

Prepared for:

**North Carolina Department of Transportation**

**Geotechnical Engineering Unit**

**GeoEnvironmental Section**

**1589 Mail Service Center**

**Raleigh, North Carolina, 27699-1589**

# Preliminary Site Assessment Report

City of Whiteville

Parcel # 55

NW Quadrant N. JK Powell Blvd. & Washington St.

Whiteville, Columbus County, North Carolina

US 701 Bypass (Madisson St-Powell Blvd) from SR 1437 (Virgil Ave) to US 74/76

TIP Number: R-5020B

WBS Element: 41499.1.3



**Apex Companies, LLC**

**(dba Apex Engineering, PC)**

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**November 21, 2018**

*not considered final unless all signatures are completed*

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## 1.0 INTRODUCTION

This report presents the results of a Preliminary Site Assessment (PSA) for the North Carolina Department of Transportation (NCDOT) Parcel 55 performed by Apex Companies, LLC (Apex) (dba Apex Engineering, PC) on behalf of the NCDOT. The subject site of this PSA report will be affected by the widening of J.K. Powell Blvd. (US 701 Bypass) from Virgil Ave. to US 74/76. The Site is comprised of a portion of an asphalt cul-de-sac surrounded by a grass median and is located in front of Walgreens, NW quadrant of N. JK Powell Blvd and Washington St. and is identified as Parcel 55, City of Whiteville Property, within the NCDOT R-5020B design project. The property is located between the W. Nance Street cul de sac and North JK Powell Boulevard in Whiteville, Columbus County, North Carolina, as shown in the attached Site Location Map (**Figure 1**). The site investigation was conducted in accordance with Apex Company's Technical and Cost proposal dated May 15, 2018.

NCDOT contracted Apex to perform the PSA within the proposed right-of-way (ROW) and/or easement of the Parcel 55, City of Whiteville Property due to the potential presence of contamination at the site and the fact that excavation and grading may occur within the area. The PSA was performed to evaluate if soils have been impacted as a result of past and present uses of the property within the proposed investigation area, if buried underground storage tanks (USTs) are present in the area of investigation, and if groundwater is impacted.

The following report presents the results of electromagnetic (EM) and ground penetrating radar (GPR) evaluation to identify potential USTs in the investigation area and describes the subsurface field investigation conducted. The report includes the evaluation of field screening, as well as field and laboratory analyses with regards to the presence or absence of soil and groundwater contamination within the area of investigation across the subject parcel. **Appendix A** includes a Photograph log for the site.

### 1.1 Site History

Parcel 55 has been identified with the address of NW quadrant of N. JK Powell Blvd and Washington Street. According to the proposed scope of work, the property is located in front of Walgreens. Based on a search of the North Carolina Department of Environmental Quality (NCDEQ) UST database registry, no registered tanks were identified for the City of Whiteville Property. Apex personnel also reviewed the NCDEQ Incident Management Database and no groundwater incidents are associated with this parcel.

### 1.2 Site Description

The site is located in a mixed commercial and residential area of Whiteville in Columbus County. The property is currently vacant. A drive path is located to the north followed by

residential properties. N. JK Powell Blvd followed by commercial properties are located to the east. Vacant, landscaped land is located to the south of the property. A fence followed by W. Nance Street and residential properties are located to the west of the property. Additionally, the geophysical surveyor, Pyramid Environmental & Engineering, PC, (Pyramid) identified one anomaly believed to be associated with a utility. Further GPR investigation, did not provide evidence of larger structures such as USTs beneath the suspected buried metallic debris found on the southern portion of the site. Pyramid concluded the geophysical data did not record evidence of metallic USTs on Parcel 55.

## 2.0 GEOLOGY

### 2.1 Regional Geology

Parcel 55, the City of Whiteville property, is located within the Coastal Plain Physiographic Province. The Coastal Plain is the largest physiographic province in the state, covering about 45% of the land area. According to the US Geological Survey Hydrogeological framework of the North Carolina coastal plain, the geology consists of eastward-dipping and eastward-thickening series of sedimentary strata which range in age from Holocene to Cretaceous. The most common type of sediment types are sand and clay, although a significant amount of limestone occurs in the southern part of the coastal plain. The Site overlies surficial sediments (to approximately 30 to 40 feet bls), the PeeDee Confining unit (approximately 10 feet thick in this area), and the Late Cretaceous age Peedee Formation. The Peedee Formation is named for exposures along the great Peedee River, it preserves belemnites and foraminifera fossils dating from the Late Cretaceous. It generally consists of marine sand, clayey sand and clay (M.D. Winner Jr. and R.W. Coble, 1996, *Hydrogeologic Framework of the North Carolina Coastal Plain, Regional Aquifer-System Analysis – Northern Atlantic Coastal Plain*, USGS Professional Paper 1404-I).

