North Carolina Department of Transportation

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

Parcel 285
Gregory Lowery Property
10575 NC 211 Highway
Aberdeen, North Carolina
October 27, 2021

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

Derick Haydin, LG
Staff Geologist

Helen Corley, LG, BCES
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 285 (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 on the southwest side of NC 211 Hwy, as shown on the Vicinity Map, **Figure 1**. The parcel, which is located at 10575 NC 211 Hwy, is currently occupied by a vacant dilapidated country store/gasoline station with a metal canopy near the road and Sandy Acres Mobile Home Park behind it. The mobile home park is located outside of the area of investigation. The Site is identified as Parcel 285, Gregory Lowell Property, within the NCDOT MicroStation survey file and is in Aberdeen of Hoke County, North Carolina. The area of investigation at Parcel 285 is approximately 1.15-acres as shown on **Figure 2**.

The Site is reported as a former country store/gasoline station with a metal canopy in the 2019 NCDOT Phase I Report. Three former dispenser islands were observed located beneath the metal canopy. Wood reviewed the North Carolina Laserfiche online database and NCDEQ documentation for Parcel 285 was not present. Wood reviewed the NCDOT Historical Aerial Imagery Index, and Parcel 285 was not covered by photographs in the index.

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 Pinehurst Formation and is underlain by medium- to coarse-grained sand with cross-bedding and rhythmic bands of clayey sand.

2.2 Site Geology

Site geology was observed through the advancement of 12 shallow soil borings (P285-B1 to P285-B12). The borings were advanced to approximate depths of 10 to 15 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 tan to brown sand overlying tan to orange clayey 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 west. 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. North Carolina 811 was contacted on August 24, 2021, for the parcel.

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.

3.2 Site Reconnaissance

Wood personnel visited the parcel on June 8, 2021, and observed that the Site was occupied by a vacant dilapidated country store/gasoline station with a metal canopy and Sandy Acres Mobile Home Park. Three former dispenser islands were observed beneath the metal canopy. The mobile home park was observed to be located outside of the area of investigation. A photographic log is included in **Appendix B**.

3.3 Geophysical Survey Results and Utility Locating

The geophysical survey was conducted by Pyramid personnel from August 10 to 11, 2021. Pyramid conducted a geophysical investigation using electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys across the investigation area. A total of two EM anomalies were identified, which were attributed to visible cultural features at the ground surface. The GPR survey confirmed the absence of buried structures in the areas of metallic interference. The geophysical survey did not identify USTs within the investigation area. The complete Pyramid geophysics report is included as **Appendix C**.

Utility locating was performed by PUL personnel on August 26, 2021. The utility locating effort identified a buried water line, buried electrical lines, several buried telephone and communication lines, suspected former fuel lines and vent lines. The buried water line was observed along the eastern parcel boundary parallel to NC 211 Hwy. Buried electrical lines were observed extending from the southern exterior of the on-Site building to light poles, a power pole, and the former dispenser islands beneath the metal canopy. Several buried telephone and communication lines were observed along the eastern parcel boundary parallel to NC 211 Hwy. In addition, the telephone and communication lines extended to the on-Site building and the mobile home park located outside of the investigation area.

The utility locating effort identified suspected fuel lines extending south from the metal canopy and terminating in the shrub-covered area located along the southern edge of the

metal canopy. Suspected vent lines were also identified in the same area which extended to the west toward the southeastern corner of the on-Site building. Based on this evidence, it is suspected a UST or USTs were formally located along the southern edge of the metal canopy.

3.4 Soil Sampling

On September 1, 2021, Wood and IET mobilized to the Site to advance 12 shallow soil borings (P285-B1 to P285-B12). The borings were advanced via direct-push technology to approximate depths of 10 to 15 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 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 5-10 foot interval for 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) in UVF. In the boring extended to 15 feet bgs near the suspected former UST(s) location, an additional portion was selected from the 10-15 foot interval for the analyses indicated above. Neither groundwater nor bedrock were encountered in the borings. Twenty-five soil samples were collected from the borings at the Site for onsite UVF analysis.

4.0 SOIL SAMPLING RESULTS

Based on September 1, 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 samples collected from the 12 borings advanced at the Site.

PID readings for the 25 soil samples ranged from not detected in boring P285-B3 to 52.2 parts per million (ppm) in sample P285-B1-0-2 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 25 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 1, 2021.

- The Site is occupied by a vacant dilapidated country store/gasoline station with a metal canopy and Sandy Acres Mobile Home Park. Three former dispenser islands were observed beneath the metal canopy. The mobile home park was observed to be located outside of the area of investigation. No USTs were identified during the

geophysical survey or field activities. The utility locating effort identified suspected fuel lines extending south from the metal canopy and terminating in the shrub-covered area located along the southern edge of the metal canopy.

- Twelve soil borings were advanced to roughly 10 to 15 feet bgs in the investigation area to collect soil samples for on-Site UVF analysis. Twenty-five soil samples were collected for on-Site UVF analysis.

- UVF analysis of the 25 soil samples collected did not identify petroleum-impacted soil.

6.0 RECOMMENDATIONS

Based on these Phase II Investigation results, Wood recommends no further soil investigation. Wood notes that the former dispenser islands and probable buried fuel piping located within the investigation area lie within the ROW and thus should be removed, in general accordance with the NCDEQ guidelines.

TABLES

Table 1: Summary of PID Screening Results
R-5709, Parcel 285 - Gregory Lowery Property
Aberdeen, North Carolina
Wood Project: 20478R5709

Boring ID	Depth of Sample Interval	PID Reading
P285-B1	0-2	52.2
	6-8	0.0
P285-B2	2-4	0.0
	6-8	0.0
P285-B3	2-4	0.0
	6-8	0.0
	12-14	0.0
P285-B4	2-4	0.0
	6-8	0.0
P285-B5	4-6	0.2
	8-10	0.1
P285-B6	4-6	0.3
	6-8	0.2
P285-B7	0-2	0.3
	4-6	0.2
P285-B8	2-4	4.7
	6-8	6.2
P285-B9	2-4	7.1
	8-10	8.0
P285-B10	4-6	7.9
	6-8	7.9
P285-B11	2-4	8.1
	6-8	8.4
P285-B12	2-4	8.0
	6-8	9.4

Notes:

1. Samples collected on 9/1/21
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 9/28/21

Table 2: UVF Hydrocarbon Soil Sampling Results
R-5709, Parcel 285 - Gregory Lowery Property
Aberdeen, North Carolina
Wood Project: 20478R5709

