

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

Sibbett Properties, Inc. Property

Parcel # 19

106 South J.K. Powell Blvd.

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)**

**10610 Metromont Parkway, Suite 206**

**Charlotte, North Carolina 28269**

Prepared by:

DocuSigned by:

A handwritten signature in black ink that reads 'Troy Holzschuh'.

2D73445FBBB9455...

Troy L. Holzschuh

Assistant Project Manager

Reviewed by:

DocuSigned by:

A handwritten signature in black ink that reads 'Eric J. Wysong'.

3CB3ABA2358C407...

Eric Wysong, L.G.

Project Manager

NC Geologist License No. 2581



**November 21, 2018**

*not considered final unless all signatures are completed*

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION</b> .....	<b>1</b>
1.1	Site History .....	1
1.2	Site Description.....	2
<b>2.0</b>	<b>GEOLOGY</b> .....	<b>3</b>
2.1	Regional Geology .....	3
2.2	Site Geology .....	3
<b>3.0</b>	<b>FIELD ACTIVITIES</b> .....	<b>3</b>
3.1	Preliminary Activities .....	3
3.2	Site Reconnaissance .....	4
3.3	Geophysical Survey Results .....	4
3.4	Well Survey.....	4
3.5	Soil Sampling.....	4
3.6	Groundwater Sampling .....	5
<b>4.0</b>	<b>SAMPLING RESULTS</b> .....	<b>5</b>
<b>5.0</b>	<b>CONCLUSIONS</b> .....	<b>6</b>
<b>6.0</b>	<b>RECOMMENDATIONS</b> .....	<b>7</b>

### TABLES

Table 1 UVF Onsite Hydrocarbon Analytical Soil Data

### FIGURES

Figure 1 Site Location Map  
 Figure 2 Site Map with Soil Boring Locations  
 Figure 3 Onsite UVF Hydrocarbon Analysis Results – Soil  
 Figure 4 Site Map with Estimated Area of Groundwater Contamination

### APPENDICES

Appendix A Photograph Log  
 Appendix B Historical Records  
 Appendix C Boring Logs  
 Appendix D Geophysical Report  
 Appendix E UVF Hydrocarbon Analysis Results

## 1.0 INTRODUCTION

This report presents the results of a Preliminary Site Assessment (PSA) for the North Carolina Department of Transportation (NCDOT) Parcel 19 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 one parcel and is located at 106 South J.K. Powell Boulevard and is identified as Parcel 19, Sibbett Properties, Inc. property, within the NCDOT R-5020B design project. The property is located on the western side of South J.K. Powell Boulevard approximately 105 feet south of the intersection of South J.K. Powell Boulevard and West Lewis Street 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 19 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 an electromagnetic (EM) and ground penetrating radar (GPR) evaluation to identify USTs in the investigation area and describes the subsurface field investigation at the site. The report includes the evaluation of field screening, as well as field analyses with regards to the presence or absence of soil and groundwater contamination within the area of investigation across Parcel 19. **Appendix A** includes a Photograph log for the site.

### 1.1 Site History

Parcel 19 has been identified with the address of 106 South J.K. Powell Boulevard. Based on a search of the North Carolina Department of Environmental Quality (NCDEQ) UST database registry, no registered tanks were identified for the 106 South J.K. Powell Boulevard site. Additionally, the geophysical survey did not identify evidence of USTs on site. Apex personnel also reviewed the NCDEQ Incident Management Database and groundwater and found incident number 94050 associated with this parcel. Additionally, Apex personnel verified in the field the presence of a remediation system and monitoring wells on this parcel. The remediation system trailer was located on site. The remediation system trailer was interconnected with PVC pipe and a series of vaults that were on Parcel 19 and the adjacent parcel to the north, Parcel 20. An incident number is not assigned to the Parcel 20 address. Parcel 19 currently operates as Sibbett Auto sales, however, the site formerly operated as a petroleum retail facility and

convenience store. According to available information a former above ground storage tank (AST) system owned by Whiteville Oil Company, Inc. (Whiteville Oil) consisted of two 6,000-gallon capacity gasoline ASTs and one 280-gallon capacity kerosene AST. The tank system was taken out-of-service in July 2000 and the tanks subsequently removed by Whiteville Oil. An air sparging (AS) system consisting of 30 AS wells, a soil vapor extraction (SVE) system consisting of 12 SVE wells and associated equipment began operating on November 29, 2004. Geological Resources, Inc. (GRI) performed a receptor survey on July 20, 2016 and reported that no water supply wells are located within 1,500 feet of the site. In a report prepared for Whiteville Oil by GRI dated August 11, 2016, GRI states that benzene, toluene, xylenes, MTBE and/or naphthalene exceeded the North Carolina 2L Groundwater Quality Standards (2L Standards) in groundwater samples collected from monitoring wells located on Parcel 19 and neighboring parcels. However, none of the contamination concentrations exceeded the gross contamination levels. Additionally, GRI states that in accordance with House Bill 765, the site is now classified as a low risk incident. GRI recommends that the incident be closed. On September 13, 2016 NCDEQ responded to Whiteville Oil acknowledging that the site can be closed. However, property owners where contamination has migrated will be required to agree to land restrictions before the incident can be closed and a No Further Action letter issued. According to the Mike Haseltine of NCDEQ the incident has not yet been closed. Historical records can be found in **Appendix B**.

## **1.2 Site Description**

The site is located in a mixed commercial and residential area of Columbus County, Whiteville, North Carolina. The property currently houses one predominantly brick building and one remediation system trailer housing. The remediation trailer is enclosed in a fenced area on the north side of the building. The permanent building operates as Sibbett Auto Sales and has four bay doors which face South J.K. Powell Boulevard. The groundwater remediation system consists of a series of vaults interconnected by PVC piping. The site was observed to have monitoring wells. The rest of the parcel is covered with paved asphalt and grass. South J.K. Powell borders the site to the east followed by Dale's Seafood. The parcel is bordered to the north by a vacant lot. The west is bordered by woods followed by residential properties. The southern property line is bordered by an ABC store. The geophysical surveyor, Pyramid Environmental & Engineering, PC, (Pyramid) identified a total of six EM anomalies on site. No evidence of larger structures such as USTs were observed beneath the reinforcement. Pyramid concluded the geophysical data did not record any evidence of metallic USTs on Parcel 19.

## 2.0 GEOLOGY

### 2.1 Regional Geology

Parcel 19, Sibbett Properties, Inc. 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 four 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) because the design plan indicates fill be added and drainage features are not proposed. Soil consisting predominantly of tan to yellow clayey silt to yellow sandy clayey silt was observed across the parcel. Borings on the site intercepted water at approximately five feet bgs. According to the topographical maps found on the Columbus County GIS site and historical reports found in the NCDEQ archives, the parcel slopes from southeast to the northwest suggesting that the direction of groundwater flow generally flows to the west towards Mollie Branch. Boring logs are presented in **Appendix C**.

## 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 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 6, 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.

### 3.3 Geophysical Survey Results

The geophysical survey of the site was conducted from May 30, 2018 to June 4, 2018. Pyramid performed an EM induction metal survey followed by a GPR survey. A copy of the Geophysical Report is presented in **Appendix D**. A total of six EM anomalies were identified. These areas were associated with reinforced concrete, possible utilities parked cars or well covers, and utilities associated with a remediation system. The anomalies were investigated further with the GPR method. No evidence of larger structures such as USTs were observed beneath the reinforcement. Pyramid concluded the geophysical data did not indicate evidence of metallic USTs on Parcel 19.

### 3.4 Well Survey

According to a receptor survey completed on July 20, 2016, no water supply wells are located within a 1,500-foot radius of the site. One active groundwater monitoring well was observed within the investigation area of Parcel 19, and as discussed in Section 1.1 (Site History), a remediation system was operated on-site and AS and SVE well vaults remain on-site.

### 3.5 Soil Sampling

Apex conducted drilling activities at the site on June 6, 2018. The purpose of soil sampling was to determine if a petroleum release has 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 four direct push soil borings within the proposed investigation area. These four boring locations were placed in a pattern to maximize the likelihood of identifying potential soil contamination. **Figure 2** presents the Site Map with soil 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 depths ranging from four to five feet bgs. However, contamination was not evident based on FID/PID field screening or UVF hydrocarbon analysis of soil sampling within the smear zone. There is no evidence of significant petroleum hydrocarbon contamination of groundwater onsite, within the area of investigation. Historical reports indicate that benzene, toluene, ethylbenzene, xylenes, MTBE and naphthalene are present in MW-2 located in the northeastern portion of the site. Groundwater flows northwest offsite towards Parcel 20.

## 4.0 SAMPLING RESULTS

Based on FID/PID field screening and onsite UVF hydrocarbon analysis from the June 2018 soil sampling there is evidence of petroleum hydrocarbon contamination onsite, within the area of investigation. Elevated FID/PID readings were not observed above ten parts per million (ppm). FID readings ranged from non-detectable to 5.95 ppm in soils above the smear zone. The PID readings ranged from non-detectable to 1.75 ppm in soils above the smear zone. The FID/PID field screening results are provided on the boring logs-in **Appendix C**.

Soil concentrations of TPH gasoline range organics (GRO) and diesel range organics (DRO) measured using the onsite UVF unit are presented in **Table 1**, with instrument generated tables and chromatographs in **Appendix E**. **Figure 3** presents the TPH-GRO and TPH-DRO results at each boring.

Based on the UVF analyses, TPH-GRO was not identified on Parcel 19, however TPH-DRO was identified. TPH-GRO concentrations were below detectable levels but TPH-DRO concentrations ranged from below detectable levels to 8.7 mg/kg (P19-SB1) for soils sampled above the smear zone. Within the smear zone, TPH-DRO concentrations ranged from below detectable levels to 0.57 mg/kg (P19-SB1). 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.

In a report dated August 11, 2016, MW-2 located in the northeastern portion of the parcel, reportedly contained benzene, MTBE and naphthalene. This is the only monitoring well on site to indicate elevated concentrations. Groundwater flows northwest towards Parcel 20. **Appendix B** provides historical groundwater data and **Figure 4** provides potential area of groundwater contamination. The estimated area of potential groundwater impact in the southeastern portion of Parcel 19 is approximately 1,693 square feet in size.

## 5.0 CONCLUSIONS

Based on site observations and onsite UVF analysis, petroleum-impacted soil contamination was not identified above the NCDEQ Action level of 50 mg/kg for TPH-GRO and was not identified above the NCDEQ Action level of 100 mg/kg for TPH-DRO.

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 6, 2018.

- Results of the geophysical survey did not produce evidence of anomalies characteristic of USTs.
- Four 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 TPH-GRO concentrations above their respective NCDEQ Action levels of 50 mg/kg.
- Soil samples analyzed using the UVF did not contain TPH-DRO concentrations above their respective NCDEQ Action levels of 100 mg/kg.
- Groundwater was encountered on site between four and five feet bgs. However, contamination was not evident based on FID/PID field screening or UVF hydrocarbon analysis.
- A former AST system owned by Whiteville Oil consisting of two 6,000-gallon capacity gasoline ASTs and one 280-gallon capacity kerosene AST were taken out-of-service in July 2000 and have since been removed. To address both Parcels 19 and 20, an AS system consisting of 30 AS wells and a SVE system consisting of 12 SVE wells and associated equipment began operating on November 29, 2004.



- Historically Benzene, MTBE and/or naphthalene were found in groundwater at concentrations exceeding their respective 2L Standards. There is an open groundwater incident for the site. Based on the low risk ranking, the site will be closed once land use restrictions for all impacted properties are approved. No evidence of groundwater contamination was observed during this preliminary site assessment.

## **6.0 RECOMMENDATIONS**

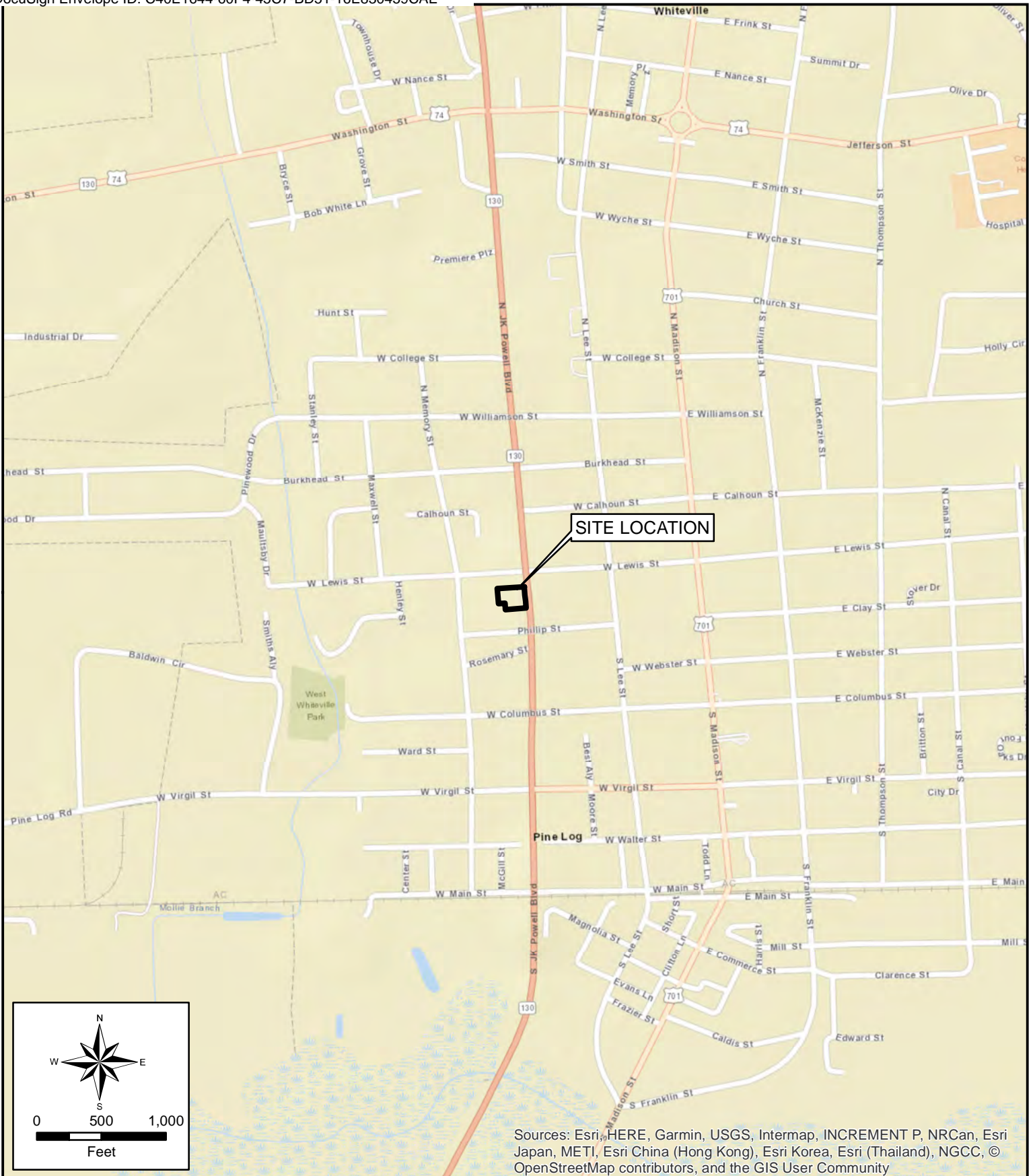
Based on these PSA results, Apex does not recommend further assessment or soil sampling in the area of investigation. A remediation system composed of a series of interconnected vaults is on site. The remediation trailer is not within the design area however many of the vaults and interconnecting PVC piping are. This system and associated monitoring wells will need to be abandoned and removed prior to construction activities. Groundwater impacted with low levels of petroleum related compounds may be encountered and generated during construction activities. This groundwater will need to be managed in accordance with applicable requirements.

