



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 054 – 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.:** 054  
**Owner:** George Nick Angle  
**Address:** 4341-53 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.

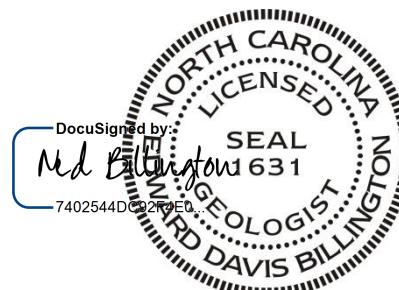
We appreciate the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, Inc.

A handwritten signature in blue ink, appearing to read "Edward D. Billington".

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



not considered Final unless all signatures are completed

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## **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 054 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 George Nick Angle and is currently occupied by several active businesses. The facility is listed in the North Carolina Department of Environmental Quality's (NCDEQ's) UST Section Registry with Facility ID #: 0-016068 and was assigned Ground Water Incident #: 14721. Three USTs were removed from the parcel in 1994 and the site's UST release incident was reportedly closed out in 2006. Two monitoring wells are on site and appear to be active but are locked with padlocks; therefore, ESP was unable to sample these wells (Figure 3).

## **3.0 SITE OBSERVATIONS**

During our May 2018 field work, the site was operating as several active businesses (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 24, 2018. We performed direct-push drilling and sampling of subsurface soils within the proposed easement on September 6, 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).

### **4.2 Borings**

ESP performed direct-push drilling activities within the easement of Parcel 054 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Five borings were drilled, designated B54-1 through B54-5 (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 had a recovery of 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. All of the soil samples obtained had a PID reading of less than 10 parts per million (ppm).

Soil samples selected for laboratory analysis were Sample S-9 (corresponding depth of 9.0-9.5 feet) from each of Borings B54-1, B54-3, and B54-5; Sample S-8 (8.0-8.5 feet) from Boring B54-2; Sample S-7 (7.0-7.5 feet) from Boring B54-4. 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 did not indicate any anomalies (response above background) that did not correspond to known site features.

The EM61 early time gate response and differential response are shown on the plan sheet on Figures 5 and 6, 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, PAHs, and GRO were below the detection limits for all samples. DRO was detected in 2 of the 5 soil samples tested but below the NCDEQ action level of 100 ppm. The highest DRO reading was 10 ppm in Sample S-9 (9.0-9.5 feet) from Boring B54-3.

## **6.0 CONCLUSIONS**

### **6.1 Interpretation of Results**

The results of the PSA for Parcel 054 of NCDOT Project U-2579AB do not indicate the presence of abandoned USTs. No petroleum hydrocarbon soil contamination at or above NCDEQ action levels was detected within the proposed construction easement on Parcel 054.

### **6.2 Geophysics**

The geophysical data do not indicate the presence of abandoned USTs.

### **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 054 (Figure 7).

## **7.0 RECOMMENDATIONS**

No limitations on construction activities or special handling of excavated soil are recommended for Parcel 054.

