

*Pyramid Environmental & Engineering, P.C. Project # 2023-247
GeoEnvironmental Phase II Investigation – Twelve Star Express Inc*

**GEOENVIRONMENTAL PHASE II INVESTIGATION
TWELVE STAR EXPRSS INC.
1035 E. CLEMMONSVILLE ROAD
WINSTON-SALEM, FORSYTH COUNTY, NORTH CAROLINA
STATE PROJECT: I-5880
WBS ELEMENT: 53080.1.1
October 10, 2023**

Report prepared for:

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**GEOENVIRONMENTAL PHASE II INVESTIGATION
TWELVE STAR EXPRESS INC.
1035 E. CLEMMONSVILLE ROAD
WINSTON-SALEM, FORSYTH COUNTY, NORTH CAROLINA**

EXECUTIVE SUMMARY OF RESULTS

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations at a parcel owned by Twelve Star Express Inc. The property is located at 1035 E. Clemmons Road, Winston Salem, NC, and is currently an active convenience store that sells gasoline. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's August 23, 2023, technical proposal. This Phase II is a part of State Project I-5880.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils across the proposed right-of-way and/or easement as indicated on the enclosed plan sheets for the site. The Phase II was conducted with particular attention to the proposed right-of-way and proposed easements associated with the project design.

The following statements summarize the results of the Phase II:

- **Site History:** Pyramid interviewed DEQ personnel, reviewed DEQ Databases, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2023 obtained from Google Earth.

Review of the NCDEQ records and the NCDOT GeoEnvironmental Planning Report did not find any current or previous environmental incidents. The NCDEQ UST Facility ID is 00-0-0000015233, the according to the NCDEQ UST database indicates two (2) active USTs (two 8,000-gallon gasoline tanks) at the site. According the NCDEQ UST database, one 8,000-gallon UST was installed in April 30, 1985 and the other 8,000-gallon UST December 31, 1987.

On September 7, 2023, Pyramid emailed the site information to incident manager, Hydrogeologist Christina Schroeter with the NCDEQ UST Section in the Winston Salem Regional Office, with a request to investigate any environmental incidents associated with the property. Ms. Schroeter responded to the email and stated the following, "We do not have documentation that USTs have been removed from the

site. There have been no reported petroleum release from this address (no reported petroleum releases from either USTs, ASTs, or spills)”.

Pyramid Staff Professional Tim Leatherman performed a site investigation at the property. Mr. Leatherman did not observe any significant environmental risks at the property at the time of the investigation.

- **Geophysical Survey:** The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of thirteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was performed across and around all sources of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs and to confirm the presence of reinforcement within the concrete slabs. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. The geophysical survey identified evidence of utilities and/or buried debris.

Two known USTs were observed to the east of the pump island. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide. Three probable USTs were observed southwest of the pump island, in the vicinity of an apparent former pump island. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide. Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1.

- **Limited Soil Assessment:** A total of eight (8) soil borings were performed across the property. Soil samples were screened in the field using a Photo-Ionization Detector (PID), and nine (9) soil samples were analyzed for Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using a QED Analyzer. The NCDEQ Action Level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with a PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer.

Soil borings/soil samples B-2(8-10), B-3(6-8), B-4(6-8), B-5(6-8), B-6(6-8), and B-7(6-8) exhibited GRO concentrations ranging from 31.8 mg/kg to 2,730 mg/kg and DRO concentrations ranging from <0.41 mg/kg to 148.5 mg/kg. All of these borings exhibited either a GRO or DRO concentration that exceeds NCDEQ Action Levels.

- Soil borings/soil samples B-1(2-4), B-1(10-12), and B-8(2-4) did not exhibit GRO and/or DRO concentrations above the NCDEQ Action Levels.

- **Contaminated Soil Volumes:** Pyramid's Phase II investigation resulted in an estimated area of 4,882 square feet of impacted soil at the locations of borings B-2, B-3, B-4, B-5, B-6, and B-7. **Using the deepest contaminated sample (B-2, 8-10 feet), this translates to an estimated volume of 1,808 cubic yard of contaminated soil.** The NCDOT engineering plans indicate that these contaminated soils are within the proposed ROW and within a potential zone of planned soil excavation associated with proposed drainage features. The boundaries of the areas of petroleum contamination are approximate due to limited soil analytical data.

It should be noted that, if additional impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

1.0 INTRODUCTION

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this GeoEnvironmental Phase II Investigation (Phase II) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for the parcel owned by Twelve Star Express, Inc. The property is located at 1035 E. Clemmons Road, Winston-Salem, NC, and is currently an active convenience store that sells gasoline. This Phase II was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's August 23, 2023, technical proposal. This Phase II is a part of State Project I-5880.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils within the proposed Right-Of-Way (ROW) and/or easements as indicated on the plan sheets for each site. The Phase II was conducted with particular attention to the proposed right-of-way and proposed easements associated with the project design.

1.1 Background Information

Based on the NCDOT's *Request for Technical and Cost Proposal (RFP)*, the Phase II was conducted only within the proposed ROW and/or easements as indicated on the plan sheets for each site, with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. The Phase II included the following:

- Research the property for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment across the proposed right-of-way and/or easement portion of the properties as indicated on the enclosed plan sheets.

1.2 Project Information

Prior to field activities, a Health and Safety Plan was prepared, and the property owner was notified by mailed letter. Prior to drilling activities, the public underground utilities were located and marked by the North Carolina One-Call Service. Pyramid's geophysical staff provided additional private utility locating services to mark the on-site private, buried utilities.

2.0 SITE HISTORY

The NCDOT GeoEnvironmental Planning Report comments for the parcel in the RFP documents provided to Pyramid, provided the following background information related to the site:

Parcel #	Owner	Address
001	Twelve Star Express Inc.	Site Address: 1035 Clemmons Rd Winston Salem 27107

This parcel has an active convenience store that sales gasoline on the southern portion of the property.

Pyramid interviewed DEQ personnel, reviewed DEQ Databases, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed aerial photographs from 1993 – 2023 obtained from Google Earth.

Review of the NCDEQ records and the NCDOT GeoEnvironmental Planning Report did not find any current or previous environmental incidents. The NCDEQ UST Facility ID is 00-0-0000015233, the according to the NCDEQ UST database indicates two (2) active USTs (two 8,000-gallon gasoline tanks) at the site. According the NCDEQ UST database, one 8,000-gallon UST was installed in April 30, 1985 and the other 8,000-gallon UST December 31, 1987.

On September 7, 2023, Pyramid emailed the site information to the incident manager, Hydrogeologist Christina Schroeter with the NCDEQ UST Section in the Winston-Salem Regional Office, with a request to investigate any environmental incidents associated with the property. Ms. Schroeter responded to the email and stated the following, “We do not have documentation that USTs have been removed from the site. There have been no reported petroleum release from this address (no reported petroleum releases from either USTs, ASTs, or spills)”. Aerial photographs from the years 1993, 2005, 2010, 2019, and 2023 are included in **Appendix A**.

Review of the NCDEQ records and the NCDOT GeoEnvironmental Planning Report did not indicate any current or historical regulatory incidents associated with the property.

Prior to drilling, Pyramid Staff Professional Tim Leatherman performed a site inspection at the property. Mr. Leatherman did not observe any significant environmental risks at the property.

3.0 GEOPHYSICAL INVESTIGATION

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

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

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of thirteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. The majority of the EM anomalies were directly attributed to visible cultural features at the groundwater surface. The geophysical survey identified evidence of utilities and/or buried debris. Two known or active USTs were observed to the east of the active pump island. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide. Three probable USTs were observed southwest of the active or current pump island, in the vicinity of an apparent former pump island. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide. Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1.

The full details of the geophysical investigation are documented in Pyramid's Geophysical Investigation Report, dated September 15, 2023, which is included as **Appendix B**.

4.0 SOIL SAMPLING ACTIVITIES & RESULTS

4.1 Soil Assessment Field Activities

On September 27, 2023, Pyramid mobilized to the site, drilled soil borings, and collected the proposed soil samples for the Phase II assessment. Eight (8) soil borings (B1 through B8) were advanced on the subject property. The soil borings were completed using a truck-mounted Geoprobe drill rig. The selected locations were chosen to avoid public utilities along the adjacent roads and private utilities associated with the business while remaining

in the proposed ROW and/or easement, or within other areas of concern such as proposed drainage features and areas designated for soil removal as indicated by the NCDOT engineering plans.

Soil samples were continuously collected in four-foot-long disposable sleeves from each boring for geologic description and visual examination for signs of contamination. Soil recovered from each macro-core was screened in the field using a Photo-Ionization Detector (PID) approximately every 2 feet, depending on the soil recovery. The split spoons were cleaned or decontaminated between samples. In general, the soil sample with the highest PID reading was selected from each boring for QED Ultra-Violet Fluorescence (UVF) laboratory analysis. If field screening detected multiple elevated readings, then additional soil samples from each boring were selectively chosen for UVF analysis. The soil boring logs with the soil descriptions, visual examination, and PID screening results are included in **Appendix D**. The PID field screening results are summarized in **Table 1**. Significant petroleum odor was observed in soil borings B2 through B7.

The soil samples selected for total petroleum hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from RED Lab. The DEQ & NCDOT accept this instrument as an analytical method to provide total petroleum hydrocarbon (TPH) results for soil analysis for Phase II projects. Pyramid preserved the samples for UVF analysis in methanol-filled containers provided by RED Lab. The samples were shipped to RED Lab for analysis following the soil collection. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO).

4.2 Soil Sample Analytical Results

QED Results

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Soil borings/soil samples B-2(8-10), B-3(6-8), B-4(6-8), B-5(6-8), B-6(6-8), and B-7(6-8) exhibited GRO concentrations ranging from 31.8 mg/kg to 2,730 mg/kg and DRO concentrations ranging from <0.41 mg/kg to 148.5 mg/kg. All of these borings exhibited either a GRO or DRO concentration that exceeds NCDEQ Action Levels.

Soil borings/soil samples B-1(2-4), B-1(10-12), and B-8(2-4) did not exhibit GRO and/or DRO concentrations above the NCDEQ Action Levels. The soil sample QED results are summarized in **Table 2**. The locations of the borings and the analytical results are shown on **Figure 2**. A copy of the QED analysis report is included in **Appendix E**.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As requested by the NCDOT, Pyramid has completed a Phase II at 1035 E. Clemmons Road, Winston Salem, NC. The property is owned by Twelve Star Express Inc. The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of thirteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. The majority of the EM anomalies were directly attributed to visible cultural features at the groundwater surface. The geophysical survey identified evidence of utilities and/or buried debris. Two known or active USTs were observed to the east of the active pump island. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide. Three probable USTs were observed southwest of the active or current pump island, in the vicinity of an apparent former pump island. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide. Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1.

5.2 Limited Soil Assessment

The NCDEQ Action Level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with a PID and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Soil borings/soil samples B-2(8-10), B-3(6-8), B-4(6-8), B-5(6-8), B-6(6-8), and B-7(6-8) exhibited GRO concentrations ranging from 31.8 mg/kg to 2,730 mg/kg and DRO concentrations ranging from <0.41 mg/kg to 148.5 mg/kg. All of these borings exhibited either a GRO or DRO concentration that exceeds NCDEQ Action Levels.

Soil borings/soil samples B-1(2-4), B-1(10-12), and B-8(2-4) did not exhibit GRO and/or DRO concentrations above the NCDEQ Action Levels.

5.3 Recommendations

Petroleum-Impacted Soils

During road construction activities, it is possible the NCDOT may encounter USTs and petroleum impacted soil near soil borings B-2, B-3, B-4, B-5, B-6, and B-7.

