



November 5, 2018

Mr. Cyrus Parker, L.G., P.E.  
Geotechnical Engineering Unit  
State of N.C. Department of Transportation – Division of Highways  
P.O. Box 25201  
Raleigh, NC 27611-5201

**RE: PRELIMINARY SITE ASSESSMENT OF PARCEL 050 – Revision 1  
ESP Project No. CS34.366**

**WBS:** 34839.1.8  
**TIP:** U-2579AB  
**County:** Forsyth  
**Description:** Winston-Salem - Northern Beltway Eastern Section (Future I-74) From I-40 to I-40  
Business/US 421  
**Parcel No.:** 050  
**Owner:** Amy P. Stinnitt  
**Address:** 4308 Kernersville Road, Winston-Salem, NC

Dear Mr. Parker:

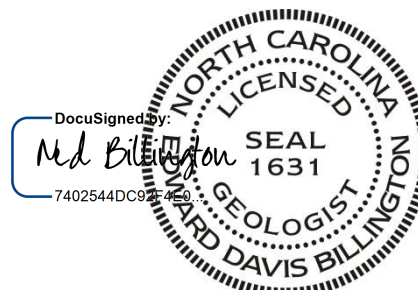
ESP Associates, Inc. (ESP) is pleased to submit this report on our Preliminary Site Assessment of the subject parcel. This work was performed in accordance with your Request for Proposal dated April 17, 2018 and our Cost Proposal dated May 3, 2018.

We appreciate the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, Inc.

Edward D. Billington, PG  
Senior Geologist/Geophysicist  
DMN/EDB/CJW



not considered Final unless all signatures are completed

## TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	HISTORY .....	1
3.0	SITE OBSERVATIONS.....	1
4.0	METHODS .....	1
4.1	Geophysics .....	1
4.2	Borings .....	1
4.3	Soil Sample Protocol.....	2
4.4	Groundwater.....	2
5.0	RESULTS .....	2
5.1	Geophysics .....	2
5.2	Sample Data .....	3
5.3	Sample Observations.....	3
6.0	CONCLUSIONS.....	3
6.1	Interpretation of Results.....	3
6.2	Geophysics .....	3
6.3	Soil .....	4
7.0	RECOMMENDATIONS.....	4
8.0	LIMITATIONS.....	4

## TABLES

Table 1	Soil Sample PID Readings
Table 2	Soil Sample UVF Results Summary

## FIGURES

Figure 1	Parcel 050, Site Vicinity Map
Figure 2	Parcel 050, Site Photographs
Figure 3	Parcel 050, EM61 Early Time Gate Response
Figure 4	Parcel 050, EM61 Differential Response
Figure 5	Parcel 050, GPR Images of Probable UST
Figure 6	Parcel 050, EM61 Early Time Gate Response on Plan Sheet
Figure 7	Parcel 050, EM61 Differential Response on Plan Sheet
Figure 8	Parcel 050, Soil Analytical Results on Plan Sheet
Figure 9	Legend for Plan Sheet Figures

## **TABLE OF CONTENTS (continued)**

### **APPENDICES**

Appendix A	Soil Boring Logs
Appendix B	RED Lab Laboratory Testing Report
Appendix C	Chain-of-Custody Form

## **1.0 INTRODUCTION**

The North Carolina Department of Transportation (NCDOT) is planning to construct the Winston-Salem - Northern Beltway Eastern Section (Future I-74) From I-40 to I-40 Business/US 421 (Figure 1). The NCDOT requested that ESP Associates, Inc. (ESP) perform a Preliminary Site Assessment (PSA) of Parcel 050 within the proposed Right of Way (ROW) and/or easement to locate possible underground storage tanks (USTs), sample soil, and delineate potential contaminated soil.

## **2.0 HISTORY**

This parcel is owned by Amy P. Stinnitt and is currently occupied by a vacant produce store. According to the North Carolina Department of Environmental Quality's (NCDEQ's) UST Section Registry, two USTs were removed from the parcel in 1974 and one in 1985. The site's UST release incidents were reportedly closed out in 2006.

## **3.0 SITE OBSERVATIONS**

During our May 2018 field work, the site was occupied by a vacant produce store (Figure 2). The ground in the study area was covered by asphalt, concrete, and grass.

## **4.0 METHODS**

ESP performed a geophysical study of the area designated by the NCDOT on May 22, 2018. We performed direct-push drilling and sampling of subsurface soils within the proposed easement on September 4 and 5, 2018. A photoionization detector (PID) was used to screen subsurface soils in the field and select soil samples to send for laboratory analysis.

### **4.1 Geophysics**

ESP performed a metal detector study over the accessible areas of the site using a Geonics EM61 MK2 with a line spacing of about three feet (Figures 3 and 4). Location control was provided in real-time using a differential global positioning system (DGPS). We collected ground-penetrating radar (GPR) data over selected EM61 anomalies using our Sensors and Software Noggin 250 GPR system. The GPR data were collected using a line spacing of one to two feet (Figure 5).

### **4.2 Borings**

ESP performed direct-push drilling activities within the easement of Parcel 050 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Five borings were drilled, designated B50-1 through B50-5 (Figure 3). The soil borings were advanced using a GeoProbe 7822DT drill rig. Continuous soil samples were obtained to a depth of approximately ten feet using five-foot

long Macro Cores®. Soil cores varied in recovery from three to five feet. The sampling equipment was decontaminated prior to drilling and between borings by the driller using a Liquinox® detergent solution.

### **4.3 Soil Sample Protocol**

Representative soil samples were taken from the Macro Core tubes at approximate one-foot intervals by the ESP field geologist while wearing nitrile disposable gloves. Each sample was placed in a sealed plastic bag and then kept in a sunny area for at least 5 minutes prior to measuring volatile organic compound (VOC) levels in the head space with the PID. The soil samples had PID readings of less than 10 parts per million (ppm) (Table 1).

Soil samples selected for laboratory analysis were Sample S-9 (corresponding depth of 9.0-9.5 feet) from each of Borings B50-1, B50-2, B50-3, Sample S-10 (9.0-10.0 feet) from Boring B50-4, and Sample S-8 (7.0-8.0 feet) from Boring B50-5. For each selected sample, an approximate 10-gram soil sample was collected from the Macro-Core tube using a Terra Core Sampler and placed into a laboratory-supplied 40-milliliter volatile organic analysis (VOA) vial containing methanol. Once sealed, the vial was labeled with the sample identification number and then shaken vigorously for about one minute. The samples were packed on ice and sent via overnight delivery to RED Lab, LLC (RED Lab), located in Wilmington, North Carolina, following proper chain-of-custody procedures (Appendix C).

RED Lab used a QED Hydrocarbon Analyzer to quantitatively analyze the soil samples using the ultraviolet fluorescence (UVF) method for benzene, toluene, ethylbenzene, and xylene (BTEX); gasoline range organics (GRO); diesel range organics (DRO); total petroleum hydrocarbons (TPH); total aromatics; polycyclic aromatic hydrocarbons (PAHs); and benzo(a)pyrene (BaP).

### **4.4 Groundwater**

Groundwater was not encountered in the five borings drilled on the site.

## **5.0 RESULTS**

### **5.1 Geophysics**

The EM61 early time gate data show the response from both shallow and deeper metallic objects (Figure 3). The differential response reduces the effect of shallow anomalies and emphasizes anomalies from larger and more deeply buried metallic objects, such as USTs (Figure 4). The EM61 differential results indicated one anomaly (response above background) that did not correspond to known site features.

GPR data were collected over the EM61 anomalies. The GPR data collected indicated the presence of one probable UST within the study area under the concrete slab southwest of the existing building (Figure 5). The probable UST is approximately 5 feet diameter by 10 feet long and buried about 2.5 feet below the ground surface. We marked a square outline around the probable UST using pink marking paint (Figure 2.c).

The EM61 early time gate response and differential response are shown on the plan sheet on Figures 6 and 7, respectively.

## **5.2 Sample Data**

The soil sample UVF hydrocarbon analysis results for BTEX, GRO, DRO, and PAHs are presented in Table 2. The RED Lab laboratory report, which includes results for TPH, total aromatics, and BaP, is provided in Appendix B. Values are provided in milligrams per kilogram (mg/kg or ppm).

