. 4

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Road
Charlotte, NC 28208

Contact: Helen Corley

Project: P123

Samples taken Friday, September 3, 2021
Samples extracted Friday, September 3, 2021
Samples analysed Friday, September 3, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P123-B1-0-2	14.0	<0.3	<0.3	<0.14	0.029	0.029	0.003	<0.001	0	95.5	4.5	Residual HC
Soil	P123-B1-6-8	12.0	<0.3	<0.3	<0.12	<0.3	<0.006	<0.006	<0.004	0	100	0	Residual HC
Soil	P123-B2-0-2	13.0	<0.3	<0.3	<0.13	<0.3	<0.007	<0.007	<0.004	0	100	0	Residual HC
Soil	P123-B2-4-6	10.0	<0.25	<0.25	0.17	0.17	0.08	0.004	<0.001	0	80.4	19.6	V.Deg.PHC 89.4%,(FCM)
Soil	P123-B3-0-2	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	100	0	Residual HC,(BO)
Soil	P123-B3-4-6	9.0	<0.22	<0.22	0.9	0.9	0.4	0.016	<0.001	0	84.9	15.1	V.Deg.PHC 90.5%,(FCM)
Soil	P123-B4-2-4	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P123-B4-6-8	5.0	<0.12	<0.12	0.08	0.08	0.07	0.01	0.002	0	47.7	52.3	Background Organics

Initial Calibrator QC check OK

Final FCM QC Check OK 96.5%

Analysis by QED HC-1 Analyser

Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

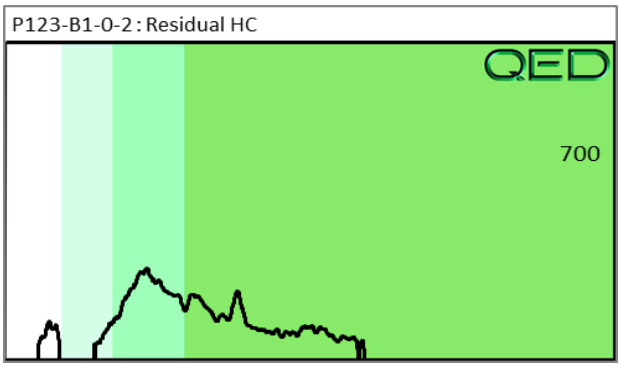
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

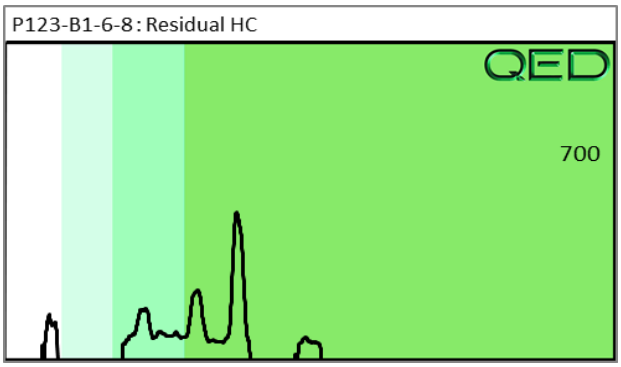
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