Estimating the Area of Contamination

The estimated area of petroleum contamination is depicted on **Figure 2**. The boundaries of the area of contamination are generally estimated by applying a circular area of contamination around the borings exhibiting DRO/GRO levels above action levels with a

radius equal to half the distance between that boring and the nearest “clean” boring. In cases where this approach is not feasible, such as near property boundaries of where data does not exist to provide a definite boundary, the area of petroleum contamination is terminated using the distance to the property boundary as a radius, or an educated approximation is applied.

Pyramid’s Phase II investigation resulted in an estimated area of 4,882 square feet of impacted soil at the locations of borings B-2, B-3, B-4, B-5, B-6, and B-7. **Using the deepest contaminated sample (B-2, 8-10 feet), this translates to an estimated volume of 1,808 cubic yard of contaminated soil.** The NCDOT engineering plans indicate that these contaminated soils are within the proposed ROW and within a potential zone of planned soil excavation associated with proposed drainage features. The boundaries of the areas of petroleum contamination are approximate due to limited soil analytical data.

It should be noted that, if additional impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

6.0 LIMITATIONS

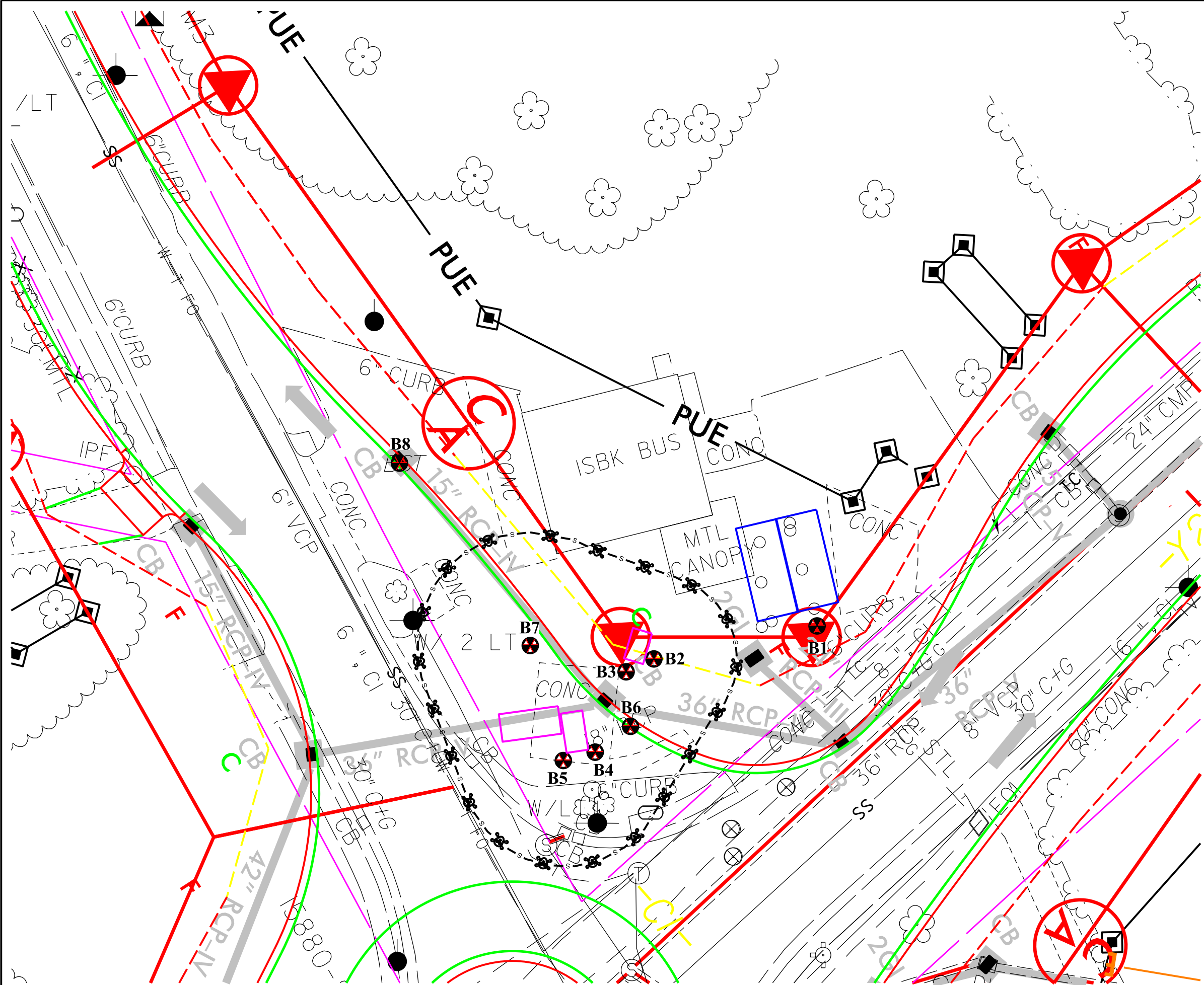
The results of this preliminary investigation are limited to the boring locations completed during this limited assessment and presented in this report. The laboratory results only reflect the current conditions at the locations sampled on the date this Phase II was performed.

7.0 CLOSURE

This report was prepared for, and is available solely for use by, the NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The scope of services for this environmental report relies on documented environmental data provided by others. The NCDEQ accepted the previous environmental investigations; therefore, these reports are counted as reliable in providing historical data for the evaluations in this Phase II report. The subsurface is inherently heterogeneous and subsurface heterogeneities not identified in this limited study may influence COCs in unpredicted ways. The opinions and conclusions in this report are in accordance with industry accepted geologic and hydrogeologic practices used at the time and location where the report was prepared. The observations, conclusions, and recommendations

documented in this report are based on site conditions and information reviewed at the time of Pyramid's investigation. Pyramid appreciates the opportunity to provide this environmental service.

FIGURES

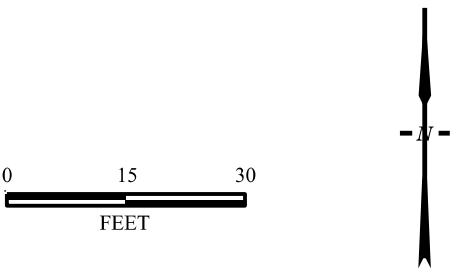


LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- KNOWN UST
- PROBABLE UST
- KNOWN SOIL CONTAMINATION
- SOIL BORING LOCATION

SAMPLE ID	DEPTH (feet)	GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)
1B1(2-4)	2-4	<0.46	0.72
1B1(10-12)	10-12	<0.47	25.3
1B2(8-10)	8-10	386.8	<6
1B3(6-8)	6-8	117.5	<0.41
1B4(6-8)	6-8	1056	<6.2
1B5(6-8)	6-8	2730	<17.8
1B6(6-8)	6-8	302.8	<3.5
1B7(6-8)	6-8	31.8	148.5
1B8(2-4)	2-4	<0.46	7.5

BOLD VALUES INDICATE ABOVE NCDEQ ACTION LEVELS. FULL ANALYTICAL RESULTS PRESENTED IN TABLE 2 OF REPORT.



TITLE SOIL BORING LOCATIONS AND ESTIMATED AREA OF CONTAMINATION	
PROJECT 1035 CLEMMONSVILLE ROAD WINSTON-SALEM, NC NCDOT PROJECT I-5880	
 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 10-9-2023	REVISION NO. 0
PYRAMID PROJECT NO. 2023-247	FIGURE NO. 2

TABLES

TABLE 1
Summary of Soil Field Screening Results
 NCDOT Project I-5880
 Twelve Star Express Inc.
 1035 E. Clemmons Road
 Winston Salem, Forsyth County, North Carolina

SOIL BORING 5/23/2023	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
B1	B1(0-2)	0 to 2	14.0
	B1(2-4)	2 to 4	38.0
	B1(4-6)	4 to 6	3.0
	B1(6-8)	6 to 8	30.0
	B1(8-10)	8 to 10	13.0
	B1(10-12)	10 to 12	32.0
B2	B2(0-2)	0 to 2	NR
	B2(2-4)	2 to 4	34.0
	B2(4-6)	4 to 6	41.0
	B2(6-8)	6 to 8	400.0
	B2(8-10)	8 to 10	1042.0
	B2(10-11)	10 to 11	150.0
B3	B3(0-2)	0 to 2	NR
	B3(2-4)	2 to 4	55.0
	B3(4-6)	4 to 6	81.0
	B3(6-8)	6 to 8	355.0
B4	B4(0-2)	0 to 2	0.8
	B4(2-4)	2 to 4	49.0
	B4(4-6)	4 to 6	8.0
	B4(6-8)	6 to 8	1283.0
B5	B5(0-2)	0 to 2	13.0
	B5(2-4)	2 to 4	74.0
	B5(4-6)	4 to 6	122.0
	B5(6-8)	6 to 8	905.0
B6	B6(0-2)	0 to 2	37.0
	B6(2-4)	2 to 4	45.0
	B6(4-6)	4 to 6	145.0
	B6(6-8)	6 to 8	450.0
B7	B7(0-2)	0 to 2	1.5
	B7(2-4)	2 to 4	4.0
	B7(4-6)	4 to 6	14.0
	B7(6-8)	6 to 8	338.0
B8	B8(0-2)	0 to 2	1.0
	B8(2-4)	2 to 4	9.5
	B8(4-6)	4 to 6	2.1
	B7(6-8)	6 to 8	1.4

NR= no recovery

bgs= below ground surface

PID= photo-ionization detector

PPM= parts-per-million

= sampled for lab analysis &/or QROS-QED analysis

OVA= Organic Vapor Analyzer

TABLE 2
Summary of Soil Sample QED Analytical Results for GRO/DRO
 NCDOT State Project I-5880
 Twelve Star Express Inc. - 1035 E. Clemmons Road
 Winston Salem, Forsyth County, North Carolina

SAMPLE ID	DATE	DEPTH (feet)	PID (ppm)	QROS - QED Analysis		
				GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)	TPH (mg/kg) (C5-C35)
1B1(2-4)	9/27/2023	2-4	38.0	<0.46	0.72	0.72
1B1(10-12)	9/27/2023	10-12	32.0	<0.47	25.3	25.3
1B2(8-10)	9/27/2023	8-10	1042.0	386.8	<6	386.8
1B3(6-8)	9/27/2023	6-8	355.0	117.5	<0.41	117.5
1B4(6-8)	9/27/2023	6-8	1283.0	1056	<6.2	1056
1B5(6-8)	9/27/2023	6-8	905.0	2730	<17.8	2730
1B6(6-8)	9/27/2023	6-8	450.0	302.8	<3.5	302.8
1B7(6-8)	9/27/2023	6-8	338.0	31.8	148.5	180.3
1B8(2-4)	9/27/2023	2-4	9.5	<0.46	7.5	7.5
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				50	100	NA