## **TABLES**

**Table 1**  
**UVF Onsite Hydrocarbon Analytical Soil Data from June 2018**  
**R-5020B, Parcel 19, Sibbett Properties, Inc. 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>P19-SB-1</b>	6/6/2018	1 - 2	<0.57	8.7
<b>P19-SB1*</b>	6/6/2018	4 - 5	<0.57	0.57
<b>P19-SB2</b>	6/6/2018	1 - 2	<0.61	<0.61
<b>P19-SB2</b>	6/6/2018	4 - 5	<0.49	<0.49
<b>P19-SB3</b>	6/6/2018	1 - 2	<0.27	<0.27
<b>P19-SB3</b>	6/6/2018	4 - 5	<0.27	<0.27
<b>P19-SB4</b>	6/6/2018	1 - 2	<0.27	<0.27
<b>P19-SB4</b>	6/6/2018	5 - 5.5	<0.27	<0.27
<b>P19-DUP-1</b>	6/6/2018	---	<0.57	0.57
<b>NOTES:</b> (mg/kg) = Milligrams per kilogram * = Collected a Duplicate Sample 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 Bold TPH - DRO values in exceedance of NCDEQ Action Level of 100 mg/kg are shown in Bold				

## FIGURES



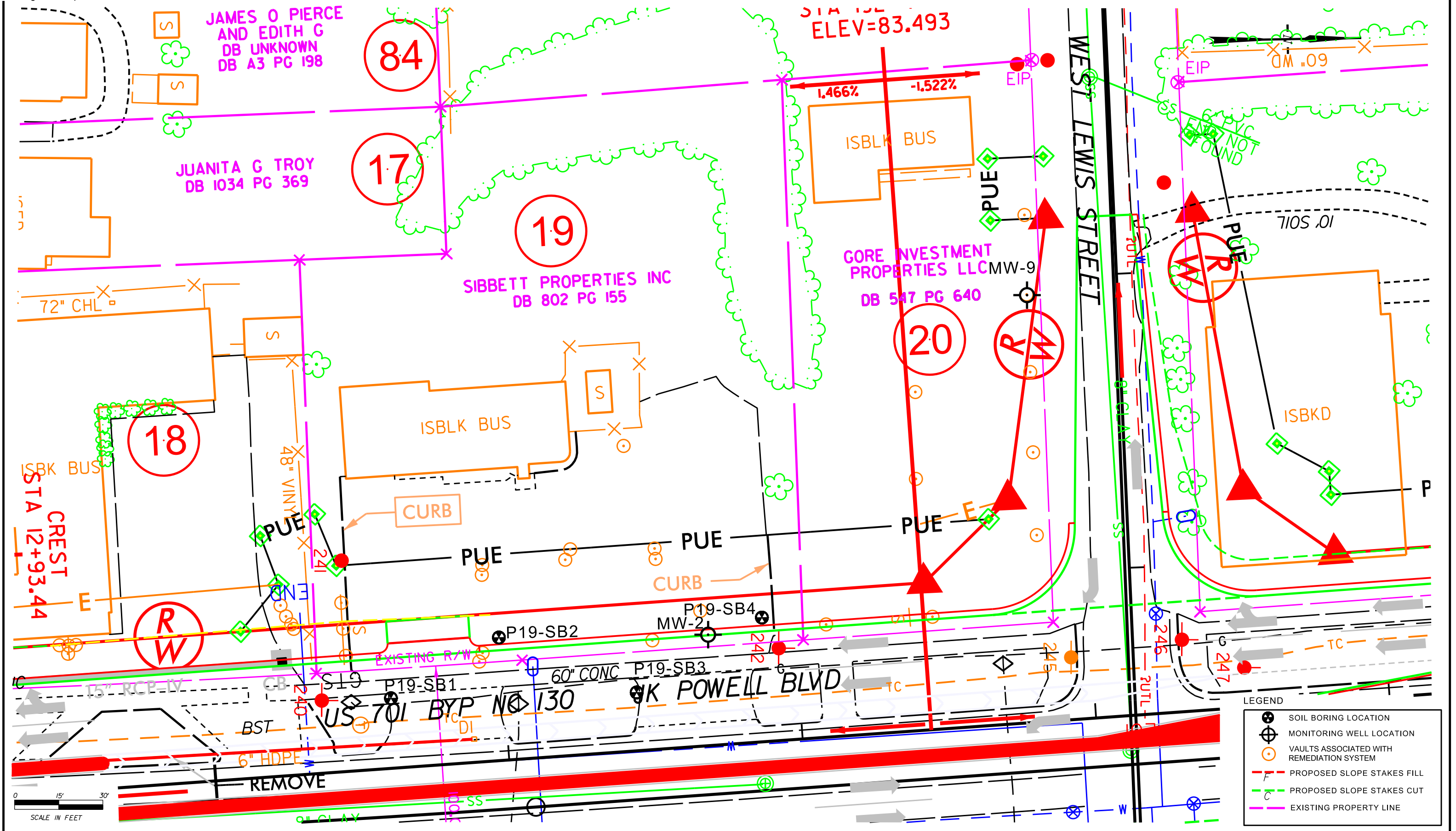
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

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 #19**  
**106 S. JK POWELL BOULEVARD**  
**WHITEVILLE, NORTH CAROLINA**



FIGURE  
  
**1**



LEGEND

	SOIL BORING LOCATION
	MONITORING WELL LOCATION
	VAULTS ASSOCIATED WITH REMEDIATION SYSTEM
	PROPOSED SLOPE STAKES FILL
	PROPOSED SLOPE STAKES CUT
	EXISTING PROPERTY LINE

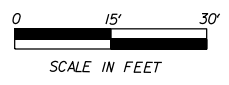
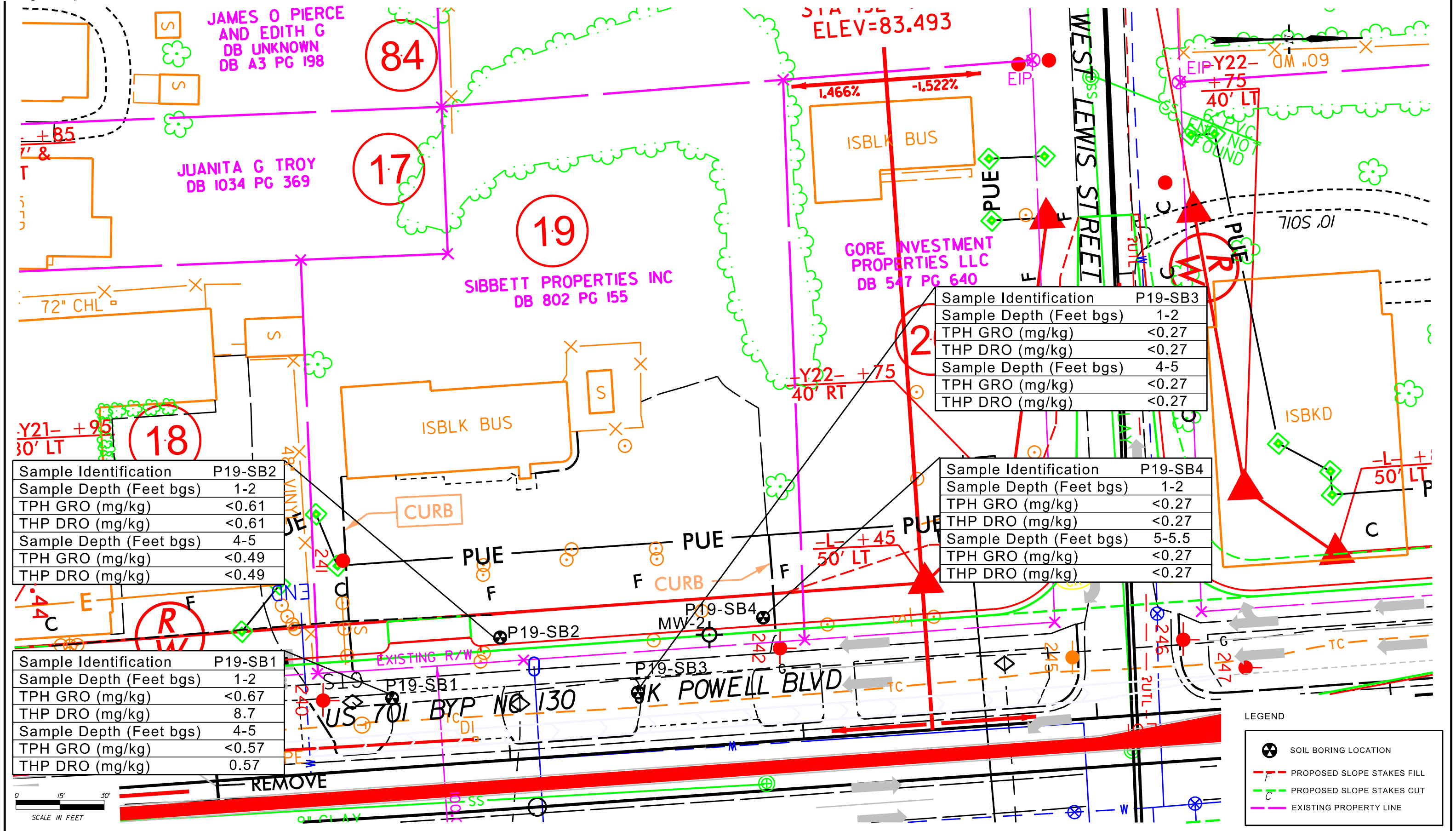


FIGURE 2  
 PARCEL 019  
 106 S. JK. POWELL BLVD.  
 SITE MAP WITH BORING  
 LOCATIONS

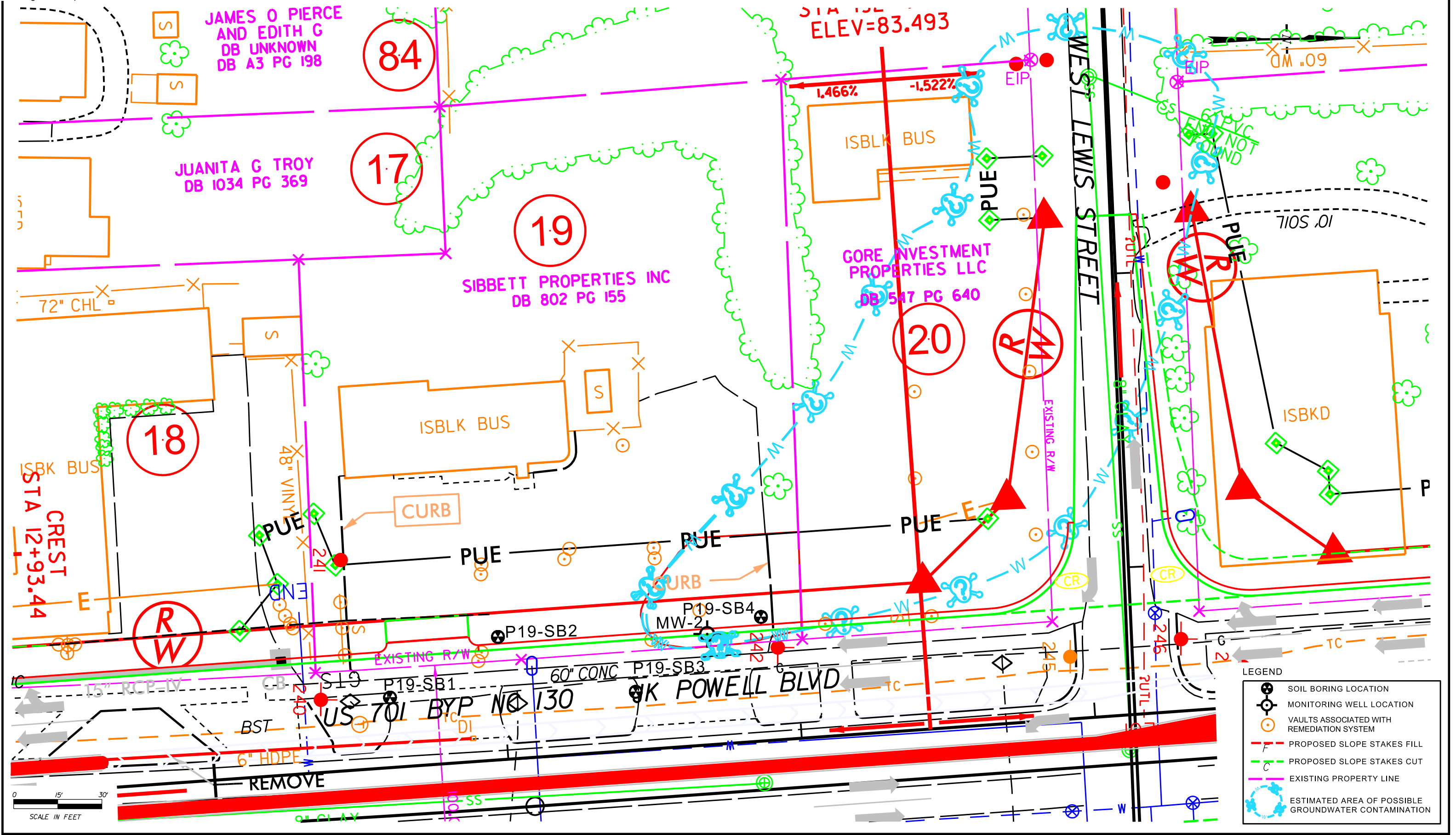


Date:	6/6/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. #	NCDOT-001	
pc_019_fig 2.dgn		Project Title:
CAD File:		Approx. Scale:
	1" = 30'	Drawn by:
		MJO
		NC DOT



**FIGURE 3**  
**PARCEL 019**  
 106 S. JK. POWELL BLVD.  
 ONSITE UVF HYDROCARBON ANALYSIS RESULTS - SOIL  
 6/6/18

Date:	7/19/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. #	NCDOT-001	
pc_019_fig 3.dgn		Project Title:
CAD File:		1" = 30'
Approx. Scale:		Drawn by: MJO
		Client: NC DOT



0 15' 30'  
SCALE IN FEET

LEGEND

- SOIL BORING LOCATION
- MONITORING WELL LOCATION
- VAULTS ASSOCIATED WITH REMEDIATION SYSTEM
- PROPOSED SLOPE STAKES FILL
- PROPOSED SLOPE STAKES CUT
- EXISTING PROPERTY LINE
- ESTIMATED AREA OF POSSIBLE GROUNDWATER CONTAMINATION



FIGURE 4  
PARCEL 019  
106 S. JK. POWELL BLVD.  
SITE MAP WITH ESTIMATED AREA OF GROUNDWATER CONTAMINATION

Date:	8/28/18	Project Title:	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. #	NCDOT-001	Client:	NC DOT
pc_019_fig 4.dgn		Drawn by:	MJO
CAD File:		Approx. Scale:	1" = 30'



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



**Photo 1**

Overview of site prior to preliminary site assessment activities.



**Photo 2**

View of CSI hand augering to 5 feet prior to operating direct push rig.

10610 Metromont Pkwy  
Suite 206  
Charlotte, NC 28269



WBS 41499.1.3  
PROCESSED TLH  
DATE June 2018

PHOTOGRAPHIC LOG  
PSA Field Activities  
Parcel 19  
Sibbett Properties, Inc. Property  
Whiteville, NC



**Photo 1**

View of remediation vaults located within the proposed right of way.



**Photo 2**

View of monitoring wells located within the proposed right of way.

10610 Metromont Pkwy  
Suite 206  
Charlotte, NC 28269



WBS 41499.1.3  
PROCESSED TLH  
DATE June 2018

PHOTOGRAPHIC LOG  
PSA Field Activities  
Parcel 19  
Sibbett Properties, Inc. Property  
Whiteville, NC

**APPENDIX B**  
**HISTORICAL RECORDS**



**Geological Resources, Inc.**

August 11, 2016

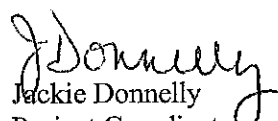
Ms. Debbie Mayo  
NCDEQ – DWM, UST Section  
Wilmington Regional Office  
127 Cardinal Drive Extension  
Wilmington, NC 28405

Re: Ground Water Monitoring Report  
July 2016  
701 Service Station  
106 JK Powell Blvd  
Whiteville, Columbus County, North Carolina  
Incident Number: 94050  
Risk Classification/Ranking: Pending  
GRI Project No: 2598

Dear Ms. Mayo,

Please find enclosed the referenced report for the above mentioned site. If you have any questions, please do not hesitate to contact Justin Radford, P.G. at 704-845-4010.