## **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**



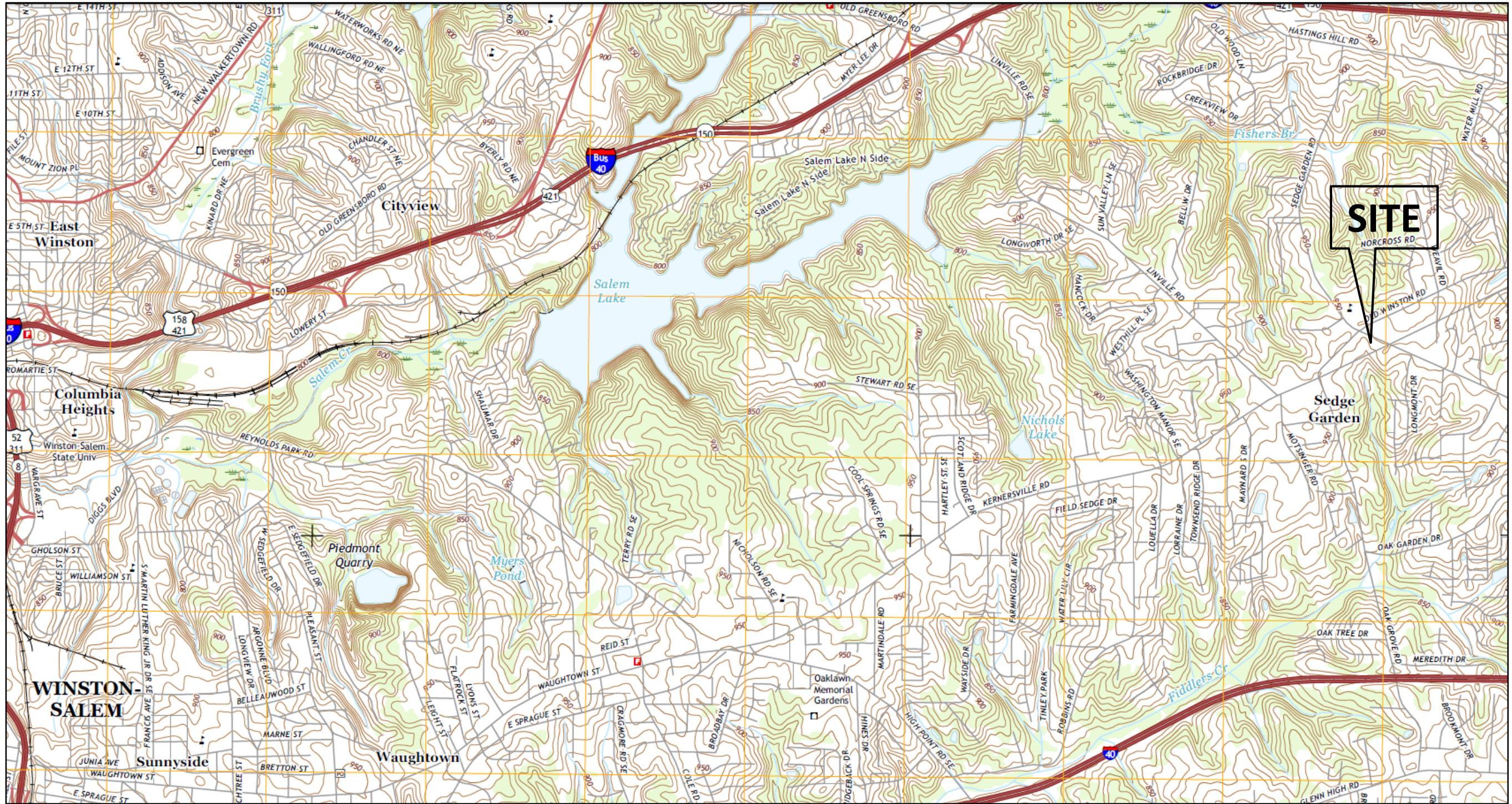
**TABLE 1**  
**SOIL SAMPLE PID READINGS**

<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>
B54-1	none	1.3 (5.0-5.5)
B54-2	none	1.0 (8.0-8.5)
B54-3	none	2.1 (9.0-9.5)
B54-4	none	1.1 (5.0-5.5)
B54-5	none	1.6 (1.0-1.5)

**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>
B54-1	S-9 (9.0-9.5)	9/10/18	<0.51	<0.51	<0.51	<0.16
B54-2	S-8 (8.0-8.5)	9/10/18	<0.45	<0.45	1.3	<0.15
B54-3	S-9 (9.0-9.5)	9/10/18	<0.82	<0.82	10	<0.26
B54-4	S-7 (7.0-7.5)	9/10/18	<0.64	<0.64	<0.64	<0.2
B54-5	S-9 (9.0-9.5)	9/10/18	<0.29	<0.29	<0.29	<0.09

## FIGURES



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

PROJECT NO.	CS34.366
SCALE	AS SHOWN
DATE	11/6/18
BY	DMN

**FIGURE 1 – PARCEL 054, GEORGE NICK ANGLE 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**



7011 Albert Pick Rd.,  
Suite E  
Greensboro, NC 27409

336.334.7724

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a. Photo from northeast side of site looking southwest.




b. Photo from east side of site looking west.