PID= photo-ionization detector

GRO= Gasoline Range Organics

TPH= Total Petroleum

NA= Not Applicable

PPM= parts-per-million

DRO= Diesel Range Organics

Hydrocarbons (GRO + DRO)

mg/kg= milligrams-per-kilogram

* Bold values indicate concentrations above initial action levels

APPENDIX A



Legend

-  1035 E
-  Dirt Busters
-  EASTON GROCERY
-  Gas Town

Google Earth

Image U.S. Geological Survey

300 ft



Legend

- 1035 E
- Dirt Busters
- EASTON GROCERY
- Gas Town

Google Earth

Image U.S. Geological Survey

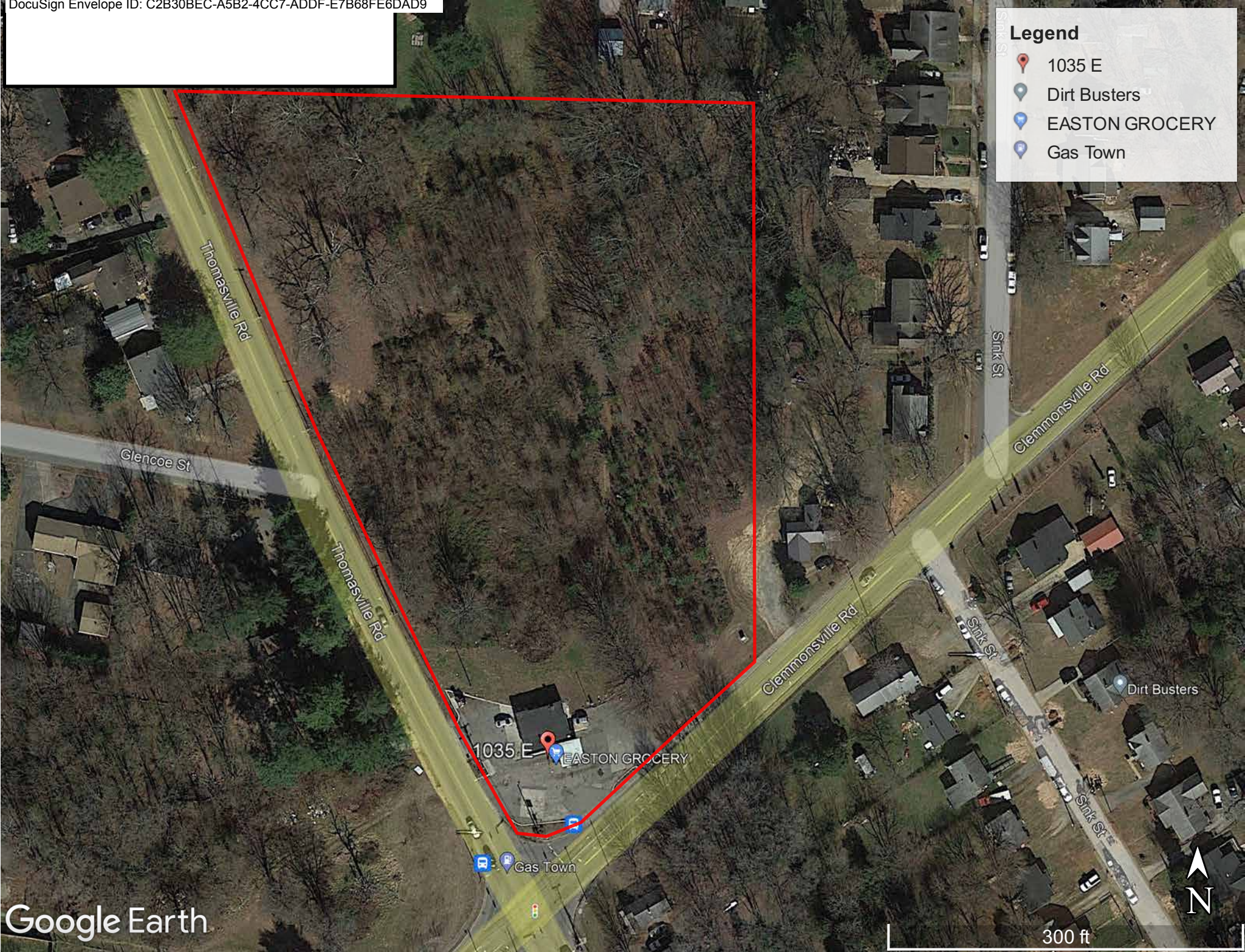
300 ft





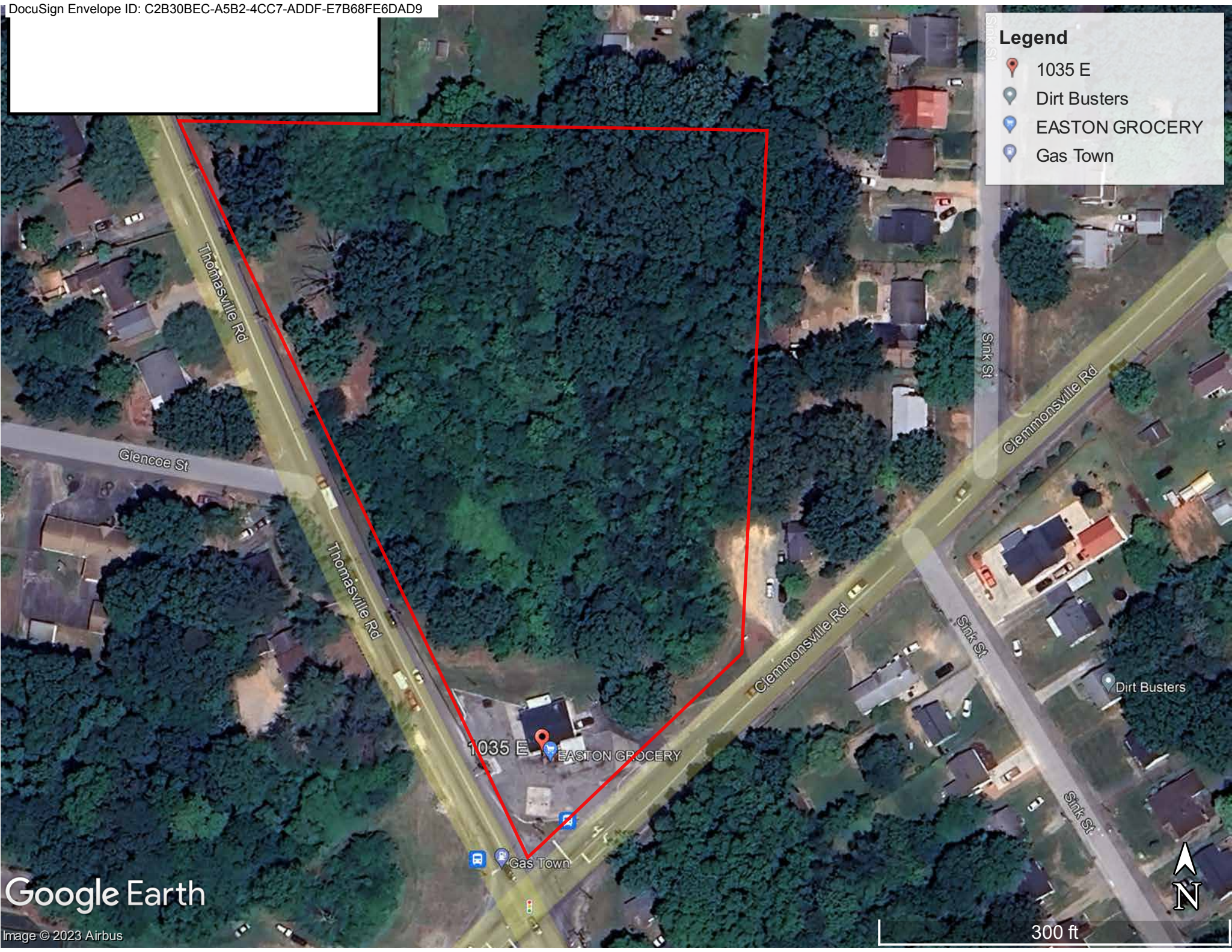
Legend

-  1035 E
-  Dirt Busters
-  EASTON GROCERY
-  Gas Town



Legend

-  1035 E
-  Dirt Busters
-  EASTON GROCERY
-  Gas Town



Legend

-  1035 E
-  Dirt Busters
-  EASTON GROCERY
-  Gas Town

Google Earth

300 ft



APPENDIX B



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2023-247)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 1
NCDOT PROJECT I-5880 (53080.1.1)

1035 CLEMMONSVILLE ROAD, WINSTON-SALEM, NC

September 15, 2023

Report prepared for: Craig Haden, LG
NCDOT Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

Prepared by: _____

A handwritten signature in black ink, appearing to read "E. Cross".

Eric C. Cross, P.G.
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Reviewed by: _____

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503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406

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C257: GEOLOGY

C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 1 – 1035 Clemmonsville Road
Winston-Salem, Forsyth County, North Carolina

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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

Project Description: Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 1, located at 1035 Clemmons Road, in Winston-Salem, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project I-5880). The survey was designed to include all accessible portions of the property within the survey area indicated to Pyramid by the NCDOT. Conducted on September 15, 2023, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of thirteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. The geophysical survey identified evidence of utilities and/or buried debris.

Two known USTs were observed to the east of the pump island. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide. Three probable USTs were observed southwest of the pump island, in the vicinity of an apparent former pump island. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide. Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1.

INTRODUCTION

Pyramid Geophysical Services (Pyramid), a department within Pyramid Environmental & Engineering, P.C., conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 1, located at 1035 Clemmons Road, in Winston-Salem, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project I-5880). The survey was designed to include all accessible portions of the property within the survey area indicated to Pyramid by the NCDOT. Conducted on September 15, 2023, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site consisted of an active gas station surrounded by grass, asphalt, and concrete surfaces. An aerial photograph, showing the survey area boundaries, and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

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

approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on September 15, 2023, using a Geophysical Survey Systems, Inc. (GSSI) SIR 4000 control unit coupled to a 350 MHz HS antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the SIR 4000 unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the SIR 4000 unit for post-processing and figure generation.

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

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

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Sign/Utilities/Metal on Ground Surface	
2	Suspected Utilities	✓
3	Dumpster	✓
4	Building/Container	✓
5	Vehicle	✓
6	Two Known USTs/Pump Island	✓
7	Suspected Buried Metallic Debris	✓
8	One Probable UST	✓
9	Suspected Buried Metallic Debris	✓
10	Sign/Utilities	
11	Drop Inlet	
12	Metal Curb	
13	Two Probable USTs/Former Pump Island	✓

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including signs, metal on the ground surface, a dumpster, a building, a container, a vehicle, two known USTs, a pump island, utilities, a drop inlet, a metal curb, and a former pump island. GPR was performed around and across all areas of significant metallic interference to confirm that the interference did not obscure any significant structures such as USTs. GPR was also performed across EM Anomalies 2, 7, 8, 9, and 13 to confirm whether the anomaly was the result of a more significant structure such as a UST.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, a reconnaissance GPR area, as well as select transect images. All of the transect images are included in **Appendix A**. A total of twenty-one formal GPR transects were performed at the site.

GPR Transects 1-4 and 14-21, were performed around and across the areas of significant metallic interference as well as across the minor EM anomalies indicated in **Figure 2**. GPR Transects 1-3 were performed across the known USTs. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide. **Figure 4** provides the locations and sizes of the two known USTs overlain on an aerial, along with ground-level photographs. GPR Transects 1-4 also showed reinforcement within the slab. GPR Transects 14-21 showed minor hyperbolic reflectors consistent with utilities and/or buried debris. Additionally, GPR Transects 5, 6, and 11-12 showed minor hyperbolic reflectors consistent with utilities and/or buried debris. These transects were performed across EM Anomalies 7, 9, and 2, respectively.