### 2.2 Site Geology

Site geology was observed through the drilling and sampling of two direct push technology (DPT) soil borings (SB) onsite. **Figure 2** presents the boring locations and site layout. Borings did not exceed a total depth of five feet below ground surface (bgs) since that depth was the maximum excavation depth for proposed drainage features. Soil consisting predominantly of tan sand and gray and brown clayey silt was observed across the parcel. The soils were unconsolidated and as a result the borings often collapsed. According to the topographical maps found on the Columbus County Geographic Information System (GIS) site, the parcel is located on a knoll but topography in the surrounding parcels slope to the west. Although groundwater does not always follow topographic changes, the topography suggests that the direction of groundwater flow generally flows to the west toward the Mollie Branch surface water feature. Boring logs are presented in **Appendix B**.

## **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 prepared to include the site-specific health and safety information necessary for the field activities. North Carolina-One Call was contacted on May 25, 2018 to report the proposed drilling activities and notify affected utilities. Apex subcontracted Pyramid to locate subsurface utilities and other subsurface drilling hazards as well as to perform a geophysical survey. Carolina Soil Investigations, LLC (CSI) of Olin, North Carolina was retained by Apex to perform the DPT borings for soil sampling. REDLAB, LLC (REDLAB) provided an ultraviolet fluorescence (UVF) Hydrocarbon Analyzer and Eastern Solutions provided a calibrated Flame Ionization/Photoionization Detector (FID/PID). Boring locations were strategically placed in a pattern within the area of investigation to maximize the opportunity to encounter potentially contaminated soil.

### **3.2 Site Reconnaissance**

Apex personnel performed a site reconnaissance on June 5, 2018. During the site reconnaissance, the area was visually examined for the presence of potential USTs or areas/obstructions that could potentially affect the subsurface investigation. The proposed boring locations were marked based on the site inspection and geophysical survey results. Apex personnel also used the site visit as an opportunity to contact the property manager/owner to inform them of upcoming field activities, where applicable.

### **3.3 Geophysics Survey Results**

The geophysical survey of the site was conducted on May 29 to May 31, 2018. Pyramid performed an electromagnetic (EM) induction metal survey followed by a GPR survey. A single EM anomaly was identified. The single EM anomaly was a result of a suspected utility and was investigated further with GPR. The GPR recorded an isolated, hyperbolic reflector suggestive of a utility. Pyramid concluded the geophysical data did not indicate evidence of metallic USTs on Parcel 55. A copy of the Geophysical Report is presented in **Appendix C**. The anomaly location is depicted on **Figure 2** of the Geophysical report.

### **3.4 Well Survey**

No water supply or groundwater monitoring wells were observed on Parcel 55.

### **3.5 Soil Sampling**

Apex conducted drilling activities at the site on June 5, 2018. The purpose of soil sampling was to determine if a petroleum release had occurred within the investigation area, and if so, to estimate the volume of impacted soil that might require special handling during construction activities. Apex drilling subcontractor, CSI, advanced two direct push soil borings within the proposed investigation area. These two boring locations were placed in a pattern to maximize the likelihood of identifying potential soil contamination. **Figure 2** presents the Site Map with boring locations and site structures.

Soil sampling was performed utilizing hand auger and direct push methods accompanied by field screening of volatile organic vapors with the FID/PID unit and onsite quantitative analyses with the UVF Hydrocarbon Analyzer. One to two intervals of the soil boring, exhibiting the most elevated FID/PID readings, were selected for onsite quantitative analysis of total petroleum hydrocarbons (TPH) in soil using the REDLAB UVF Hydrocarbon Analyzer. The analysis was performed onsite by Troy Holzschuh, a certified REDLAB UVF technician with Apex. The UVF results were generated concurrent with soil boring activities so that rapid assessment could be utilized for strategic boring placement.

### **3.6 Groundwater Sampling**

Groundwater was encountered on site at a depth ranging from four to five feet bgs. However, soil contamination was not evident in the water table smear zone based on FID/PID field screening or UVF hydrocarbon analysis. There is no evidence of significant petroleum hydrocarbon contamination of groundwater onsite, within the area of investigation.

## **4.0 SAMPLING RESULTS**

Based on FID/PID field screening and onsite UVF hydrocarbon analysis from the June 2018 soil sampling there is no evidence of significant petroleum hydrocarbon contamination onsite, within the area of investigation.

Elevated FID/PID readings, above ten parts per million (ppm), were observed in soils in several of the borings. The FID readings ranged from non-detect to 40 ppm, and PID readings ranged from non-detect to 180 ppm. The FID/PID field screening results are provided on the boring logs in **Appendix B**.