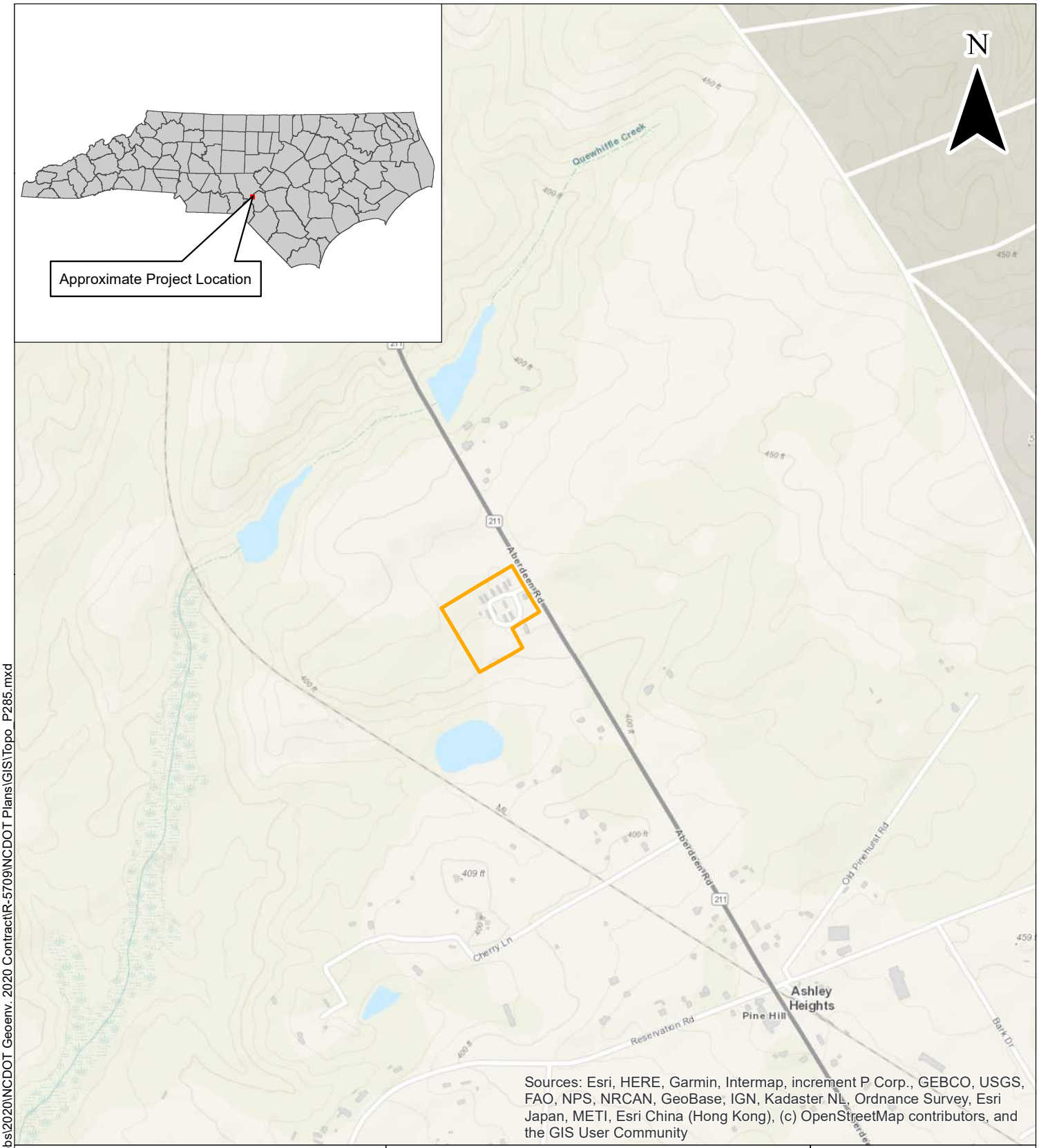
Sample ID Number	Sample Depth (ft. bgs)	BTEX (mg/kg)	GRO (mg/kg)	DRO (mg/kg)	PAHs (mg/kg)
P285-B1-0-2	0-2	<0.22	<0.22	0.06	0.003
P285-B1-6-8	6-8	<0.22	<0.22	0.13	0.012
P285-B2-2-4	2-4	<0.3	<0.3	<0.12	<0.006
P285-B2-6-8	6-8	<0.22	<0.22	<0.09	<0.005
P285-B3-2-4	2-4	<0.25	<0.25	0.4	0.006
P285-B3-6-8	6-8	<0.22	<0.22	0.15	0.003
P285-B3-12-14	12-14	<0.22	<0.22	<0.09	<0.005
P285-B4-2-4	2-4	<0.3	<0.3	0.08	0.002
P285-B4-6-8	6-8	<0.25	<0.25	<0.1	<0.005
P285-B5-4-6	4-6	<0.27	<0.27	0.4	0.009
P285-B5-8-10	8-10	<0.4	<0.4	<0.17	<0.009
P285-B6-4-6	4-6	<0.25	<0.25	0.6	0.014
P285-B6-6-8	6-8	<0.3	<0.3	0.28	0.009
P285-B7-0-2	0-2	<0.2	<0.2	0.7	0.017
P285-B7-4-6	4-6	<0.25	<0.25	0.25	0.009
P285-B8-2-4	2-4	<0.25	<0.25	0.29	0.007
P285-B8-6-8	6-8	<0.27	<0.27	9.9	0.009
P285-B9-2-4	2-4	<0.27	<0.27	<0.11	<0.006
P285-B9-8-10	8-10	<0.17	<0.17	0.07	<0.001
P285-B10-4-6	4-6	<0.27	<0.27	9.7	0.04
P285-B10-6-8	6-8	<0.17	<0.17	<0.07	0.002
P285-B11-2-4	2-4	<0.22	<0.22	7.9	0.005
P285-B11-6-8	6-8	<0.22	<0.22	0.09	0.001
P285-B12-2-4	2-4	<0.2	<0.2	<0.08	<0.004
P285-B12-6-8	6-8	<0.2	<0.2	<0.08	<0.004
NC State Action Level		**N/A**	**50**	**100**	**N/A**

Notes:

1. Samples collected on September 1, 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: MAS 9/30/21

FIGURES



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

wood.
Wood Environment & Infrastructure Solutions, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, NC 28208
(704) 357-8600

VICINITY MAP
R5709-PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

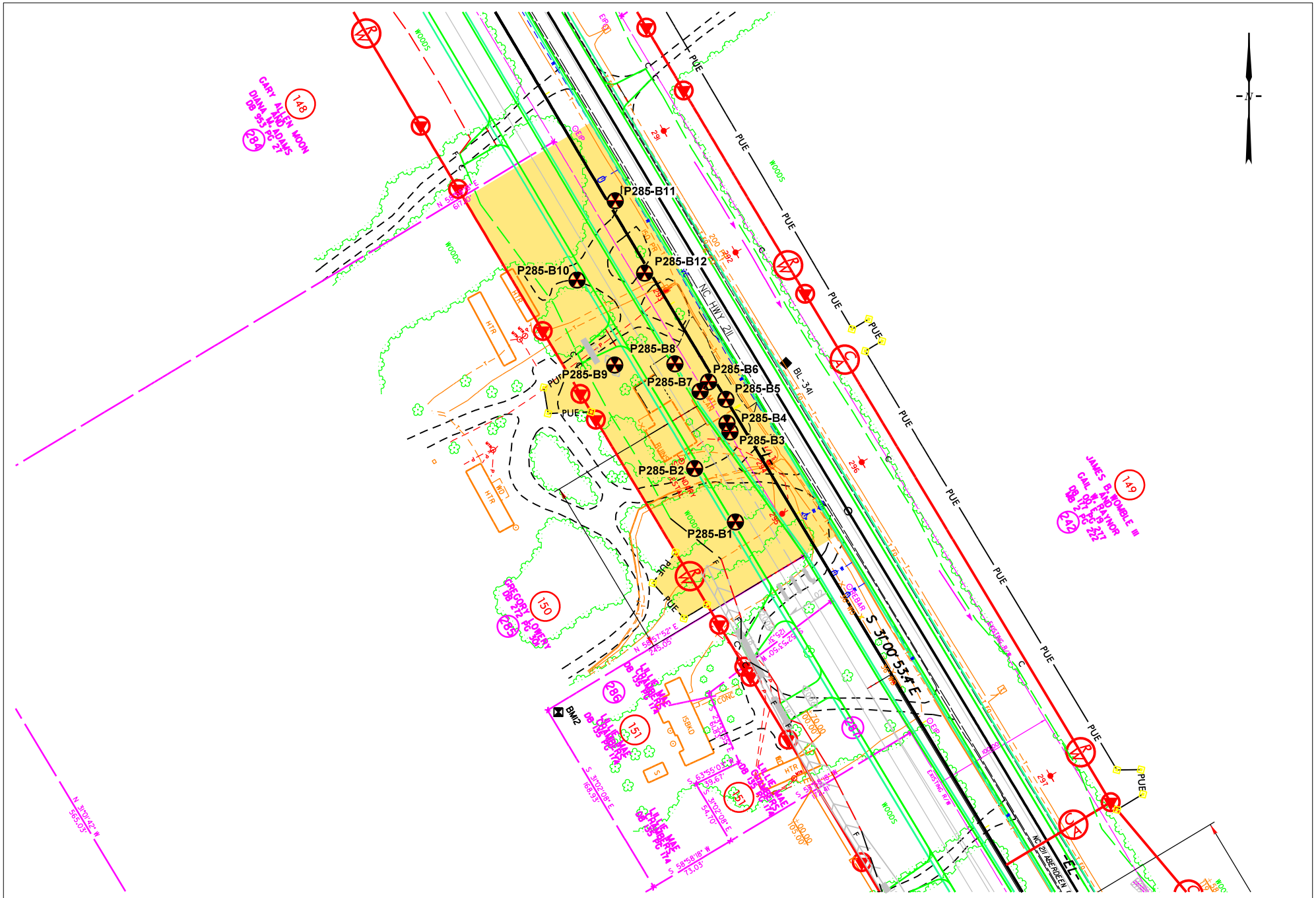
PREPARED BY:	LMM
DATE:	9/30/2021
CHECKED BY:	HPC
DATE:	9/30/2021
PROJECT NO:	20478R5709
FIGURE:	1

Legend

Site Boundary

0 1,000 2,000 Feet

Document Path: P:\6228 Environmental\jobs\2020\NCDOT Geoenv. 2020 Contract\R-5709\NCDOT Plans\GIS\Topo_P285.mxd