GPR Transects 7-9 were performed across EM Anomaly 13. GPR Transect 7 showed large, high-amplitude hyperbolic and lateral reflectors, as did GPR Transects 8 and 9. GPR Transects 10 and 11 were performed across EM Anomaly 8. These transects also showed large, high-amplitude hyperbolic and lateral reflectors. All of these reflectors are consistent with the widths and lengths of USTs. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide. **Figure 4** provides the locations and sizes of the three probable USTs overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1. **Figure 5** provides an overlay of the metal detection results, two known USTs, and three Probable USTs onto the NCDOT Engineering plans.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 1 in Winston-Salem, 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.
- The geophysical survey identified evidence of utilities and/or buried debris.
- Two known USTs were observed to the east of the pump island. Known UST #1 and #2 are both approximately 24 feet long by 10.5 feet wide.
- Three probable USTs were observed southwest of the pump island, in the vicinity of an apparent former pump island. Probable UST #1 is approximately 15 feet long by 7 feet wide, Probable UST #2 is approximately 10 feet long by 5.5 feet wide, and Probable UST #3 is approximately 8 feet long by 5 feet wide.
- Collectively, the geophysical data recorded evidence of two known and three probable USTs at Parcel 1.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for the North Carolina Department of Transportation 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)

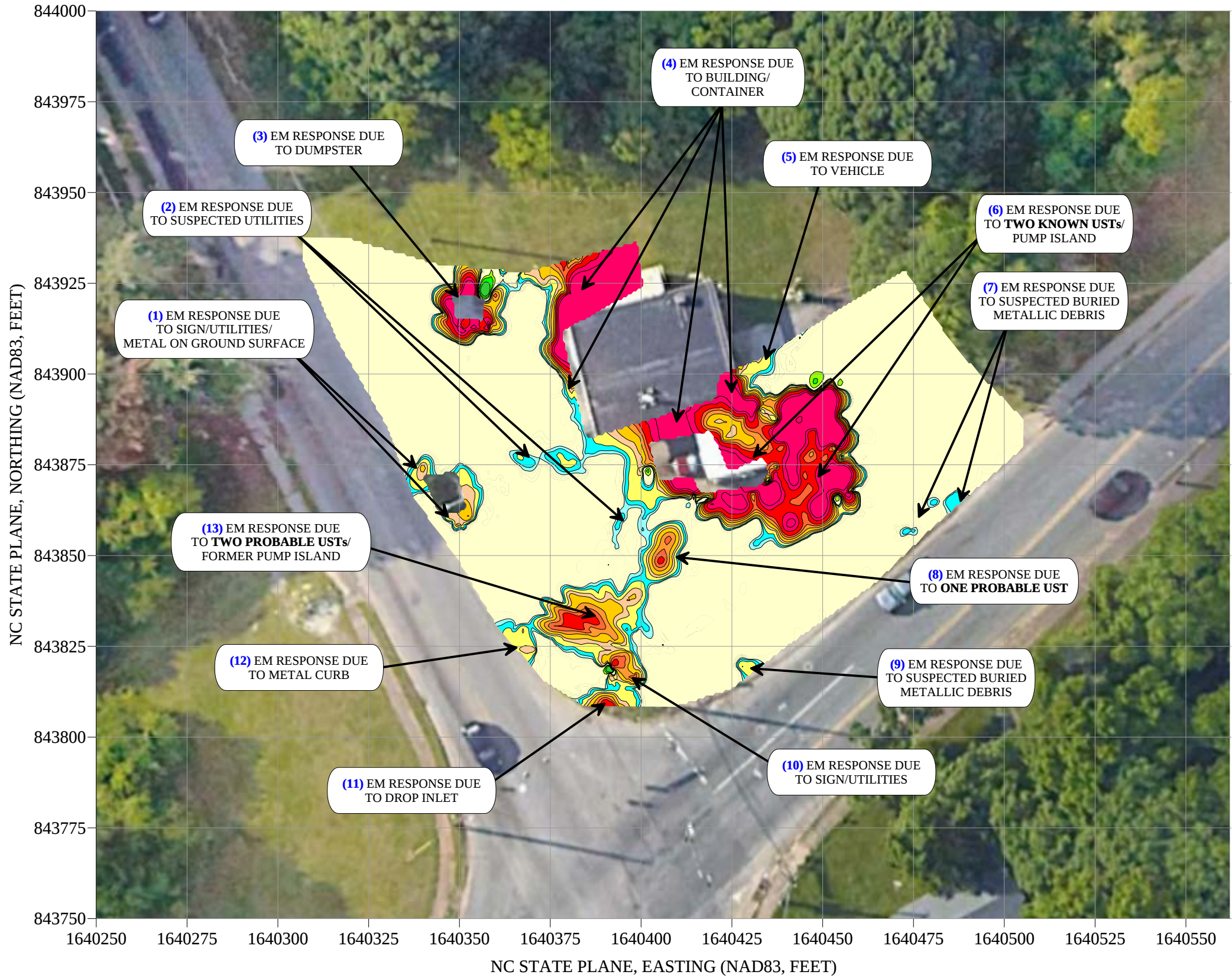


View of Survey Area (Facing Approximately Northeast)



 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 1 WINSTON-SALMEM, NORTH CAROLINA NCDOT PROJECT I-5880	TITLE PARCEL 1 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 9/15/2023	CLIENT NCDOT
			PYRAMID PROJECT #: 2023-247	FIGURE 1

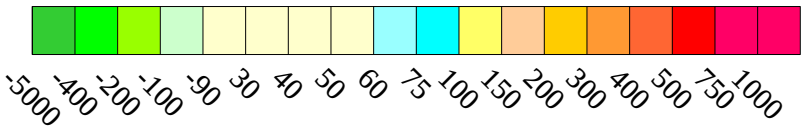
EM61 METAL DETECTION RESULTS



EVIDENCE OF TWO KNOWN AND THREE PROBABLE USTs WAS OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on September 15, 2023, using a Geonics EM61-MK2 instrument. Verification GPR data were collected using a GSSI SIR 4000 instrument with a 350 MHz HS antenna on September 15, 2023.

EM61 Metal Detection Response (millivolts)



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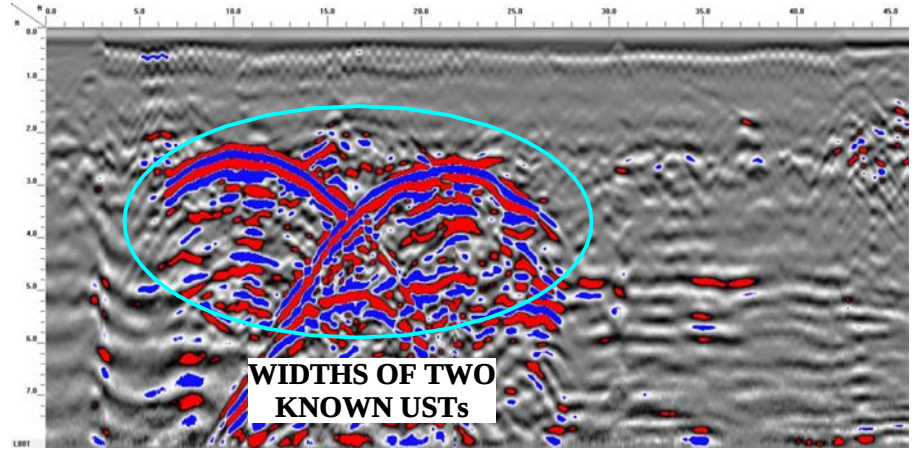
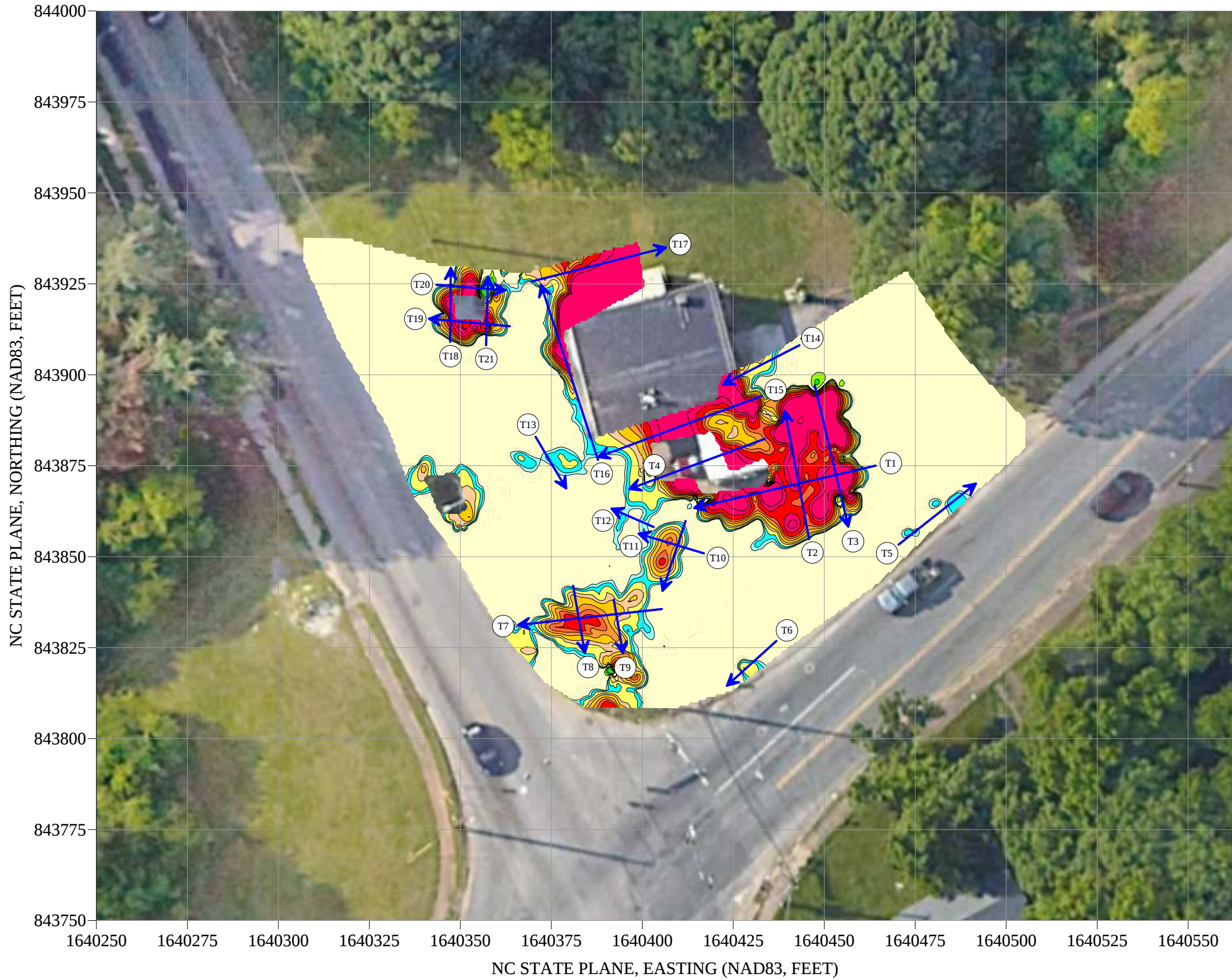
PROJECT
PARCEL 1
WINSTON-SALMEM, NORTH CAROLINA
NCDOT PROJECT I-5880

TITLE
PARCEL 1 -
EM61 METAL DETECTION CONTOUR MAP

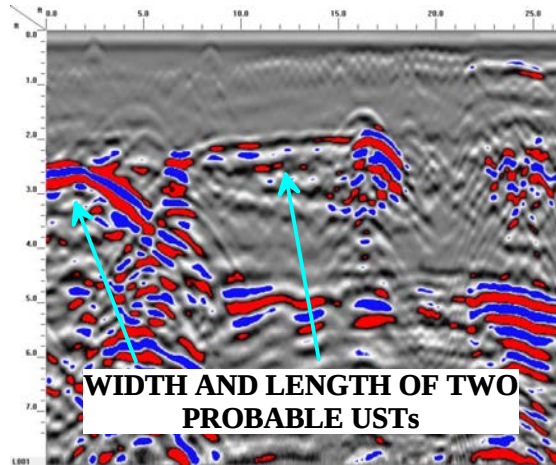
DATE
9/15/2023
PYRAMID
PROJECT #: 2023-247