## **5.3 Sample Observations**

The results of the laboratory testing indicated that BTEX and PAHs were below the detection limits for all samples. GRO was detected in 2 of the 5 soil samples tested but below the NCDEQ action level of 50 ppm. DRO was detected in 1 of the 5 soil samples tested but below the NCDEQ action level of 100 ppm. The highest GRO reading was 0.7 ppm in Sample S-9 (9.0-9.5 feet) from Boring B50-3. The highest DRO reading was 0.48 ppm in Sample S-9 (9.0-9.5 feet) from Boring B50-3.

## **6.0 CONCLUSIONS**

### **6.1 Interpretation of Results**

The results of the PSA for Parcel 050 of NCDOT Project U-2579AB indicate the presence of one abandoned UST. No petroleum hydrocarbon soil contamination at or above NCDEQ action levels was detected within the proposed construction easement on Parcel 050.

### **6.2 Geophysics**

The geophysical data indicate the location of one probable UST within the parcel. The probable UST is located under the concrete slab southwest of the existing building and is approximately 1,500 gallons in size and buried about 2.5 feet below the ground surface.

### **6.3 Soil**

The results of the PID field screening readings and off-site UVF hydrocarbon analyses do not indicate the presence of contaminated soil at or above the NCDEQ action levels within the proposed construction easement on Parcel 050 (Figure 8).

### **7.0 RECOMMENDATIONS**

ESP recommends that prior to acquisition, the probable UST be closed by removal and that a UST Closure Report be submitted to NCDEQ. Other than the UST closure, no limitations on construction activities or special handling of excavated soil are recommended for Parcel 050.

### **8.0 LIMITATIONS**

ESP's professional services have been performed, findings obtained, and recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. ESP is not responsible for the independent conclusions, opinions, or recommendations made by others based on the data presented in this report.

The passage of time may result in a change in the environmental characteristics at this site and surrounding properties. ESP does not warrant against future operations or conditions, or against operations or conditions present of a type or at a location not investigated. ESP does not assume responsibility for other environmental issues that may be associated with the subject site.

## **TABLES**



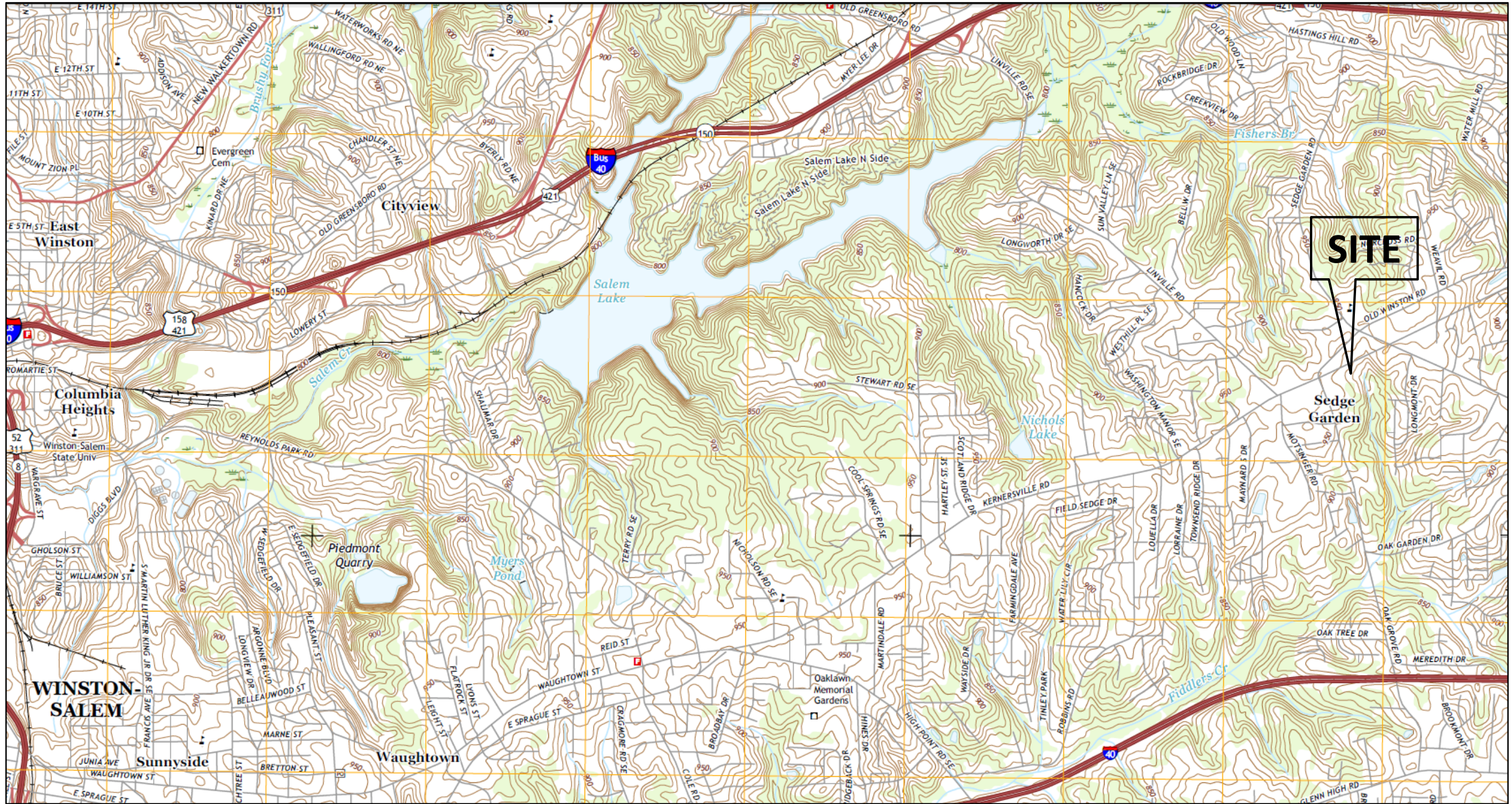
**TABLE 1**  
**SOIL SAMPLE PID READINGS**

<b>Boring</b>	<b>Sample Depth Range with PID &gt; 10 ppm (feet bgs)</b>	<b>Maximum PID Reading (ppm) and Sample Depth (feet bgs)</b>
B50-1	none	1.7 (6.0-6.5)
B50-2	none	1.9 (1.0-1.5)
B50-3	none	1.5 (7.0-7.5)
B50-4	none	0.4 (4.0-5.0)
B50-5	none	0.8 (0.0-1.0)

**TABLE 2**  
**SOIL SAMPLE UVF RESULTS SUMMARY**

<b>Boring</b>	<b>Sample ID (depth in feet bgs)</b>	<b>Date Collected</b>	<b>BTEX (C6-C9) (mg/kg)</b>	<b>GRO (C5-C10) (mg/kg)</b>	<b>DRO (C10-C35) (mg/kg)</b>	<b>PAHs (mg/kg)</b>
B50-1	S-9 (9.0-9.5)	9/10/18	<0.58	<0.58	<0.58	<0.19
B50-2	S-9 (9.0-9.5)	9/10/18	<0.54	<0.54	<0.54	<0.17
B50-3	S-9 (9.0-9.5)	9/10/18	<0.34	0.7	0.48	<0.11
B50-4	S-10 (9.0-10.0)	9/10/18	<0.32	0.58	<0.32	<0.1
B50-5	S-8 (7.0-8.0)	9/10/18	<0.32	<0.32	<0.32	<0.1

## FIGURES



From: USGS US Topo 7.5 - minute map for WINSTON-SALEM EAST, NC Date: 2016, Scale: 1:24,000

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SCALE	AS SHOWN
DATE	11/6/18
BY	DMN

**FIGURE 1 – PARCEL 050, AMY P. STINNITT  
SITE VICINITY MAP**

**U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
FORSYTH COUNTY, NORTH CAROLINA**



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a. Photo from west side of site looking east.




b. Photo from north side of site looking south.