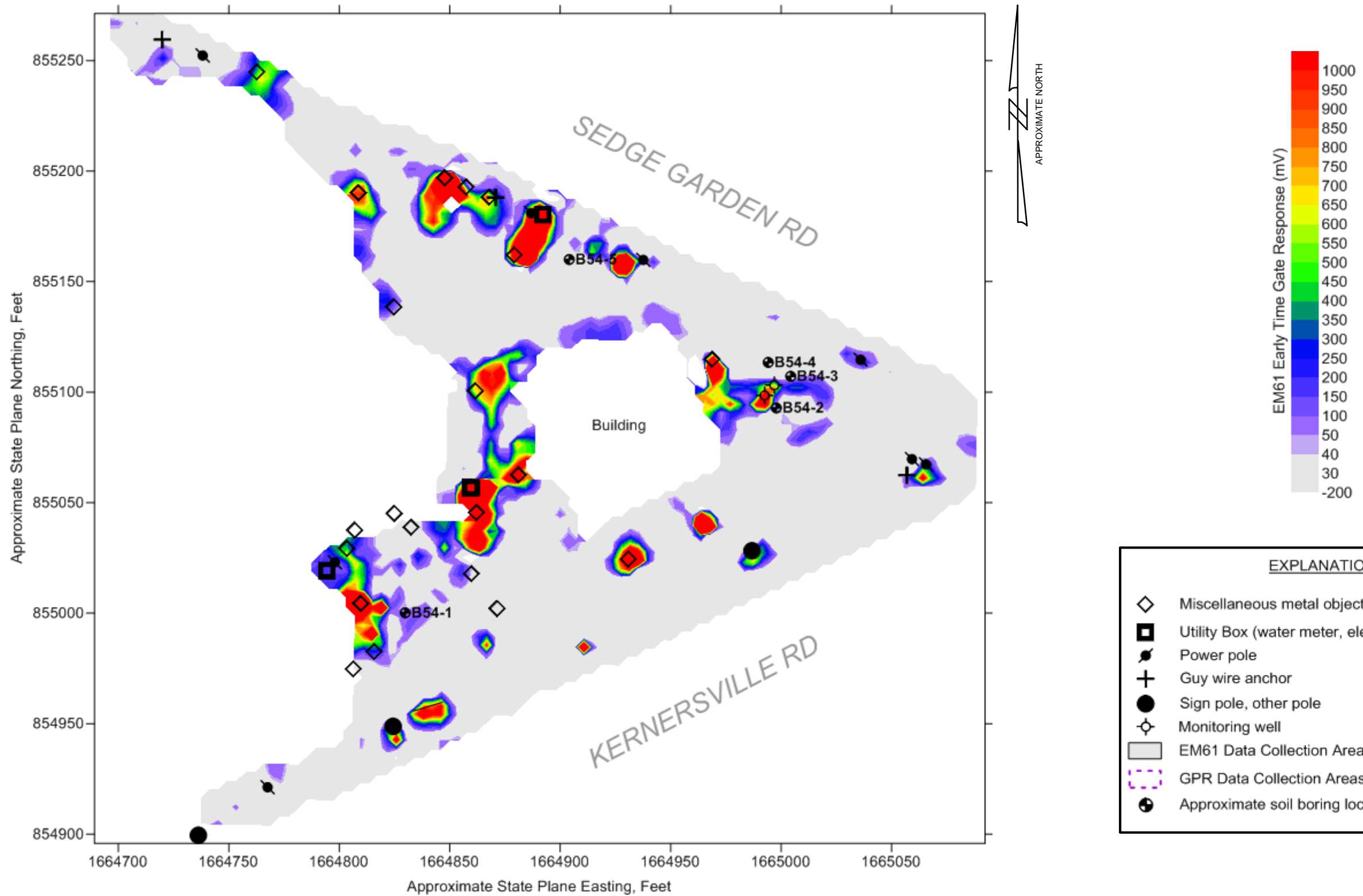


c. Photo from northwest side of site looking southeast.



d. Photo from southwest side of site looking northeast.