Soil samples which exhibited the highest PID and/or FID concentrations were field-analyzed using the UVF for the presence of total petroleum hydrocarbons (TPH) as diesel range organics (DRO) and gasoline range organics (GRO). These analytical results are provided in **Table 1**,

with instrument generated tables and chromatographs included in **Appendix D. Figure 3** presents the TPH-GRO and TPH-DRO results at each boring.

Based on the UVF analyses, TPH-GRO and TPH-DRO was identified in soils on Parcel 55. TPH-GRO concentrations ranged from below detectable levels to one milligram per kilogram (mg/kg) (P-55-SB-1). TPH-DRO concentrations ranged from below detectable levels to 3.2 mg/kg (P-55-SB-2). TPH-GRO concentrations did not exceed the regulatory action level of 50 mg/kg and the TPH-DRO concentrations did not exceed the regulatory action level of 100 mg/kg.

## 5.0 CONCLUSIONS

Based on site observations and onsite UVF analysis, the following bulleted summary is based upon Apex's evaluation of field observations and onsite quantitative analyses of samples collected from the Site on June 5, 2018.

- Results of the geophysical survey produced evidence of one anomaly created by a subgrade utility line.
- Two soil borings were advanced onsite. Soil samples collected from each boring were analyzed in the field using a REDLAB UVF Hydrocarbon Analyzer.
- Soil samples analyzed using the UVF did not contain either TPH-DRO or TPH-GRO concentrations above their respective NCDEQ Action levels of 100 mg/kg and 50 mg/kg.

## 6.0 RECOMMENDATIONS

Based on these PSA results, Apex does not recommend further assessment or soil sampling in the area of investigation.