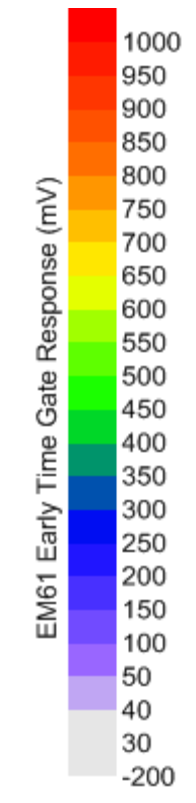
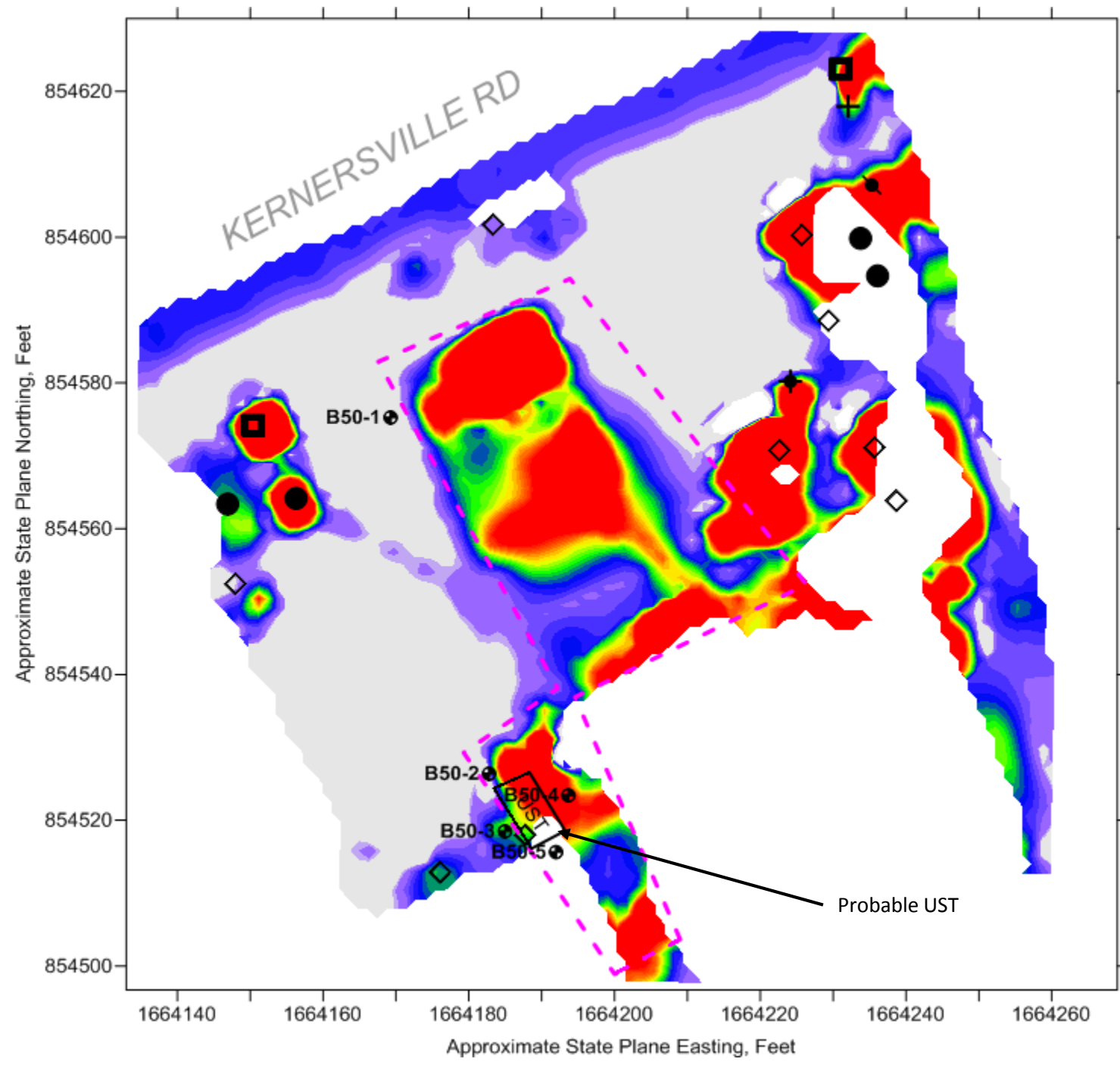


c. Photo of marked probable UST.



d. Photo of marked product line.

PROJECT NO. CS34.366	<b>FIGURE 2 – PARCEL 050, AMY P. STINNITT SITE PHOTOGRAPHS</b>	<b>U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421 FORSYTH COUNTY, NORTH CAROLINA</b>	 7011 Albert Pick Rd., Suite E Greensboro, NC 27409  336.334.7724  www.espassociates.com
SCALE AS SHOWN			
DATE 11/6/18			
BY DMN			



EXPLANATION	
◇	Miscellaneous metal object (pipe, debris, etc.)
■	Utility Box (water meter, electrical outlet, etc.)
⊠	Drop Inlet or Catch Basin
⚡	Power pole
+	Guy wire anchor
●	Sign pole, other pole
○	Existing UST fill port
■	EM61 Data Collection Areas
⋮	GPR Data Collection Areas
UST	Approximate location of probable UST
⊕	Approximate soil boring location

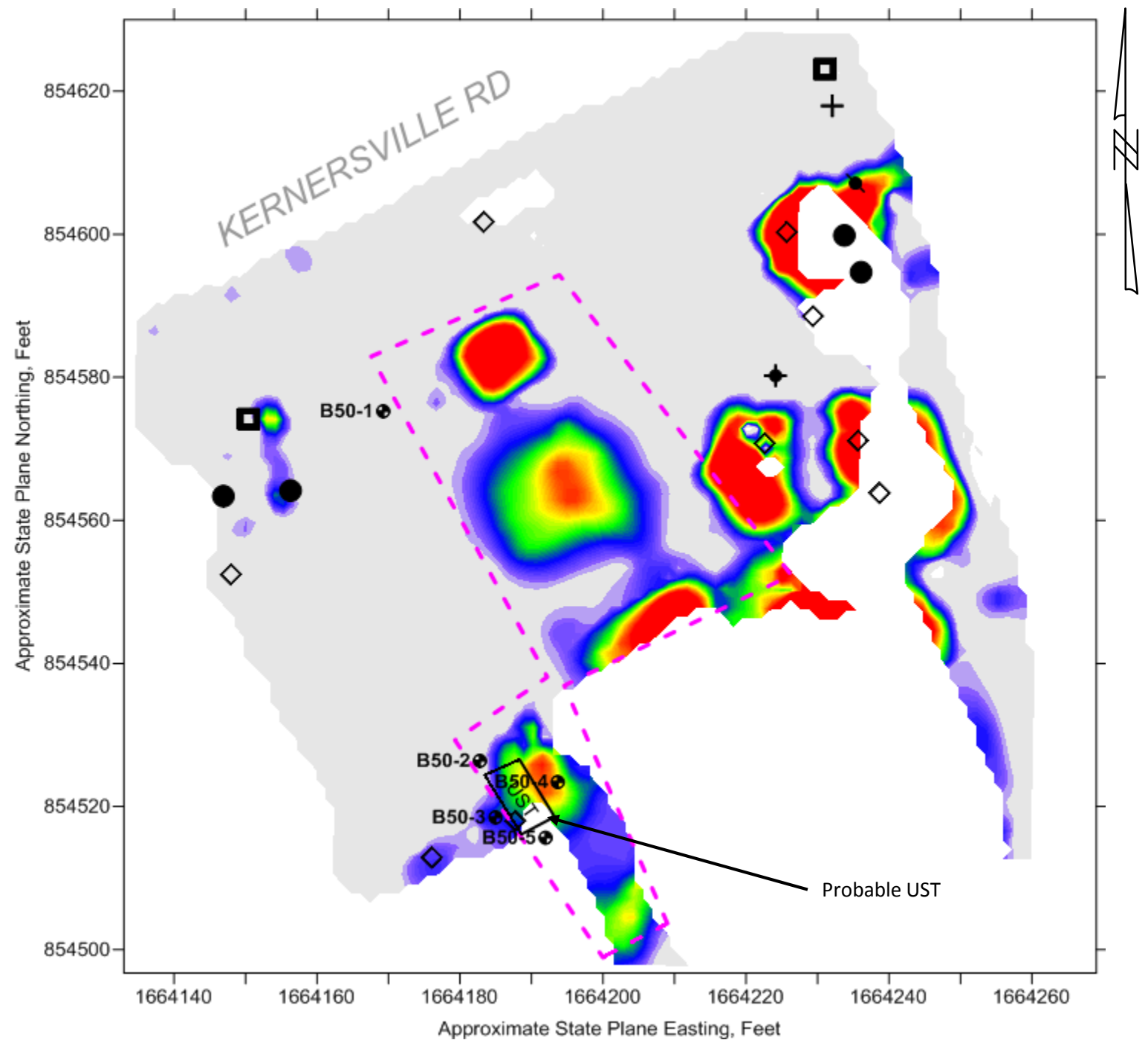
Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP makes no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