Sincerely,  
**Geological Resources, Inc.**

  
Jackie Donnelly  
Project Coordinator

Enclosure

Cc: Mr. Sammy Black, Whiteville Oil Company  
file

**GROUND WATER MONITORING REPORT  
JULY 2016  
701 SERVICE STATION  
106 JK POWELL BOULEVARD  
WHITEVILLE, COLUMBUS COUNTY  
INCIDENT NO. 94050  
RISK CLASSIFICATION/RANKING: PENDING  
GRI PROJECT NO. 2598**

Prepared for:

Whiteville Oil Company  
Post Office Box 689  
Whiteville, North Carolina 28472

Prepared by:

Geological Resources, Inc.  
3502 Hayes Road  
Monroe, North Carolina 28110  
(704) 845-4010

August 11, 2016

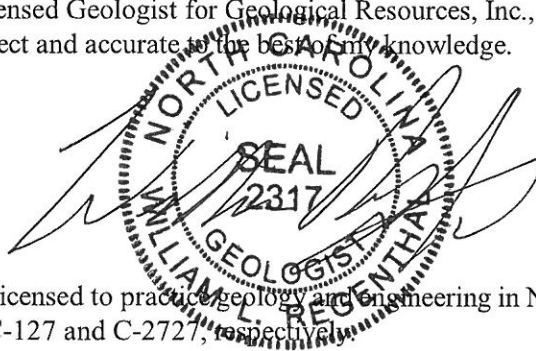
  
Lisa Weathersby

### SITE IDENTIFICATION

- **Facility Name:** 701 Service Station
- **Location:** 106 JK Powell Boulevard  
Whiteville, Columbus County
- **Ground Water Incident No.:** 94050
- **Facility ID No:** N/A
- **Risk Classification:** Pending
- **Land Use Classification:** Commercial
- **Property Owner:** Sibbett Properties, Inc.  
2402 Canal Cove Road  
Lake Waccamaw, North Carolina 28450
- **AST Owner/Operator:** Whiteville Oil Company, Inc.  
Post Office Box 689  
Whiteville, North Carolina 28472
- **Consultant:** Geological Resources, Inc.  
3502 Hayes Road  
Monroe, North Carolina 28110  
(704) 845-4010
- **Laboratory:** Accutest Laboratories  
4405 Vineland Road, Suite C-15  
Orlando, Florida 32811  
(407) 425-6700  
State Certification Number: 573
- **Release Information**
- **Date Discovered:** June 30, 2000
- **Estimated Quantity of Release:** Approximately 400 gallons of gasoline
- **Cause of Release:** Leaking AST System
- **Source of Release:** AST System
- **UST System Size/Contents:** (2) 6,000-gallon gasoline and (1) 280-gallon kerosene ASTs.
- **Latitude/Longitude:** 34.328556° North / 78.708778° West

### Certification

I, William L. Regenthal, a Licensed Geologist for Geological Resources, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.



Geological Resources, Inc. is licensed to practice geology and engineering in North Carolina. The certification numbers of the company are C-127 and C-2721, respectively.

## **EXECUTIVE SUMMARY**

The 701 Service Station site is located at 106 JK Powell Boulevard in Whiteville, Columbus County, North Carolina. The adjoining properties are commercial and residential. The release was discovered in June 2000 from an above ground storage tank (AST) system. Municipal water is available to the site and surrounding properties.

A Receptor Survey was completed on July 20, 2016. No water supply wells were identified within a 1,500-foot radius of the site. No surface water bodies were identified within a 500-foot radius of the site. The site does not lie within a designated wellhead protection area.

On July 20, 2016, eight Type II monitoring wells were gauged, purged and sampled. Concentrations of requested method constituents that exceeded the Maximum Allowable Concentrations (MACs) specified in T15A NCAC 2L.0202 were reported in the ground water samples collected from MW-2, MW-7 through MW-10 and MW-13. None of the reported contaminant concentrations exceeded the gross contamination levels (GCLs). Oxygen releasing compound (ORC) treated socks were reinstalled in MW-7, MW-8 and MW-9 at the conclusion of the sampling event.

In accordance with House Bill 765, risk based assessments were approved to be implemented on above ground storage tank petroleum incidents. Based on the current site information, the incident is located in a low risk area and would be classified as a Low Risk incident. Therefore, upon NCDEQ implementing the risk based assessments, the incident should be closed upon completion of a Land Use Restriction.



**TABLE OF CONTENTS**

**1.0 SITE HISTORY AND CHARACTERIZATION.....1**

**2.0 CURRENT SITE ASSESSMENT .....1**

**3.0 RECEPTOR SURVEY .....1**

**3.0 GROUND WATER QUALITY .....1**

**4.0 CONCLUSIONS AND RECOMMENDATIONS.....2**

**5.0 LIMITATIONS .....2**

**FIGURES**

- Figure 1: Site Location Map
- Figure 2 : Site Vicinity Map
- Figure 3: Site Map
- Figure 4: Water Table Surface Map
- Figure 5: Ground Water Quality Map

**TABLES**

- Table 1: Adjacent Property Owner Information
- Table 2: Summary of Ground Water Elevation Data
- Table 3: Summary of Laboratory Analytical Results – Ground Water Samples

**APPENDIX**

- Appendix A: Laboratory Report - Ground Water Samples

## **1.0 SITE HISTORY AND CHARACTERIZATION**

The 701 Service Station site is a former petroleum retail facility and convenience store located at 106 JK Powell Boulevard in Whiteville, Columbus County, North Carolina (**Figure 1**). According to available information, a former AST system owned by Whiteville Oil Company, Inc. (Whiteville Oil) consisting of two 6,000-gallon gasoline ASTs and one 280-gallon kerosene AST were taken out-of-service in July 2000 and have since been removed by Whiteville Oil. An air sparging (AS) system consisting of 30 AS wells, a soil vapor extraction (SVE) system consisting of 12 SVE wells, and associated equipment began operation on November 29, 2004. Previous assessment and remediation activities were conducted by CBM Environmental Services, Inc. (CBM). Whiteville Oil c/o BB&T Wealth Management contracted Geological Resources, Inc. (GRI) in September 2007 to take over as the environmental consultant for the site.

Please note that certain information contained in this report was obtained under the supervision of previous consultants. Although GRI cannot verify the accuracy of this information, for the purposes of this report it is assumed to be correct.

## **2.0 CURRENT SITE ASSESSMENT**

The purpose of this report is to present the results of receptor survey and ground water sampling activities conducted on July 20, 2016, at the former 701 Service Station site. The activities were conducted in accordance with GRI proposal number 16-087 which was submitted to Whiteville Oil Company and approved on July 7, 2016. The purpose of the activities was to obtain current receptor and ground water quality information for the site.

## **3.0 RECEPTOR SURVEY**

A receptor survey was completed on July 20, 2016. No water supply wells were identified within a 1,500 foot radius of the site. Municipal water is available to the site and the surrounding properties. No surface water bodies were identified within a 500-foot radius of the site. The site does not lie within a designated wellhead protection area.

## **4.0 GROUND WATER QUALITY**

Eight Type II monitoring wells (MW-2, MW-7 through MW-10, MW-13, MW-14 and MW 15) were gauged, purged and sampled on July 20, 2016. The depths to ground water in the Type II monitoring wells during the July 2016 sampling event ranged from 1.73 to 6.12 feet below the tops of well casings. Ground water elevations in the Type II monitoring wells relative to a temporary benchmark of 100.00 feet established previously by CBM ranged from 82.56 to 93.88 feet. Based on this information, ground water flow was generally toward the northwest. The average horizontal hydraulic gradient across the site during the July 2016 sampling event was

approximately 0.04 feet per foot. A Site Map showing the locations of monitoring wells and structures onsite has been included as **Figure 2**. A Water Table Surface Map based on the July 2016 gauging event is included as **Figure 3**. A summary of ground water elevation data is presented in **Table 1**.

Laboratory analyses were performed on the ground water samples collected from the monitoring wells during the July 2016 sampling event for volatile organic compounds by EPA Method 602. Concentrations of benzene, toluene, xylenes, MTBE and/or naphthalene that exceeded the Maximum Allowable Concentrations (MACs) specified in T15A NCAC 2L.0202 were reported in the ground water samples collected from MW-2, MW-7 through MW-10 and MW-13. None of the reported contaminant concentrations exceeded the Gross Contamination Levels (GCLs). A Ground Water Quality Map based on data from the July 2016 sampling event has been included as **Figure 4**. A summary of ground water sample analytical results is presented in **Table 2**. A complete copy of the laboratory report has been included in **Appendix A**.

Oxygen releasing compound (ORC) treated socks were reinstalled in MW-7, MW-8 and MW-9 at the conclusion of the sampling event.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

- The average depth to water during the July 2016 sampling event was approximately 3.95 feet below the tops of well casings. The ground water flow direction in July 2016 was generally toward the northwest with an average horizontal hydraulic gradient of approximately 0.04 feet per foot.
- Concentrations of benzene, toluene, xylenes, MTBE and/or naphthalene that exceeded the MACs were reported in the ground water samples collected from MW-2, MW-7 through MW-10, and MW-13. None of the reported contaminant concentrations exceeded the GCLs.
- In accordance with House Bill 765, risked based assessments were approved to be implemented on above ground storage tank petroleum incidents. Based on the current site information, the incident is located in a low risk area and would be classified as a Low Risk incident. Therefore, upon NCDEQ implementing the risk based assessments, the incident should be closed upon completion of a Land Use Restriction.

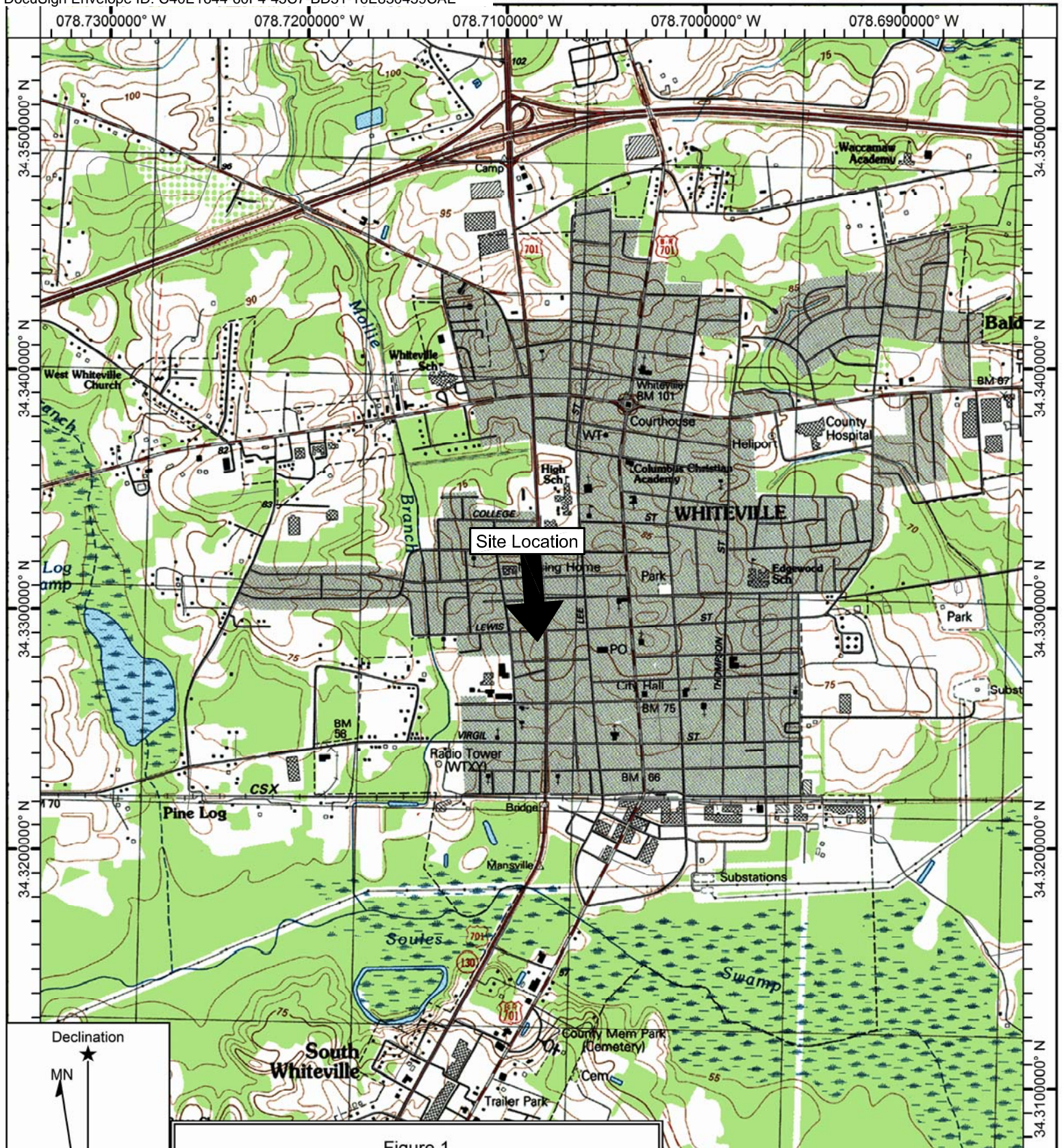
## **6.0 LIMITATIONS**

This report has been prepared for the exclusive use of Whiteville Oil Company for specific application to the referenced site in Columbus County, North Carolina. The assessment was conducted based on the scope of work and level of effort specified by NCDEQ and with resources adequate only for that scope of work. Our findings have been developed in accordance with generally accepted standards of geology and hydrogeology practices in the State of North Carolina, available information, and our professional judgment. No other warranty is expressed

or implied.

The data that are presented in this report are indicative of conditions that existed at the precise locations sampled and at the time the samples were collected. In addition, the data obtained from samples would be interpreted as being meaningful with respect to parameters indicated in the laboratory report. No additional information can logically be inferred from these data. Please note that certain information contained in this report was not obtained under the direct supervision of GRI personnel. Therefore, GRI cannot verify the accuracy of this information. However, for the purpose of this report, GRI assumes the information is correct.

## **FIGURES**



Site Location

Figure 1  
 701 Service Station  
 106 JK Powell Boulevard  
 Whiteville, North Carolina  
 Incident No. 94050  
 GRI Project No. 2598

SCALE 1:24000



Declination



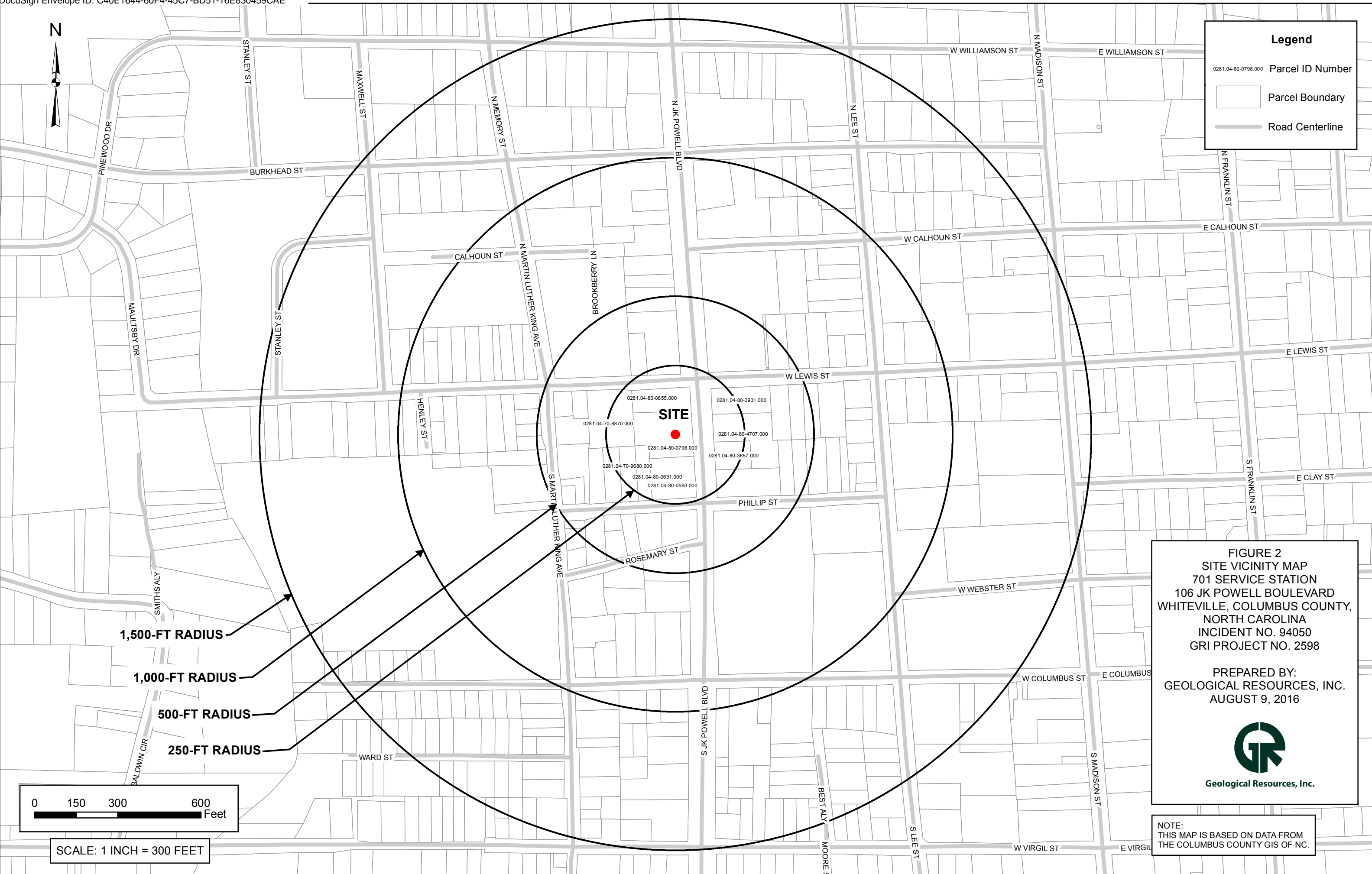
Name: Site Location Map  
 Date: 08/04/16  
 Scale: 1 inch = 2,000 ft.