PROJECT NO. CS34.366	<b>FIGURE 2 – PARCEL 054, GEORGE NICK ANGLE 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>	 <b>ESP</b>	7011 Albert Pick Rd., Suite E Greensboro, NC 27409
SCALE AS SHOWN				336.334.7724
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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 054, GEORGE NICK ANGLE  
EM61 EARLY TIME GATE RESPONSE**

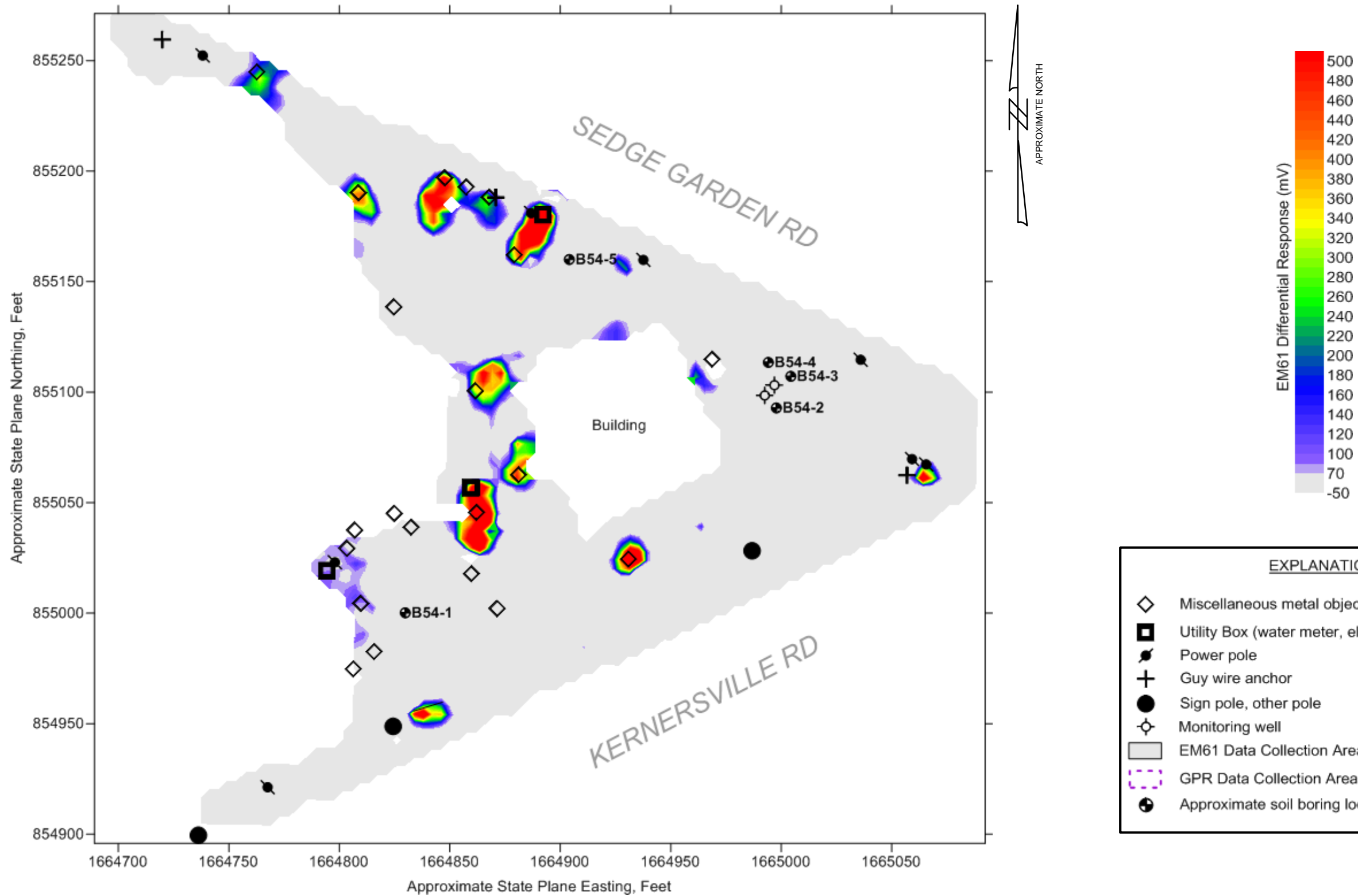
U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION  
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EXPLANATION	
◇	Miscellaneous metal object (pipe, debris, etc.)
◻	Utility Box (water meter, electrical outlet, etc.)
●	Power pole
+	Guy wire anchor
●	Sign pole, other pole
○	Monitoring well
■	EM61 Data Collection Areas
▭	GPR Data Collection Areas
●	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 4 – PARCEL 054, GEORGE NICK ANGLE  
EM61 EARLY TIME GATE RESPONSE**