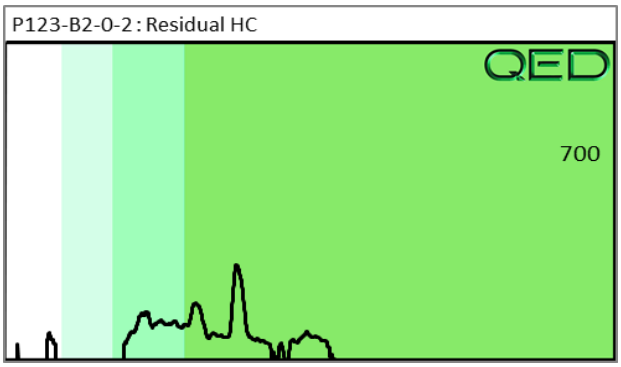
(TD) = Calibration outside limit

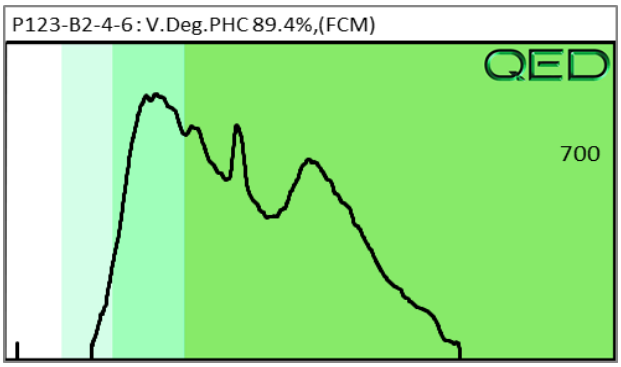
QED Hydrocarbon Fingerprints

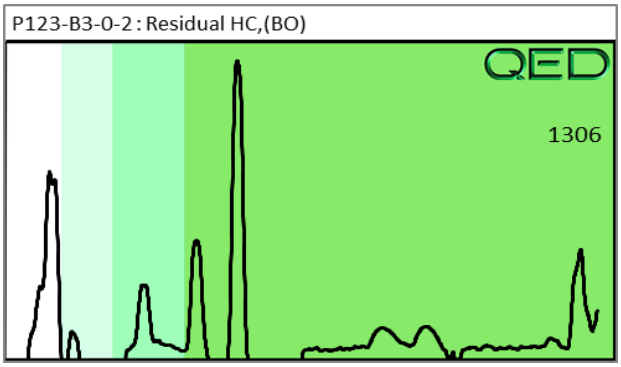
Project: P123

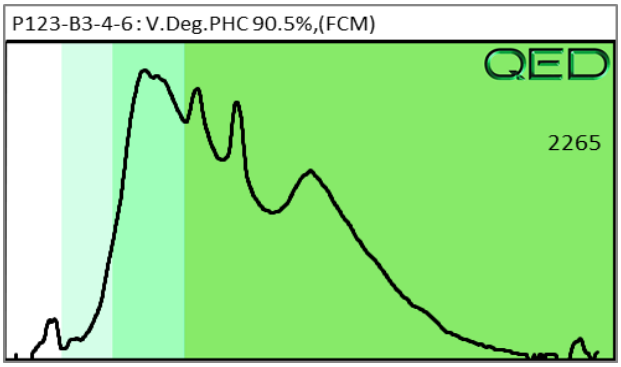


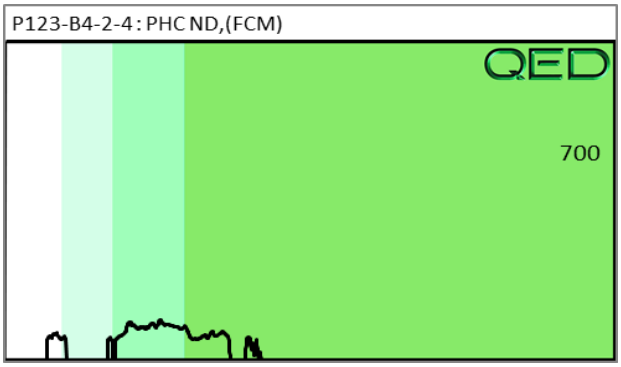


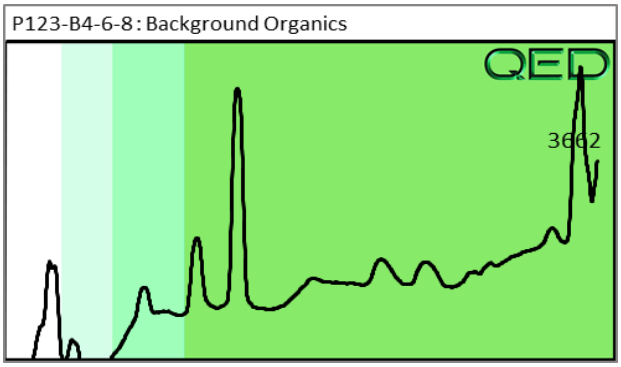












Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Road
Charlotte, NC 28208

Contact: Helen Corley

Project: P123

Samples taken Friday, September 3, 2021
Samples extracted Friday, September 3, 2021
Samples analysed Friday, September 3, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P123-B5-2-4	11.0	<0.27	<0.27	5.7	5.7	2.8	0.08	0.001	0	87.5	12.5	V.Deg.PHC 81.2%,(FCM)
Soil	P123-B5-6-8	13.0	<0.3	<0.3	<0.13	0.008	0.008	0.001	<0.004	0	0	100	Residual HC
Soil	P123-B6-2-4	10.0	<0.25	<0.25	0.029	0.029	0.025	0.002	<0.003	0	100	0	Residual HC