Map Center Location: 034.3285560° N 078.7087780° W



**Legend**

- 0281.04-80-0798.000 Parcel ID Number
- Parcel Boundary
- Road Centerline

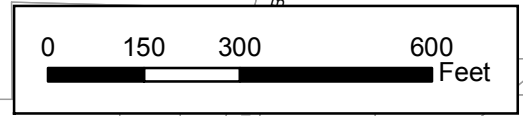


1,500-FT RADIUS

1,000-FT RADIUS

500-FT RADIUS

250-FT RADIUS



SCALE: 1 INCH = 300 FEET

**FIGURE 2**  
**SITE VICINITY MAP**  
 701 SERVICE STATION  
 106 JK POWELL BOULEVARD  
 WHITEVILLE, COLUMBUS COUNTY,  
 NORTH CAROLINA  
 INCIDENT NO. 94050  
 GRI PROJECT NO. 2598

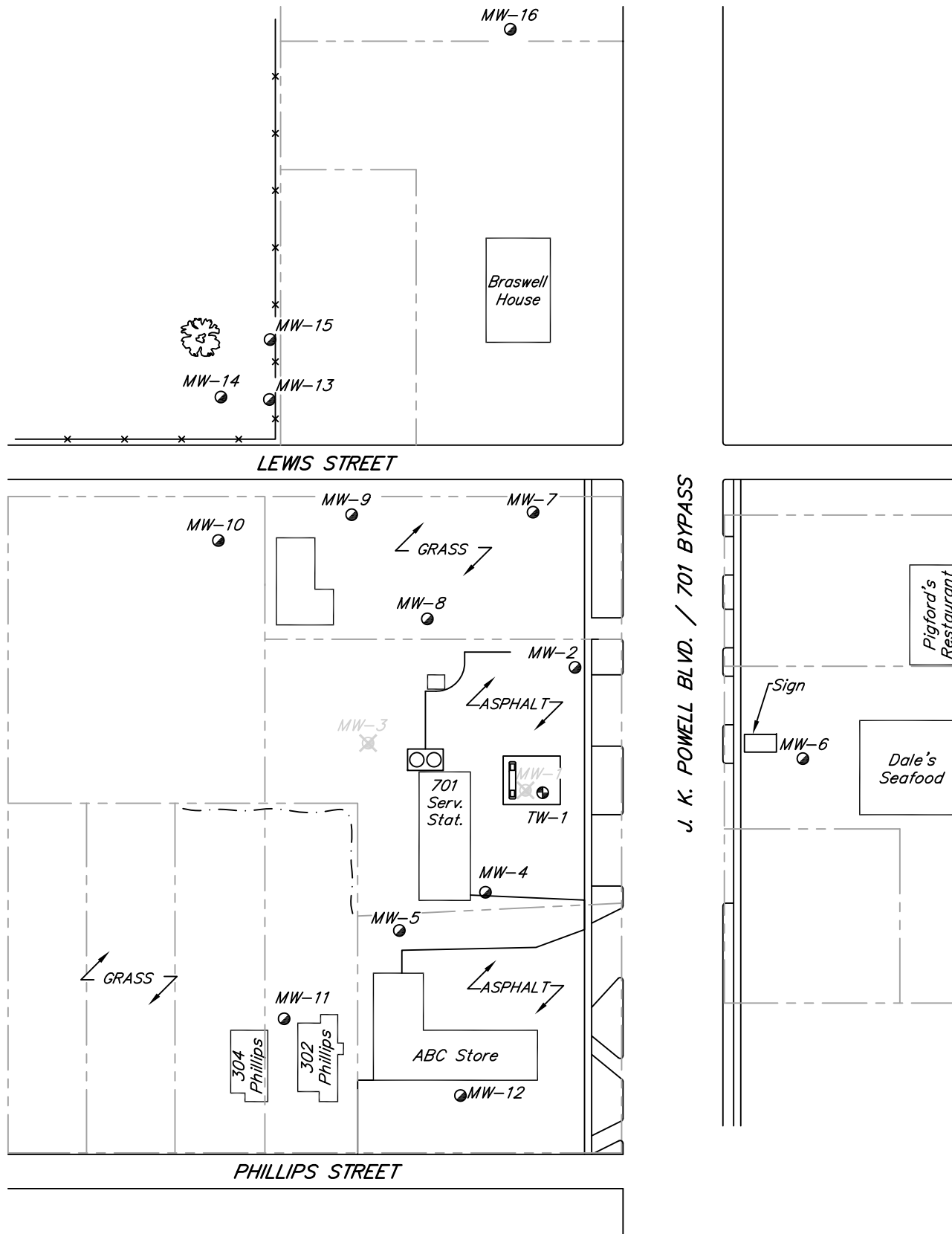
PREPARED BY:  
 GEOLOGICAL RESOURCES, INC.  
 AUGUST 9, 2016

**Geological Resources, Inc.**

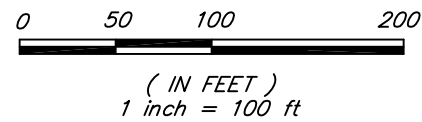
NOTE:  
 THIS MAP IS BASED ON DATA FROM  
 THE COLUMBUS COUNTY GIS OF NC.

**LEGEND**

- TYPE II MONITORING WELL
- ⊗ TYPE II MONITORING WELL (DESTROYED)
- ⊙ TYPE III MONITORING WELL
- - - DITCH
- \* - \* - FENCE
- - - - - PROPERTY BOUNDARY
- ⊗ TREE



Geological Resources, Inc.



**SITE MAP**

701 Service Station  
Incident No. 94050  
GRI Project No. 2598

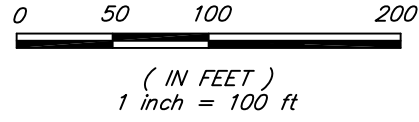
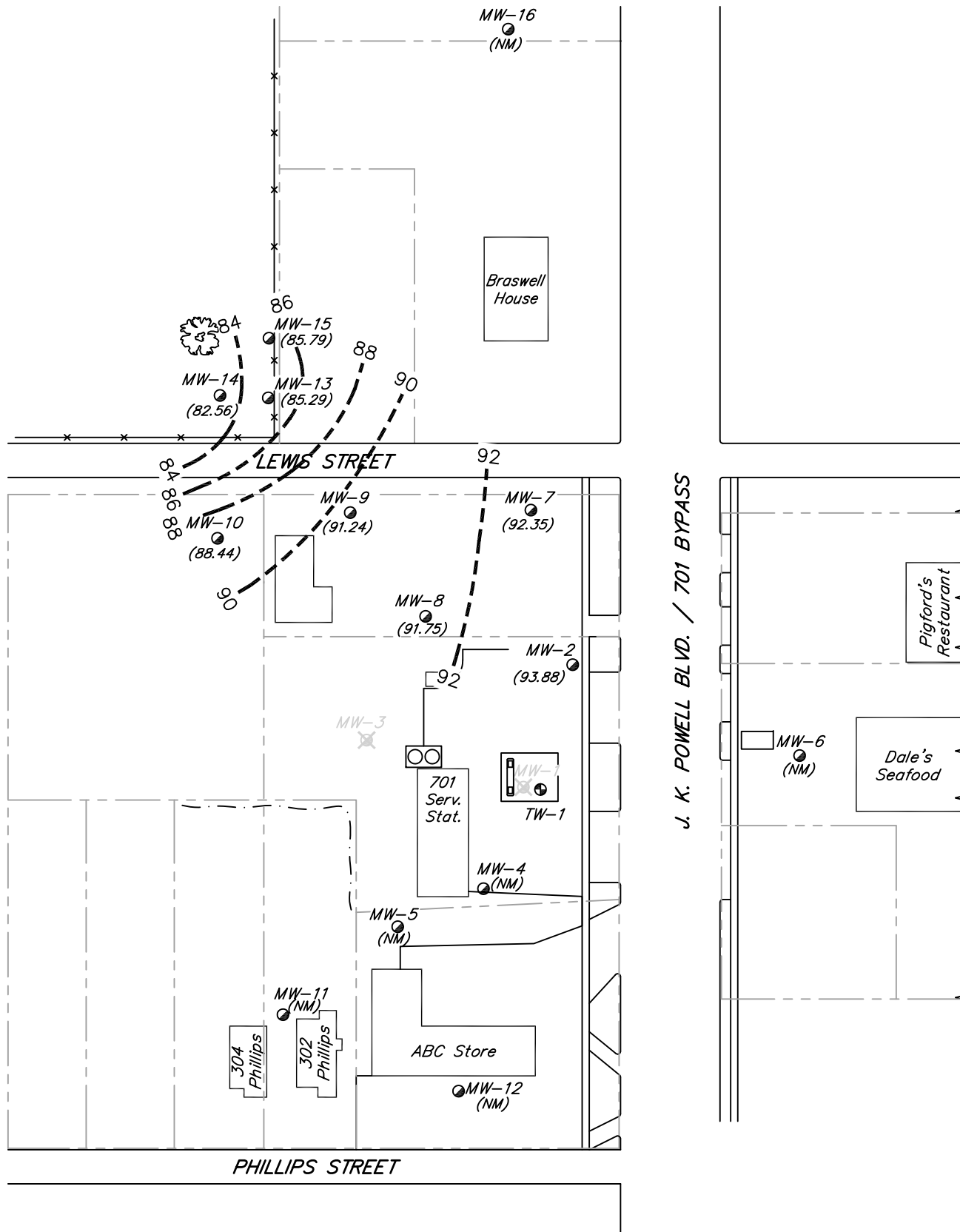
106 JK Powell Boulevard  
Whiteville, Columbus County,  
NC

Date: 08/04/16 Drawn by: ECH Figure: 3



**LEGEND**

- TYPE II MONITORING WELL
- ⊗ TYPE II MONITORING WELL (DESTROYED)
- ⊙ TYPE III MONITORING WELL
- - - DITCH
- \* - \* - FENCE
- - - - PROPERTY BOUNDARY
- ⊗ TREE
- - - 93 - - WATER TABLE SURFACE CONTOUR  
(93.88) GROUND WATER ELEVATION (FT.)  
(NM) NOT MEASURED



<b>WATER TABLE SURFACE MAP (07/20/16)</b>			
701 Service Station Incident No. 94050 GRI Project No. 2598		106 JK Powell Boulevard Whiteville, Columbus County, NC	
Date:	08/04/16	Drawn by:	ECH
Figure:			4

**LEGEND**

- TYPE II MONITORING WELL
- ⊗ TYPE II MONITORING WELL (DESTROYED)
- ⊙ TYPE III MONITORING WELL

- - - DITCH
- \* - \* - FENCE
- - - - - PROPERTY BOUNDARY

21.5	BENZENE
0.24 J	TOLUENE
65.7	ETHYLBENZENE
0.52 J	XYLENES
30.2	MTBE
98.5	NAPHTHALENE

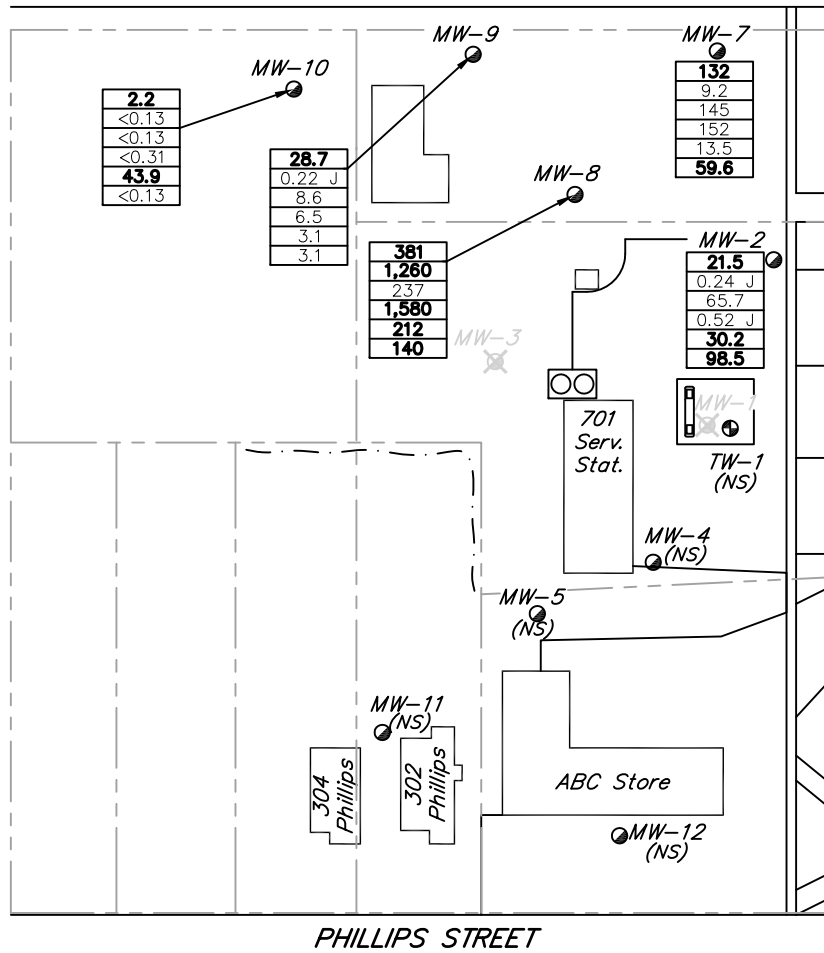
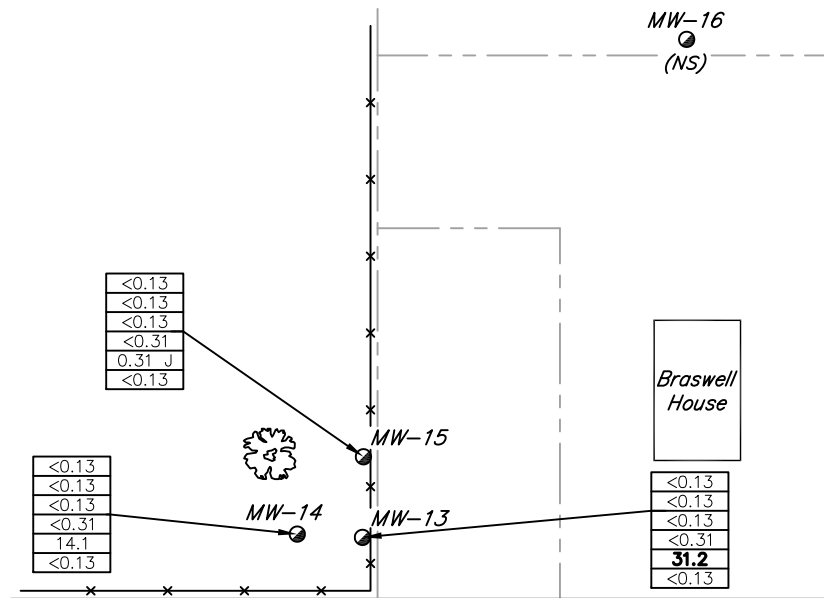
CONCENTRATIONS IN µg/L

<0.13 LESS THAN THE METHOD DETECTION LIMIT SPECIFIED IN THE LABORATORY REPORT

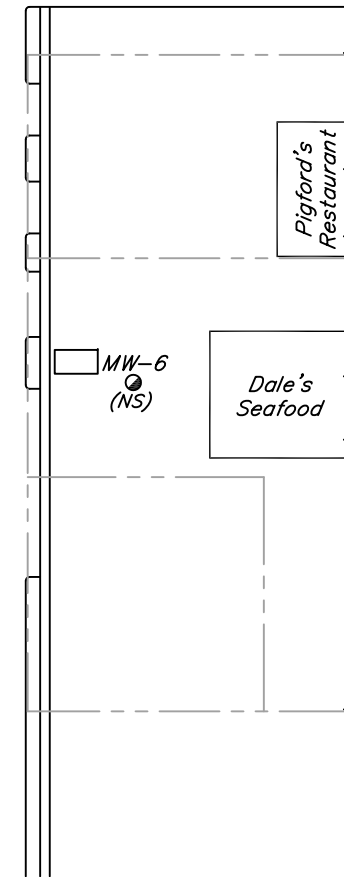
"J" ESTIMATED VALUE

CONCENTRATIONS IN ITALICS EXCEEDED THE GCLS

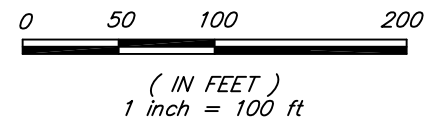
(NS) NOT SAMPLED



J. K. POWELL BLVD. / 701 BYPASS



Geological Resources, Inc.