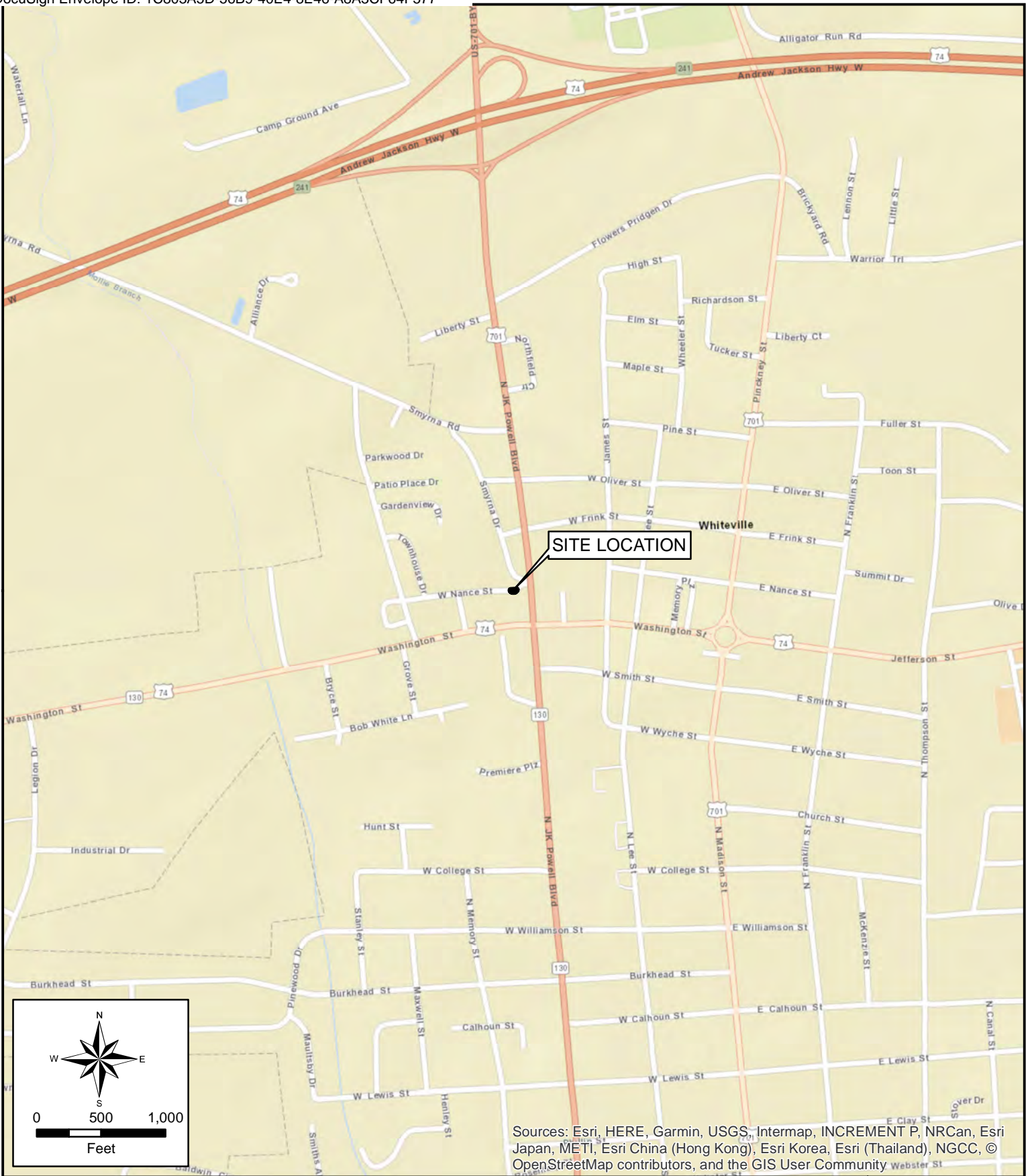
## **TABLES**



**Table 1**  
**UVF Onsite Hydrocarbon Analytical Soil Data from June 2018**  
**R-5020B, Parcel 55, City of Whiteville Property**  
**Whiteville, Columbus County, North Carolina**

Sample ID Number	Sample Date	Sample Depth (ft bgs)	GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)
<b>SOIL</b>				
<b>NCDEQ Action Level in mg/kg</b>			<b>50</b>	<b>100</b>
<b>P55-SB1</b>	6/5/2018	2 - 3	1	2.3
<b>P55-SB1</b>	6/5/2018	4 - 5	<0.66	<0.66
<b>P55-SB2</b>	6/5/2018	2 - 3	<0.52	0.52
<b>P55-SB2*</b>	6/5/2018	3.5 - 4	<0.71	3.2
<b>P55-DUP-1</b>	6/5/2018	---	<0.71	1.7
<b>NOTES:</b> (mg/kg) = Milligrams per kilogram * = Duplicate sample was collected GRO = Gasoline Range Organics DRO = Diesel Range Organics ft bgs = feet below ground surface TPH - GRO values in exceedance of NCDEQ Action Level of 50 mg/kg are shown in <b>Bold</b> TPH - DRO values in exceedance of NCDEQ Action Level of 100 mg/kg are shown in <b>Bold</b>				

## FIGURES



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

CHECK BY: TH
DRAWN BY: SP
DATE: 7/6/2018
SCALE: AS SHOWN
CAD NO.: NCDOT-001
PRJ NO.: NCDOT-001

**SITE LOCATION MAP**  
  
**PARCEL #55**  
**NW QUADRANT N. JK POWELL BOULEVARD**  
**& WASHINGTON STREET**  
**WHITEVILLE, NORTH CAROLINA**



FIGURE  
  
**1**



Sample Identification	P55-SB1
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	1
THP DRO (mg/kg)	2.3
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	<0.66
THP DRO (mg/kg)	<0.66

Sample Identification	P55-SB2
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	<0.52
THP DRO (mg/kg)	0.52
Sample Depth (Feet bgs)	3.5-4
TPH GRO (mg/kg)	<0.71
THP DRO (mg/kg)	3.2