CLIENT
NCDOT
FIGURE 2

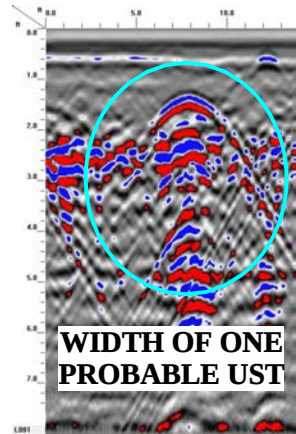
GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



GPR TRANSECT 7 (T7)

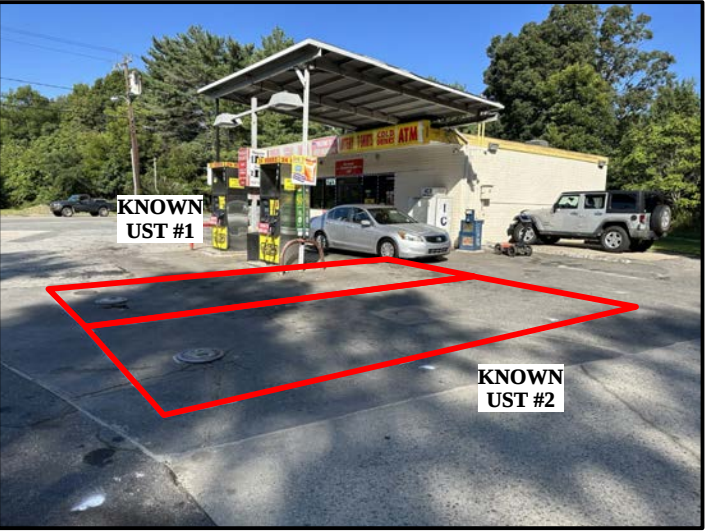


GPR TRANSECT 11 (T11)

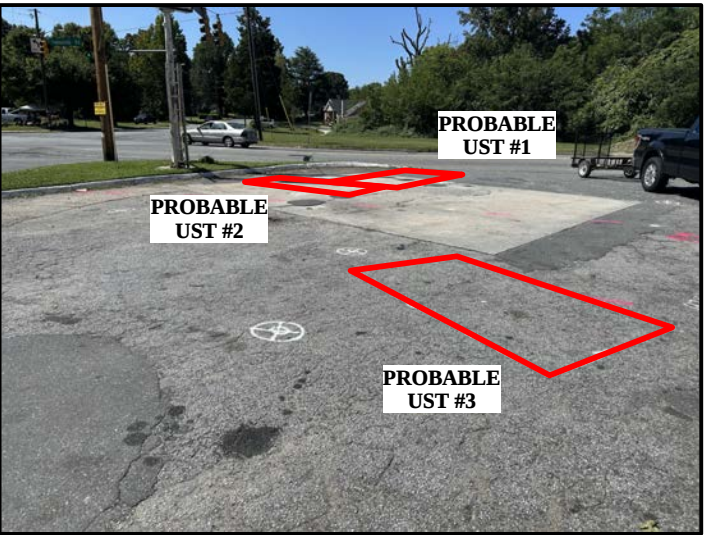


 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 1 WINSTON-SALMEM, NORTH CAROLINA NCDOT PROJECT I-5880	TITLE PARCEL 1 - GPR TRANSECT LOCATIONS AND SELECT IMAGES	DATE 9/15/2023	CLIENT NCDOT
			PYRAMID PROJECT #: 2023-247	FIGURE 3

LOCATIONS OF TWO KNOWN AND THREE PROBABLE USTs



View of Two Known USTs
(Facing Approximately West)



View of Three Probable USTs
(Facing Approximately Southwest)



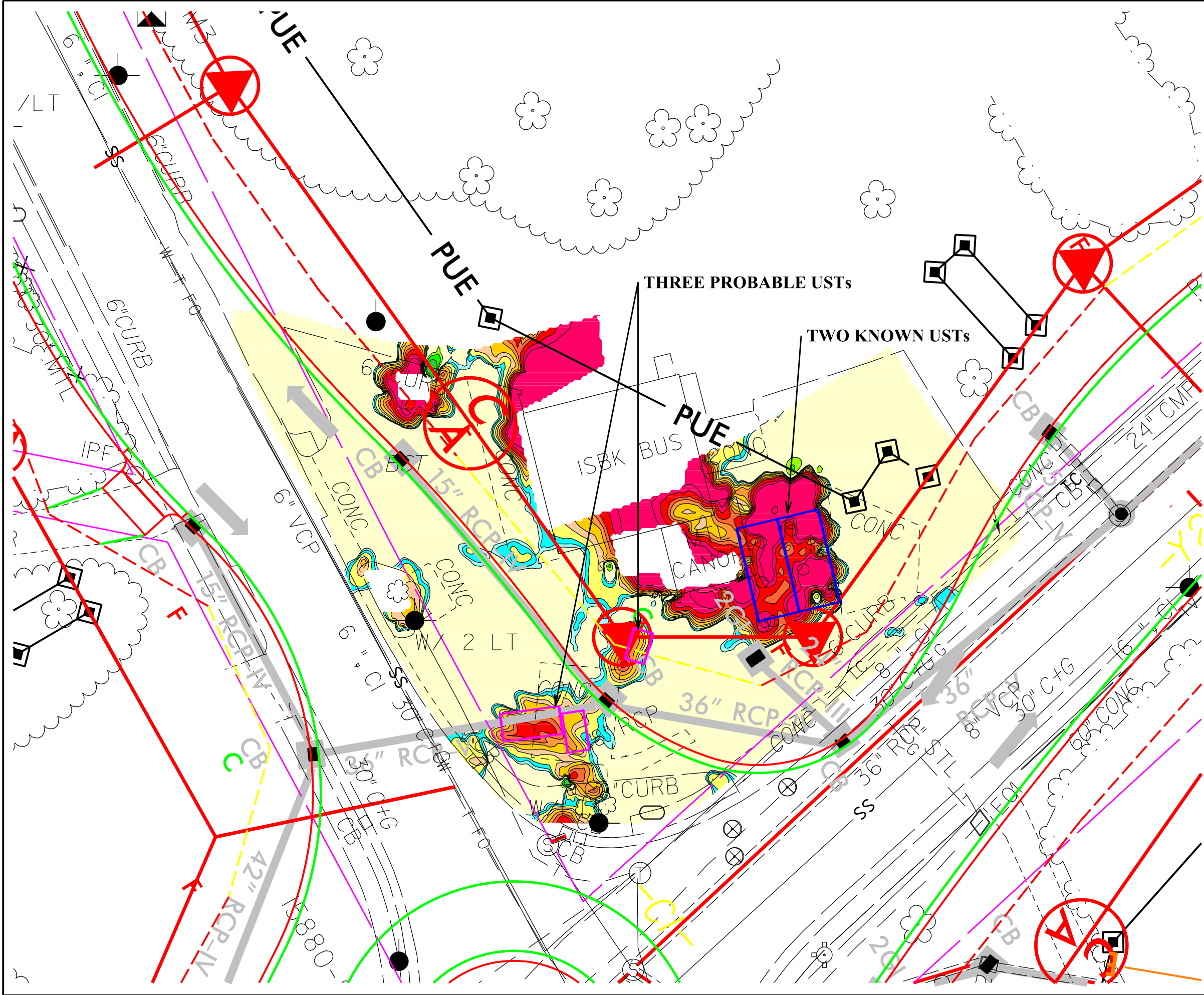
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PROJECT
PARCEL 1
WINSTON-SALMEM, NORTH CAROLINA
NCDOT PROJECT I-5880

TITLE
PARCEL 1 -
LOCATIONS AND SIZES OF TWO KNOWN
AND THREE PROBABLE USTs

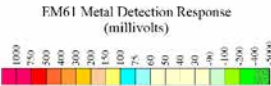
DATE
9/15/2023
PYRAMID
PROJECT #: 2023-247

CLIENT
NCDOT
FIGURE 4



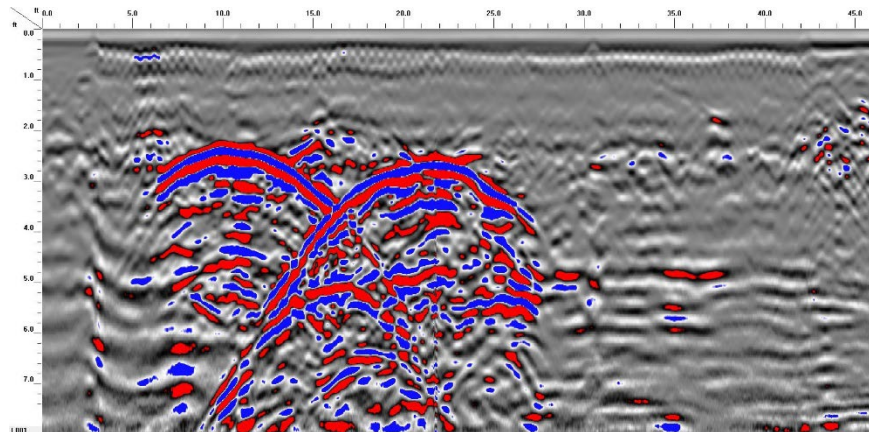
LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- KNOWN UST
- PROBABLE UST

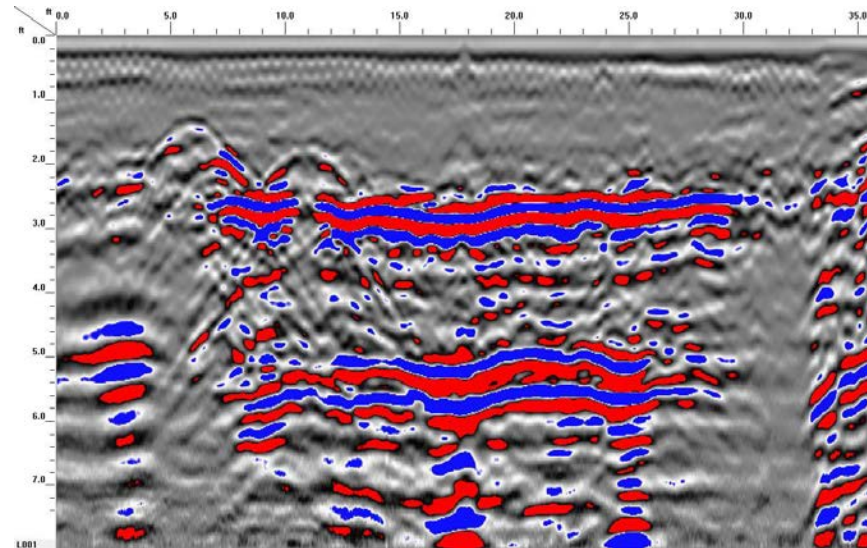


TITLE OVERLAY OF METAL DETECTION RESULTS, TWO KNOWN AND THREE PROBABLE USTs ON NCDOT ENGINEERING PLANS	
PROJECT 1035 CLEMMONSVILLE ROAD WINSTON-SALEM, NC NCDOT PROJECT I-5880	
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DATE: 10-9-2023	REVISION NO. 0
PYRAMID PROJECT NO. 2023-247	FIGURE NO. 5