**GROUND WATER QUALITY MAP (07/20/16)**

701 Service Station  
Incident No. 94050  
GRI Project No. 2598

106 JK Powell Boulevard  
Whiteville, Columbus County,  
NC

Date: 08/04/16 Drawn by: ECH Figure: 5

## **TABLES**

**TABLE 1**  
**ADJACENT PROPERTY OWNER INFORMATION**  
**701 SERVICE STATION (INCIDENT NO. 94050)**

Date: 08/01/16Facility ID #: NA

Parcel ID No.	Property Owner Name	Mailing Address
0281.04-80-0798.000 (Site)	Sibbett Properties, Inc.	2402 Canal Cove Road Lake Waccamaw, North Carolina 28450
0281.04-80-0855.000		
0281.04-70-8870.000	Wilbur G. Best, Jr.	311 W Lewis Street Whiteville, North Carolina 28472
0281.04-80-3931.000	John E. and Sara B. Thompson	115 W Main Street Whiteville, North Carolina 28472
0281.04-80-4707.000	Gerald & Gerald, Inc.	107 S Powell Boulevard Post Office Box 184 Whiteville, North Carolina 28472
0281.04-80-3657.000		
0281.04-80-0593.000	Whiteville ABC Store	112 S JK Powell Boulevard Whiteville, North Carolina 28472
0281.04-80-0631.000	Juanita G. Troy	30 Scranton Court Cameron, North Carolina 28326
0281.04-70-9680.000	James O. & Edith G. Price	304 W Phillip Street Whiteville, North Carolina 28472

- This information is based on the Columbus County GIS website.
- Properties are keyed to **Figure 2**.

**TABLE 2  
SUMMARY OF GROUND WATER ELEVATION DATA  
701 SERVICE STATION (INCIDENT NO. 94050)**

Date: 07/29/16

Facility ID #: N/A

Well No.	Date Water Level Measured (mm/dd/yy)	Top of Casing Elevation	Depth to Product	Depth to Ground Water	Ground Water Elevation
MW-1	11/20/07	99.34	NA	NF	NF
MW-2	11/20/07	100.00	NA	9.55	90.45
	12/19/07			10.00	90.00
	11/25/08			6.29	93.71
	06/02/09			7.21	92.79
	11/17/09			6.23	93.77
	05/05/10			6.20	93.80
	11/16/10			6.38	93.62
	09/16/11			6.31	93.69
	07/19/12			6.54	93.46
	12/12/12			6.78	93.22
	09/22/14			6.08	93.92
	03/03/15			6.03	93.97
	09/04/15			6.61	93.39
07/20/16	6.12	93.88			
MW-3	11/20/07	99.00	NA	NF	NF
MW-4	11/20/07	99.43	NA	NM	NM
	12/19/07			6.62	92.81
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM
MW-5	11/20/07	96.98	NA	NM	NM
	12/19/07			5.70	91.28
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
07/19/12	NM	NM			
12/12/12	NM	NM			
MW-6	11/20/07	100.62	NA	NM	NM
	12/19/07			10.85	89.77
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM
MW-7	11/20/07	97.81	NA	9.18	88.63
	12/19/07			9.65	88.16
	11/25/08			6.10	91.71
	06/02/09			4.70	93.11
	11/17/09			3.76	94.05
	05/05/10			6.14	91.67
	11/16/10			6.33	91.48
	09/16/11			5.33	92.48
	07/19/12			6.82	90.99
	12/12/12			6.93	90.88
	09/22/14			4.10	93.71
	03/03/15			3.70	94.11
	09/04/15			7.87	89.94
07/20/16	5.46	92.35			
MW-8	11/20/07	95.11	NA	8.30	86.81
	12/19/07			14.45	80.66
	11/25/08			2.87	92.24
	06/02/09			1.95	93.16
	11/17/09			2.15	92.96
	05/05/10			3.32	91.79
	11/16/10			3.60	91.51
	09/16/11			3.20	91.91
	07/19/12			4.55	90.56
	12/12/12			3.71	91.40
	09/22/14			2.22	92.89
	03/03/15			0.43	94.68
	09/04/15			6.29	88.82
07/20/16	3.36	91.75			

**TABLE 2  
SUMMARY OF GROUND WATER ELEVATION DATA  
701 SERVICE STATION (INCIDENT NO. 94050)**

Date: 07/29/16

Facility ID #: N/A

Well No.	Date Water Level Measured (mm/dd/yy)	Top of Casing Elevation	Depth to Product	Depth to Ground Water	Ground Water Elevation
MW-9	11/20/07	92.97	NA	8.25	84.72
	12/19/07			10.55	82.42
	11/25/08			2.38	90.59
	06/02/09			1.31	91.66
	11/17/09			0.00	92.97
	05/05/10			2.60	90.37
	11/16/10			2.50	90.47
	09/16/11			2.17	90.80
	07/19/12			3.15	89.82
	12/12/12			3.05	89.92
	09/22/14			1.05	91.92
	03/03/15			TOC	NM
	09/04/15			5.19	87.78
	07/20/16			1.73	91.24
MW-10	11/20/07	91.13	NA	9.40	81.73
	12/19/07			11.50	79.63
	11/25/08			2.91	88.22
	06/02/09			2.28	88.85
	11/17/09			1.15	89.98
	05/05/10			4.12	87.01
	11/16/10			3.34	87.79
	09/16/11			1.24	89.89
	07/19/12			4.66	86.47
	12/12/12			4.01	87.12
	09/22/14			3.05	88.08
	03/03/15			1.89	89.24
	09/04/15			5.09	86.04
	07/20/16			2.69	88.44
MW-11	11/20/07	93.77	NA	NM	NM
	12/19/07			14.75	79.02
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM
MW-12	11/20/07	95.06	NA	NM	NM
	12/19/07			6.80	88.26
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM
MW-13	11/20/07	89.39	NA	7.25	82.14
	12/19/07			8.30	81.09
	11/25/08			2.80	86.59
	06/02/09			0.42	88.97
	11/17/09			4.25	85.14
	05/05/10			3.32	86.07
	11/16/10			5.60	83.79
	09/16/11			5.21	84.18
	07/19/12			5.25	84.44
	12/12/12			2.56	86.83
	09/22/14			1.44	87.95
	03/03/15			TOC	NM
	09/04/15			6.03	83.36
	07/20/16			4.10	85.29
MW-14	11/20/07	88.29	NA	NM	NM
	12/19/07			11.65	76.64
	11/25/08			8.08	80.21
	06/02/09			2.82	85.47
	11/17/09			5.01	83.28
	05/05/10			5.01	83.28
	11/16/10			8.24	80.05
	09/16/11			4.87	83.42
	07/19/12			7.66	80.63
	12/12/12			8.27	80.02
	09/22/14			3.42	84.87
	03/03/15			2.07	86.22
	09/04/15			8.41	79.88
	07/20/16			5.73	82.56

**TABLE 2  
SUMMARY OF GROUND WATER ELEVATION DATA  
701 SERVICE STATION (INCIDENT NO. 94050)**

Date: 07/29/16

Facility ID #: N/A

Well No.	Date Water Level Measured (mm/dd/yy)	Top of Casing Elevation	Depth to Product	Depth to Ground Water	Ground Water Elevation
MW-15	11/20/07	88.20	NA	NM	NM
	12/19/07			9.20	79.00
	11/25/08			2.95	85.25
	06/02/09			0.00	88.20
	11/17/09			6.75	81.45
	05/05/10			2.51	85.69
	11/16/10			7.79	80.41
	09/16/11			8.11	80.09
	07/19/12			7.59	80.61
	12/12/12			1.67	86.53
	09/22/14			1.31	86.89
	03/03/15			TOC	NM
	09/04/15			6.46	81.74
	07/20/16			2.41	85.79
MW-16	11/20/07	93.99	NA	NM	NM
	12/19/07			10.45	83.54
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM
TW-1	11/20/07	99.59	NA	NM	NM
	12/19/07			21.55	78.04
	11/25/08			NM	NM
	06/02/09			NM	NM
	11/17/09			NM	NM
	05/05/10			NM	NM
	11/16/10			NM	NM
	09/16/11			NM	NM
	07/19/12			NM	NM
	12/12/12			NM	NM

## Notes:

- Elevations relative to a temporary benchmark with an assumed datum of 100.00 feet; data reported in feet.
- NF = Not found; well assumed to be destroyed.
- NM = Not measured.
- TW-1 is a Type III monitoring well.
- TOC = Ground Water observed above top of well casing.

**APPENDIX**



**APPENDIX A**

Laboratory Report - Ground Water Samples



**ACCUTEST**  
Southeast

07/29/16

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY.



*e-Hardcopy 2.0*  
*Automated Report*

**Technical Report for**

**GRI (Geological Resources Inc.)**

**701 Service Station; 106 JK Powell Blvd, Whiteville, NC**

**94050/2598**

**SGS Accutest Job Number: FA35610**

**Sampling Date: 07/20/16**



**Report to:**

**GRI**  
**3502 Hayes Rd**  
**Monroe, NC 28110**  
**jjr@geologicalresourcesinc.com; carriekennedy@geologicalresourcesinc.com;**  
**jjr@geologicalresourcesinc.com**  
**ATTN: Justin Radford**

**Total number of pages in report: 25**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

**Norm Farmer**  
**Technical Director**

**Client Service contact: Muna Mohammed 407-425-6700**

Certifications: FL (E83510), LA (03051), KS (E-10327), IA (366), IL (200063), NC (573), NJ (FL002), SC (96038001)  
DoD ELAP (L-A-B L2229), CA (2937), TX (T104704404), PA (68-03573), VA (460177),  
AK, AR, GA, KY, MA, NV, OK, UT, WA

This report shall not be reproduced, except in its entirety, without the written approval of SGS Accutest.  
Test results relate only to samples analyzed.



# Table of Contents

-1-

<b>Section 1: Sample Summary</b> .....	<b>3</b>
<b>Section 2: Summary of Hits</b> .....	<b>4</b>
<b>Section 3: Sample Results</b> .....	<b>6</b>
<b>3.1:</b> FA35610-1: MW-2 .....	7
<b>3.2:</b> FA35610-2: MW-7 .....	8
<b>3.3:</b> FA35610-3: MW-8 .....	9
<b>3.4:</b> FA35610-4: MW-9 .....	10
<b>3.5:</b> FA35610-5: MW-10 .....	11
<b>3.6:</b> FA35610-6: MW-13 .....	12
<b>3.7:</b> FA35610-7: MW-14 .....	13
<b>3.8:</b> FA35610-8: MW-15 .....	14
<b>Section 4: Misc. Forms</b> .....	<b>15</b>
<b>4.1:</b> Chain of Custody .....	16
<b>Section 5: GC/MS Volatiles - QC Data Summaries</b> .....	<b>19</b>
<b>5.1:</b> Method Blank Summary .....	20
<b>5.2:</b> Blank Spike Summary .....	22
<b>5.3:</b> Matrix Spike Summary .....	24
<b>5.4:</b> Matrix Spike/Matrix Spike Duplicate Summary .....	25

1

2

3

4

5

SGS Accutest

## Sample Summary

GRI (Geological Resources Inc.)

Job No: FA35610

701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Project No: 94050/2598

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
FA35610-1	07/20/16	11:33 ZC	07/22/16	AQ	Ground Water	MW-2
FA35610-2	07/20/16	11:20 ZC	07/22/16	AQ	Ground Water	MW-7
FA35610-3	07/20/16	11:24 ZC	07/22/16	AQ	Ground Water	MW-8
FA35610-4	07/20/16	11:10 ZC	07/22/16	AQ	Ground Water	MW-9
FA35610-5	07/20/16	11:07 ZC	07/22/16	AQ	Ground Water	MW-10
FA35610-6	07/20/16	12:04 ZC	07/22/16	AQ	Ground Water	MW-13
FA35610-7	07/20/16	11:55 ZC	07/22/16	AQ	Ground Water	MW-14
FA35610-8	07/20/16	12:10 ZC	07/22/16	AQ	Ground Water	MW-15

**Summary of Hits**

**Job Number:** FA35610  
**Account:** GRI (Geological Resources Inc.)  
**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC  
**Collected:** 07/20/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA35610-1 MW-2**

Benzene	21.5	0.50	0.13	ug/l	SM 6200B
Di-Isopropyl Ether	0.55	0.50	0.13	ug/l	SM 6200B
Ethylbenzene	65.7	2.5	0.63	ug/l	SM 6200B
Methyl Tert Butyl Ether	30.2	0.50	0.13	ug/l	SM 6200B
Naphthalene	98.5	2.5	0.63	ug/l	SM 6200B
Toluene	0.24 J	0.50	0.13	ug/l	SM 6200B
Xylene (total)	0.52 J	1.5	0.31	ug/l	SM 6200B

**FA35610-2 MW-7**

Benzene	132	2.5	0.63	ug/l	SM 6200B
Di-Isopropyl Ether	3.9	0.50	0.13	ug/l	SM 6200B
Ethylbenzene	145	2.5	0.63	ug/l	SM 6200B
Methyl Tert Butyl Ether	13.5	0.50	0.13	ug/l	SM 6200B
Naphthalene	59.6	2.5	0.63	ug/l	SM 6200B
Toluene	9.2	0.50	0.13	ug/l	SM 6200B
Xylene (total)	152	7.5	1.5	ug/l	SM 6200B

**FA35610-3 MW-8**

Benzene	381	25	6.3	ug/l	SM 6200B
Di-Isopropyl Ether	8.9 J	25	6.3	ug/l	SM 6200B
Ethylbenzene	237	25	6.3	ug/l	SM 6200B
Methyl Tert Butyl Ether	212	25	6.3	ug/l	SM 6200B
Naphthalene	140	25	6.3	ug/l	SM 6200B
Toluene	1260	25	6.3	ug/l	SM 6200B
Xylene (total)	1580	75	15	ug/l	SM 6200B

**FA35610-4 MW-9**

Benzene <sup>a</sup>	28.7	0.50	0.13	ug/l	SM 6200B
Di-Isopropyl Ether <sup>a</sup>	0.20 J	0.50	0.13	ug/l	SM 6200B
Ethylbenzene <sup>a</sup>	8.6	0.50	0.13	ug/l	SM 6200B
Methyl Tert Butyl Ether <sup>a</sup>	3.1	0.50	0.13	ug/l	SM 6200B
Naphthalene <sup>a</sup>	3.1	0.50	0.13	ug/l	SM 6200B
Toluene <sup>a</sup>	0.22 J	0.50	0.13	ug/l	SM 6200B
Xylene (total) <sup>a</sup>	6.5	1.5	0.31	ug/l	SM 6200B

**FA35610-5 MW-10**

Benzene	2.2	0.50	0.13	ug/l	SM 6200B
Di-Isopropyl Ether	11.6	0.50	0.13	ug/l	SM 6200B
Methyl Tert Butyl Ether	43.9	0.50	0.13	ug/l	SM 6200B

**Summary of Hits**

**Job Number:** FA35610  
**Account:** GRI (Geological Resources Inc.)  
**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC  
**Collected:** 07/20/16

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**FA35610-6 MW-13**

Di-Isopropyl Ether	0.57	0.50	0.13	ug/l	SM 6200B
Methyl Tert Butyl Ether	31.2	0.50	0.13	ug/l	SM 6200B

**FA35610-7 MW-14**

Di-Isopropyl Ether	1.5	0.50	0.13	ug/l	SM 6200B
Methyl Tert Butyl Ether	14.1	0.50	0.13	ug/l	SM 6200B

**FA35610-8 MW-15**

Methyl Tert Butyl Ether	0.31 J	0.50	0.13	ug/l	SM 6200B
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(a) Sample was not preserved to a pH < 2.