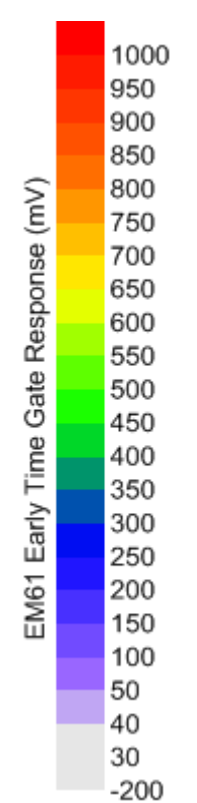
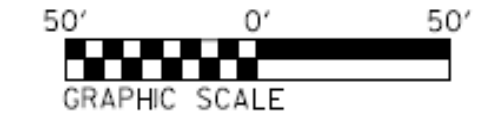
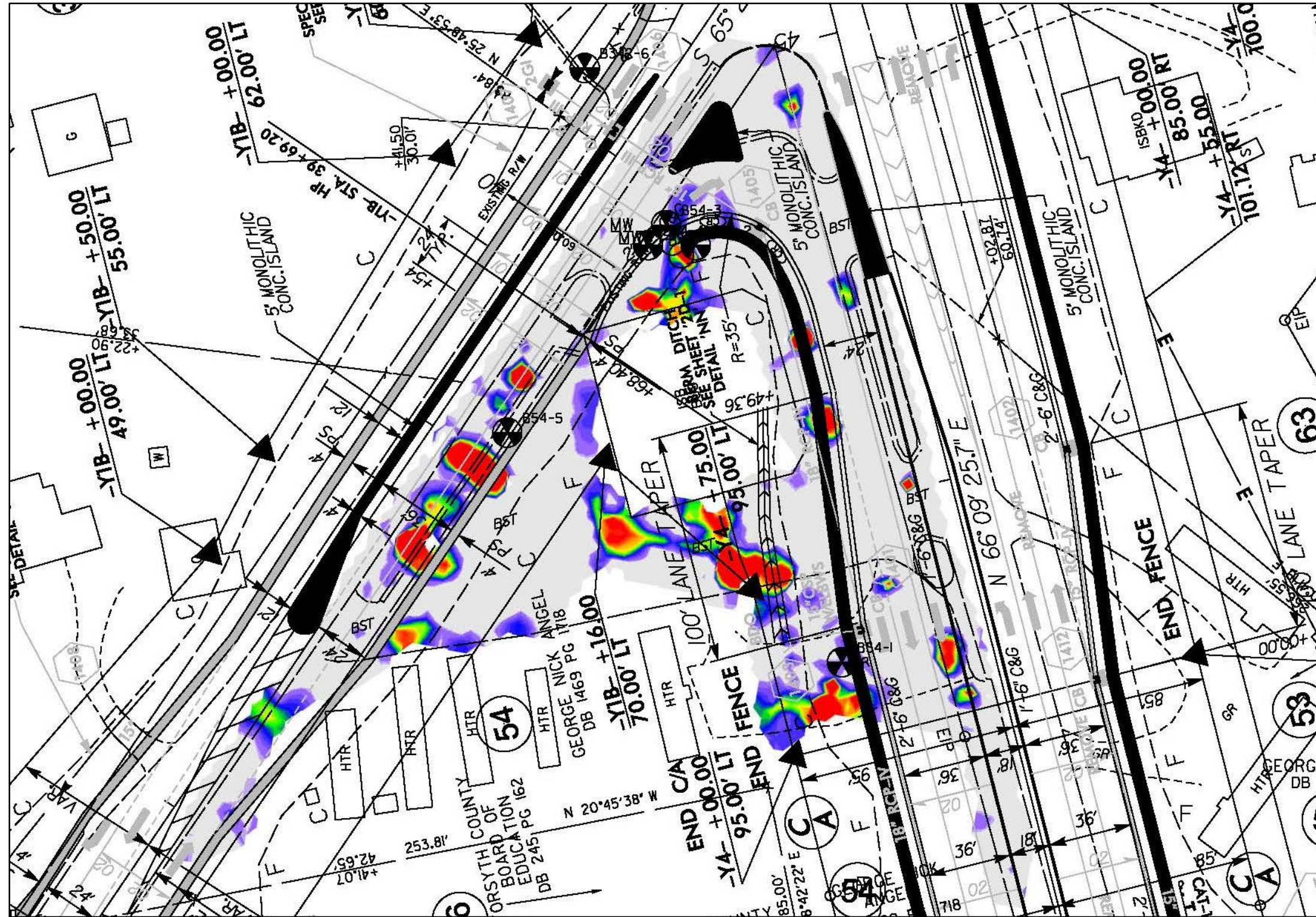
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List of NCDOT reference files