BORING LOCATION

AREA OF INVESTIGATION

50′ 0′ 50′ 100′

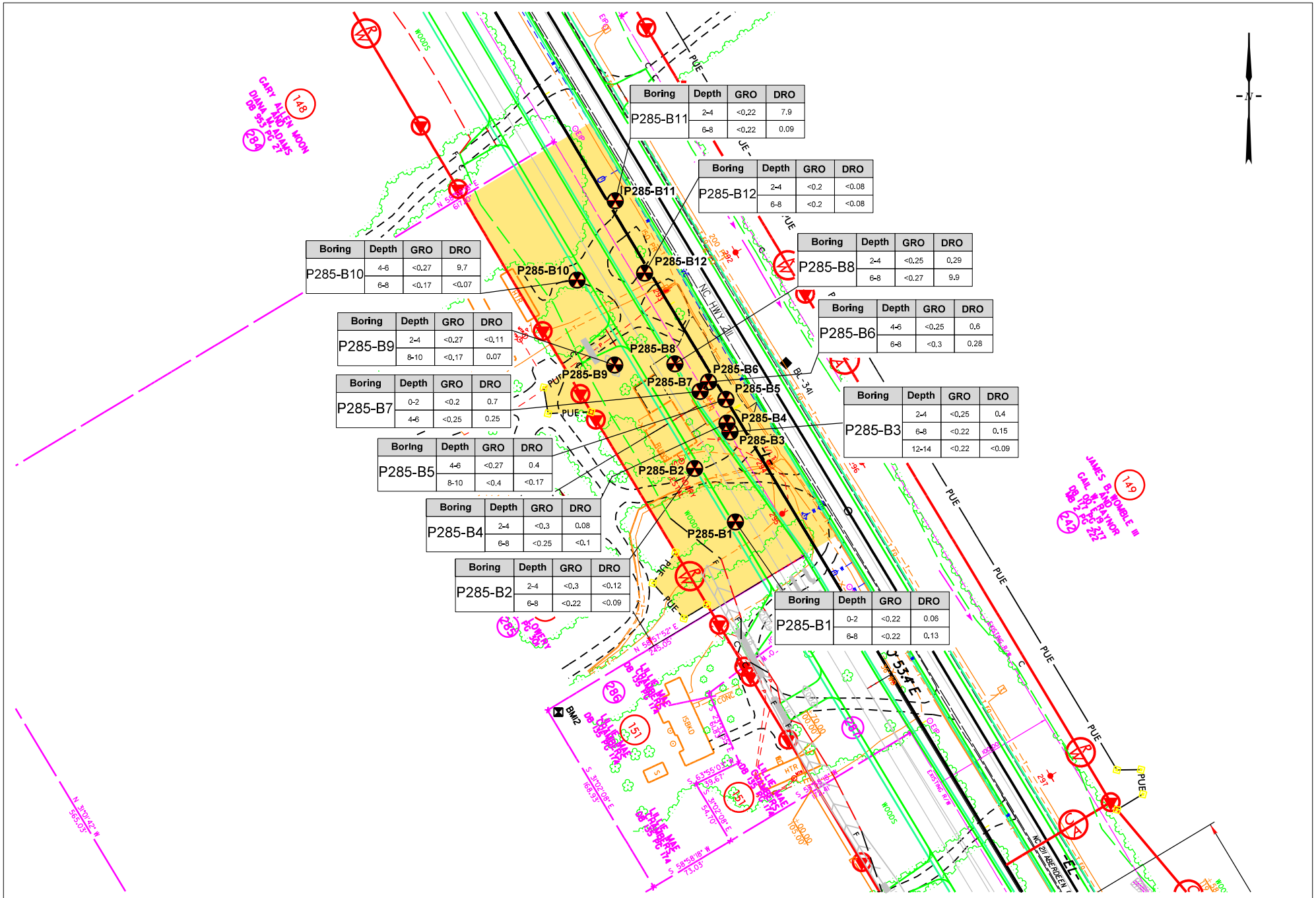
25′

(ENGLISH)

wood.

SITE MAP
R-5709 - PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	2



Boring	Depth	GRO	DRO
P285-B11	2-4	<0.22	7.9
	6-8	<0.22	0.09

Boring	Depth	GRO	DRO
P285-B12	2-4	<0.2	<0.08
	6-8	<0.2	<0.08

Boring	Depth	GRO	DRO
P285-B10	4-6	<0.27	9.7
	6-8	<0.17	<0.07

Boring	Depth	GRO	DRO
P285-B8	2-4	<0.25	0.29
	6-8	<0.27	9.9

Boring	Depth	GRO	DRO
P285-B9	2-4	<0.27	<0.11
	8-10	<0.17	0.07

Boring	Depth	GRO	DRO
P285-B6	4-6	<0.25	0.6
	6-8	<0.3	0.28

Boring	Depth	GRO	DRO
P285-B7	0-2	<0.2	0.7
	4-6	<0.25	0.25

Boring	Depth	GRO	DRO
P285-B3	2-4	<0.25	0.4
	6-8	<0.22	0.15
	12-14	<0.22	<0.09

Boring	Depth	GRO	DRO
P285-B5	4-6	<0.27	0.4
	8-10	<0.4	<0.17

Boring	Depth	GRO	DRO
P285-B4	2-4	<0.3	0.08
	6-8	<0.25	<0.1

Boring	Depth	GRO	DRO
P285-B2	2-4	<0.3	<0.12
	6-8	<0.22	<0.09

Boring	Depth	GRO	DRO
P285-B1	0-2	<0.22	0.06
	6-8	<0.22	0.13

BORING 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

50′ 0′ 50′ 100′
25′
(ENGLISH)

wood.

ANALYTICAL RESULTS MAP
R-5709 - PARCEL 285
10575 NC 211 HWY
ABERDEEN, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER	FIGURE
LMM	10/26/21	AJF	10/26/21	20478R5709	3

APPENDIX A

BORING LOGS

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B1**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	52.2	Brown sand, pine tree odor	P285-B1-0-2 selected for UVF analyses
2		Tan sand	
3	4.5		
4		Tan/brown sand	
5	0.0		
6			
7	0.0	Orange/red clayey sand	P285-B1-6-8 selected for UVF analyses
8			
9	0.0		
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 #	**P285-B2**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Tan sand	
2		Tan/brown sand	
3	0.0		P285-B2-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0	Tan/orange clayey sand	P285-B2-6-8 selected for UVF analyses
8			
9	0.0		
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 #	**P285-B3**	BORING DEPTH (ft)	**15**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Brown sand, possible fill	
2			
3	0.0		P285-B3-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0		P285-B3-6-8 selected for UVF analyses
8			
9	0.0		
10			
11	0.0		
12			
13	0.0		P285-B3-12-14 selected for UVF analyses
14		Tan/white sand	
15	0.0	Tan/white sand, moist	
16		Boring terminated at 15 feet bgs	
17			
18			
19			
20			
21			

Log Completed By: **AJF**

Page: **1**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B4**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Concrete/gravel	
2		Tan/brown sand	
3	0.0		P285-B4-2-4 selected for UVF analyses
4			
5	0.0		
6			
7	0.0		P285-B4-6-8 selected for UVF analyses
8		Tan sand	
9	0.0		
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 #	**P285-B5**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.0	Concrete/gravel	
2		Tan/brown sand	
3	0.1		
4		Tan sand	
5	0.2		P285-B5-4-6 selected for UVF analyses
6			
7	0.1		
8		Tan/orange clayey sand	
9	0.1		P285-B5-8-10 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**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B6**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.1	Brown sand	
2		Tan sand	
3	0.1		
4			
5	0.3	Tan/brown sand	P285-B6-4-6 selected for UVF analyses
6			
7	0.2		P285-B6-6-8 selected for UVF analyses
8		Tan/orange clayey 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**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B7**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	0.3	Concrete/gravel Tan/brown sand	P285-B7-0-2 selected for UVF analyses
2			
3	0.2		
4			
5	0.2	Tan/orange clayey sand	P285-B7-4-6 selected for UVF analyses
6			
7	0.1		
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 #	**P285-B8**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.1	Tan/brown sand	
2			
3	4.7		P285-B8-2-4 selected for UVF analyses
4			
5	5.5		
6			
7	6.2	Tan/orange clayey sand	P285-B8-6-8 selected for UVF analyses
8			
9	5.6		
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 #	**P285-B9**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	6.6	Tan sand	
2			
3	7.1		P285-B9-2-4 selected for UVF analyses
4		Tan/brown sand	
5	7.9		
6			
7	7.2		
8		Tan/orange clayey sand	
9	8.0		P285-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**

wood.

SOIL BORING FIELD WORKSHEET

BORING #	**P285-B10**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	3.6	Brown sand	
2		Tan/brown sand	
3	7.3		
4			
5	7.9	Tan sand	P285-B10-4-6 selected for UVF analyses
6			
7	7.9	Brown sand	P285-B10-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	7.7		
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 #	**P285-B11**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.3	Tan sand	
2			
3	8.1		P285-B11-2-4 selected for UVF analyses
4		Tan/brown sand	
5	8.2		
6			
7	8.4		P285-B11-6-8 selected for UVF analyses
8		Tan/orange clayey sand	
9	7.8		
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 #	**P285-B12**	BORING DEPTH (ft)	**10**	NUMBER OF PAGES	**1**
PROJECT #	**20478R5709**			PROJECT NAME	**NCDOT R-5709**
DATE DRILLED	**9/1/2021**			WEATHER CONDITIONS	**Cloudy, 85°F**
DRILLING SUB-CONTRACTOR	**IET**			DRILL RIG	**AMS PowerProbe**

DEPTH (ft bgs)	PID (ppm)	SOIL DESCRIPTION	SAMPLE INFO
1	7.1	Tan/brown sand	
2			
3	8.0		P285-B12-2-4 selected for UVF analyses
4			
5	8.3		
6			
7	9.4	Tan/orange clayey sand	P285-B12-6-8 selected for UVF analyses
8			
9	8.3		
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:
Building and canopy at parcel 285, facing northwest. Shrub covered area in center of photo is suspected location of former UST(s).