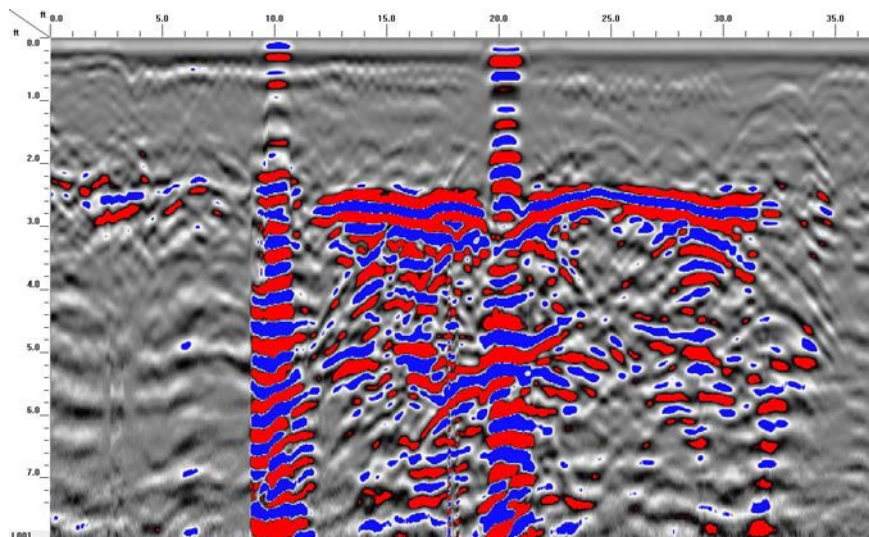
Appendix A – GPR Transect Images



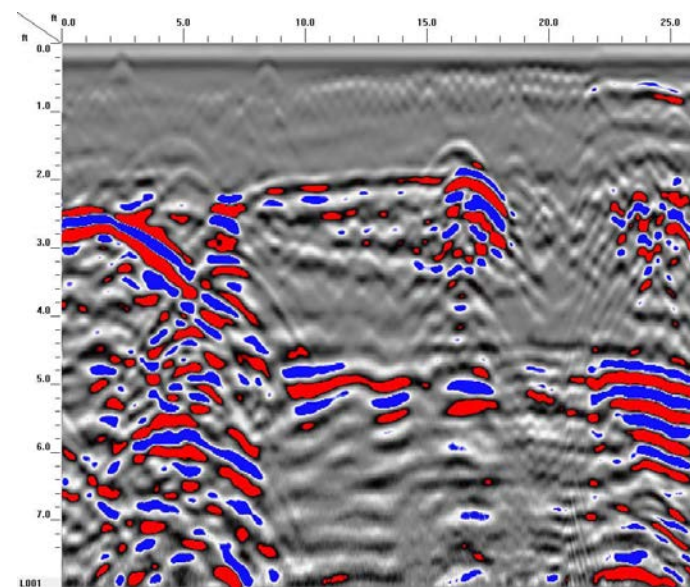
GPR TRANSECT 1



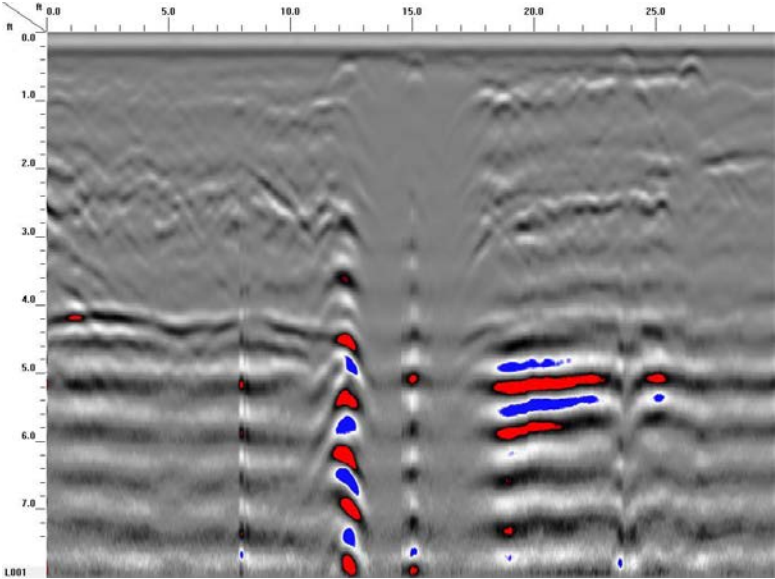
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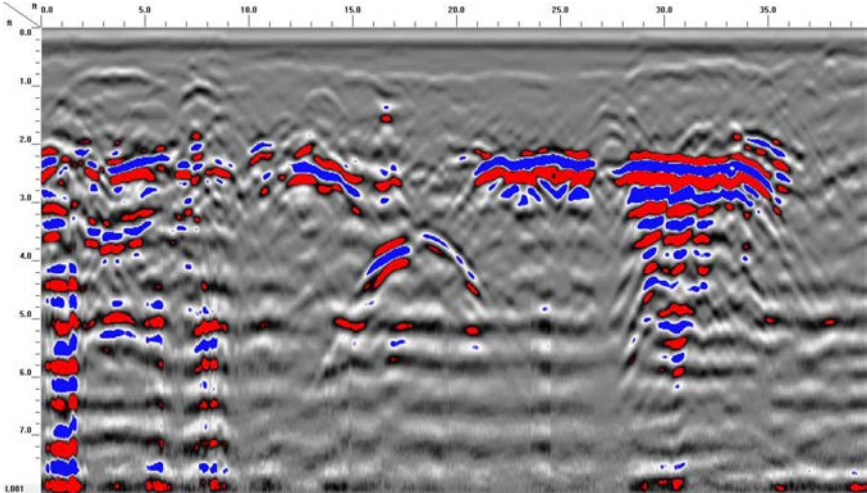
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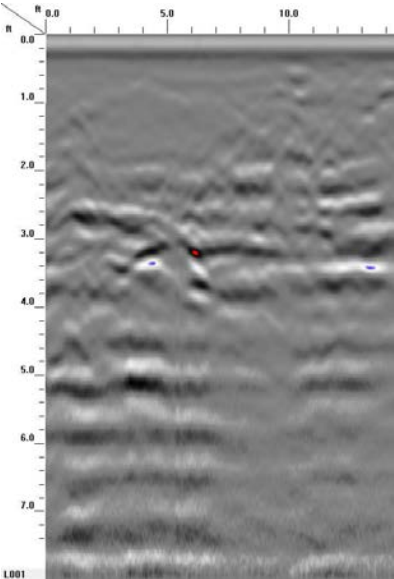
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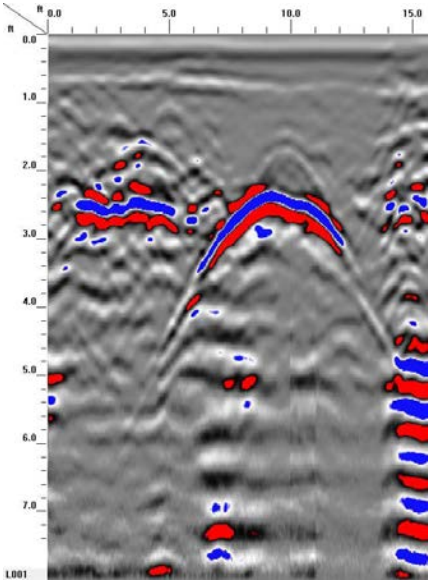
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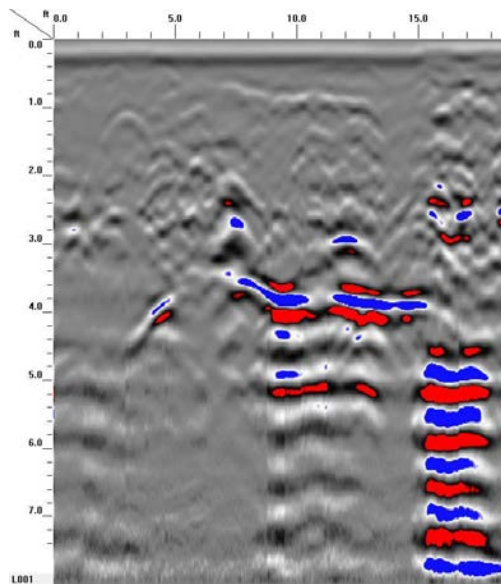
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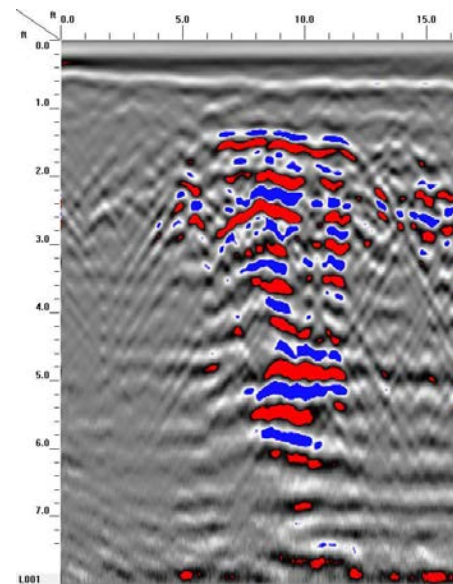
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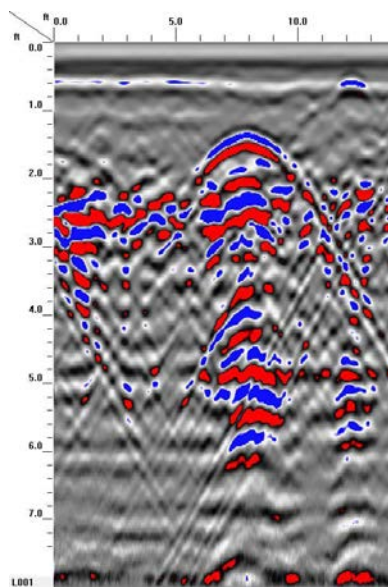
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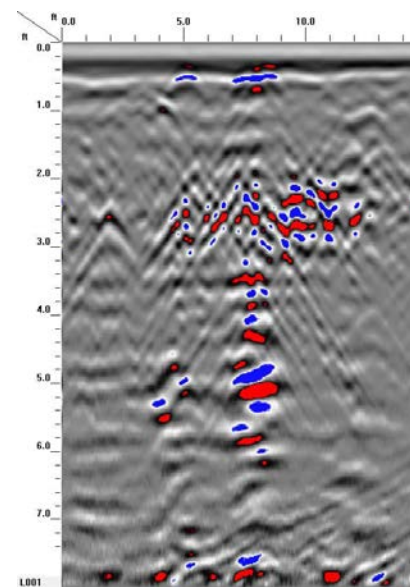
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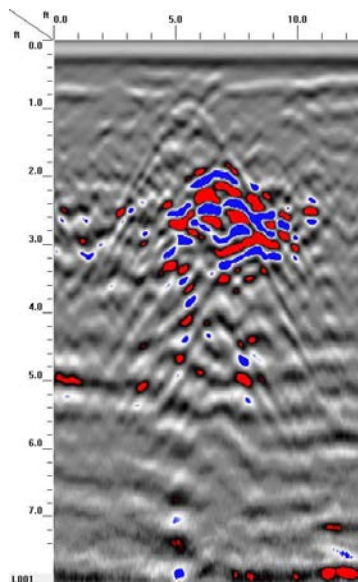
GPR TRANSECT 11