**ACCUTEST**  
Southeast

**Section 3**



**Sample Results**

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**Report of Analysis**

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SGS Accutest

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> MW-2		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-1		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047257.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2	E047278.D	5	07/26/16	TD	n/a	n/a	VE1566

Run #	Purge Volume
Run #1	10.0 ml
Run #2	10.0 ml

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	21.5	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	0.55	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	65.7 <sup>a</sup>	2.5	0.63	ug/l	
1634-04-4	Methyl Tert Butyl Ether	30.2	0.50	0.13	ug/l	
91-20-3	Naphthalene	98.5 <sup>a</sup>	2.5	0.63	ug/l	
108-88-3	Toluene	0.24	0.50	0.13	ug/l	J
1330-20-7	Xylene (total)	0.52	1.5	0.31	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	106%	70-130%
17060-07-0	1,2-Dichloroethane-D4	106%	109%	70-130%
2037-26-5	Toluene-D8	97%	99%	70-130%
460-00-4	4-Bromofluorobenzene	104%	102%	70-130%

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



SGS Accutest

**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b> MW-7		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-2		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047258.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2	E047288.D	5	07/26/16	TD	n/a	n/a	VE1566

	Purge Volume
Run #1	10.0 ml
Run #2	10.0 ml

**Purgeable Aromatics, Full List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	132 <sup>a</sup>	2.5	0.63	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	3.9	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	145 <sup>a</sup>	2.5	0.63	ug/l	
1634-04-4	Methyl Tert Butyl Ether	13.5	0.50	0.13	ug/l	
91-20-3	Naphthalene	59.6 <sup>a</sup>	2.5	0.63	ug/l	
108-88-3	Toluene	9.2	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	152 <sup>a</sup>	7.5	1.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	101%	70-130%
17060-07-0	1,2-Dichloroethane-D4	102%	102%	70-130%
2037-26-5	Toluene-D8	97%	101%	70-130%
460-00-4	4-Bromofluorobenzene	102%	103%	70-130%

(a) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

SGS Accutest

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> MW-8		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-3		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047259.D	50	07/25/16	TD	n/a	n/a	VE1565
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	381	25	6.3	ug/l	
108-90-7	Chlorobenzene	ND	25	6.3	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	25	6.3	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	25	6.3	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	25	6.3	ug/l	
108-20-3	Di-Isopropyl Ether	8.9	25	6.3	ug/l	J
100-41-4	Ethylbenzene	237	25	6.3	ug/l	
1634-04-4	Methyl Tert Butyl Ether	212	25	6.3	ug/l	
91-20-3	Naphthalene	140	25	6.3	ug/l	
108-88-3	Toluene	1260	25	6.3	ug/l	
1330-20-7	Xylene (total)	1580	75	15	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	100%		70-130%
2037-26-5	Toluene-D8	102%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

SGS Accutest

**Report of Analysis**

Page 1 of 1

34  
3

<b>Client Sample ID:</b> MW-9		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-4		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 <sup>a</sup>	E047260.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2							

	Purge Volume
Run #1	10.0 ml
Run #2	

**Purgeable Aromatics, Full List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	28.7	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	0.20	0.50	0.13	ug/l	J
100-41-4	Ethylbenzene	8.6	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	3.1	0.50	0.13	ug/l	
91-20-3	Naphthalene	3.1	0.50	0.13	ug/l	
108-88-3	Toluene	0.22	0.50	0.13	ug/l	J
1330-20-7	Xylene (total)	6.5	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%

(a) Sample was not preserved to a pH &lt; 2.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

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**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b> MW-10		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-5		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047261.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

**Purgeable Aromatics, Full List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	2.2	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	11.6	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	43.9	0.50	0.13	ug/l	
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

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## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> MW-13		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-6		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047262.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	0.57	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	31.2	0.50	0.13	ug/l	
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		70-130%
17060-07-0	1,2-Dichloroethane-D4	101%		70-130%
2037-26-5	Toluene-D8	102%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b> MW-14		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-7		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047263.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

**Purgeable Aromatics, Full List**

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	1.5	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	14.1	0.50	0.13	ug/l	
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%
2037-26-5	Toluene-D8	100%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

SGS Accutest

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b> MW-15		<b>Date Sampled:</b> 07/20/16
<b>Lab Sample ID:</b> FA35610-8		<b>Date Received:</b> 07/22/16
<b>Matrix:</b> AQ - Ground Water		<b>Percent Solids:</b> n/a
<b>Method:</b> SM 6200B		
<b>Project:</b> 701 Service Station; 106 JK Powell Blvd, Whiteville, NC		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	E047264.D	1	07/25/16	TD	n/a	n/a	VE1565
Run #2							

Run #	Purge Volume
Run #1	10.0 ml
Run #2	

## Purgeable Aromatics, Full List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	ND	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.31	0.50	0.13	ug/l	J
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	102%		70-130%
2037-26-5	Toluene-D8	101%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound



Misc. Forms

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Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody





**Chain of Custody**  
 4405 Vineland Road, Suite C-15 Orlando, FL 32811  
 TEL: 407-425-6700 • FAX: 407-425-0707  
 www.accutest.com

Accutest JOB # **FA35610** PAGE 1 OF 1

Accutest Quote # \_\_\_\_\_ SKIFF# \_\_\_\_\_

Client / Reporting Information		Project Information		Analytical Information										Matrix Codes		
Company Name <i>Geological Resources Inc</i>		Project Name: <i>701 Service Station</i>												DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe		
Address _____		Street <i>106 JF Power Blvd</i>														
City <i>Monroe</i> State <i>NC</i> Zip <i>28110</i>		City <i>Whiteville</i> State <i>NC</i>														
Project Contact <i>Justin</i> E-mail _____		Project # <i>2898</i>														
Phone# _____		Fax # _____														
Sampler(s) Name(s) (Printed) <i>Ho Zac</i>		Client Purchase Order # _____														
		COLLECTION		CONTAINER INFORMATION												
Accutest Sample #	Field ID / Point of Collection	DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	ICI	NO3H	NO3S	NO3CA	NO3ZNO		NO3WATER	NO3MEDI
1	<i>MW-2</i>	<i>7/20</i>	<i>1133</i>	<i>ZC</i>	<i>GO</i>	<i>3</i>										
2	<i>MW-7</i>		<i>1120</i>													
3	<i>MW-8</i>		<i>1124</i>													
4	<i>MW-9</i>		<i>1110</i>													
5	<i>MW-10</i>		<i>1107</i>													
6	<i>MW-13</i>		<i>1204</i>													
7	<i>MW-14</i>		<i>1155</i>													
8	<i>MW-15</i>		<i>1210</i>													

16202

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TURNAROUND TIME (Business Days)		Data Deliverable Information		Comments / Remarks	
<input checked="" type="checkbox"/> 10 Days Standard <input type="checkbox"/> 7 Day RUSH <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day EMERGENCY <input type="checkbox"/> 2 Day EMERGENCY <input type="checkbox"/> 1 Day EMERGENCY <input type="checkbox"/> OTHER	Approved By: / Rush Code _____	<input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY) <input type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC) <input type="checkbox"/> REDT1 (EPA LEVEL 3) <input type="checkbox"/> FULT1 (EPA LEVEL 4) <input type="checkbox"/> EDD'S	2828-C QUEEN CT DR CLT NC 28203		

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: _____	Date Time: <i>7/20</i>	Received By: <i>FX</i>	Relinquished by: <i>FX</i>	Date Time: _____	Received By: _____
1 _____		2 _____	3 _____		4 _____ <i>915</i>
Relinquished by: _____	Date Time: _____	Received By: _____	Relinquished by: _____	Date Time: _____	Received By: _____
5 _____		6 _____	7 _____		8 _____ <i>7/22/16</i>

Lab Use Only: Custody Seal in Place: Y N Temp Blank Provided: Y N Preserved where Applicable: Y N Total # of Coolers: 1 Cooler Temperature (s) Celsius: 3.0

### ACCUTEST LABORATORIES SAMPLE RECEIPT CONFIRMATION

ACCUTEST'S JOB NUMBER: FA35610 CLIENT: CORT PROJECT: 2598  
 DATE/TIME RECEIVED: 7/22/16 915 (MM/DD/YY 24:00) NUMBER OF COOLERS RECEIVED: 1  
 METHOD OF DELIVERY: FEDEX UPS ACCUTEST COURIER DELIVERY OTHER: \_\_\_\_\_  
 AIRBILL NUMBERS: 8087 5428 7786

#### COOLER INFORMATION

- CUSTODY SEAL NOT PRESENT OR NOT INTACT
- CHAIN OF CUSTODY NOT RECEIVED (COC)
- ANALYSIS REQUESTED IS UNCLEAR OR MISSING
- SAMPLE DATES OR TIMES UNCLEAR OR MISSING
- TEMPERATURE CRITERIA NOT MET

#### TRIP BLANK INFORMATION

- TRIP BLANK PROVIDED
- TRIP BLANK NOT PROVIDED
- TRIP BLANK NOT ON COC
- TRIP BLANK INTACT
- TRIP BLANK NOT INTACT
- RECEIVED WATER TRIP BLANK
- RECEIVED SOIL TRIP BLANK

#### MISC. INFORMATION

NUMBER OF ENCORES ? 25-GRAM \_\_\_\_\_ 5-GRAM \_\_\_\_\_  
 NUMBER OF 5035 FIELD KITS ? \_\_\_\_\_  
 NUMBER OF LAB FILTERED METALS ? \_\_\_\_\_

TEST STRIP LOT#s pH 0-3 230315 pH 10-12 219813A OTHER (specify) \_\_\_\_\_

SUMMARY OF COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

#### TEMPERATURE INFORMATION

- IR THERM ID 1 CORR. FACTOR 10.0
- OBSERVED TEMPS: 3.0
- CORRECTED TEMPS: 3.0 (USED FOR LIMS)

#### SAMPLE INFORMATION

- INCORRECT NUMBER OF CONTAINERS USED
- SAMPLE RECEIVED IMPROPERLY PRESERVED
- INSUFFICIENT VOLUME FOR ANALYSIS
- DATES/TIMES ON COC DO NOT MATCH SAMPLE LABEL
- ID'S ON COC DO NOT MATCH LABEL
- VOC VIALS HAVE HEADSPACE (MACRO BUBBLES)
- BOTTLES RECEIVED BUT ANALYSIS NOT REQUESTED
- NO BOTTLES RECEIVED FOR ANALYSIS REQUESTED
- UNCLEAR FILTERING OR COMPOSITING INSTRUCTIONS
- SAMPLE CONTAINER(S) RECEIVED BROKEN
- 5035 FIELD KITS NOT RECEIVED WITHIN 48 HOURS
- BULK VOA SOIL JARS NOT RECEIVED WITHIN 48 HOURS
- % SOLIDS JAR NOT RECEIVED
- RESIDUAL CHLORINE PRESENT LOT# \_\_\_\_\_

(APPLICABLE TO EPA 600 SERIES OR NORTH CAROLINA ORGANICS)

TECHNICIAN SIGNATURE/DATE [Signature] 7/22/16 REVIEWER SIGNATURE/DATE [Signature] 7-22-16

NF 11/15

RECEIPTLOG040416.xls

FA35610: Chain of Custody

Page 2 of 3

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4

ORIGIN ID: ME0A

SHIP DATE: 21 JUL 16  
ACTWGT: 28.30 LB  
CAD: 70FFC1704  
DIMS: 18x11x16 IN

Part # 13207-5811200-0077 16  
PARTIAL OF 13207-5811200-0077 16

UNITED STATES US  
TO

BILL SENDER

**SAMPLE RECEIVING**  
4405 VINELAND RD  
STE C15  
ORLANDO FL 32811

(407) 426-8700

REF:

DEPT:



**FedEx**  
Express

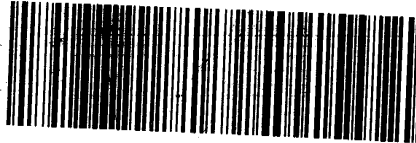


TAK# 8087 5428 7786  
0682

**FRI - 22 JUL 3:00P**  
**STANDARD OVERNIGHT**

**XH TIXA**

**32811**  
FL-US MCO



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**GC/MS Volatiles**

**QC Data Summaries**

---

**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE1565-MB	E047239.D	1	07/25/16	TD	n/a	n/a	VE1565

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2, FA35610-3, FA35610-4, FA35610-5, FA35610-6, FA35610-7, FA35610-8

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/l	
108-90-7	Chlorobenzene	ND	0.50	0.13	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	0.50	0.13	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	0.50	0.13	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	0.50	0.13	ug/l	
108-20-3	Di-Isopropyl Ether	ND	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	0.50	0.13	ug/l	
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
108-88-3	Toluene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	99%	70-130%
17060-07-0	1,2-Dichloroethane-D4	99%	70-130%
2037-26-5	Toluene-D8	101%	70-130%
460-00-4	4-Bromofluorobenzene	103%	70-130%

**Method Blank Summary**

Page 1 of 1

**Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE1566-MB	E047274.D	1	07/26/16	TD	n/a	n/a	VE1566

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	0.50	0.13	ug/l	
100-41-4	Ethylbenzene	ND	0.50	0.13	ug/l	
91-20-3	Naphthalene	ND	0.50	0.13	ug/l	
1330-20-7	Xylene (total)	ND	1.5	0.31	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	100% 70-130%
17060-07-0	1,2-Dichloroethane-D4	102% 70-130%
2037-26-5	Toluene-D8	102% 70-130%
460-00-4	4-Bromofluorobenzene	104% 70-130%

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**Blank Spike Summary****Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE1565-BS <sup>a</sup>	E047238.D	1	07/25/16	TD	n/a	n/a	VE1565

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2, FA35610-3, FA35610-4, FA35610-5, FA35610-6, FA35610-7, FA35610-8

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	10	10.5	105	70-130
108-90-7	Chlorobenzene	10	10.5	105	70-130
95-50-1	1,2-Dichlorobenzene	10	10.7	107	70-130
541-73-1	1,3-Dichlorobenzene	10	11.0	110	70-130
106-46-7	1,4-Dichlorobenzene	10	10.5	105	70-130
108-20-3	Di-Isopropyl Ether	10	9.6	96	70-130
100-41-4	Ethylbenzene	10	10.7	107	70-130
1634-04-4	Methyl Tert Butyl Ether	10	9.3	93	70-130
91-20-3	Naphthalene	10	11.4	114	70-130
108-88-3	Toluene	10	10.5	105	70-130
1330-20-7	Xylene (total)	30	33.4	111	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	70-130%
17060-07-0	1,2-Dichloroethane-D4	100%	70-130%
2037-26-5	Toluene-D8	99%	70-130%
460-00-4	4-Bromofluorobenzene	102%	70-130%

(a) No MSD available for this run.

\* = Outside of Control Limits.

**Blank Spike Summary**

Page 1 of 1

**Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VE1566-BS	E047273.D	1	07/26/16	TD	n/a	n/a	VE1566

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	10	10.1	101	70-130
100-41-4	Ethylbenzene	10	10.3	103	70-130
91-20-3	Naphthalene	10	10.5	105	70-130
1330-20-7	Xylene (total)	30	31.8	106	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	70-130%
17060-07-0	1,2-Dichloroethane-D4	103%	70-130%
2037-26-5	Toluene-D8	100%	70-130%
460-00-4	4-Bromofluorobenzene	100%	70-130%

\* = Outside of Control Limits.



**Matrix Spike Summary****Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA35519-2MS	E047265.D	1	07/25/16	TD	n/a	n/a	VE1565
FA35519-2	E047245.D	1	07/25/16	TD	n/a	n/a	VE1565

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2, FA35610-3, FA35610-4, FA35610-5, FA35610-6, FA35610-7, FA35610-8

CAS No.	Compound	FA35519-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
71-43-2	Benzene	ND	10	8.1	81	70-130	
108-90-7	Chlorobenzene	ND	10	8.0	80	70-130	
95-50-1	1,2-Dichlorobenzene	ND	10	7.8	78	70-130	
541-73-1	1,3-Dichlorobenzene	ND	10	8.0	80	70-130	
106-46-7	1,4-Dichlorobenzene	ND	10	7.9	79	70-130	
108-20-3	Di-Isopropyl Ether	ND	10	7.4	74	70-130	
100-41-4	Ethylbenzene	ND	10	8.1	81	70-130	
1634-04-4	Methyl Tert Butyl Ether	ND	10	7.3	73	70-130	
91-20-3	Naphthalene	ND	10	7.6	76	70-130	
108-88-3	Toluene	ND	10	7.9	79	70-130	
1330-20-7	Xylene (total)	ND	30	24.9	83	70-130	

CAS No.	Surrogate Recoveries	MS	FA35519-2	Limits
1868-53-7	Dibromofluoromethane	103%	98%	70-130%
17060-07-0	1,2-Dichloroethane-D4	106%	98%	70-130%
2037-26-5	Toluene-D8	99%	101%	70-130%
460-00-4	4-Bromofluorobenzene	100%	102%	70-130%

\* = Outside of Control Limits.

**Matrix Spike/Matrix Spike Duplicate Summary**

Page 1 of 1

**Job Number:** FA35610**Account:** GRINCC GRI (Geological Resources Inc.)**Project:** 701 Service Station; 106 JK Powell Blvd, Whiteville, NC

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA35611-2MS	E047297.D	100	07/26/16	TD	n/a	n/a	VE1566
FA35611-2MSD	E047298.D	100	07/26/16	TD	n/a	n/a	VE1566
FA35611-2	E047282.D	100	07/26/16	TD	n/a	n/a	VE1566

**The QC reported here applies to the following samples:****Method:** SM 6200B

FA35610-1, FA35610-2

CAS No.	Compound	FA35611-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	200	1000	1180	98	1000	1140	94	3	70-130/20
100-41-4	Ethylbenzene	3410	1000	4350	94	1000	4160	75	4	70-130/20
91-20-3	Naphthalene	913	1000	2000	109	1000	2050	114	2	70-130/20
1330-20-7	Xylene (total)	6040	3000	8940	97	3000	8590	85	4	70-130/20

CAS No.	Surrogate Recoveries	MS	MSD	FA35611-2	Limits
1868-53-7	Dibromofluoromethane	102%	102%	99%	70-130%
17060-07-0	1,2-Dichloroethane-D4	107%	108%	100%	70-130%
2037-26-5	Toluene-D8	99%	99%	101%	70-130%
460-00-4	4-Bromofluorobenzene	101%	102%	102%	70-130%

\* = Outside of Control Limits.