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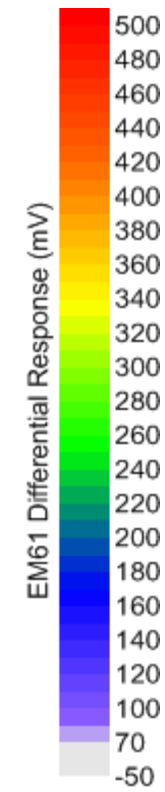
**FIGURE 3 – PARCEL 050, AMY P. STINNITT**  
**EM61 EARLY TIME GATE RESPONSE**  
 U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
 (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
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APPROXIMATE NORTH



EXPLANATION	
◇	Miscellaneous metal object (pipe, debris, etc.)
■	Utility Box (water meter, electrical outlet, etc.)
⊠	Drop Inlet or Catch Basin
⦿	Power pole
+	Guy wire anchor
●	Sign pole, other pole
○	Existing UST fill port
■	EM61 Data Collection Areas
⋈	GPR Data Collection Areas
⊠	Approximate location of probable UST
⦿	Approximate soil boring location

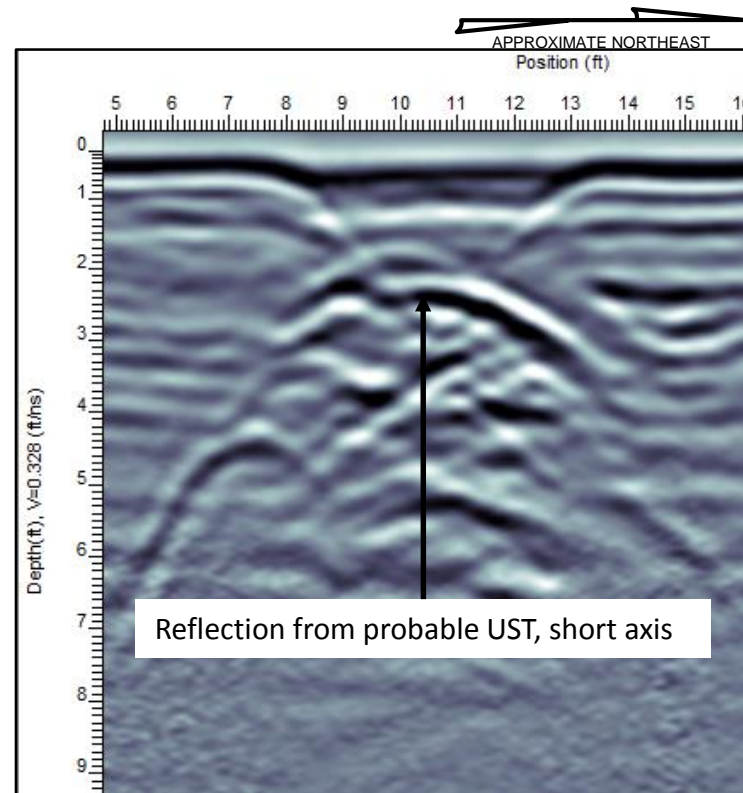
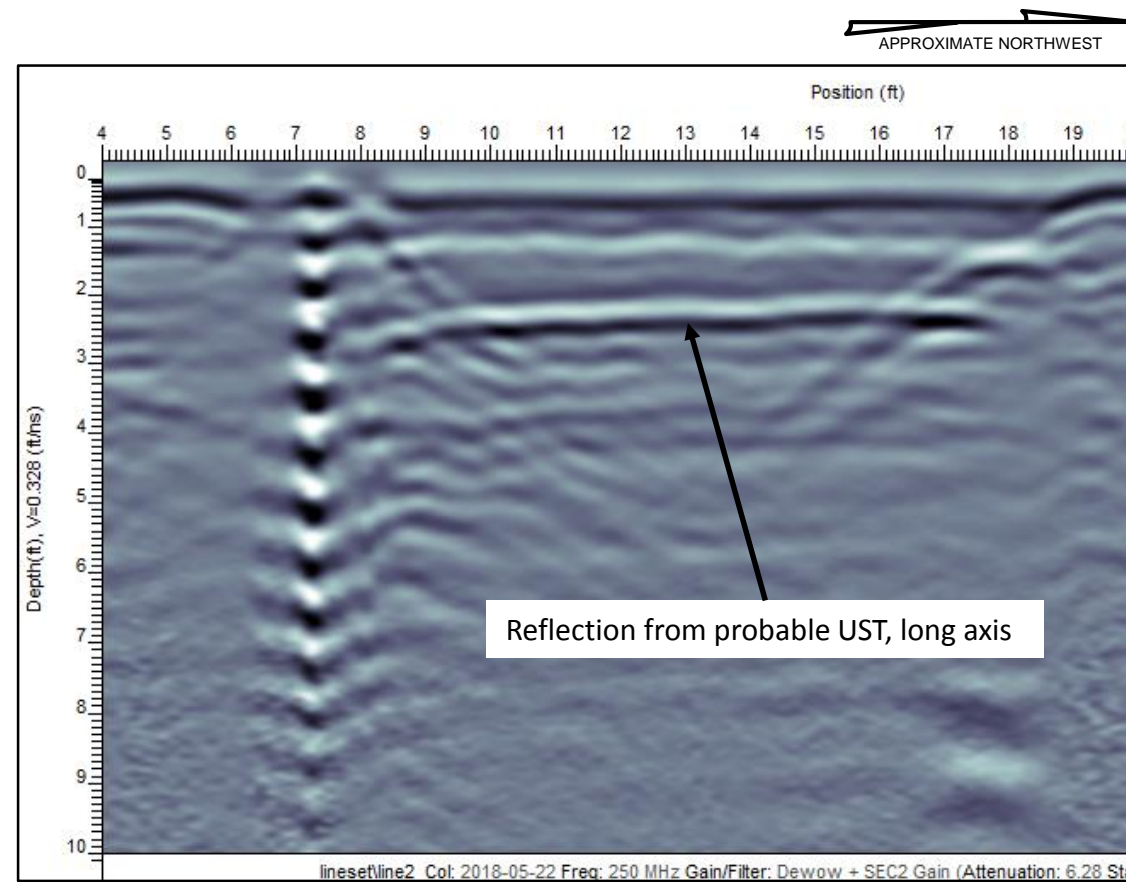
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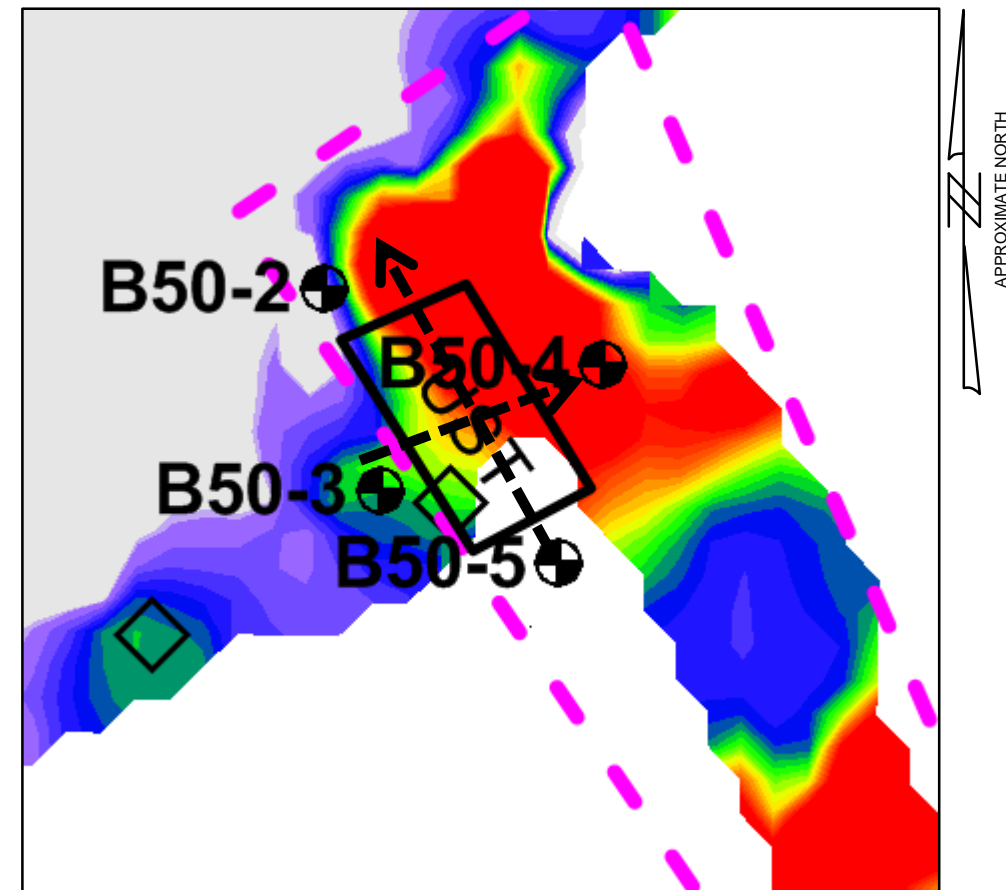
**FIGURE 4- PARCEL 050 , AMY P. STINNITT**  
**EM61 DIFFERENTIAL RESPONSE**  
 U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
 (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
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A. GPR images from SE to NW and SW to NE across probable UST.