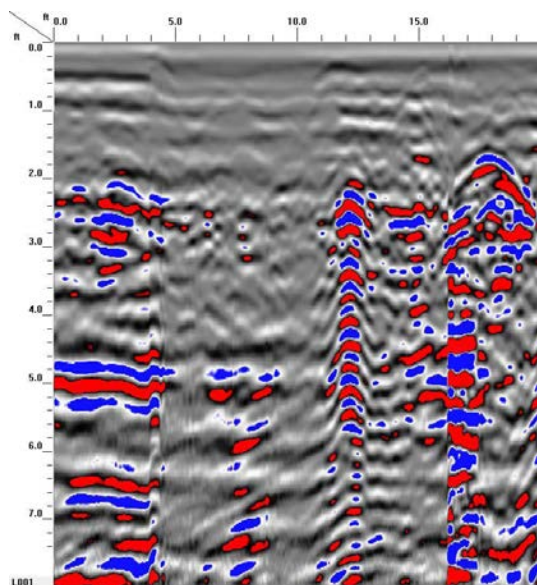
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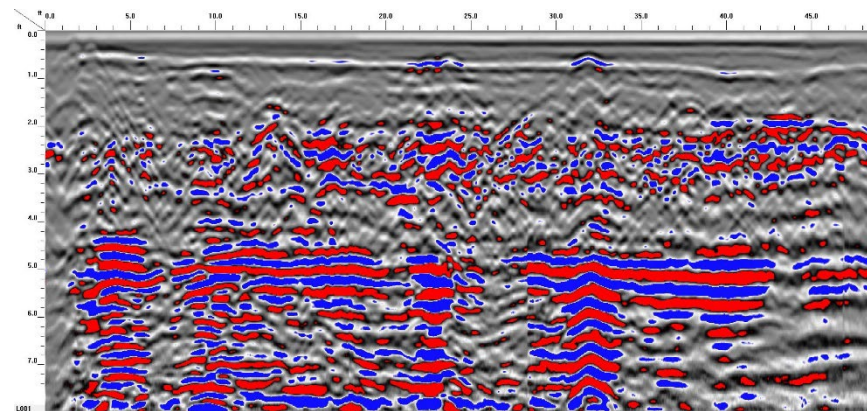
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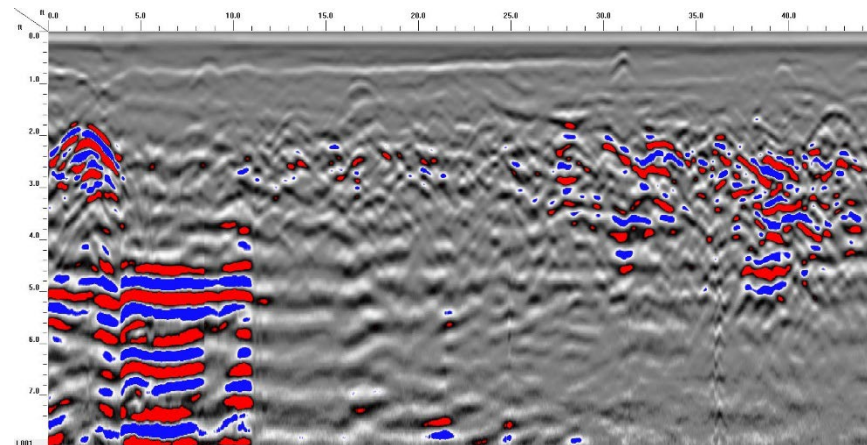
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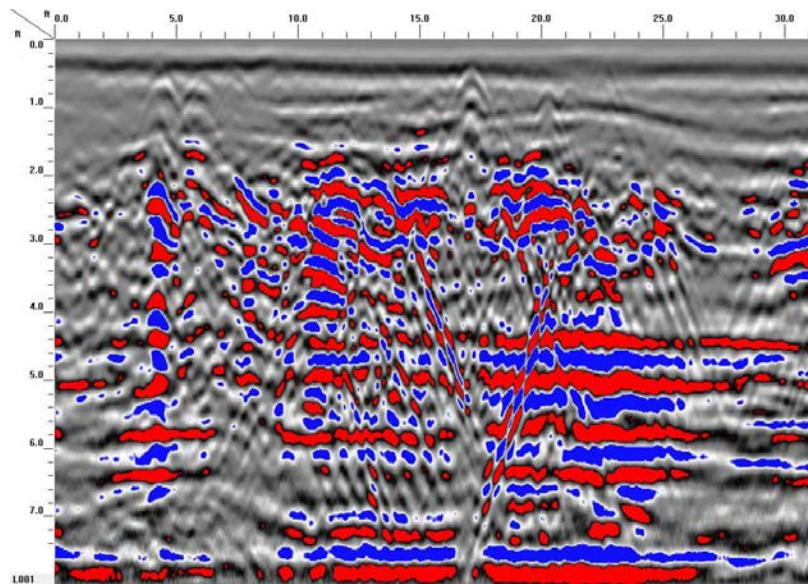
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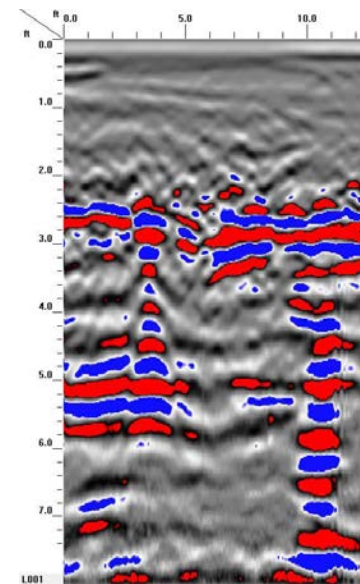
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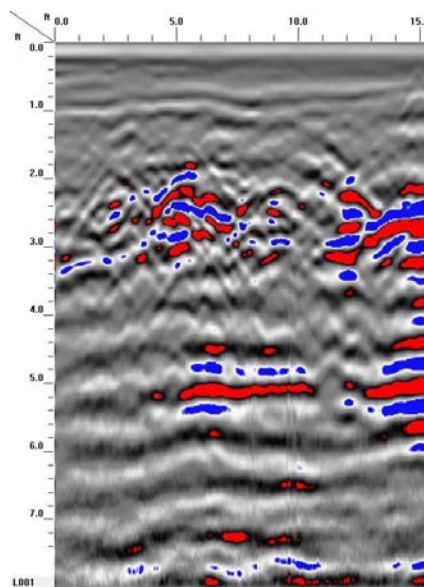
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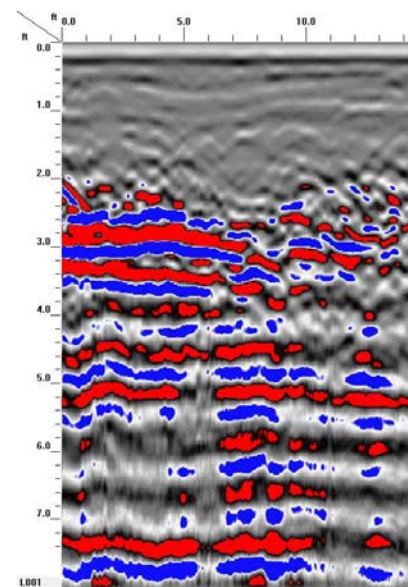
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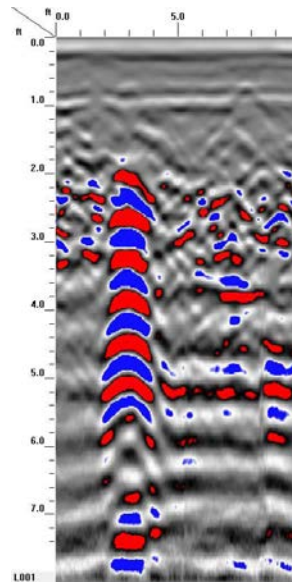
GPR TRANSECT 19



GPR TRANSECT 18



GPR TRANSECT 20



GPR TRANSECT 21

APPENDIX C

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B1
	1035 E. Clemmonsville Road, Winston-Salem, Forsyth County, NC		Southeast; Down-gradient of Active Tank System
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	12 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
----------------	---	-------------

	Surface – Asphalt	
0 – 4’	Brownish-gray, sandy-clayey-silt (ML), slightly moist, slight odor	0-2’PID= 14.0 PPM
		2-4’PID= 38.0 PPM
4 – 8’	Brown, sandy-silty-clay (ML–CL), very firm to hard, slightly moist,	4-6’PID= 3.0 PPM
	Slight odor	6-8’PID= 30.0 PPM
8 – 12’	Brown to tan, sandy-silty-clay (ML-CL), very firm to hard, slightly moist,	8-10’PID= 13.0 PPM
	Slight odor	10-12’PID= 32.0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B2
	1035 E. Clemmons ville Road, Winston-Salem, Forsyth County, NC		East of possible UST; Northeast of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	11 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
----------------	---	-------------

	Surface – Asphalt	
0 – 2’	No Recovery	0-2’PID= NR
2 – 6’	Gray to brownish gray, silty-clay (CL), firm, moist, petroleum odor	2-4’PID= 34.0 PPM
		4-6’PID= 41.0 PPM
6 – 8’	Reddish brown to brown, silty-clay (ML-CL), very firm to hard,	6-8’PID= 400.0 PPM
	Slightly moist, petroleum odor	
8 – 11’	Brown to tan, sandy-silty-clay (ML-CL), very firm to hard, slightly moist,	8-10’PID= 1042.0 PPM
	Petroleum odor	10-11’PID= 150.0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B3
	1035 E. Clemmonsville Road, Winston-Salem, Forsyth County, NC		South of possible UST; NE of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 – 2’	No Recovery	0-2’PID= NR
2 – 6’	Dark brown to gray, sandy-silty-clay (ML-CL), firm, moist,	2-4’PID= 55.0 PPM
	Petroleum odor	4-6’PID= 81.0 PPM
6 – 8’	Brown, sandy-silty-clay (ML-CL), very firm to hard, slightly moist,	6-8’PID= 355.0 PPM
	Petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B4
	1035 E. Clemmons ville Road, Winston-Salem, Forsyth County, NC		Near possible UST; South of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 – 2’	Dark brown, sandy-clayey-silt (ML), moist, petroleum odor	0-2’PID= 0.8 PPM
2 – 6’	Brown, sandy-silty-clay (ML-CL), moist, petroleum odor	2-4’PID= 49.0 PPM
		4-6’PID= 8.0 PPM
6 – 8’	Brown, sandy-silty-clay (ML-CL), firm to hard, slightly moist,	6-8’PID= 1283.0 PPM
	Petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B5
	1035 E. Clemmonsville Road, Winston-Salem, Forsyth County, NC		Near possible UST; South of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 – 2'	Dark brown, sandy-silty-clay (CL) with some gravel, moist, petroleum	0-2'PID= 13.0 PPM
	Odor	
2 – 6'	Dark brown, silty-sandy-clay (ML-CL), firm, moist, petroleum odor	2-4'PID= 74.0 PPM
		4-6'PID= 122.0 PPM
6 – 8'	Brown to dark brown, sandy-silty-clay (ML-CL), firm to hard,	6-8'PID= 905.0 PPM
	Slightly moist, petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B6
	1035 E. Clemmonsville Road, Winston-Salem, Forsyth County, NC		East of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 – 2’	Dark brown, sandy-silty-clay (ML), firm, moist, petroleum odor	0-2’PID= 37.0 PPM
2 – 4’	Brown, silty-clay (CL), firm, moist, petroleum odor	2-4’PID= 45.0 PPM
4 – 6’	Brown, sandy-silty-clay (ML), firm, moist, petroleum odor	4-6’PID= 145.0 PPM
6 – 8’	Reddish brown, sandy-silty-clay (ML), very firm to hard, moist,	6-8’PID= 450.0 PPM
	Petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B7
	1035 E. Clemmons ville Road, Winston-Salem, Forsyth County, NC		Northwest corner of former pump island area
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 – 2’	Brown, sandy-silty-clay (ML), firm, moist, slight petroleum odor	0-2’PID= 1.5 PPM
2 – 6’	Brown, sandy-silty-clay (ML-CL), firm to hard, moist, petroleum odor	2-4’PID= 4.0 PPM
		4-6’PID= 14.0 PPM
6 – 8’	Brown to tan, sandy-silty-clay (ML-CL), very firm to hard, slightly moist,	6-8’PID= 338.0 PPM
	Petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5880, Winston-Salen, NC (2023-247)	BORING/WELL NO:	B8
	1035 E. Clemmons ville Road, Winston-Salem, Forsyth County, NC		Northwest of convenience store
SITE LOCATION:		BORING/WELL LOCATION:	
START DATE:	09/27/2023	COMPLETED:	09/27/2023
GEOLOGIST:	T. Leatherman	DRILLER:	TRC
DRILL METHOD:	Direct Push - Geoprobe	SAMPLE METHOD:	Macro-Core
BORING DIA:	2 -inch	CASING DIA:	NA
TOTAL DEPTH:	8 Feet	CASING DEPTH:	NA

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	PID RESULTS
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	Surface – Asphalt	
0 –4’	Brown, sandy-silty-clay (ML), firm, slightly moist, slight petroleum odor	0-2’PID= 1.0 PPM
4 – 6’	Brown, sandy-silty-clay (ML-CL), slightly moist, slight petroleum odor	2-4’PID= 9.5 PPM
		4-6’PID= 2.1 PPM
6 – 8’	Brown to tan, sandy-silty-clay (ML-CL), very firm to hard, slightly moist,	6-8’PID= 1.4 PPM
	Slightly petroleum odor	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

SCREEN LENGTH (ft) ____ DEPTH (ft) - ____ DIAMETER (in) ____ MATERIAL ____.