Photograph 2:
Building and canopy at parcel 285, facing southwest.

Photograph 3:
Suspected dispenser islands at parcel 285, facing southeast.

Photograph 4:
View of IET advancing direct push soil sampler at parcel 285.

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

APPENDIX C

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2021-201)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 285
NCDOT PROJECT R-5709 (50205.1.1)

11059 MHP, 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.
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 285 - 11059 Mhp
Aberdeen, Hoke County, North Carolina

Table of Contents

Figures

Appendices

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 285, located at 11059 Mhp, 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 was focused on the front (east) portion of the parcel, under and surrounding an existing canopy. Conducted from August 10-11, 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. The observed EM anomalies were associated with reinforced concrete, metal columns, and a utility pole. GPR was performed across the reinforced concrete and around the metal columns. GPR verified the presence of reinforcement within the concrete and evidence of various utility lines was observed. No evidence of significant structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Wood, PLC at Parcel 285, located at 11059 Mhp, 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 was focused on the front (east) portion of the parcel, under and surrounding an existing canopy. Conducted from August 10-11, 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 country store and canopy surrounded by grass, asphalt, and concrete 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 11, 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	Reinforced Concrete and Metal Columns	✓
2	Utility Pole	

The canopy was supported by metal columns and underlain by reinforced concrete, resulting in EM Anomaly 1. A utility pole resulted in EM Anomaly 2. GPR was performed across the reinforced concrete and beneath the canopy to confirm that the metallic interference did not obscure any significant structures such as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of seven formal GPR transects were performed at the site. GPR Transects 1-7 were performed across the reinforced concrete and around the metal columns beneath the canopy. GPR confirmed the presence of reinforcement and showed evidence of buried utilities beneath the canopy. No evidence of any significant structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285. **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 285 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.

- The observed EM anomalies were associated with reinforced concrete, metal columns and a utility pole.
- GPR was performed across the reinforced concrete and around the metal columns. GPR verified the presence of reinforcement within the concrete and evidence of various utility lines was observed. No evidence of significant structures such as USTs was observed.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 285.

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 Southeast)

View of Survey Area (Facing Approximately Northwest)

N

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503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE	PARCEL 285 - 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 11, 2021.

EM61 Metal Detection Response (millivolts)

N

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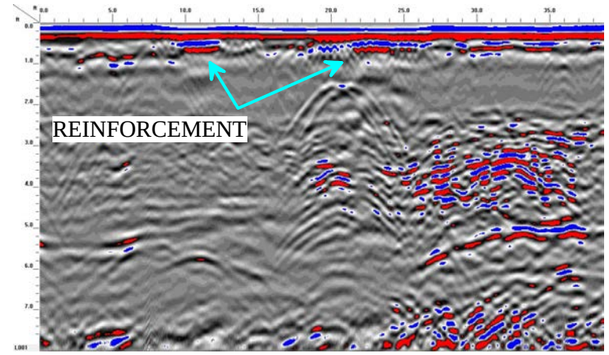
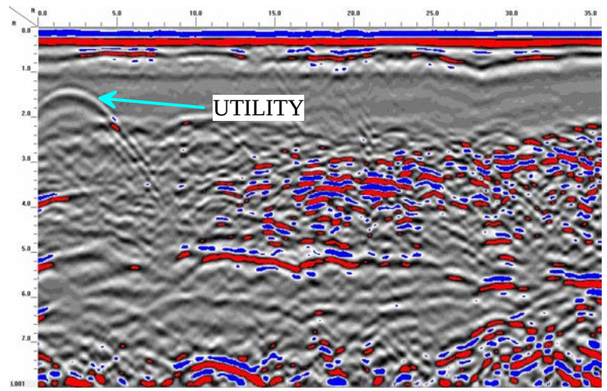
PROJECT	PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709
TITLE	PARCEL 285 - EM61 METAL DETECTION CONTOUR MAP
DATE	8/16/2021
CLIENT	Wood, PLC
PYRAMID PROJECT #:	2021-201
	FIGURE 2

GPR TRANSECT LOCATIONS



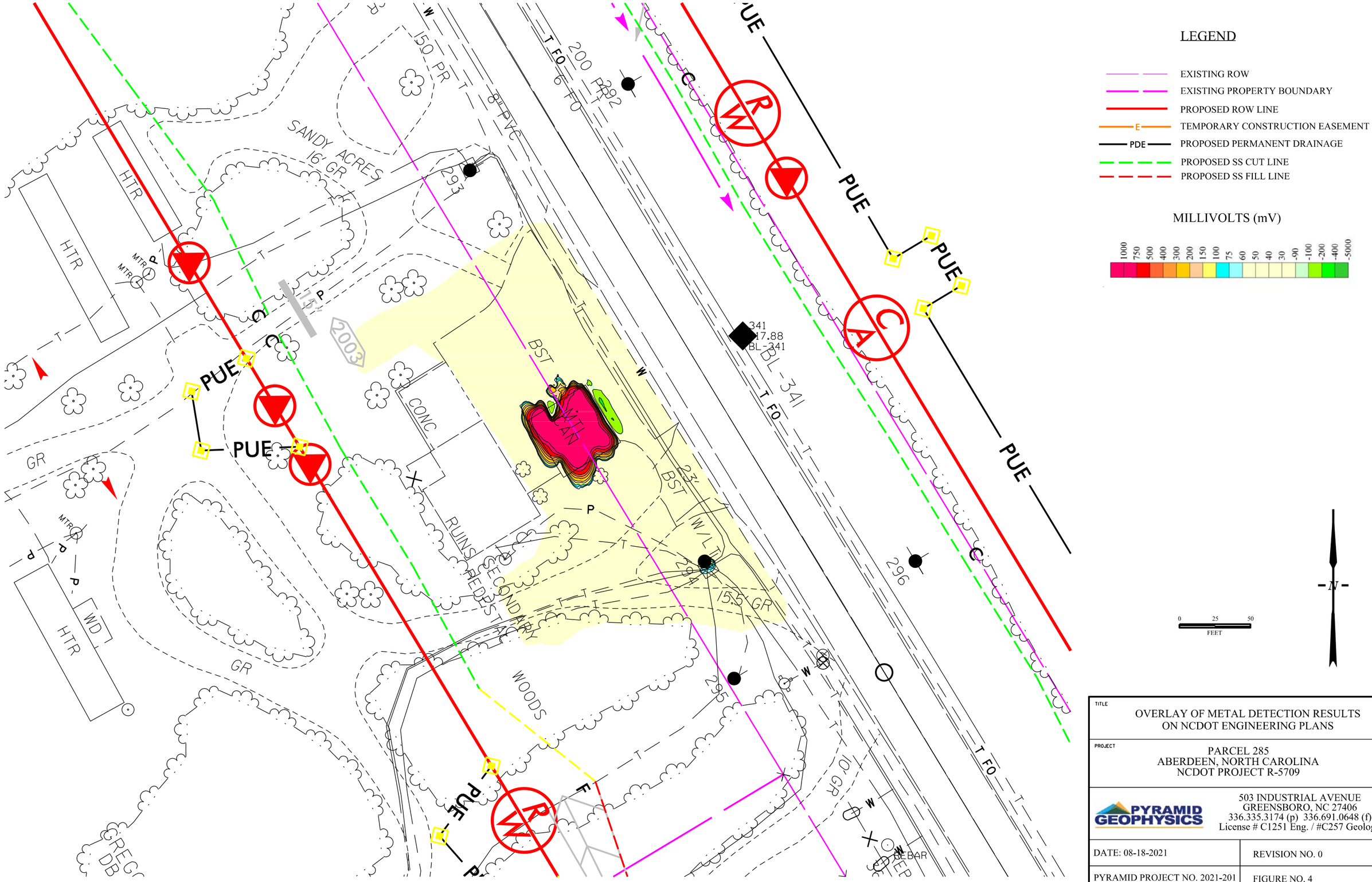
GPR TRANSECT 1 (T1)



GPR TRANSECT 6 (T6)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 285 ABERDEEN, NORTH CAROLINA NCDOT PROJECT R-5709	TITLE PARCEL 285 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE 8/16/2021 PYRAMID PROJECT #: 2021-201	CLIENT Wood, PLC **FIGURE 3**