B. Portion of Figure 3 showing approximate locations of GPR cross-sections (dashed black lines with arrows).

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**FIGURE 5 – PARCEL 050, AMY P. STINNITT  
GPR IMAGES OF PROBABLE UST**

U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
FORSYTH COUNTY, NORTH CAROLINA

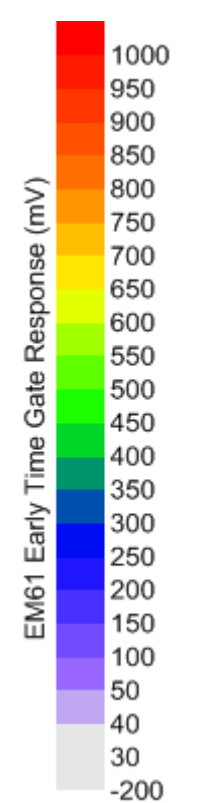
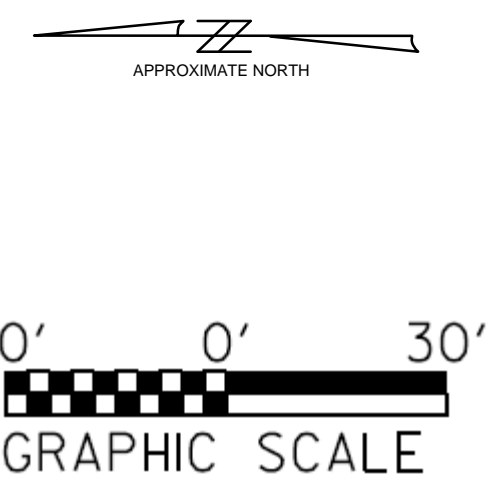
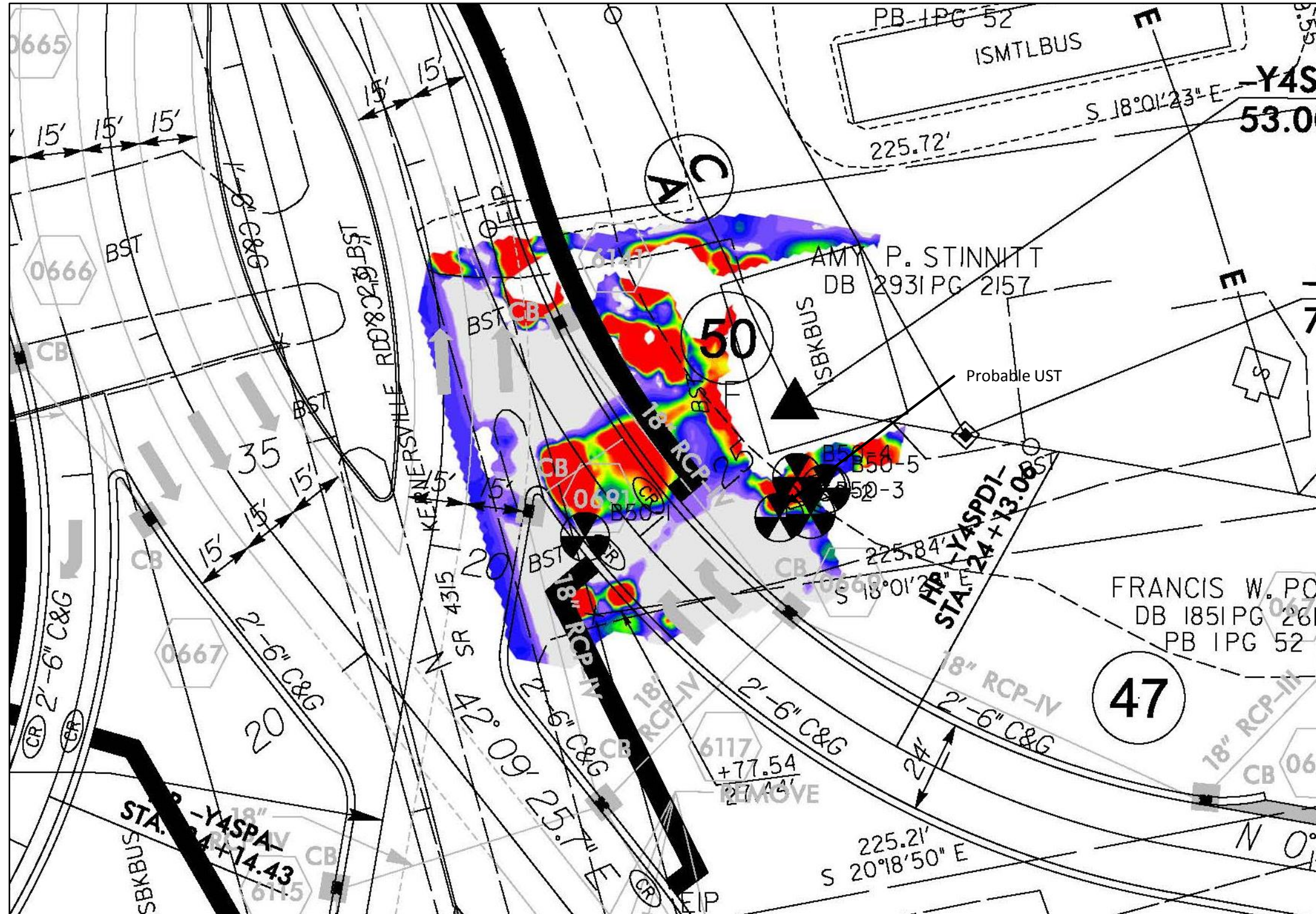


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List of NCDOT reference files

- u2579ab\_rdy\_dsn.dgn
- SS, u2579ab\_rdy\_ss.dgn
- ROW, u2579ab\_rdy\_row.dgn
- FinalSurvey\U2579AB\_ncdot\_fs.dgn
- U2579AB\_hyd\_dm.dgn