DEPTH TO TOP OF SAND ____ BAGS OF SAND ____.

DEPTH TO TOP SEAL ____ BENTONITE USED ____ BAGS OF CEMENT USED ____.

APPENDIX D



Hydrocarbon Analysis Results

Client: PYRAMID ENVIRONMENTAL
Address: 503 INDUSTRIAL AVENUE
 GREENSBORO NC

Samples taken
Samples extracted
Samples analysed

Wednesday, September 27, 2023
 Wednesday, September 27, 2023
 Friday, September 29, 2023

Contact: TIM LEATHERMAN

Operator

MAX MOYER

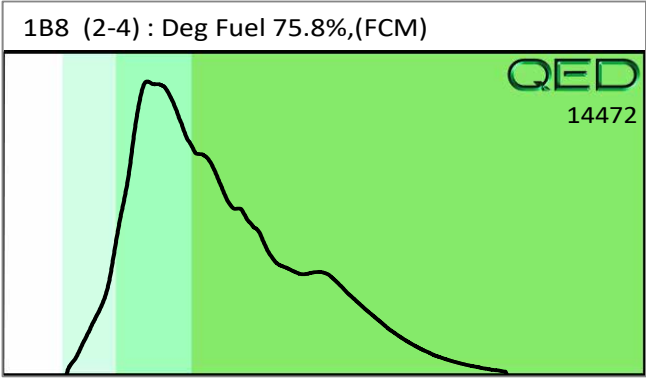
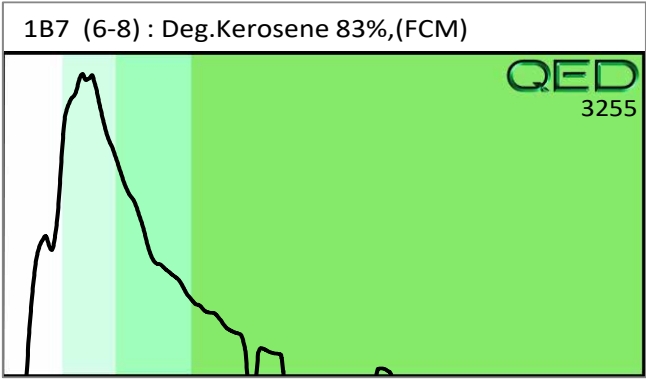
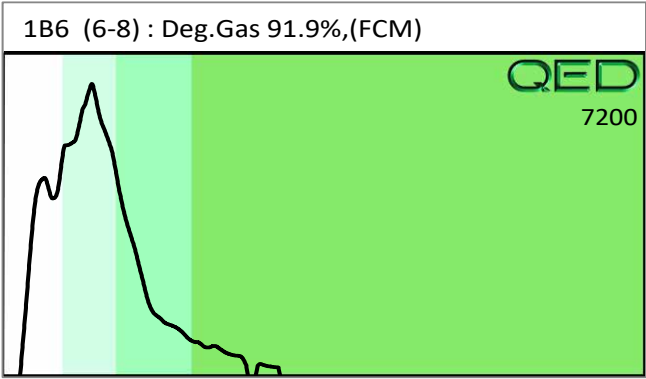
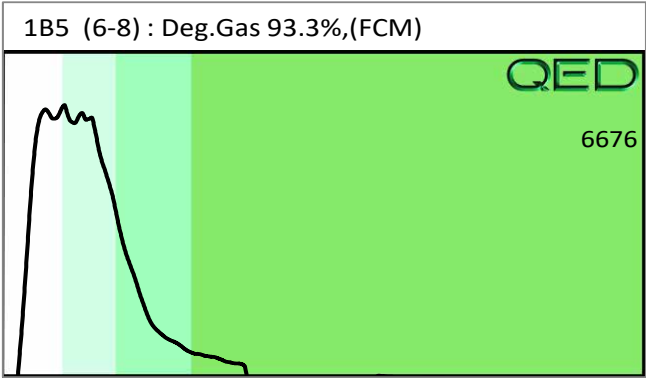
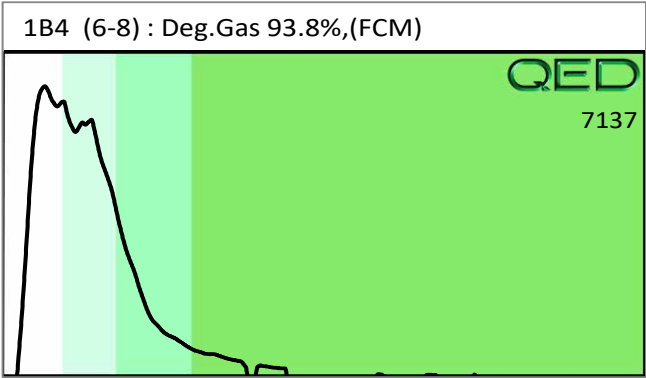
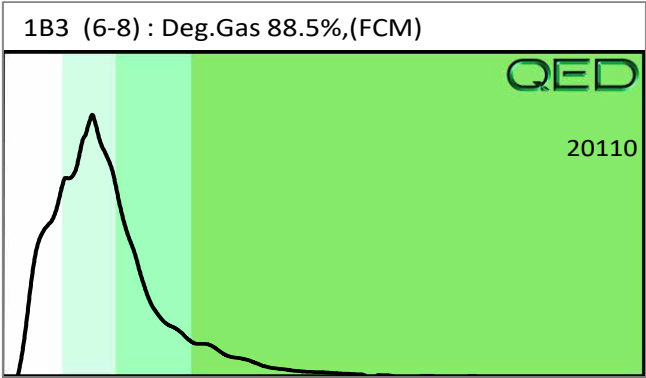
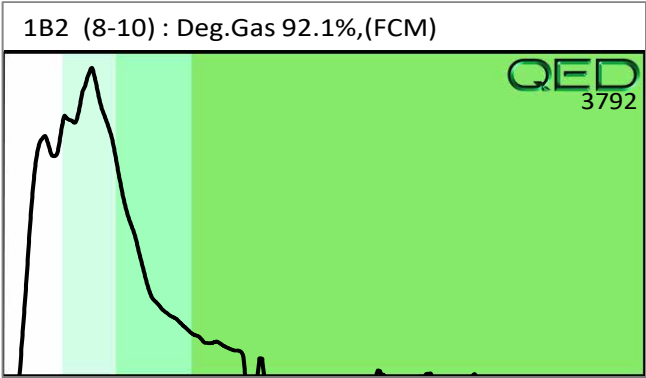
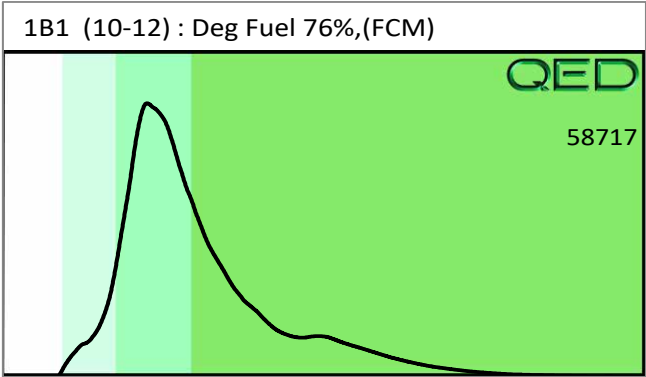
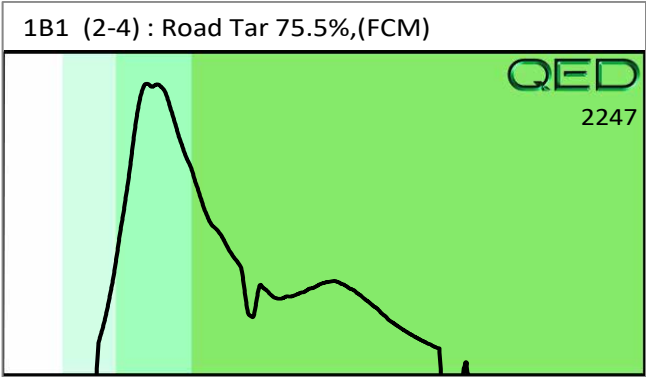
Project: NCDOT I-5880 ; 2023-247

													T03308
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	1B1 (2-4)	18.6	<0.46	<0.46	0.72	0.72	0.36	<0.15	<0.019	0	83.2	16.8	Road Tar 75.5%,(FCM)
s	1B1 (10-12)	18.8	<0.47	<0.47	25.3	25.3	22	1.2	<0.019	0	94.3	5.7	Deg Fuel 76%,(FCM)
s	1B2 (8-10)	238.0	<6	386.8	<6	386.8	42.6	<1.9	<0.24	99.7	0.3	0	Deg.Gas 92.1%,(FCM)
s	1B3 (6-8)	16.5	<0.41	117.5	<0.41	117.5	16.5	0.65	<0.016	99.6	0.3	0.1	Deg.Gas 88.5%,(FCM)
s	1B4 (6-8)	249.0	60.9	1056	<6.2	1056	67.8	2.7	<0.25	99.8	0.1	0	Deg.Gas 93.8%,(FCM)
s	1B5 (6-8)	711.0	<17.8	2730	<17.8	2730	193.7	7.6	<0.71	99.8	0.2	0	Deg.Gas 93.3%,(FCM)
s	1B6 (6-8)	140.0	<3.5	302.8	<3.5	302.8	55	2.2	<0.14	99.7	0.3	0	Deg.Gas 91.9%,(FCM)
s	1B7 (6-8)	47.0	<1.2	31.8	148.5	180.3	7.2	<0.38	<0.047	98.9	1	0.1	Deg.Kerosene 83%,(FCM)
s	1B8 (2-4)	18.3	<0.46	<0.46	7.5	7.5	4.7	0.25	<0.018	0	83.4	16.6	Deg Fuel 75.8%,(FCM)
Initial Calibrator QC check			OK		Final FCM QC Check					OK		98.8 %	

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



APPENDIX E