TITLE

OVERLAY OF METAL DETECTION RESULTS
ON NCDOT ENGINEERING PLANS

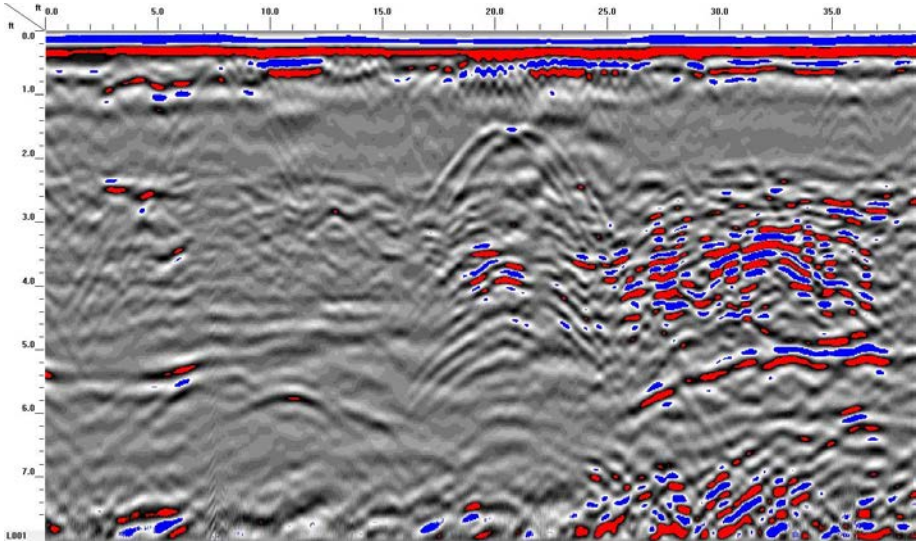
PROJECT

PARCEL 285
ABERDEEN, NORTH CAROLINA
NCDOT PROJECT R-5709

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

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

Appendix A – GPR Transect Images



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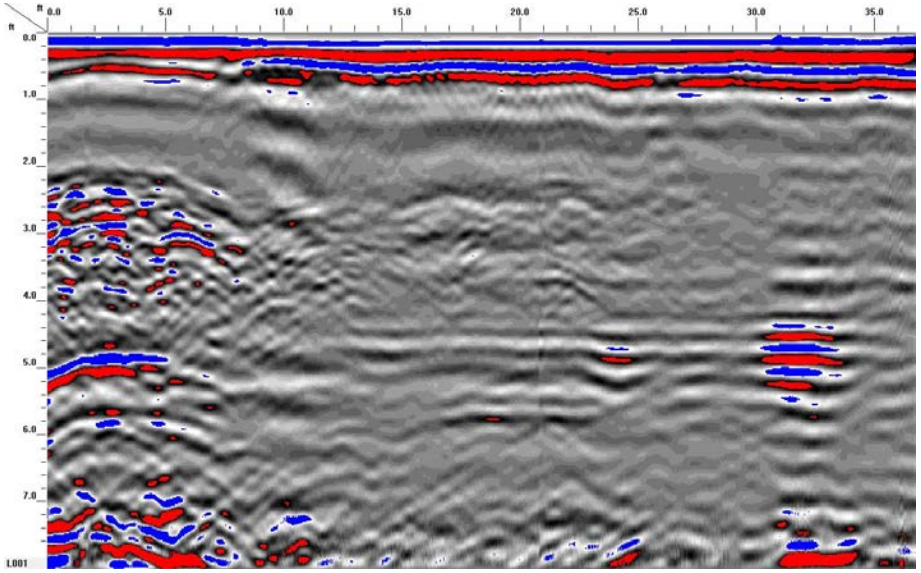

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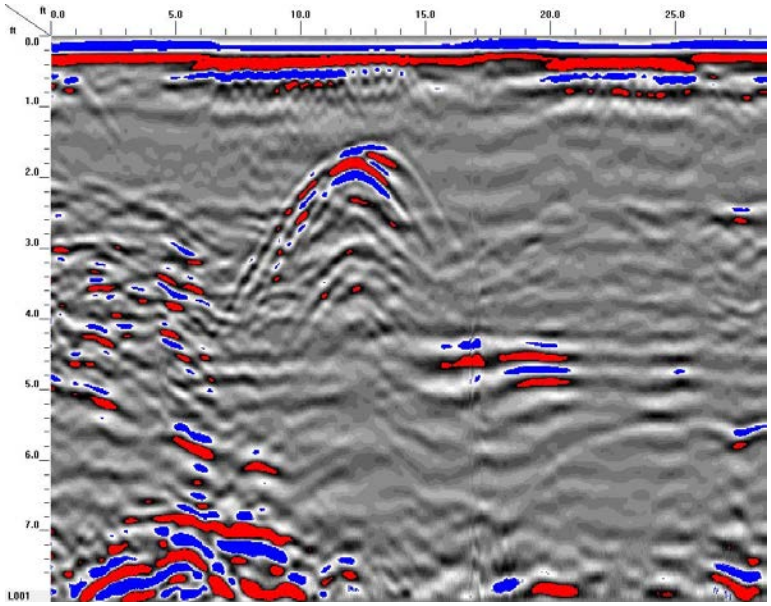

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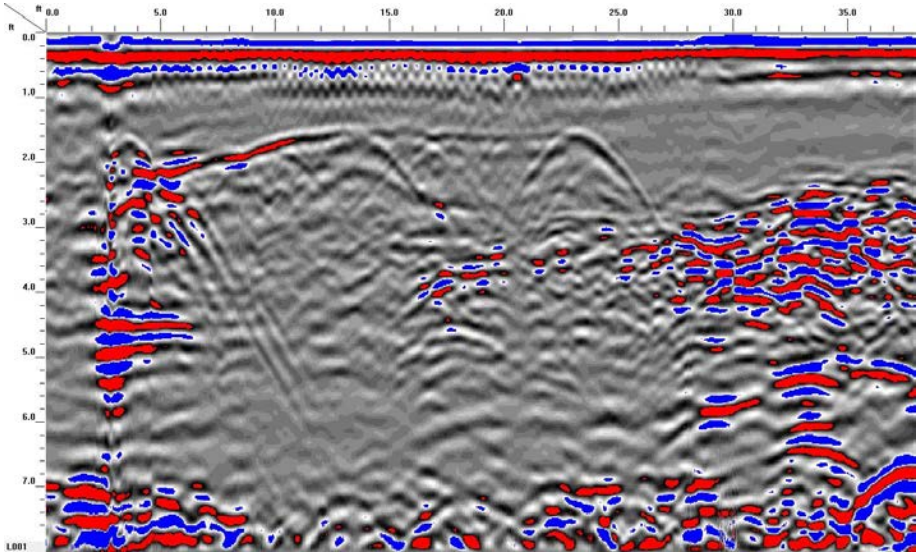

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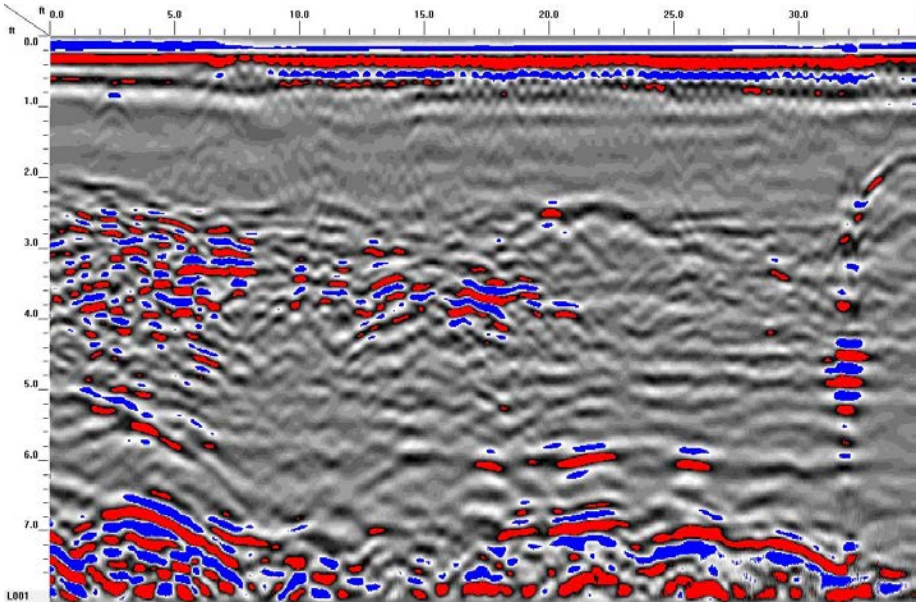