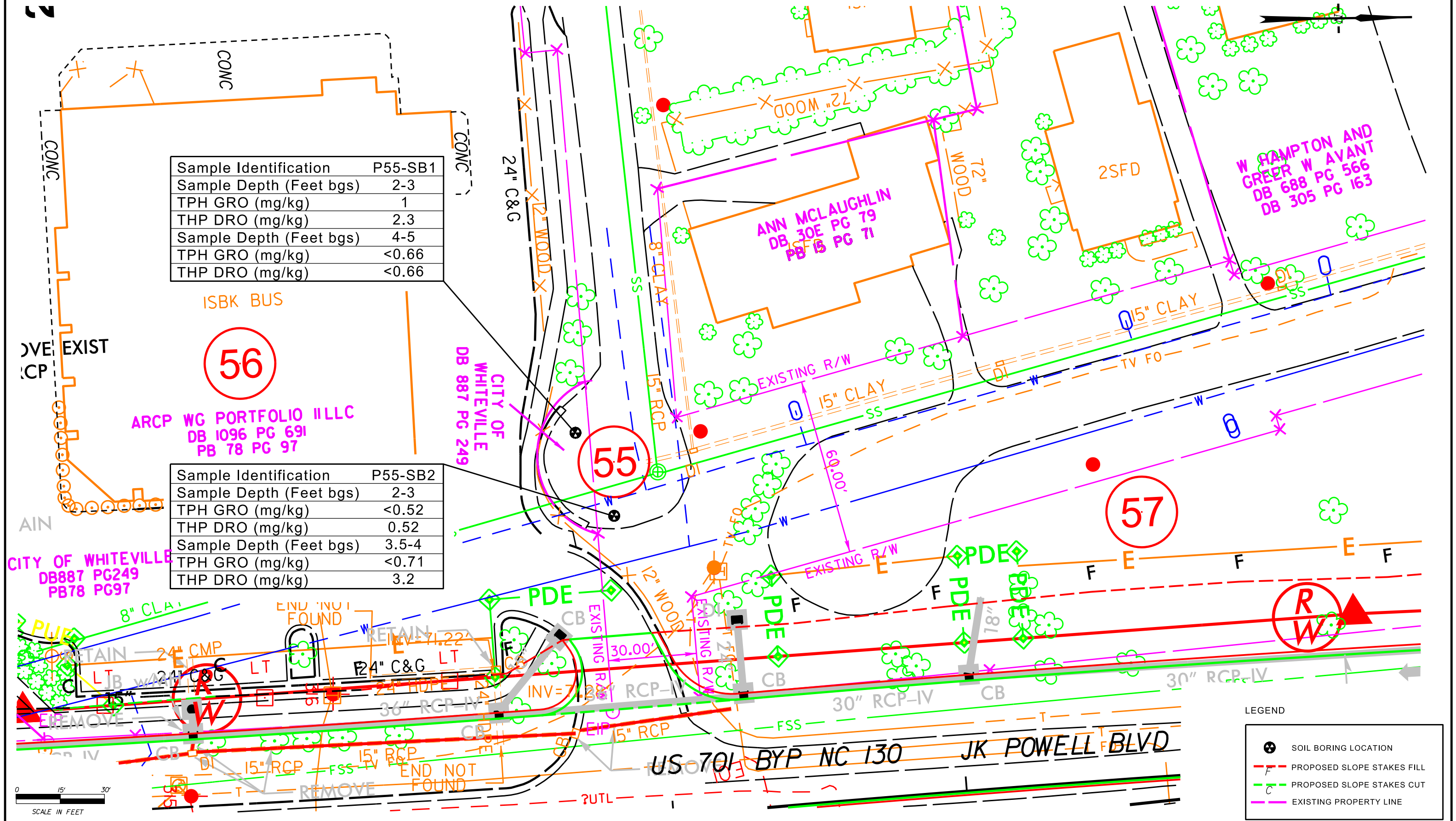


FIGURE 3  
 PARCEL 055  
 NW QUADRANT N. JK. POWELL BLVD & WASHINGTON STREET  
 ONSITE UVF HYDROCARBON ANALYSIS RESULTS - SOIL  
 6/5/18



Date:	7/24/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. #	NCDOT-001	
pc_055_fig 3.dgn		Project Title:
CAD File:		1" = 30'
Approx. Scale:		Drawn by: MJO
		Client: NC DOT

**APPENDIX A**  
**PHOTOGRAPH LOG**



**Photo 1**

Overview of site prior to preliminary site assessment activities.



**Photo 2**

View of CSI using a hand auger to clear for utilities.

10610 Metromont Pkwy  
Suite 206  
Charlotte, NC 28269



WBS 41499.1.3  
PROCESSED TLH  
DATE June 2018

PHOTOGRAPHIC LOG  
PSA Field Activities  
Parcel 55  
City of Whiteville Property  
Whiteville, NC

**APPENDIX B**  
**BORING LOGS**





## Apex Companies, LLC

### Boring Log

Boring/Well No.: P55-SB1	Site Name: Parcel 55
Date: 6/5/18	Location: Whiteville, Columbus County, NC
Job No.: NCDOT-001	Sample Method: Hand Auger and Direct Push
Apex Rep: Thomas Fisher	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2579

**Remarks:**

Depth BLS)	(ft)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1		--	--		0-0.5' Asphalt and gravel. 0.5'-2.5' Brown silty <b>SAND</b>
2		40	13		
3		79	26		2.5'-5' Gray and brown clayey <b>SILT</b> , slightly moist, plastic and saturated at 3.5-4
4		55	18		
5		25	4		
6					Boring terminated at 5 feet
7					
8					
9					
10					
11					
12					
13					
14					

**WELL CONSTRUCTION DETAILS (If Applicable)**

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:



## Apex Companies, LLC

### Boring Log

<b>Boring/Well No.:</b> P55-SB2	<b>Site Name:</b> Parcel 55
<b>Date:</b> 6/5/18	<b>Location:</b> Whiteville, Columbus County, NC
<b>Job No.:</b> NCDOT-001	<b>Sample Method:</b> Hand Auger and Direct Push
<b>Apex Rep:</b> Thomas Fisher	<b>Drilling Method:</b> Hand Auger and Direct Push
<b>Drilling Company:</b> Carolina Soil Investigations	<b>Driller Name/Cert #:</b> Danny Summers/2579