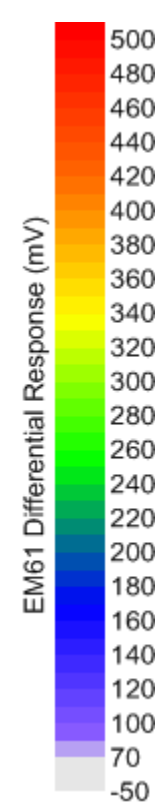
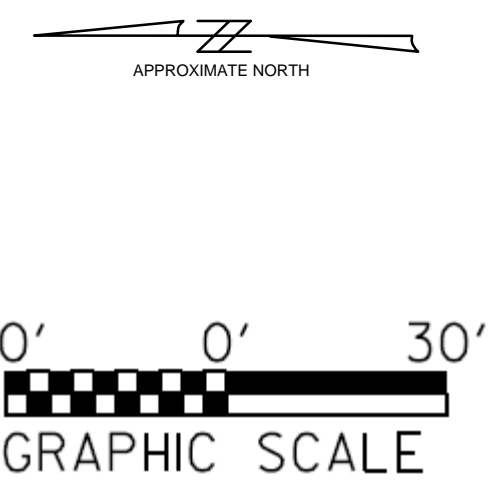
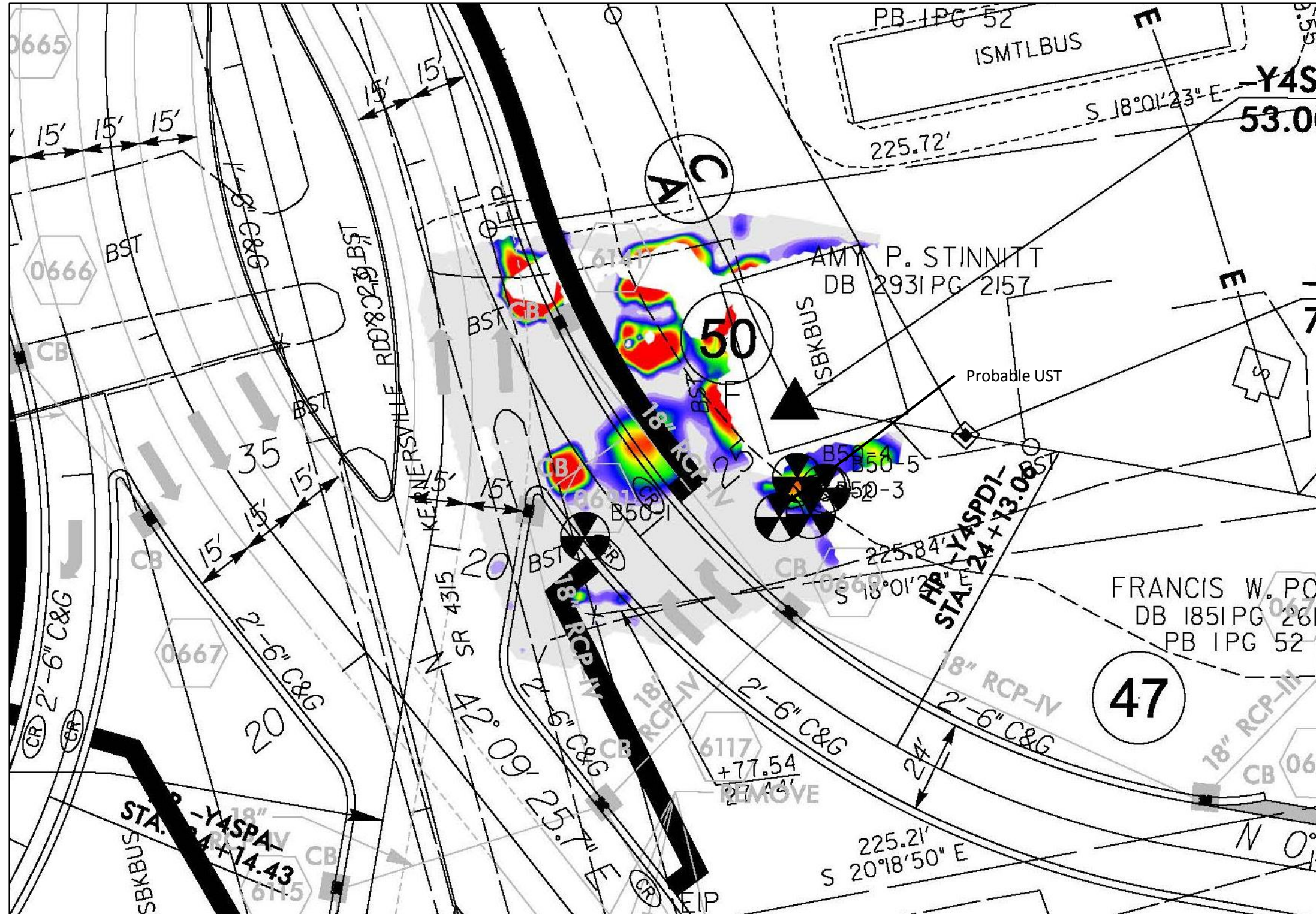
See Figure 9 for explanation of symbols and line types

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**FIGURE 6 – PARCEL 050, AMY P. STINNITT**  
**EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET**  
 U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
 (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
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  - ROW, u2579ab\_rdy\_row.dgn
  - FinalSurvey\U2579AB\_ncdot\_fs.dgn
  - U2579AB\_hyd\_dm.dgn

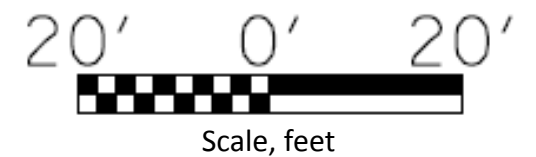
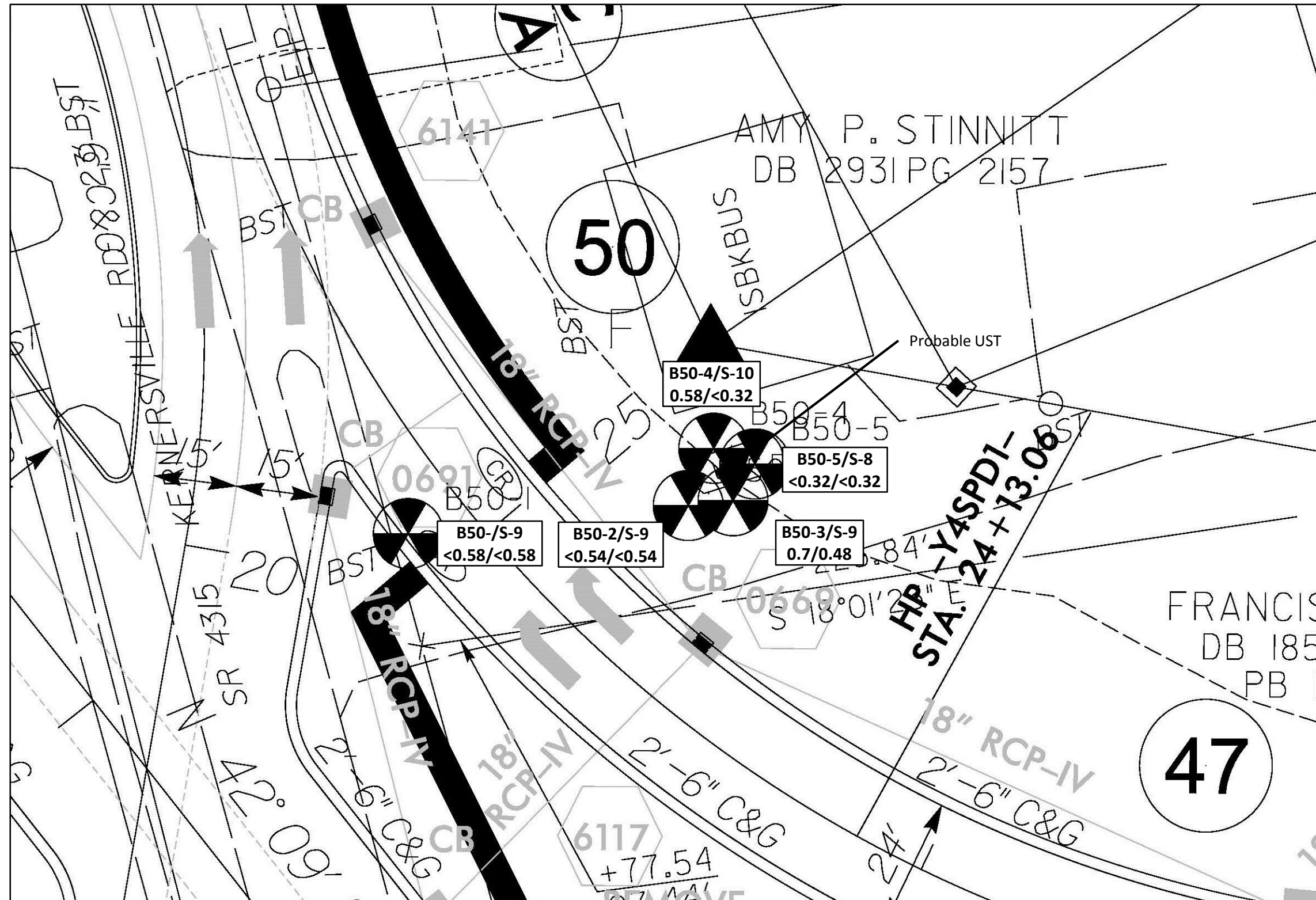
See Figure 9 for explanation of symbols and line types