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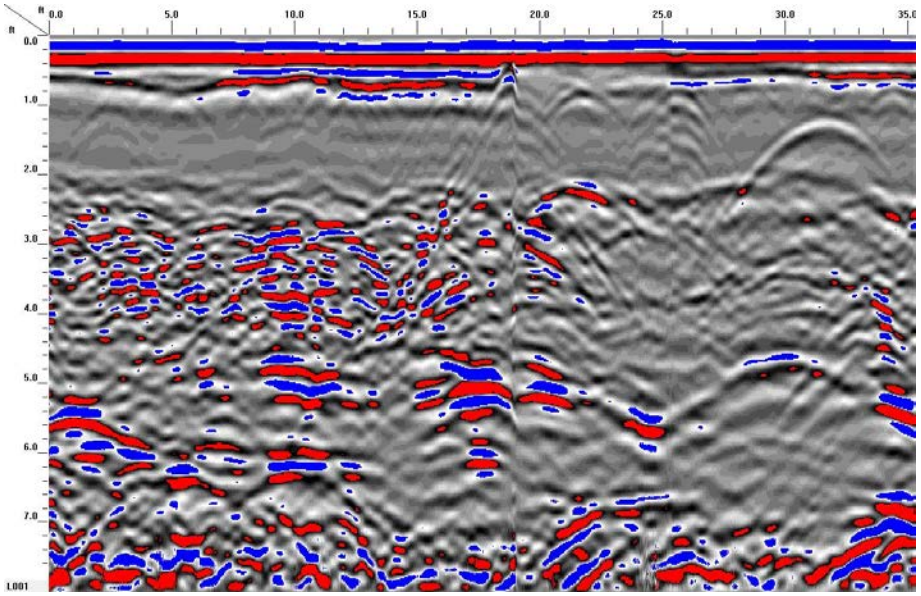
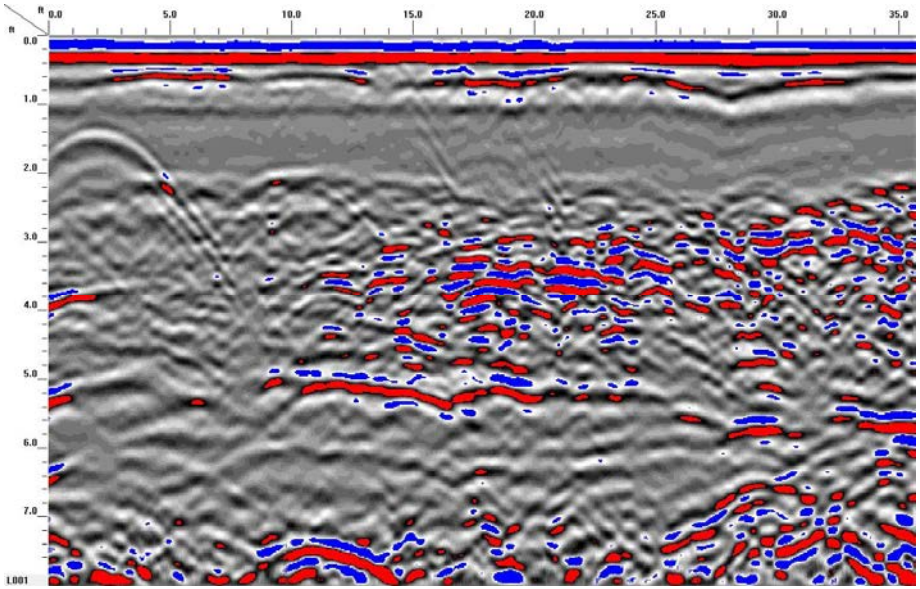


GPR TRANSECT 7



GPR TRANSECT 6

APPENDIX D

UVF HYDROCARBON ANALYTICAL RESULTS

Hydrocarbon Analysis Results

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

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 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	P285-B1-0-2	9.0	<0.22	<0.22	0.06	0.06	0.06	0.003	<0.003	0	31.5	68.5	Residual HC
Soil	P285-B1-6-8	9.0	<0.22	<0.22	0.13	0.13	0.13	0.012	<0.003	0	92.3	7.7	Residual PHC
Soil	P285-B2-2-4	12.0	<0.3	<0.3	<0.12	<0.3	<0.006	<0.006	<0.004	0	0	100	Residual HC
Soil	P285-B2-6-8	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B3-2-4	10.0	<0.25	<0.25	0.4	0.4	0.22	0.006	<0.0	0	87.7	12.3	V.Deg.PHC 68.1%,(FCM)
Soil	P285-B3-6-8	9.0	<0.22	<0.22	0.15	0.15	0.07	0.003	<0.001	0	73.1	26.9	V.Deg.PHC 71.7%,(FCM)
Soil	P285-B3-12-14	9.0	<0.22	<0.22	<0.09	<0.22	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B4-2-4	12.0	<0.3	<0.3	0.08	0.08	0.03	0.002	<0.004	0	81.4	18.6	Residual HC
Soil	P285-B4-6-8	10.0	<0.25	<0.25	<0.1	<0.25	<0.005	<0.005	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B5-4-6	11.0	<0.27	<0.27	0.4	0.4	0.19	0.009	<0.003	0	75	25	V.Deg.PHC 82.7%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 104.1%

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

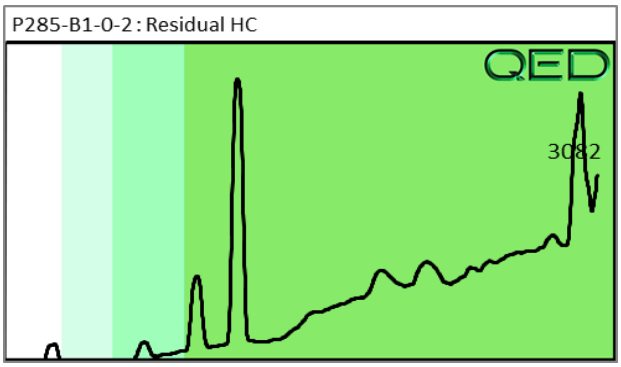
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

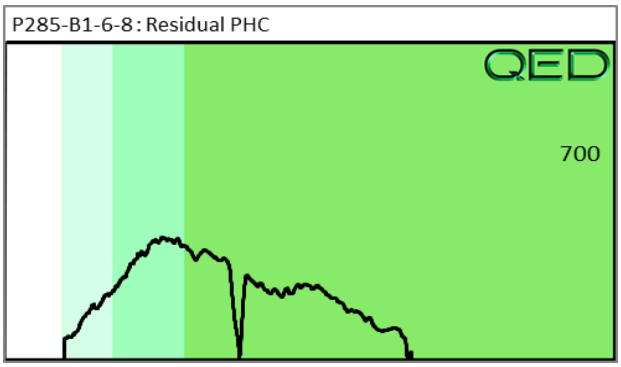
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