**Remarks:**

Depth BLS)	(ft)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1		40	180		0-2' Grass-Dark gray silty <b>SAND</b> .
2		1.0	5.0		
3		4.0	52		2'-5' Tan <b>SAND</b> , loose, saturated at 3'-3.5'.
4		11	44		
5		--	--		
					Boring terminated at 5 feet
6					
7					
8					
9					
10					
11					
12					
13					
14					

**WELL CONSTRUCTION DETAILS (If Applicable)**

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

**APPENDIX C**  
**GEOPHYSICAL REPORT**



PYRAMID GEOPHYSICAL SERVICES  
(PROJECT 2018-139)

# GEOPHYSICAL SURVEY

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**METALLIC UST INVESTIGATION:  
PARCEL 55  
NCDOT PROJECT R-5020B (41499.1.3)**

N. JK Powell Blvd. & Washington St., WHITEVILLE, NC

JUNE 21, 2018

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C257: GEOLOGY C1251: ENGINEERING

**GEOPHYSICAL INVESTIGATION REPORT**  
**Parcel 55 – N. JK Powell Blvd. & Washington St.**  
**Whiteville, Columbus County, North Carolina**

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- Figure 4 – Overlay of Geophysical Survey Boundaries on NCDOT Engineering Plans

## 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

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**Project Description:** Pyramid Environmental conducted a geophysical investigation for Apex Companies, LLC at Parcel 55, located at N. JK Powell Blvd. & Washington St., in Whiteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5020B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from May 29 – 31, 2018, 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. A single EM anomaly was identified. The single EM anomaly was a result of a suspected utility and was investigated further with GPR. GPR recorded an isolated, hyperbolic reflector suggestive of a utility. Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 55.

## INTRODUCTION

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Pyramid Environmental conducted a geophysical investigation for Apex Companies, LLC at Parcel 55, located at N. JK Powell Blvd. & Washington St., in Whiteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5020B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from May 29 – 31, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a portion of an asphalt cul-de-sac surrounded by a grass median. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

## FIELD METHODOLOGY

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

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



computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on May 31, 2018, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz 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 DF 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
<b>Known UST</b> Active tank - spatial location, orientation, and approximate depth determined by geophysics.	<b>Probable UST</b> 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.	<b>Possible UST</b> 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**. The EM anomaly identified at the site is numbered for reference in the figure and summarized in the following table.

**LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY**

<b>Metallic Anomaly #</b>	<b>Cause of Anomaly</b>	<b>Investigated with GPR</b>
1	Suspected Utility	☑

The single EM anomaly (Anomaly 1) was associated with a suspected utility and was investigated further by GPR.

*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 two GPR transects were performed at the site. GPR Transects 1 and 2 were performed across EM Anomaly 1. These transects recorded evidence of an isolated, hyperbolic reflector that was suggestive of a utility. No evidence of a larger structure such as a UST was observed in this area.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 55. **Figure 4** provides an overlay of the geophysical survey onto the NCDOT MicroStation engineering plans for reference.

**SUMMARY & CONCLUSIONS**


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Pyramid’s evaluation of the EM61 and GPR data collected at Parcel 55 in Whiteville, North Carolina, provides the following summary and conclusions:

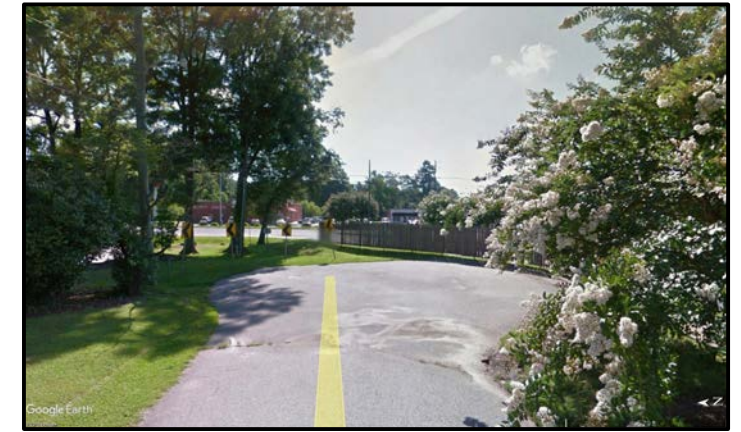
- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The single EM anomaly was a result of a suspected utility and was investigated further with GPR.
- GPR recorded an isolated, hyperbolic reflector suggestive of a utility.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 55.