Sent 9/14/16



Waste Management  
ENVIRONMENTAL QUALITY

PAT MCCRORY  
Governor

DONALD R. VAN DER VAART  
Secretary

MICHAEL SCOTT  
Director

September 13, 2016

Whiteville Oil Company  
Mr. Sammy Black  
PO Box 689  
Whiteville, NC 28472

Re: Acknowledgement of Report Receipt  
701 Service Station  
106 JK Powell Blvd, Whiteville  
Columbus County  
Incident Number: 94050

Dear Mr. Black:

The UST Section, Division of Waste Management (DWM), is in receipt of the report dated August 11, 2016. The report will be reviewed and maintained in the Wilmington Regional Office. The DWM is in agreement with the recommendations proposed. Please note, property owners where contamination has migrated, may be required to be in agreement before a no further action is issued for this site. Once the DWM has finalized how to implement risk based closure of Non-UST sites with offsite contamination, you will be directed to proceed accordingly. If you have questions, please contact me at the address or telephone number listed below.

Sincerely,

Liz Price  
Hydrogeologist  
Wilmington Regional Office  
UST Section, Division of Waste Management, NCDEQ

cc: WiRO/UST

Justin Radford, Geological Resources, Inc.

Wilmington Regional Office | 127 Cardinal Drive Extension | Wilmington, NC 28405 | (910) 796-7215

**APPENDIX C**  
**BORING LOGS**



# Apex Companies, LLC

## Boring Log

<b>Boring/Well No.:</b> P19-SB1	<b>Site Name:</b> Parcel 19
<b>Date:</b> 6/6/2018	<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> Troy Holzschuh	<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		<0.1	<0.1		0-5' Tan fine <b>SAND</b> . Saturated at 3 feet.
2					
3		<0.1	<0.1		
4					
5		<0.1	<0.1		
					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:



# Apex Companies, LLC

## Boring Log

<b>Boring/Well No.:</b> P19-SB2	<b>Site Name:</b> Parcel 19
<b>Date:</b> 6/6/2018	<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> Troy Holzschuh	<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 (ft) BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	5.95	1.75		Tan fine <b>SAND</b> saturated at 3 feet.
2				
3	6.1	1.85		
4				
5	<0.1	0.5		
6				Boring terminated at 5 feet.
7				
8				
9				
10				
11				
12				
13				
14				

**WELL CONSTRUCTION DETAILS (If Applicable)**

Well Type/Diameter: 1"	Outer Casing Interval: NA
Total Depth: 15	Outer Casing Diameter: NA
Screen Interval: 5'-10'	Bentonite Interval: NA
Sand Interval: NA	Slot Size: 0.010" slot
Grout Interval: NA	Static Water Level: 5'



# Apex Companies, LLC

## Boring Log

<b>Boring/Well No.:</b> P19-SB3	<b>Site Name:</b> Parcel 19
<b>Date:</b> 6/6/2018	<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> Troy Holzschuh	<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		--	--		0-2' Grass-Tan <b>SAND</b> .
2		<0.1	<0.1		
3		2.5	5		2'-5' Yellow clayey <b>SILT</b> saturated at 4'.
4					
5		<0.1	1.3		
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

Boring/Well No.: P19-SB4	Site Name: Parcel 19
Date: 6/6/2018	Location: Whiteville, Columbus County, NC
Job No.: NCDOT-001	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	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		<0.1	<0.1		0-2' Tan fine <b>SAND</b> .
2					
3		<0.1	<0.1		2'-5' Tan clayey <b>SILT</b> saturated at 4 feet.
4					
5					
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:



**APPENDIX D**  
**GEOPHYSICAL REPORT**



PYRAMID GEOPHYSICAL SERVICES  
(PROJECT 2018-139)

# GEOPHYSICAL SURVEY


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METALLIC UST INVESTIGATION:  
PARCEL 19  
NCDOT PROJECT R-5020B (41499.1.3)

106 S. JK POWELL BLVD., WHITEVILLE, NC

JUNE 21, 2018

Report prepared for: Katie Lippard  
Apex Companies, LLC  
1071 Pemberton Hill Rd., Suite 203  
Apex, NC 27502

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 19 – 106 S. JK Powell Blvd.**  
**Whiteville, Columbus County, North Carolina**

**Table of Contents**

Executive Summary ..... 1  
Introduction..... 2  
Field Methodology..... 2  
Discussion of Results..... 4  
    *Discussion of EM Results*..... 4  
    *Discussion of GPR Results*..... 5  
Summary & Conclusions ..... 5  
Limitations ..... 6

**Figures**

- Figure 1 – Parcel 19 Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 19 EM61 Results Contour Map
- Figure 3 – Parcel 19 GPR Transect Locations and Select Images
- Figure 4 – Overlay of Geophysical Survey Boundaries on NCDOT Engineering Plans

**Appendices**

- Appendix A – GPR Transect Images

## 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 19, located at 106 S. JK Powell Blvd., 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 30 – June 4, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Parcel 19 includes a groundwater remediation system, which is composed of a series of interconnected wells joined by PVC pipes that also extend into and throughout the adjacent property to the north (Parcel 20). The trailer housing the primary remediation system components is located to the west, outside of the survey area on Parcel 19.

**Geophysical Results:** The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of six EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several EM anomalies were caused by interference from vehicles parked throughout the site. These areas were investigated further with GPR to verify that no larger substructures were obscured by the interference. Two EM anomalies were associated with suspected reinforced concrete or possible utilities. Additionally, the series of well covers suggested that a potential groundwater remediation system was in operation at the property. GPR verified the presence of the remediation system and/or utilities underneath the vehicles parked on the site. No evidence of larger substructures, such as USTs, was observed. GPR also verified the presence of metal reinforcement within the concrete. No evidence of larger structures such as USTs was observed beneath the reinforcement. Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 19.

## INTRODUCTION

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Pyramid Environmental conducted a geophysical investigation for Apex Companies, LLC at Parcel 19, located at 106 S. JK Powell Blvd., 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 30 – June 4, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consists of an asphalt and concrete parking area associated with the commercial building to the west, with areas of grass and portions of a sidewalk. Parcel 19 includes a groundwater remediation system, which is composed of a series of interconnected wells joined by PVC pipes that also extend into and throughout the adjacent property to the north (Parcel 20). The trailer housing the primary remediation system components is located to the west, outside of the survey area on Parcel 19. 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 June 4, 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

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### *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**

<b>Metallic Anomaly #</b>	<b>Cause of Anomaly</b>	<b>Investigated with GPR</b>
1	Vehicles/Well Covers	☑
2	Utility/Sign	
3	Vehicles/Utilities/Well Covers	☑
4	Well Covers/Reinforced Concrete	☑
5	Utility	
6	Vehicles	☑

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including vehicles, well covers for the remediation system, utilities and a sign. Anomalies 1, 3, 4, and 6 were investigated with GPR due to the EM interference caused by the vehicles parked throughout the site, well covers, and potential utilities to verify that no larger substructures were obscured by the interference. Additionally, the series of well covers suggested that a potential groundwater remediation system was in operation at the property, and GPR was used to verify its presence.

GPR scans were also performed in a grid-like fashion across the suspected reinforced concrete (EM Anomaly 4) to verify the presence of metal reinforcement and confirm that no other metal structures were present beneath the reinforcement.



### *Discussion of GPR Results*

**Figure 3** presents the locations of the formal GPR transects performed at the property, as well as select transect images. A total of thirteen GPR transects were performed at the site. All of the transect images are included in **Appendix A**. GPR Transects 1 – 7 and 11 – 13 were performed across EM Anomalies 1, 3, and 6. These transects recorded evidence of isolated hyperbolic reflectors associated with the remediation system and/or utilities. No evidence of a larger structure such as a UST was observed in this area.

GPR Transects 8-10 were performed across the reinforced concrete (Anomaly 4). These transects verified the presence of metal reinforcement in the concrete and the presence of the remediation system. No evidence of larger structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 19. **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 19 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 majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Several EM anomalies were caused by interference from vehicles parked throughout the site. These areas were investigated further with GPR to verify that no larger substructures were obscured by the interference.
- Two EM anomalies were associated with suspected reinforced concrete or possible utilities.

- Additionally, the series of well covers suggested that a potential groundwater remediation system was in operation at the property.
- GPR verified the presence of the remediation system and/or utilities underneath the vehicles parked on the site. No evidence of larger substructures, such as USTs, was observed.
- GPR also verified the presence of metal reinforcement within the concrete. No evidence of larger structures such as USTs was observed beneath the reinforcement.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 19.

## 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 South)



View of Survey Area  
(Facing Approximately North)



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PROJECT  
**PARCEL 19**  
WHITEVILLE, NORTH CAROLINA  
NCDOT PROJECT R-5020B

TITLE  
**PARCEL 19 - GEOPHYSICAL SURVEY**  
BOUNDARIES AND SITE PHOTOGRAPHS

DATE  
5/30/2018

PYRAMID PROJECT #:  
2018-139

CLIENT  
Apex Companies, LLC

**FIGURE 1**

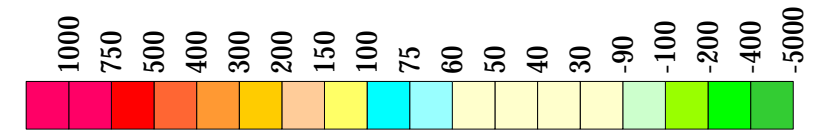
## EM61 METAL DETECTION RESULTS



### NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on May 30, 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 June 4, 2018.

EM61 Metal Detection Response (millivolts)



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PROJECT  
PARCEL 19  
WHITEVILLE, NORTH CAROLINA  
NCDOT PROJECT R-5020B

TITLE  
PARCEL 19 - EM61 METAL DETECTION  
CONTOUR MAP

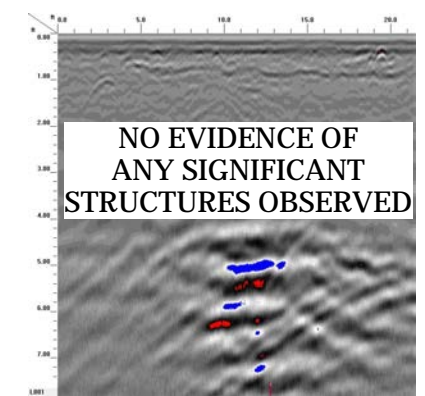
DATE  
5/30/2018

PYRAMID PROJECT #:  
2018-139

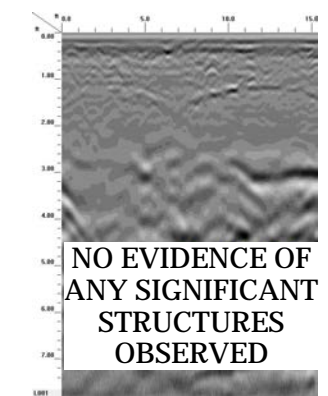
CLIENT  
Apex Companies, LLC

**FIGURE 2**

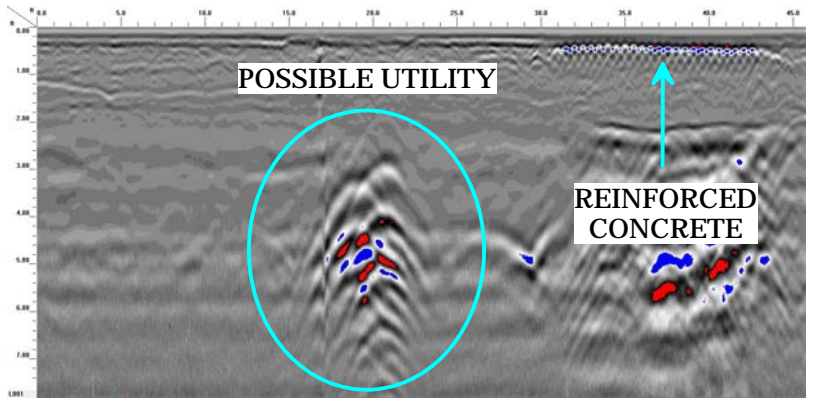
### LOCATIONS OF GPR TRANSECTS



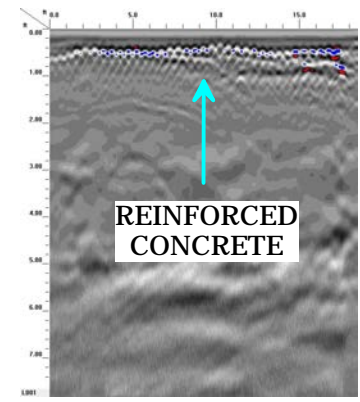
GPR TRANSECT 2 (T2)



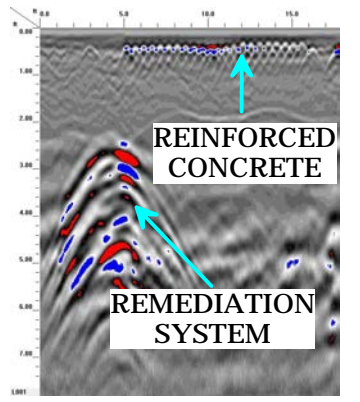
GPR TRANSECT 13 (T13)



GPR TRANSECT 7 (T7)



GPR TRANSECT 8 (T8)



GPR TRANSECT 10 (T10)



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PROJECT  
**PARCEL 19**  
WHITEVILLE, NORTH CAROLINA  
NCDOT PROJECT R-5020B

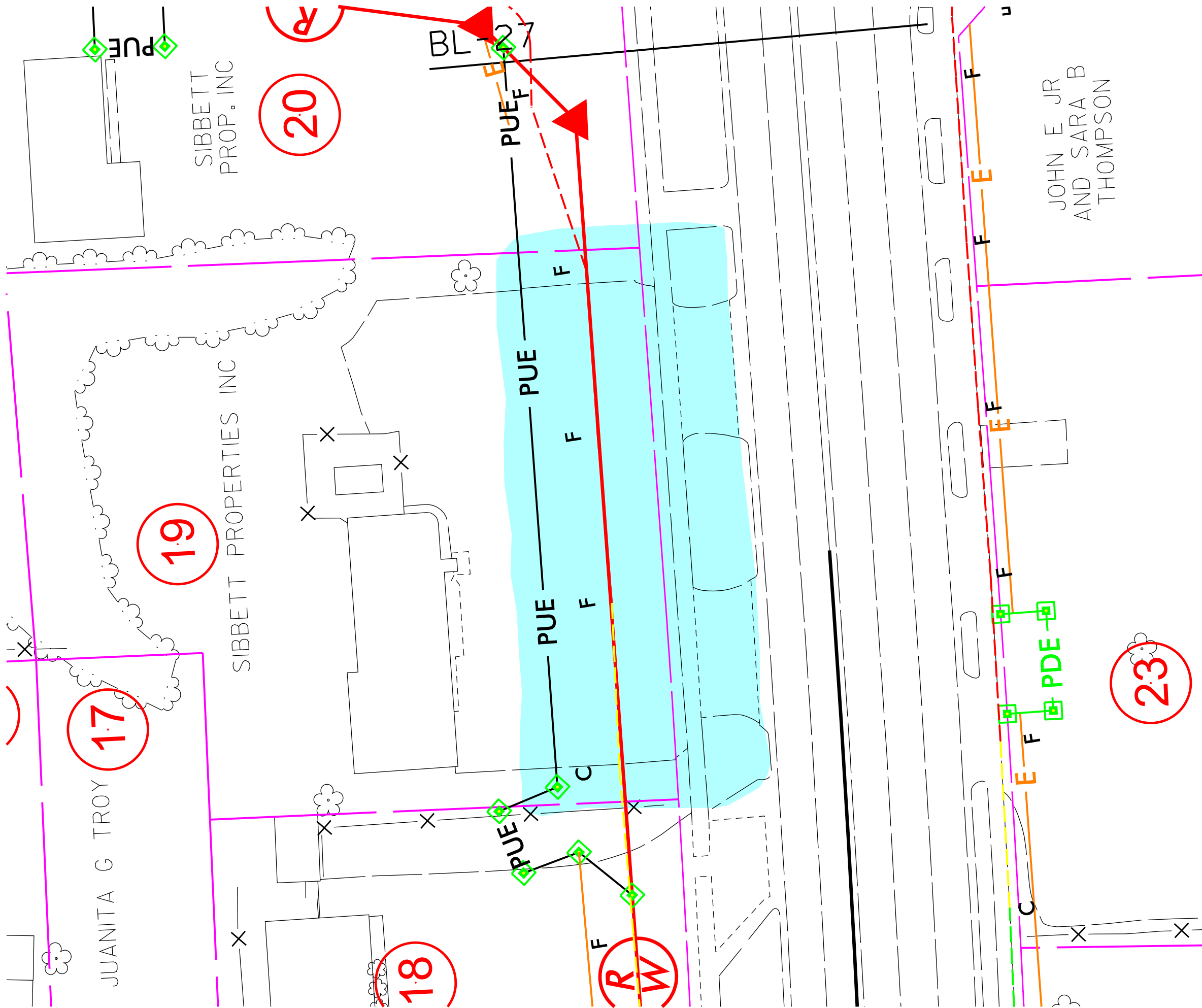
TITLE  
**PARCEL 19 - GPR TRANSECT LOCATIONS AND SELECT IMAGES**

DATE  
6/4/2018

PYRAMID PROJECT #:  
2018-139

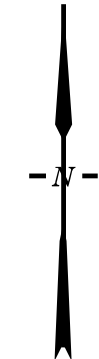
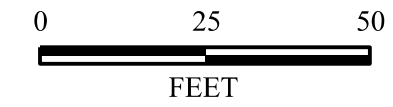
CLIENT  
Apex Companies, LLC