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**FIGURE 7- PARCEL 050, AMY P. STINNITT**  
**EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET**

U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
 (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
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Explanation	
<div style="border: 1px solid black; padding: 2px; display: inline-block;">           B50-1/S-9            &lt;0.58/&lt;0.58         </div>	<b>Maximum Analytical Results per Boring</b> Boring No./Sample No. GRO/DRO (mg/kg, ppm)

List of NCDOT reference files

- u2579ab\_rdy\_dsn.dgn
- SS, u2579ab\_rdy\_ss.dgn
- ROW, u2579ab\_rdy\_row.dgn
- FinalSurvey\U2579AB\_ncdot\_fs.dgn
- U2579AB\_hyd\_dm.dgn

See Figure 9 for explanation of symbols and line types

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**FIGURE 8 – PARCEL 050, AMY P. STINNITT  
SOIL ANALYTICAL RESULTS ON PLAN SHEET**

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(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
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# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale      \*S.U.E. = Subsurface Utility Engineering*

### BOUNDARIES AND PROPERTY:

State Line	—————
County Line	—————
Township Line	—————
City Line	—————
Reservation Line	—————
Property Line	—————
Existing Iron Pin	○
Property Corner	⊠
Property Monument	⊠
Parcel/Sequence Number	⊕
Existing Fence Line	—x—x—x—
Proposed Woven Wire Fence	—•—•—•—
Proposed Chain Link Fence	—□—□—□—
Proposed Barbed Wire Fence	—◇—◇—◇—
Existing Wetland Boundary	—w—w—w—
Proposed Wetland Boundary	—w—w—w—
Existing Endangered Animal Boundary	—a—
Existing Endangered Plant Boundary	—p—
Existing Historic Property Boundary	—h—
Known Contamination Area: Soil	—s—
Potential Contamination Area: Soil	—s—
Known Contamination Area: Water	—w—
Potential Contamination Area: Water	—w—
Contaminated Site: Known or Potential	—s—

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊕
Well	⊕
Small Mine	⊕
Foundation	⊠
Area Outline	⊠
Cemetery	⊠
Building	⊠
School	⊠
Church	⊠
Dam	⊠

### HYDROLOGY:

Stream or Body of Water	—————
Hydro, Pool or Reservoir	—————
Jurisdictional Stream	—JS—
Buffer Zone 1	—BZ 1—
Buffer Zone 2	—BZ 2—
Flow Arrow	—————
Disappearing Stream	—————
Spring	⊕
Wetland	—w—
Proposed Lateral, Tail, Head Ditch	—————
False Sump	⊕

### RAILROADS:

Standard Gauge	—————
RR Signal Milepost	⊕
Switch	⊕
RR Abandoned	—————
RR Dismantled	—————

### RIGHT OF WAY:

Baseline Control Point	⊕
Existing Right of Way Marker	⊕
Existing Right of Way Line	—————
Proposed Right of Way Line	—————
Proposed Right of Way Line with Iron Pin and Cap Marker	⊕
Proposed Right of Way Line with Concrete or Granite RW Marker	⊕
Proposed Control of Access Line with Concrete CA Marker	⊕
Existing Control of Access	⊕
Proposed Control of Access	⊕
Existing Easement Line	—E—
Proposed Temporary Construction Easement	—E—
Proposed Temporary Drainage Easement	—TDE—
Proposed Permanent Drainage Easement	—PDE—
Proposed Permanent Drainage / Utility Easement	—DUE—
Proposed Permanent Utility Easement	—PUE—
Proposed Temporary Utility Easement	—TUE—
Proposed Aerial Utility Easement	—AUE—
Proposed Permanent Easement with Iron Pin and Cap Marker	⊕

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	—————
Existing Curb	—————
Proposed Slope Stakes Cut	—————
Proposed Slope Stakes Fill	—————
Proposed Curb Ramp	⊕
Existing Metal Guardrail	—————
Proposed Guardrail	—————
Existing Cable Guiderail	—————
Proposed Cable Guiderail	—————
Equality Symbol	⊕
Pavement Removal	—————

### VEGETATION:

Single Tree	⊕
Single Shrub	⊕
Hedge	—————
Woods Line	—————

Orchard	⊕
Vineyard	⊕

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	—————
Bridge Wing Wall, Head Wall and End Wall	—————
MINOR:	
Head and End Wall	—————
Pipe Culvert	—————
Footbridge	—————
Drainage Box: Catch Basin, DI or JB	⊕
Paved Ditch Gutter	—————
Storm Sewer Manhole	⊕
Storm Sewer	—————

### UTILITIES:

POWER:	
Existing Power Pole	⊕
Proposed Power Pole	⊕
Existing Joint Use Pole	⊕
Proposed Joint Use Pole	⊕
Power Manhole	⊕
Power Line Tower	⊕
Power Transformer	⊕
U/G Power Cable Hand Hole	⊕
H-Frame Pole	⊕
U/G Power Line LOS B (S.U.E.*)	—————
U/G Power Line LOS C (S.U.E.*)	—————
U/G Power Line LOS D (S.U.E.*)	—————

### TELEPHONE:

Existing Telephone Pole	⊕
Proposed Telephone Pole	⊕
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	⊕
U/G Telephone Cable LOS B (S.U.E.*)	—————
U/G Telephone Cable LOS C (S.U.E.*)	—————
U/G Telephone Cable LOS D (S.U.E.*)	—————
U/G Telephone Conduit LOS B (S.U.E.*)	—————
U/G Telephone Conduit LOS C (S.U.E.*)	—————
U/G Telephone Conduit LOS D (S.U.E.*)	—————
U/G Fiber Optics Cable LOS B (S.U.E.*)	—————
U/G Fiber Optics Cable LOS C (S.U.E.*)	—————
U/G Fiber Optics Cable LOS D (S.U.E.*)	—————

### WATER:

Water Manhole	⊕
Water Meter	⊕
Water Valve	⊕
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	—————
U/G Water Line LOS C (S.U.E.*)	—————
U/G Water Line LOS D (S.U.E.*)	—————
Above Ground Water Line	—————

### TV:

TV Pedestal	⊕
TV Tower	⊕
U/G TV Cable Hand Hole	⊕
U/G TV Cable LOS B (S.U.E.*)	—————
U/G TV Cable LOS C (S.U.E.*)	—————
U/G TV Cable LOS D (S.U.E.*)	—————
U/G Fiber Optic Cable LOS B (S.U.E.*)	—————
U/G Fiber Optic Cable LOS C (S.U.E.*)	—————
U/G Fiber Optic Cable LOS D (S.U.E.*)	—————

### GAS:

Gas Valve	⊕
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	—————
U/G Gas Line LOS C (S.U.E.*)	—————
U/G Gas Line LOS D (S.U.E.*)	—————
Above Ground Gas Line	—————

### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	—————
Above Ground Sanitary Sewer	—————
SS Forced Main Line LOS B (S.U.E.*)	—————
SS Forced Main Line LOS C (S.U.E.*)	—————
SS Forced Main Line LOS D (S.U.E.*)	—————

### MISCELLANEOUS:

Utility Pole	⊕
Utility Pole with Base	⊕
Utility Located Object	⊕
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	—————
U/G Tank; Water, Gas, Oil	⊕
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	⊕
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

PROJECT NO.	CS34.366
SCALE	N/A
DATE	11/6/18
BY	DMN

**FIGURE 9  
LEGEND FOR PLAN SHEET FIGURES**

**U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421  
FORSYTH COUNTY, NORTH CAROLINA**



7011 Albert Pick Rd.,  
Suite E  
Greensboro, NC 27409  
336.334.7724  
www.espassociates.com

**APPENDIX A**  
**SOIL BORING LOGS**



# FIELD BORING LOG

**BORING NO.**

B50-1

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: Near Kernersville Rd.  
 TYPE OF BORING: Direct Push DATE STARTED: 9/4/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/4/18 TOTAL DEPTH: 10.0 ft  
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft  
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: \_\_\_\_\_

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt 0.5-5.7 Red-brown sandy silt	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	1.6		
2	S-2	2.0-2.5	1.7		
3	S-3	3.0-3.5	1.2		
4	S-4	4.0-4.5	1.3		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	1.3	5.7-10.0 Orange-brown silty sand	
6	S-6	6.0-6.5	1.7		
7	S-7	7.0-7.5	0.8		
8	S-8	8.0-8.5	1.0		
9	S-9	9.0-9.5	0.9		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