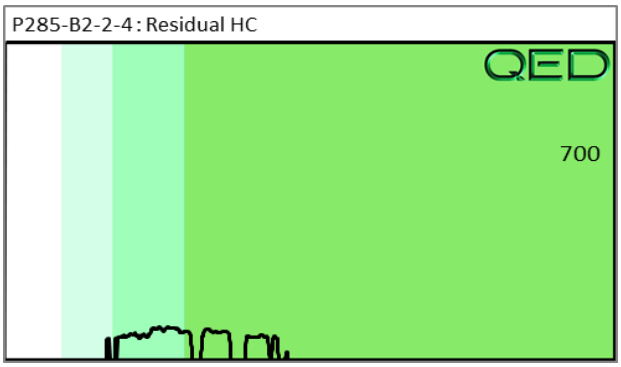
(TD) = Calibration outside limit

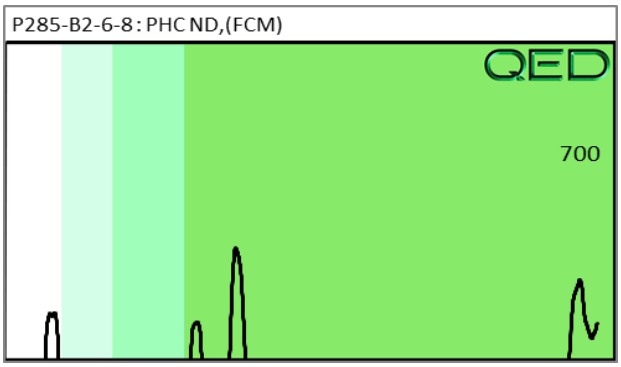
QED Hydrocarbon Fingerprints

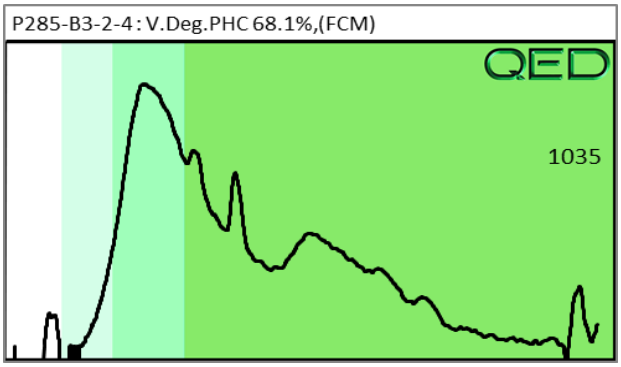
Project: P285

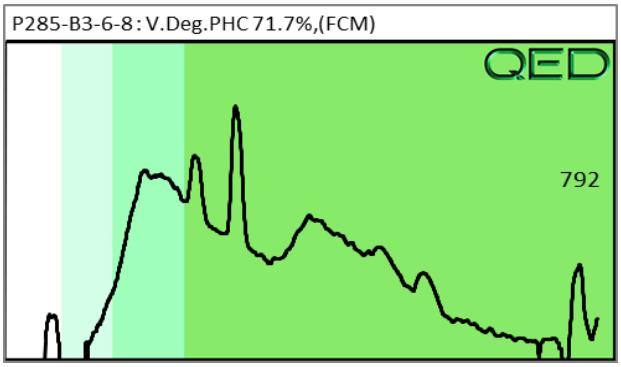


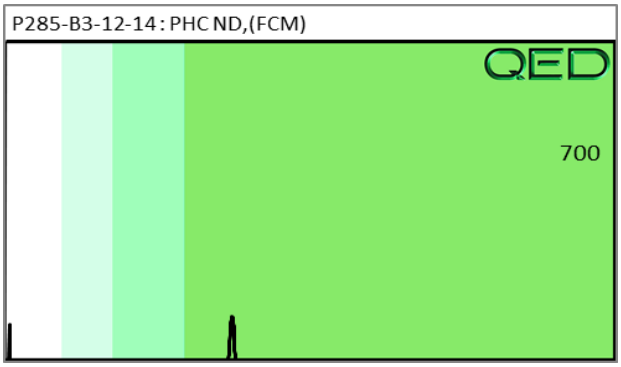


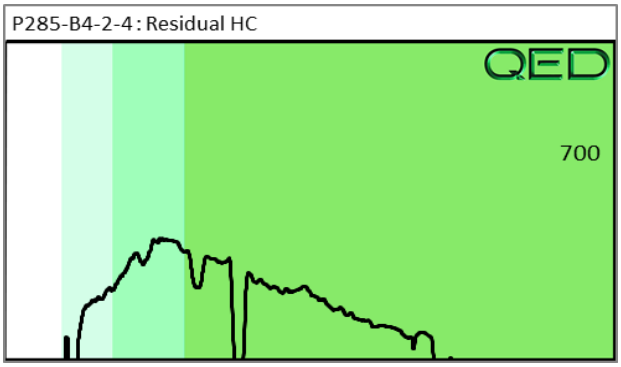


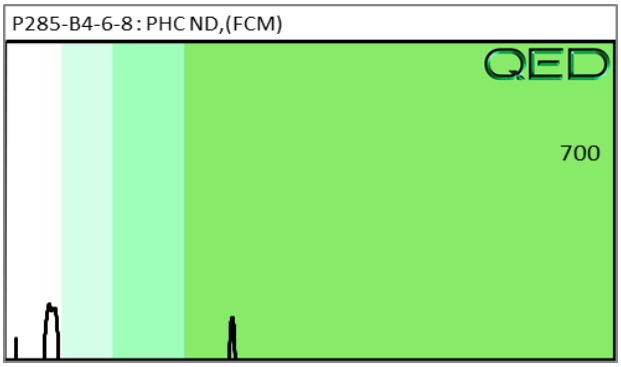


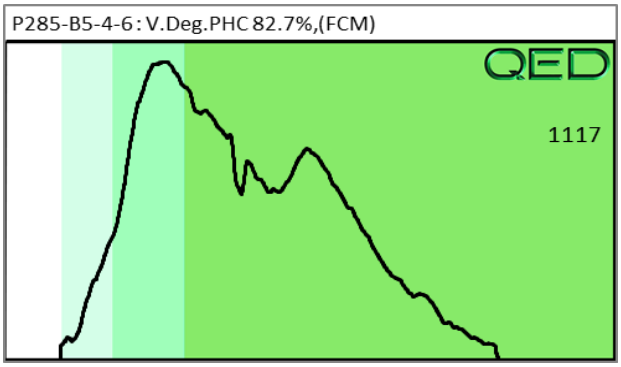












Hydrocarbon Analysis Results

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

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 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	P285-B5-8-10	17.0	<0.4	<0.4	<0.17	<0.4	<0.009	<0.009	<0.005	0	0	0	PHC ND,(FCM)
Soil	P285-B6-4-6	10.0	<0.25	<0.25	0.6	0.6	0.27	0.014	0.001	0	84.1	15.9	V.Deg.PHC 89.7%,(FCM)
Soil	P285-B6-6-8	13.0	<0.3	<0.3	0.28	0.28	0.15	0.009	<0.001	0	87.3	12.7	V.Deg.PHC 64.6%,(FCM)
Soil	P285-B7-0-2	8.0	<0.2	<0.2	0.7	0.7	0.3	0.017	<0.001	0	78.7	21.3	V.Deg.PHC 79.9%,(FCM)
Soil	P285-B7-4-6	10.0	<0.25	<0.25	0.25	0.25	0.18	0.009	<0.003	0	93.9	6.1	V.Deg.PHC 83.8%,(FCM)
Soil	P285-B8-2-4	10.0	<0.25	<0.25	0.29	0.29	0.14	0.007	<0.003	0	78.3	21.7	V.Deg.PHC 76.7%,(FCM)
Soil	P285-B8-6-8	11.0	<0.27	<0.27	9.9	9.9	0.13	0.009	<0.001	0	90.8	9.2	V.Deg.Light Fuel 99.6%,(FCM)
Soil	P285-B9-2-4	11.0	<0.27	<0.27	<0.11	<0.27	<0.006	<0.006	<0.003	0	0	0	PHC ND,(FCM)
Soil	P285-B9-8-10	7.0	<0.17	<0.17	0.07	0.07	0.06	<0.001	<0.002	0	92.4	7.6	Residual HC
Soil	P285-B10-4-6	11.0	<0.27	<0.27	9.7	9.7	0.7	0.04	<0.003	0	94.8	5.2	Deg Fuel 70.1%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 96.8%

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

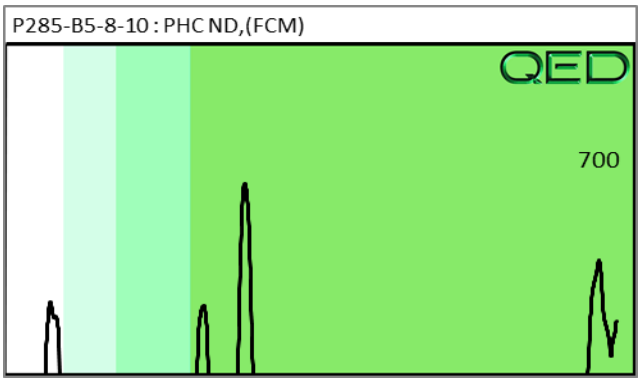
HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

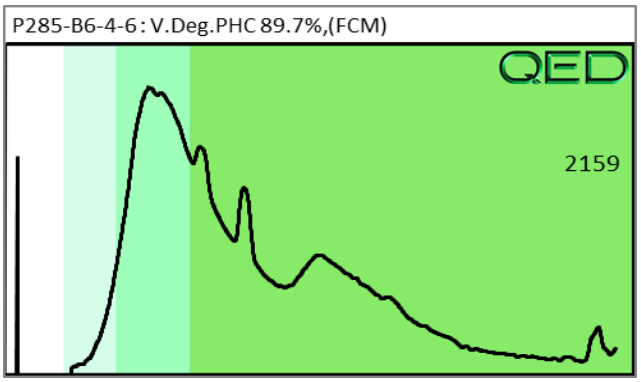
(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