- 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 8 for explanation of symbols and line types

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**FIGURE 5 – PARCEL 054, GEORGE NICK ANGLE**  
**EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET**

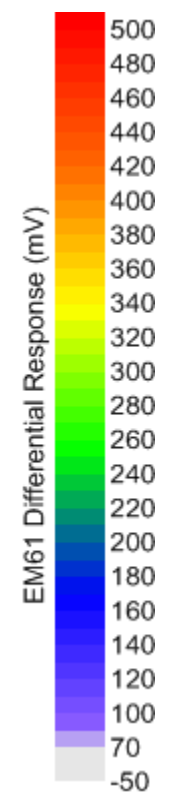
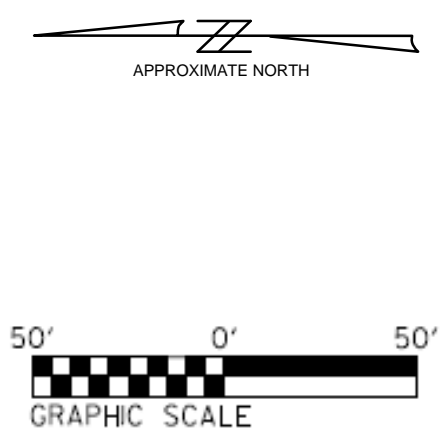