Soil	P123-B6-8-10	11.0	<0.27	<0.27	<0.11	0.009	0.009	0.001	<0.003	0	34	66	Residual HC
Soil	P123-B7-0-2	12.0	<0.3	<0.3	0.5	0.5	0.23	0.012	<0.0	0	81	19	V.Deg.PHC 86.6%,(FCM)
Soil	P123-B7-4-6	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P123-B8-2-4	12.0	<0.3	39.2	0.3	39.59	0.17	0.009	<0.004	99.6	0.3	0.1	No Match found
Soil	P123-B8-8-10	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P123-B9-2-4	10.0	<0.25	<0.25	<0.1	0.019	0.019	0.002	<0.003	0	49.7	50.3	Residual HC
Soil	P123-B9-8-10	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 92.4%

Analysis by QED HC-1 Analyser

Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

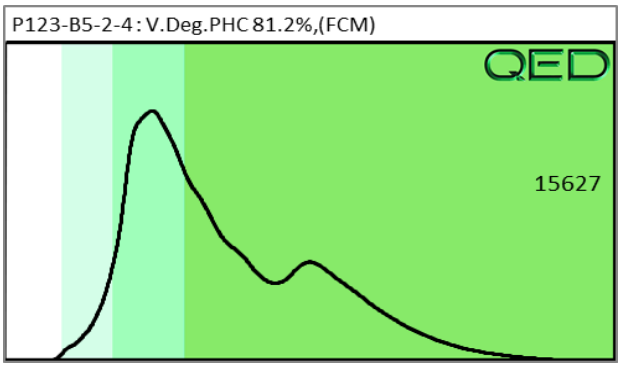
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

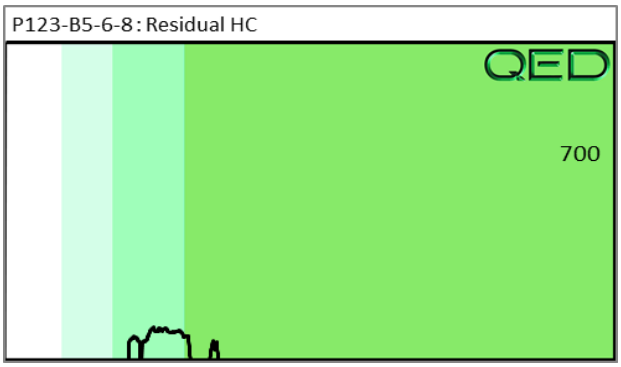
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