**FIGURE 3**



LEGEND

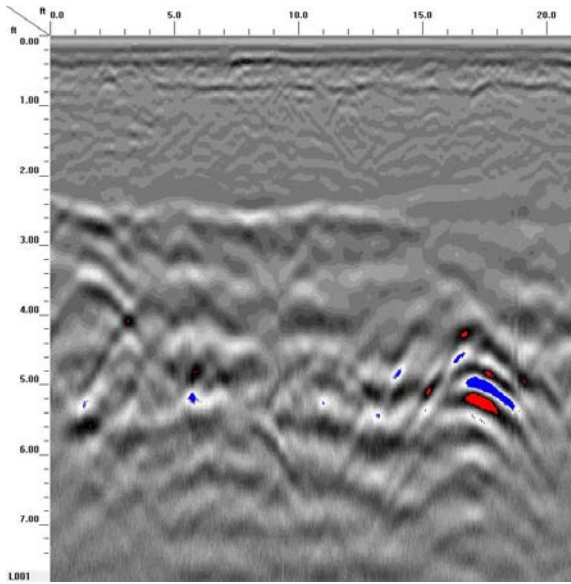
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- - - PROPOSED SS CUT LINE
- - - PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA



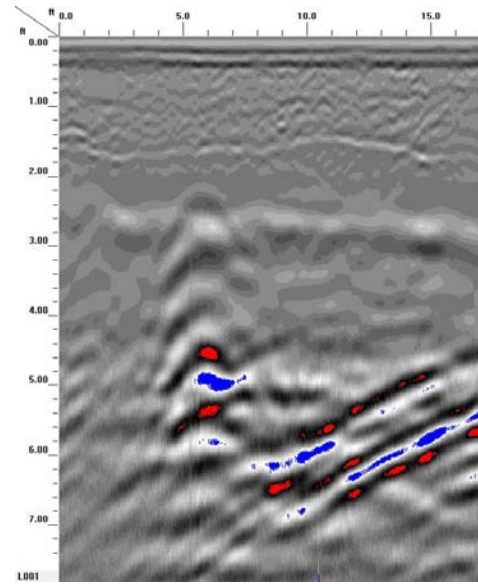
TITLE OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES ON NCDOT ENGINEERING PLANS	
PROJECT PARCEL 19 WHITEVILLE, NORTH CAROLINA NCDOT PROJECT W-5020B	
503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 06-26-2018	REVISION NO. 0
PYRAMID PROJECT NO. 2018-139	FIGURE NO. 4



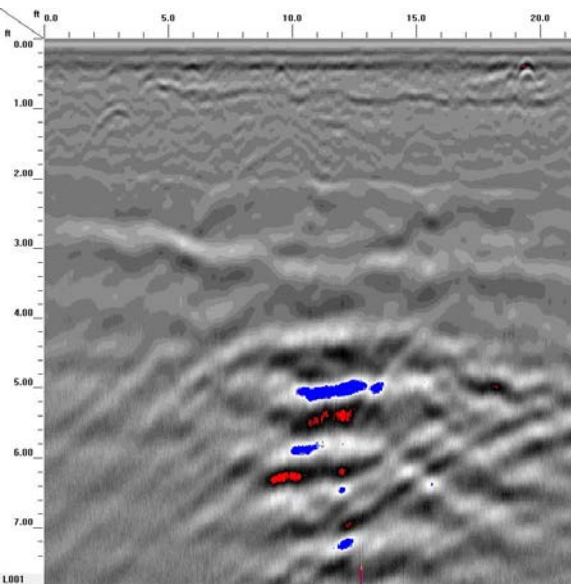
## **Appendix A – GPR Transect Images**



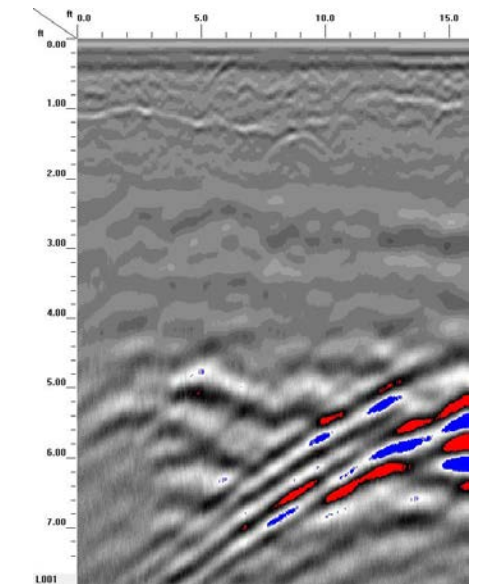
Transect 1



Transect 3

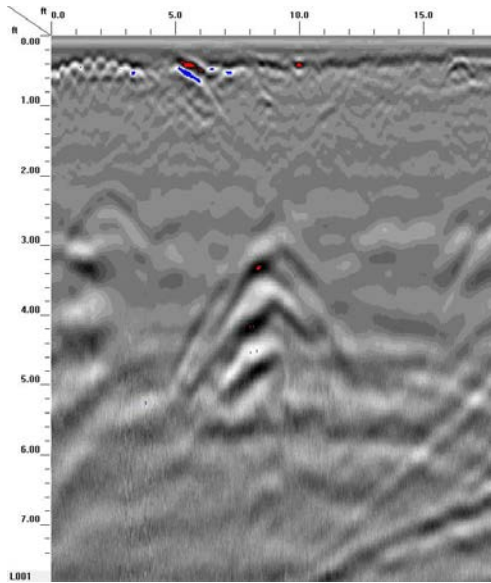


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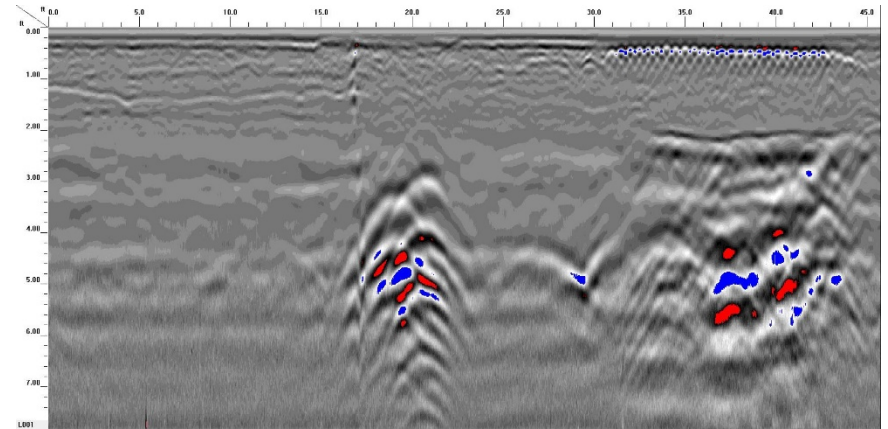


Transect 4

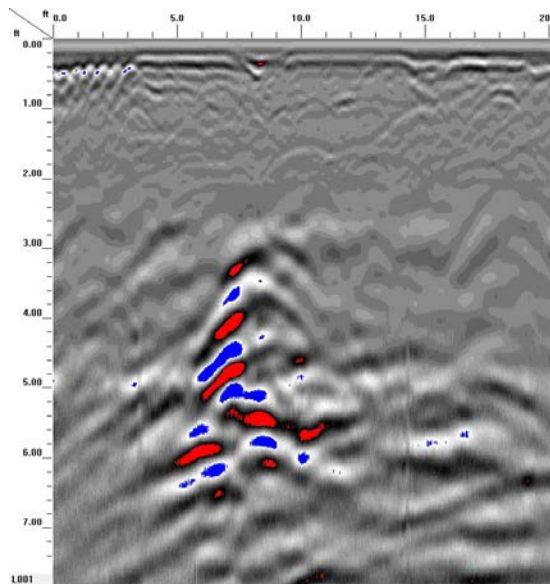




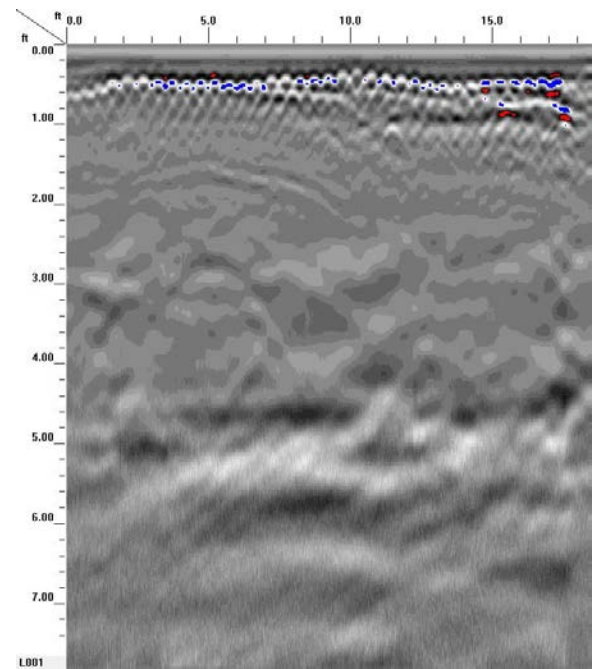
Transect 5



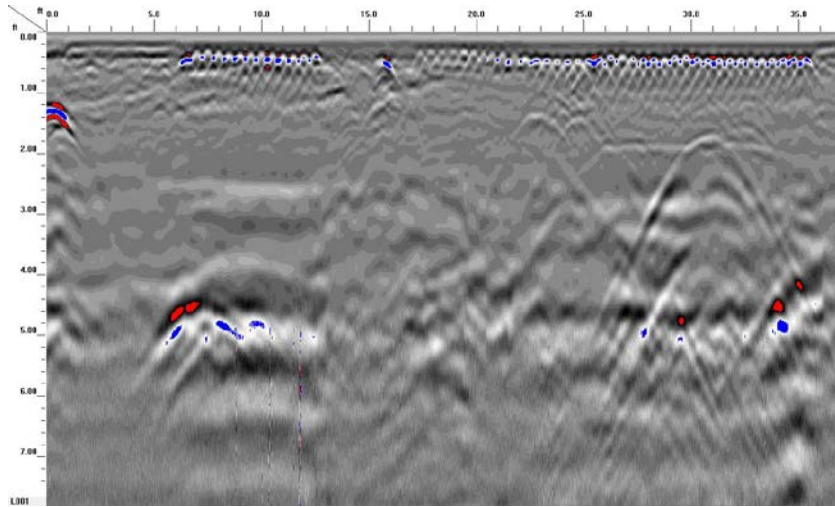
Transect 7



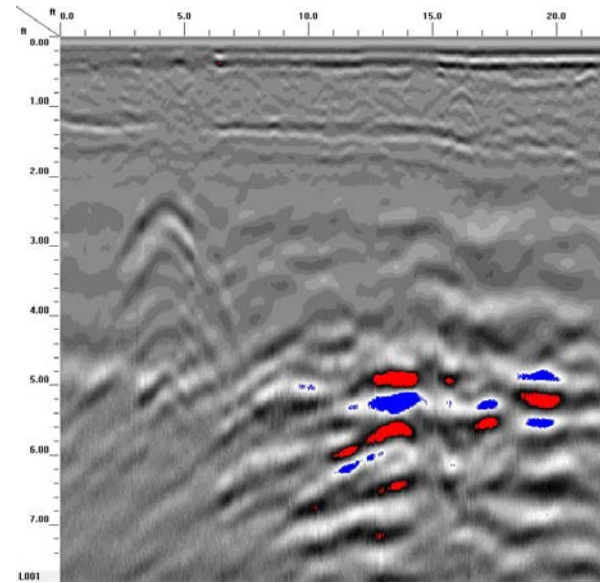
Transect 6



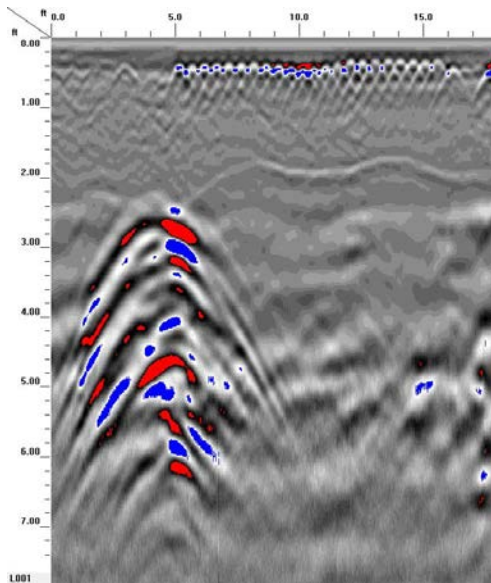
Transect 8



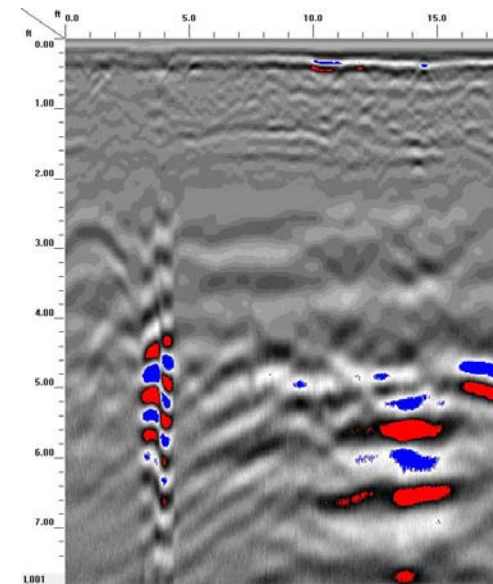
Transect 9



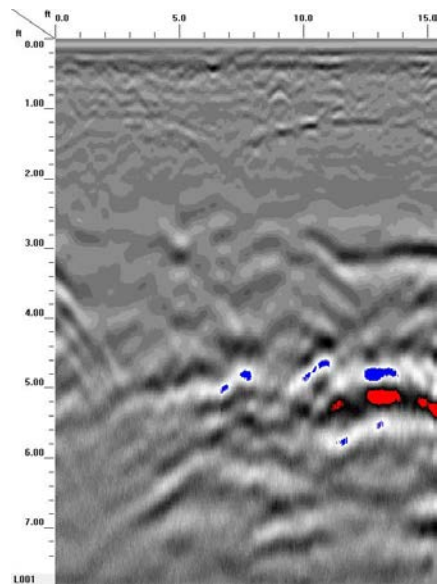
Transect 11



Transect 10



Transect 12



Transect 13

**APPENDIX E**  
**HYDROCARBON ANALYSIS RESULTS**



### Hydrocarbon Analysis Results

**Client:** NCDOT  
**Address:** Parcel 19

**Samples taken** Wednesday, June 6, 2018  
**Samples extracted** Wednesday, June 6, 2018  
**Samples analysed** Wednesday, June 6, 2018

**Contact:** Craig Haden

**Operator** Troy Holzschuh

**Project:** R-5020B Whiteville

											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	P19-SB1 (1-2)	22.6	<0.57	<0.57	8.7	8.7	4.2	0.48	<0.023	0	78.2	21.8	Road Tar 90.8%,(FCM)	
s	P19-SB1 (4-5)	22.8	<0.57	<0.57	0.57	0.57	0.53	<0.18	<0.023	0	93.7	6.3	Residual HC	
s	P19-DUP-1	22.8	<0.57	<0.57	0.57	0.57	0.49	<0.18	<0.023	0	94	6	Residual HC	
s	P19-SB2 (1-2)	24.5	<0.61	<0.61	<0.61	<0.61	<0.12	<0.2	<0.025	0	0	0	PHC not detected,(BO)	
s	P19-SB2 (4-5)	19.5	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.02	0	0	0	PHC not detected,(BO)	
s	P19-SB3 (1-2)	11.0	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM),(BO)	
s	P19-SB3 (4-5)	10.8	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM)	
s	P19-SB4 (1-2)	11.0	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM)	
s	P19-SB4 (5-5.5)	10.6	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM),(BO)	
Initial Calibrator QC check <span style="background-color: #90EE90; padding: 2px;">OK</span>											Final FCM QC Check <span style="background-color: #90EE90; padding: 2px;">OK</span>			93.6 %

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