# FIELD BORING LOG

**BORING NO.**

B50-2

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: NW side of UST  
 TYPE OF BORING: Direct Push DATE STARTED: 9/4/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/4/18 TOTAL DEPTH: 10.0 ft  
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft  
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: \_\_\_\_\_

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt 0.5-2.2 Gray-brown sandy silt	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	1.9		
2	S-2	2.0-2.5	1.1	2.2-10.0 Red-brown sandy, silty clay	
3	S-3	3.0-3.5	1.1		
4	S-4	4.0-4.5	1.2		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	1.7		
6	S-6	6.0-6.5	1.0		
7	S-7	7.0-7.5	0.9		
8	S-8	8.0-8.5	1.1		
9	S-9	9.0-9.5	1.0		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



# FIELD BORING LOG

**BORING NO.**

B50-3

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: SW side of UST  
 TYPE OF BORING: Direct Push DATE STARTED: 9/4/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/4/18 TOTAL DEPTH: 10.0 ft  
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft  
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: \_\_\_\_\_

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt 0.5-2.0 Gray-brown sandy silt	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	1.3		
2	S-2	2.0-2.5	1.1	2.0-10.0 Red-brown silty clay	
3	S-3	3.0-3.5	1.2		
4	S-4	4.0-4.5	1.2		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	1.1		
6	S-6	6.0-6.5	1.2		
7	S-7	7.0-7.5	1.5		
8	S-8	8.0-8.5	0.9		
9	S-9	9.0-9.5	1.0		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis





# FIELD BORING LOG

**BORING NO.**

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: E side of UST  
 TYPE OF BORING: Direct Push DATE STARTED: 9/5/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/5/18 TOTAL DEPTH: 10.0 ft  
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft  
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: N. Billington COMMENT: \_\_\_\_\_

B50-4

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt 0.5-3.2 Dark brown clayey sand	Core 1 Rec 5.0'/5.0'
1	S-1	0.0-1.0	0.4		
2	S-2	1.0-2.0	0.4		
3	S-3	2.0-3.0	0.4	3.2-5.5 Orange-brown clay w/ sand	
4	S-4	3.0-4.0	0.4		Core 2 Rec 5.0'/5.0'
5	S-5	4.0-5.0	0.4	5.5-10.0 Orange-brown silt w/sand	
6	S-6	5.0-6.0	0.3		
7	S-7	6.0-7.0	0.3		
8	S-8	7.0-8.0	0.3		
9	S-9	8.0-9.0	0.1		
10	S-10	9.0-10.0	0.2		
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



# FIELD BORING LOG

**BORING NO.**

B50-5

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: S side of UST  
 TYPE OF BORING: Direct Push DATE STARTED: 9/5/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/5/18 TOTAL DEPTH: 8.0 ft  
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft  
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: N. Billington COMMENT: \_\_\_\_\_

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt 0.5-3.0 Dark brown sandy clay	Core 1 Rec 3.1/5.0'
1	S-1	0.0-1.0	0.8		
2	S-2	1.0-2.0	0.3		
3	S-3	2.0-3.0	0.2	3.0-4.5 Dark brown clayey sand	
4	S-4	3.0-4.0	0.3		Core 2 Rec 5.0/5.0'
				4.5-8.0 Orange-brown to orange-gray and brown sandy silt	
5	S-5	4.0-5.0	0.1		
6	S-6	5.0-6.0	0.1		
7	S-7	6.0-7.0	0.2		
8	S-8	7.0-8.0	0.1		
9					Sample selected for laboratory analysis
10					
11					
12					
13					
14					
15					

**APPENDIX B**

**RED LAB LABORATORY TESTING REPORT**



### Hydrocarbon Analysis Results

**Client:** ESP ASSOCIATES, INC.  
**Address:** 7011 ALBERT PICK ROAD  
 SUITE E  
 GREENSBORO NC 27409

**Samples taken** Monday, September 10, 2018  
**Samples extracted** Monday, September 10, 2018  
**Samples analysed** Wednesday, September 12, 2018

**Contact:** DILLON NANCE

**Operator** NICK HENDRIX

**Project:** U-2579 AB

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	B60-4 (S-18)	11.6	<0.29	0.55	<0.29	0.55	<0.06	<0.09	<0.012	99.4	0.6	0	.(FCM),(P)
s	B60-3 (S-7)	19.2	<0.48	<0.48	5.3	5.3	3.7	0.2	<0.019	0	82.4	17.6	Deg.Fuel 72.5%,(FCM)
s	B60-2 (S-8)	26.4	<0.66	<0.66	4.2	4.2	1.8	<0.21	<0.026	0	74.1	25.9	Deg.Fuel 78.6%,(FCM),(P)
s	B60-1 (S-10)	11.9	<0.3	<0.3	0.76	0.76	0.25	<0.1	<0.012	0	85.6	14.4	V.Deg.Diesel 74.8%,(FCM)
s	B50-5 (S-9)	12.9	<0.32	<0.32	<0.32	<0.32	<0.06	<0.1	<0.013	0	79.3	20.7	.(FCM),(BO)
s	B50-4 (S-10)	12.8	<0.32	0.58	<0.32	0.58	<0.06	<0.1	<0.013	94.3	5.7	0	Deg.PHC 71.8%,(FCM)
s	B50-3 (S-9)	13.8	<0.35	0.7	0.48	1.18	<0.07	<0.11	<0.014	95.9	4.1	0	Deg.Fuel 68.3%,(FCM)
s	B50-2 (S-9)	21.5	<0.54	<0.54	<0.54	<0.54	<0.11	<0.17	<0.022	0	100	0	PHC not detected
s	B50-1 (S-9)	23.3	<0.58	<0.58	<0.58	<0.58	<0.12	<0.19	<0.023	0	0	0	PHC not detected,(BO)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

103.3 %

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

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

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

**APPENDIX C**  
**CHAIN-OF-CUSTODY FORM**

Client Name: ESP Associates, Inc  
 Address: 7011 Albert Pick Rd. Ste E  
Greensboro, NC 27409  
 Contact: Dillon Nance  
 Project Ref.: U-2579AA  
 Email: d.nance@espassociates.com  
 Phone #: 336-404-3117  
 Collected by: D. Nance



RAPID ENVIRONMENTAL DIAGNOSTICS

CHAIN OF CUSTODY AND ANALYTICAL  
REQUEST FORM

RED Lab, LLC  
 5598 Marvin K Moss Lane  
 MARBIONC Bldg, Suite 2003  
 Wilmington, NC 28409

Each sample will be analyzed for  
 BTEX, GRO, DRO, TPH, PAH total  
 aromatics and BaP

Sample Collection Date/Time	TAT Requested		Matrix (S/W)	Sample ID	UVF	GC BTEX	Total Wt.	Tare Wt.	Sample Wt.
	24 Hour	48 Hour							
9/10/18		✓	S	B36-5 S-7	✓		50.5	44.2	6.3
				B36-4 S-9			50.5	44.1	6.4
				B36-3 S-9			53.0	44.1	8.9
				B36-2 S-9			48.4	44.0	4.4
				B36-1 S-9			50.4	44.3	6.1
				B60-4 S-18			51.2	44.3	6.9
				B60-3 S-7			51.7	44.4	7.3
				B60-2 S-8			49.6	44.3	5.3
				B60-1 S-10			51.2	44.5	6.7
				B50-5 S-8			50.5	44.3	6.2
				B50-4 S-10			49.3	44.0	5.3
				B50-3 S-9			46.6	44.0	2.6
				B50-2 S-9			50.7	44.2	6.5
				B50-1 S-9			49.9	43.9	6.0
				B51-5 S-9			49.5	44.0	5.5
				B51-4 S-9			50.3	44.0	6.3
				B51-3 S-9			47.1	44.3	2.8
				B61-2 S-9			48.2	44.2	4.0
				B57-1 S-9			53.7	44.0	9.7

Comments: **Most samples underweight. Soil matrix representation affected - data results largely unaffected.**

RED Lab USE ONLY

Relinquished by	Date/Time	Accepted by	Date/Time
<u>D. Nance</u>	<u>9/10/18 16:00</u>	<u>NT 9/12</u>	<u>11:00</u>
Relinquished by	Date/Time	Accepted by	Date/Time

1a