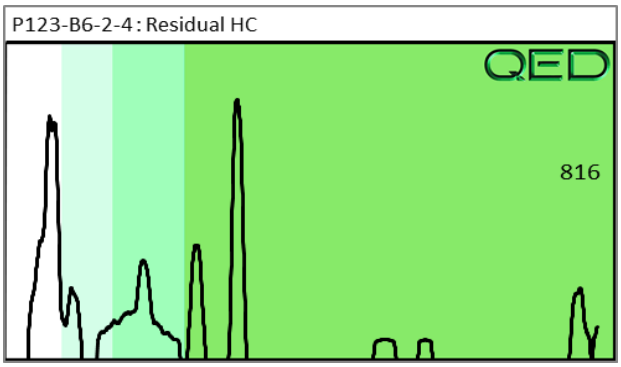
(TD) = Calibration outside limit

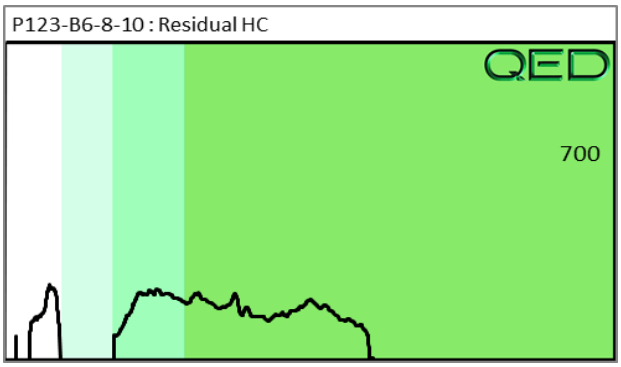
QED Hydrocarbon Fingerprints

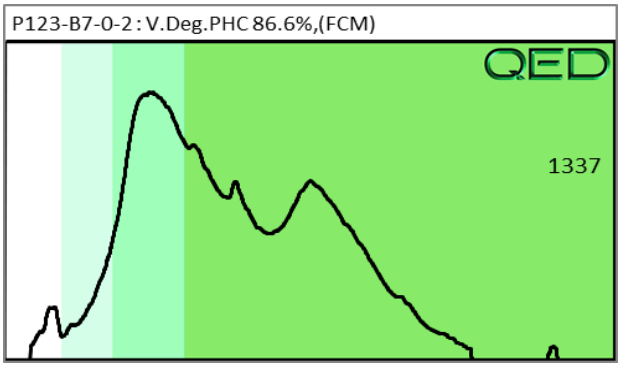
Project: P123

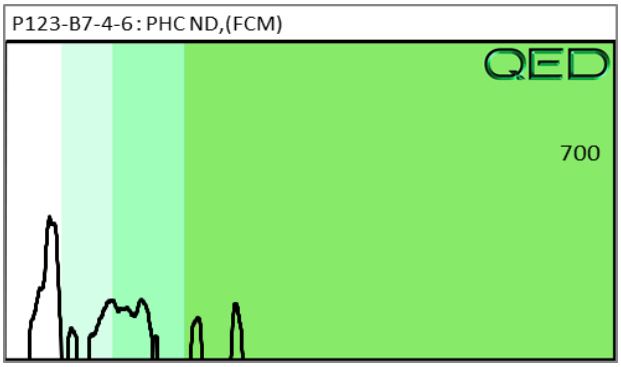


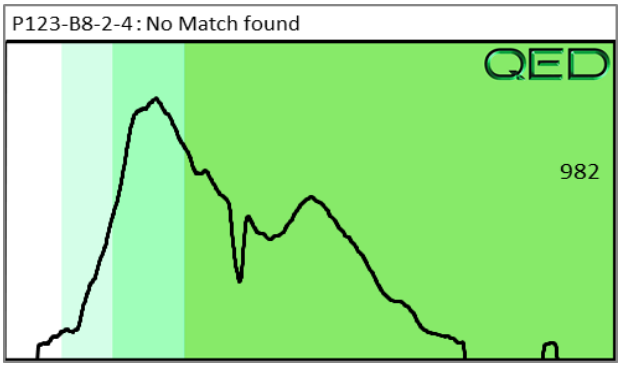


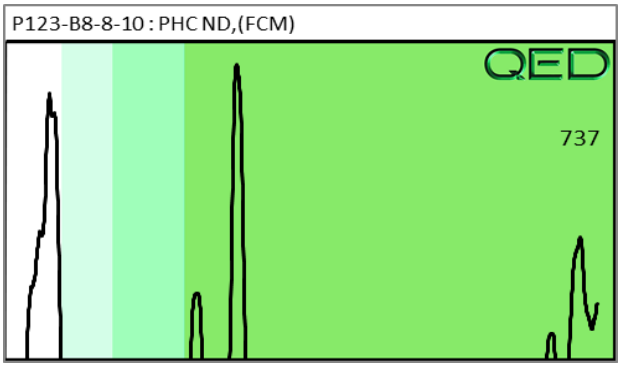


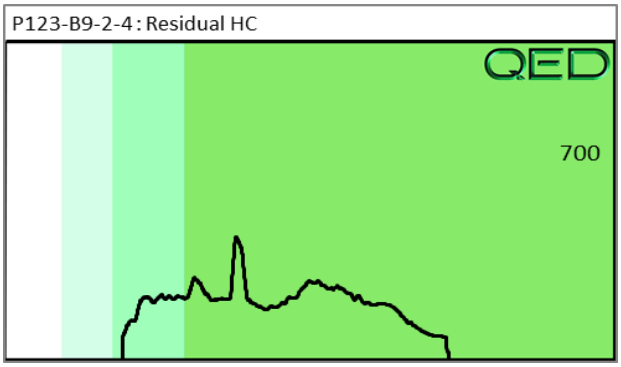


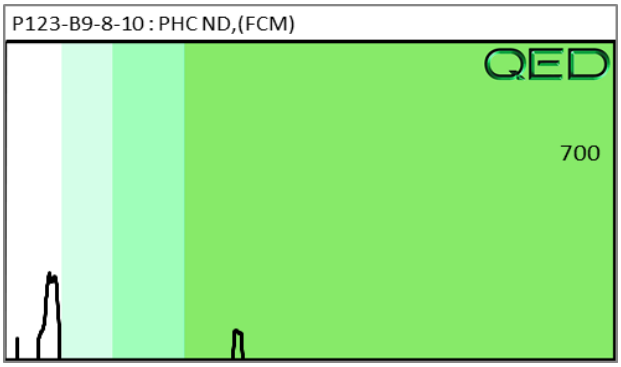












Hydrocarbon Analysis Results

Client: Wood
Address 2801 Yorkmont Rd
Charlotte, NC

Contact: Helen Corley

Project: P123

Samples taken Friday, September 3, 2021
Samples extracted Friday, September 3, 2021
Samples analysed Friday, September 3, 2021

Operator DRH

H09382

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
										C5:10	C10:C18	C18+	
Soil	P123-B10-2-4	10.0	<0.25	<0.25	0.8	0.8	0.4	0.011	<0.001	0	87.6	12.4	V.Deg.PHC 86.3%,(FCM)