## LIMITATIONS

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Geophysical surveys have been performed and this report was prepared for Apex Companies, LLC 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 North)



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License # C1251 Eng. / License # C257 Geology

PROJECT  
**PARCEL 55**  
WHITEVILLE, NORTH CAROLINA  
NCDOT PROJECT R-5020B

TITLE  
**PARCEL 55 - GEOPHYSICAL SURVEY**  
BOUNDARIES AND SITE PHOTOGRAPHS

DATE  
5/29/2018

PYRAMID PROJECT #:  
2018-139

CLIENT  
Apex Companies, LLC

**FIGURE 1**

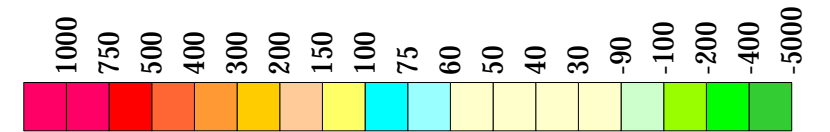
## EM61 METAL DETECTION RESULTS



**NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED.**

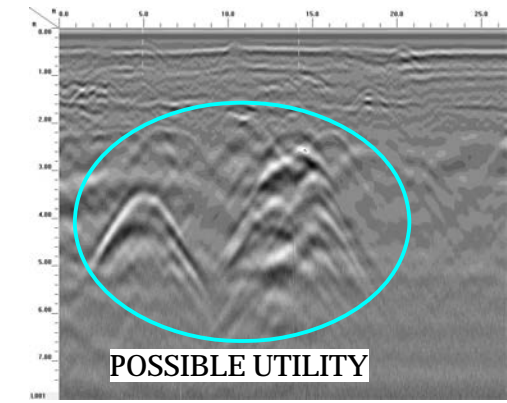
The contour plot shows the bottom coil data results of the EM61 instrument in millivolts (mV), which provide a stronger metallic response of the instrument and do not incorporate the top coil. Differential data (difference between top and bottom coils) were not used for this parcel due to interference. The EM61 data were collected on May 29, 2018, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on May 31, 2018.

**EM61 Metal Detection Response (millivolts)**

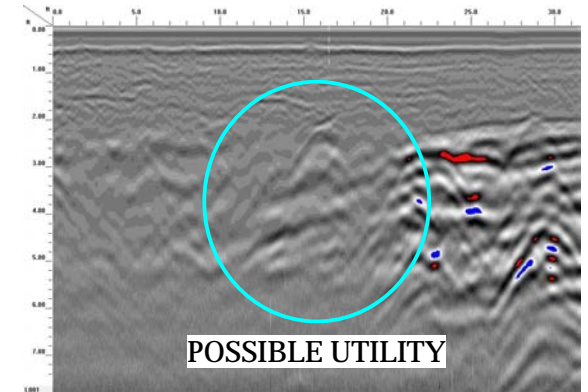


	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT <b>PARCEL 55</b> WHITEVILLE, NORTH CAROLINA NCDOT PROJECT R-5020B	TITLE <b>PARCEL 55 - EM61 METAL DETECTION CONTOUR MAP</b>	DATE	5/29/2018	CLIENT	Apex Companies, LLC
				PYRAMID PROJECT #:	2018-139		<b>FIGURE 2</b>

### LOCATIONS OF GPR TRANSECTS



GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



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PROJECT  
**PARCEL 55**  
WHITEVILLE, NORTH CAROLINA  
NCDOT PROJECT R-5020B