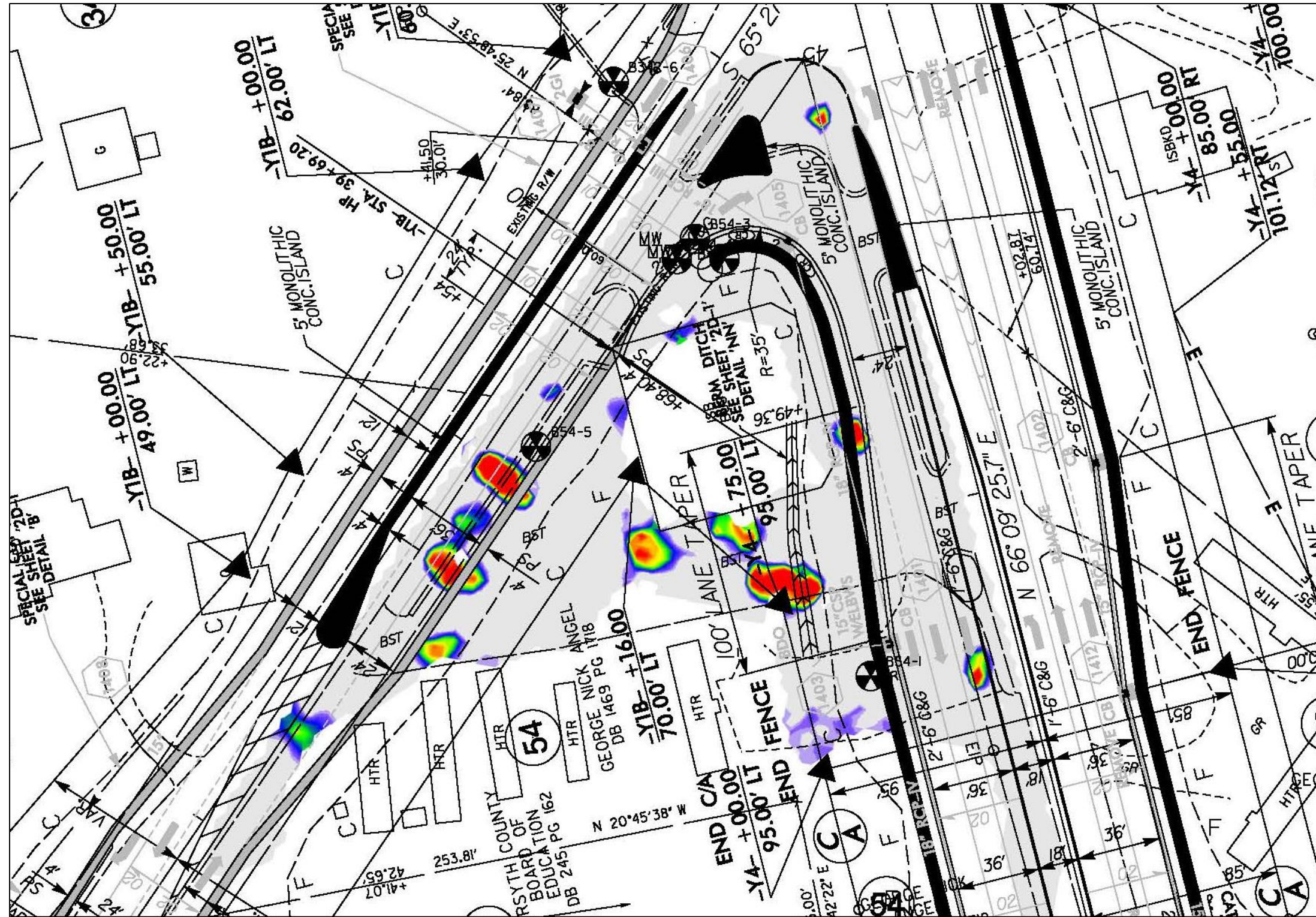
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List of NCDOT reference files

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

See Figure 8 for explanation of symbols and line types

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SCALE	AS SHOWN
DATE	11/6/18
BY	DMN