Soil	P123-B10-8-10	11.0	<0.27	<0.27	0.11	0.11	0.026	0.002	<0.003	0	100	0	Deg Fuel 78.8%,(FCM)
Soil	P123-B11-4-6	10.0	<0.25	<0.25	0.15	0.15	0.13	0.005	<0.003	0	91.4	8.6	Residual PHC
Soil	P123-B11-0-2	10.0	<0.25	<0.25	0.04	0.04	0.03	0.002	<0.003	0	34	66	Residual HC
Soil	P123-B12-4-6	14.0	<0.3	<0.3	0.4	0.4	0.28	0.008	<0.002	0	93.7	6.3	V.Deg.PHC 58.6%,(FCM)
Soil	P123-B13-0-2	9.0	<0.22	<0.22	1.3	1.3	0.8	0.03	<0.003	0	95.1	4.9	V.Deg.Light Fuel 49.6%,(FCM)
Soil	P123-B13-6-8	13.0	<0.3	<0.3	<0.13	0.009	0.009	0.001	<0.004	0	0	100	Residual HC

Initial Calibrator QC check OK

Final FCM QC Check OK 99.3%

Analysis by QED HC-1 Analyser

Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

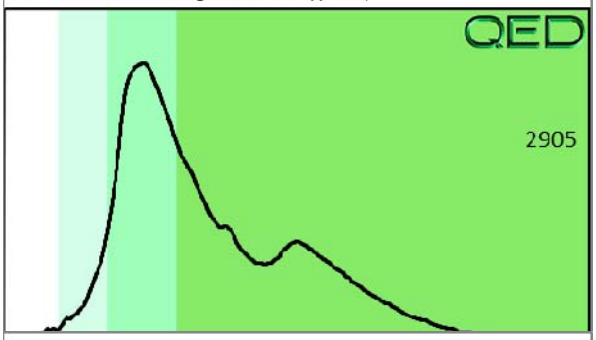
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

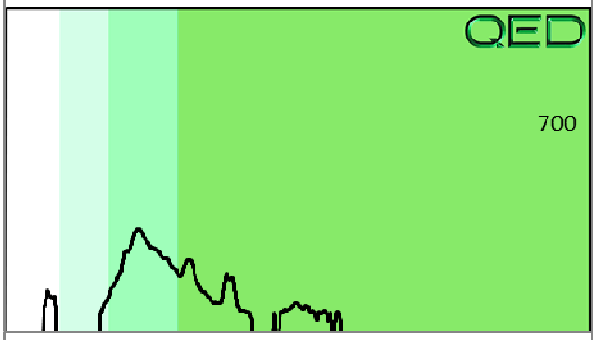
QED Hydrocarbon Fingerprints

Project: P123

P123-B10-2-4 : V.Deg.PHC 86.3%,(FCM)