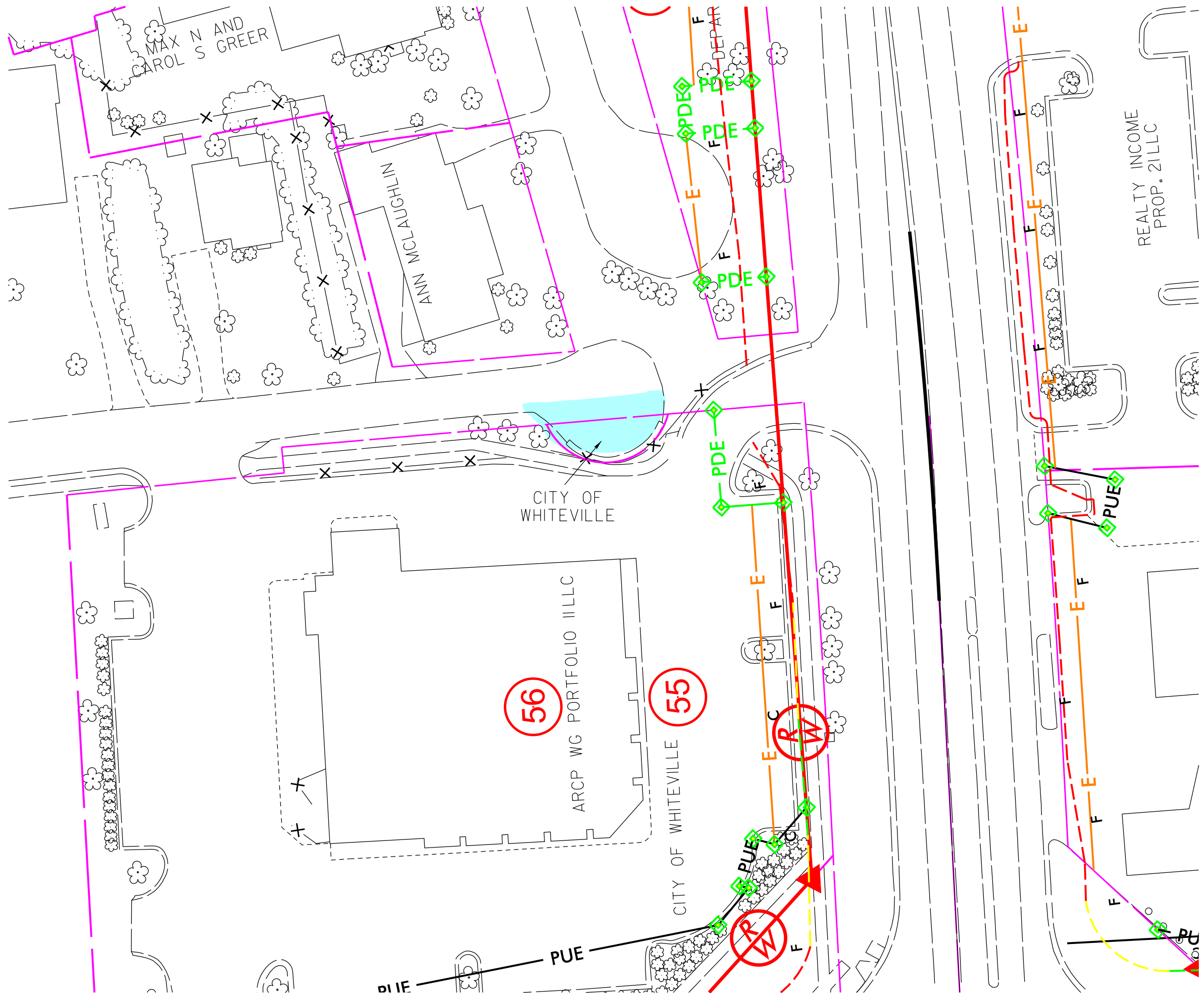
TITLE  
**PARCEL 55 - GPR TRANSECT LOCATIONS AND IMAGES**

DATE  
5/31/2018

PYRAMID PROJECT #:  
2018-139

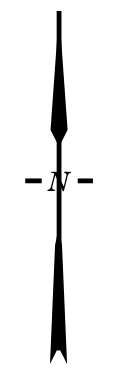
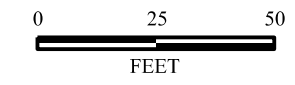
CLIENT  
Apex Companies, LLC

**FIGURE 3**



**LEGEND**

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- - - PROPOSED SS CUT LINE
- - - PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA



TITLE OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 55 WHITEVILLE, NORTH CAROLINA NCDOT PROJECT W-5020B	
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DATE: 06-26-2018	REVISION NO. 0
PYRAMID PROJECT NO. 2018-139	FIGURE NO. 4

**APPENDIX D**  
**UVF HYDROCARBON ANALYSIS RESULTS**





**Hydrocarbon Analysis Results**

**Client:** NCDOT  
**Address:** Parcel 55

**Samples taken** Tuesday, June 5, 2018  
**Samples extracted** Tuesday, June 5, 2018  
**Samples analysed** Tuesday, June 5, 2018

**Contact:** Craig Haden

**Operator** Troy L. Holzschuh

**Project:** R-5020B Whiteville, NC

											F03640				
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match		
										% light	% mid	% heavy			
s	P55-SB1 (2-3)	23.9	<0.6	1	2.3	3.3	1.1	<0.19	<0.024	53.6	36.5	9.9	Road Tar 95.2%,(FCM)		
s	P55-SB1 (4-5)	26.5	<0.66	<0.66	<0.66	<0.66	<0.13	<0.21	<0.027	0	0	0	PHC not detected,(P)		
s	P55-SB2 (2.3)	21.0	<0.52	<0.52	0.52	0.52	0.37	<0.17	<0.021	0	77.8	22.2	Residual HC		
s	P55-SB2 (3.5-4)	28.6	<0.71	<0.71	3.2	3.2	1.3	<0.23	<0.029	0	74.9	25.1	V.Deg.PHC 81.8%,(FCM)		
s	P55-DUP-1	28.6	<0.71	<0.71	1.7	1.7	0.91	<0.23	<0.029	0	68.6	31.4	V.Deg.PHC 92%,(FCM)		
			Initial Calibrator QC check				OK		Final FCM QC Check				OK		102.6 %

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content  
 Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library  
 (SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