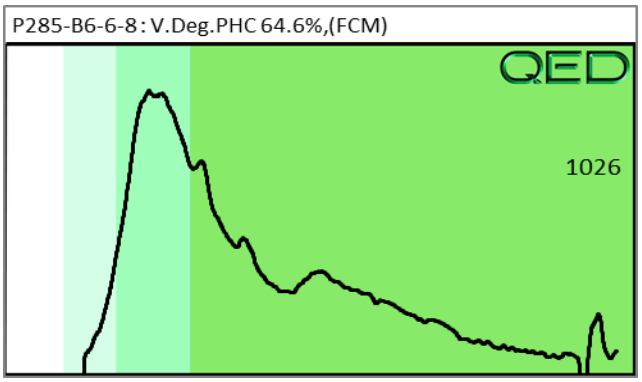
(TD) = Calibration outside limit

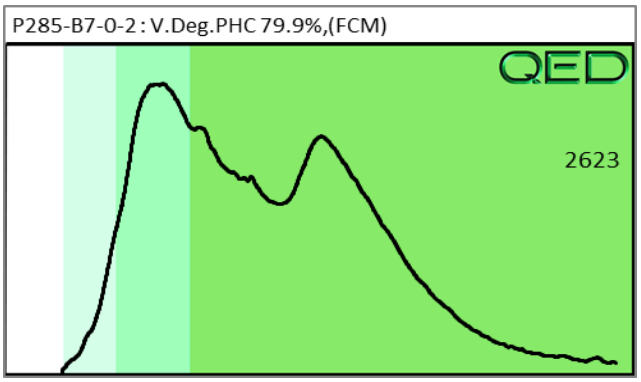
QED Hydrocarbon Fingerprints

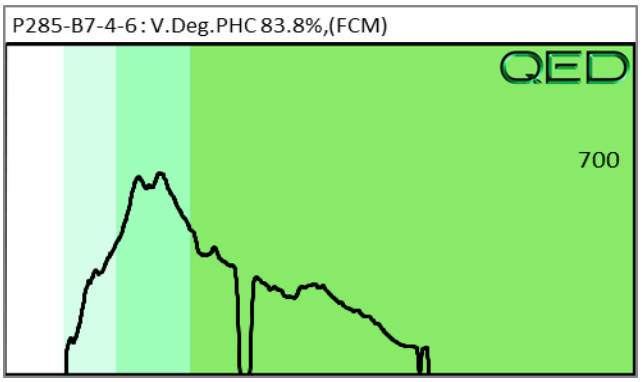
Project: P285

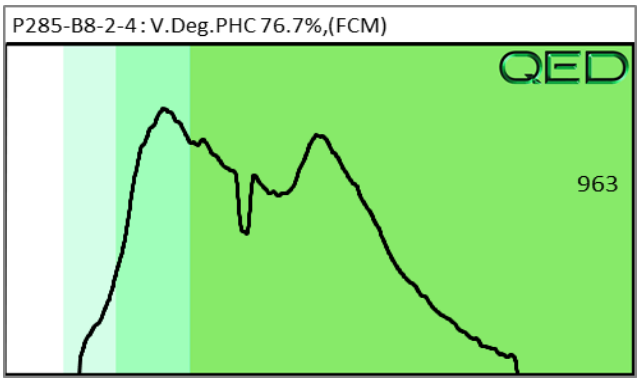


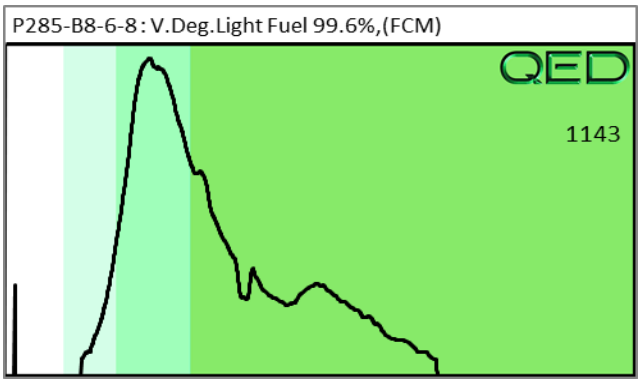


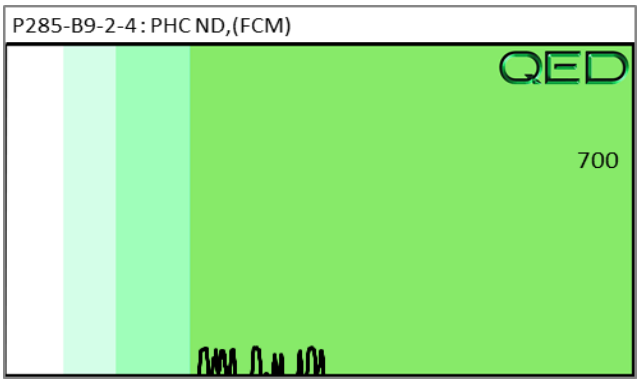


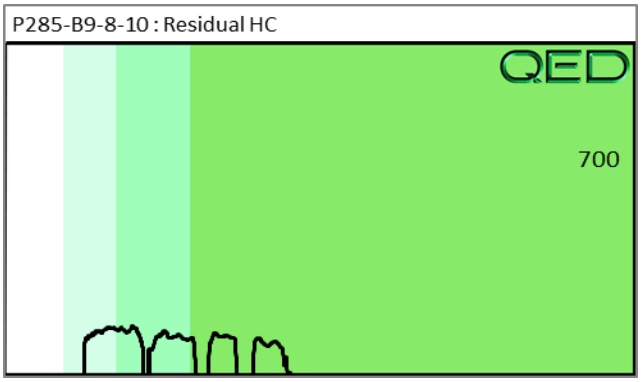


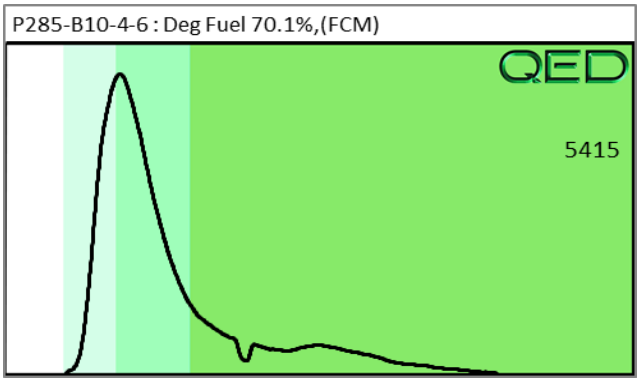












Hydrocarbon Analysis Results

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

Contact: Helen Corley

Project: P285

Samples taken Wednesday, September 1, 2021
Samples extracted Wednesday, September 1, 2021
Samples analysed Wednesday, September 1, 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	P285-B10-6-8	7.0	<0.17	<0.17	<0.07	0.016	0.016	0.002	<0.002	0	100	0	Residual HC
Soil	P285-B11-2-4	9.0	<0.22	<0.22	7.9	7.9	0.09	0.005	<0.003	0	98.6	1.4	Deg Fuel 63.6%,(FCM)
Soil	P285-B11-6-8	9.0	<0.22	<0.22	0.09	0.09	0.018	0.001	<0.003	0	100	0	Residual HC
Soil	P285-B12-2-4	8.0	<0.2	<0.2	<0.08	<0.2	<0.004	<0.004	<0.002	0	0	0	PHC ND,(FCM)
Soil	P285-B12-6-8	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 102.9%

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

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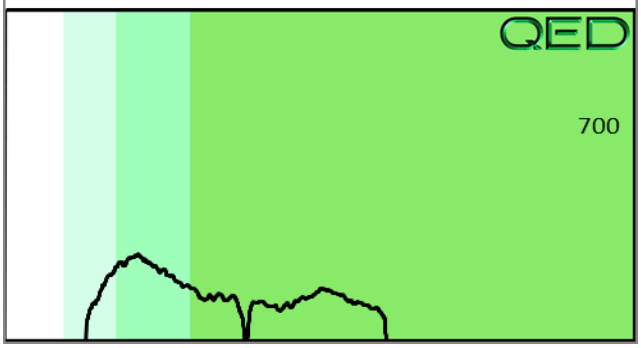
(TD) = Calibration outside limit

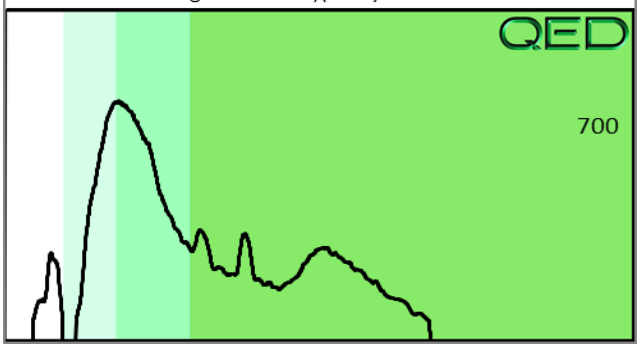
QED Hydrocarbon Fingerprints

Project: P285

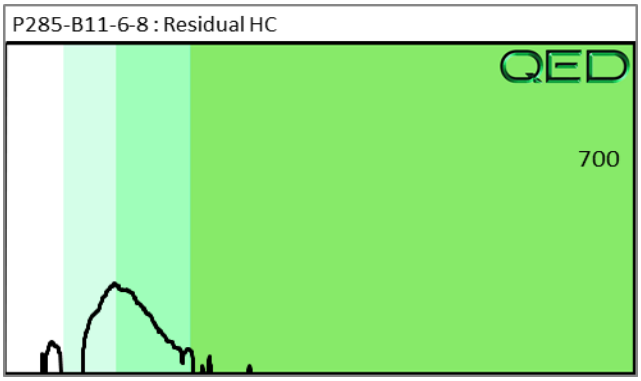
P285-B10-6-8 : Residual HC



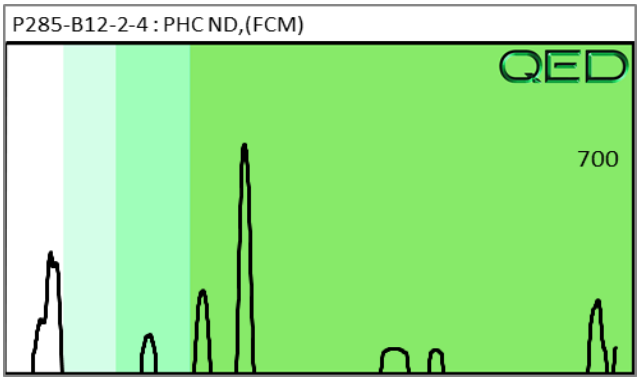
P285-B11-2-4 : Deg Fuel 63.6%,(FCM)



P285-B11-6-8 : Residual HC



P285-B12-2-4 : PHC ND,(FCM)



P285-B12-6-8 : PHC ND,(FCM)