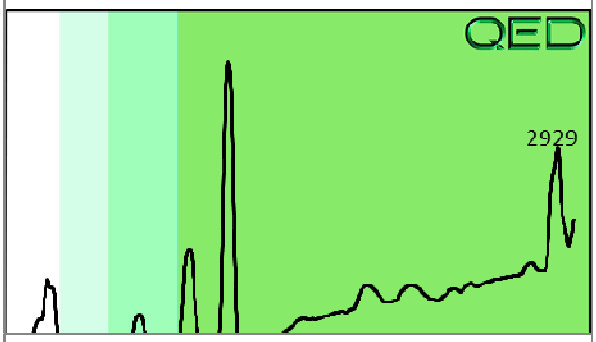


P123-B10-8-10 : Deg Fuel 78.8%,(FCM)

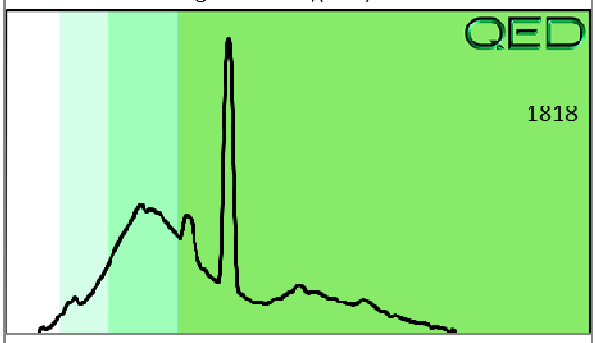


P123-B11-4-6 : Residual PHC

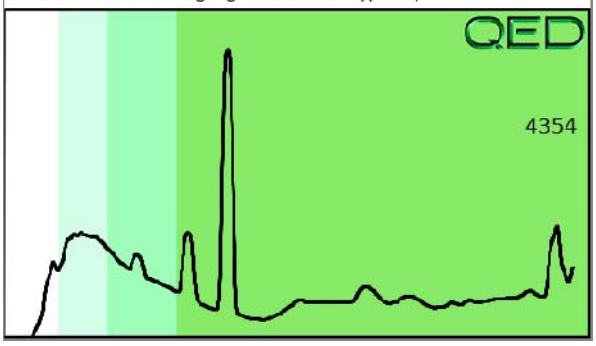
P123-B11-0-2 : Residual HC



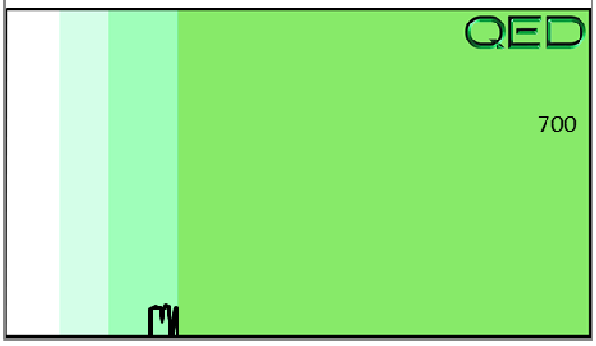
P123-B12-4-6 : V.Deg.PHC 58.6%,(FCM)



P123-B13-0-2 : V.Deg.Light Fuel 40.6%,(FCM)



P123-B13-6-8 : Residual HC



Hydrocarbon Analysis Results

Client: Wood
Address: 2801 Yorkmont Road
Charlotte, NC 28208

Contact: Helen Corley

Project: P123

Samples taken Tuesday, September 7, 2021
Samples extracted Tuesday, September 7, 2021
Samples analysed Tuesday, September 7, 2021

Operator DRH

H09382

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 C5:10	% Ratios C10:C 18	% Ratios C18+	HC Fingerprint Match
Soil	P123-B12-0-2	10.0	<0.25	<0.25	9.6	9.6	0.4	0.025	0.001	0	83.4	16.6	V.Deg.Light Fuel 91.9%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 101.7%

Analysis by QED HC-1 Analyser

Concentration values in mg/kg for soil and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

(TD) = Calibration outside limit

QED Hydrocarbon Fingerprints

Project: P123