**FIGURE 6- PARCEL 054, GEORGE NICK ANGLE  
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET**

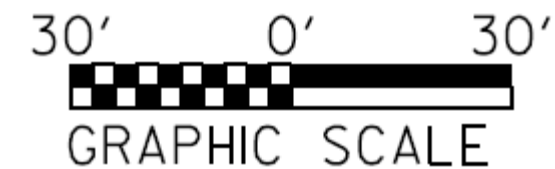
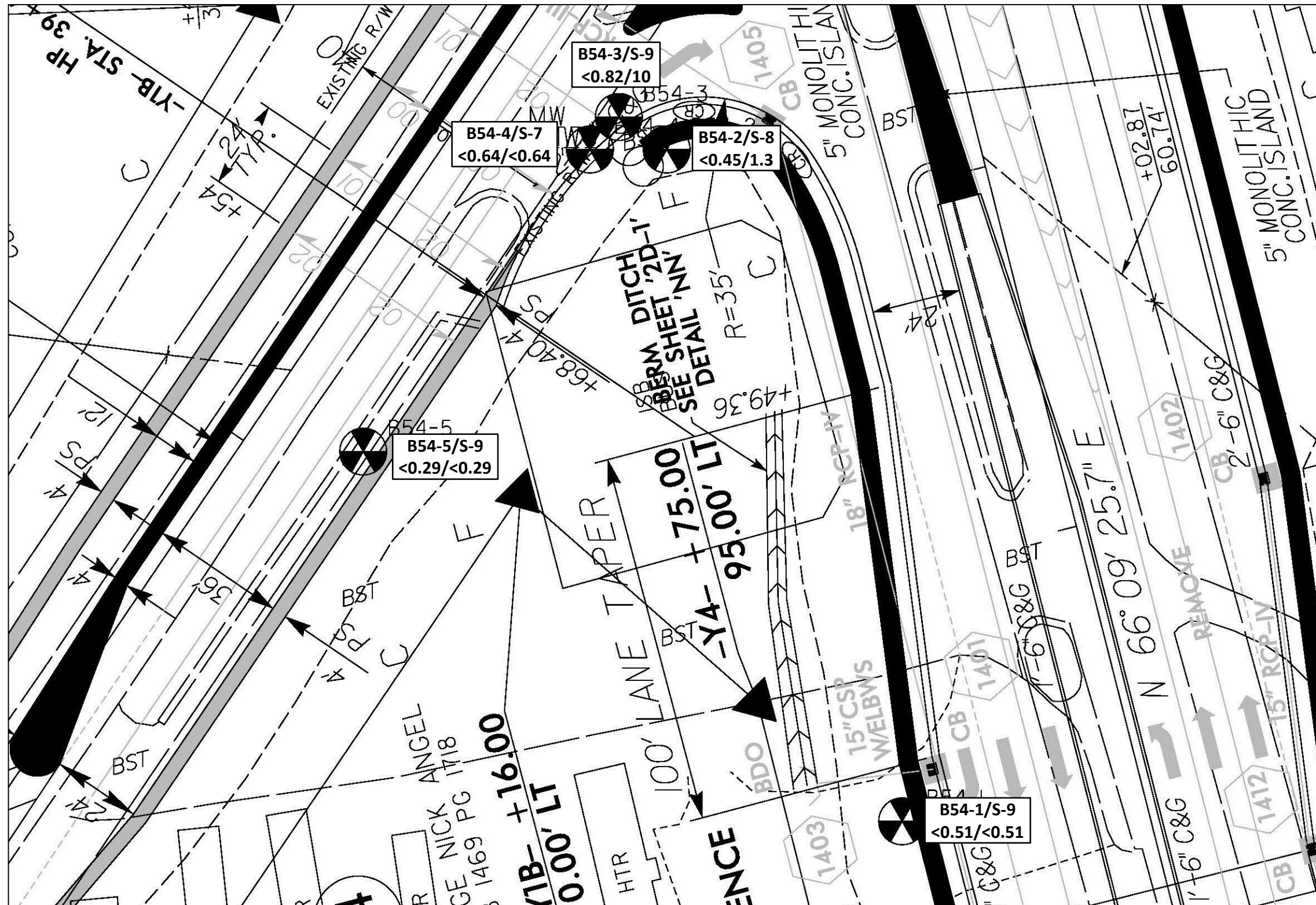
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Explanation	
<div style="border: 1px solid black; padding: 2px; display: inline-block;">           B54-1/S-9            &lt;0.51/&lt;0.51         </div>	<b>Maximum Analytical Results per Boring</b> Boring No./Sample No. GRO/DRO (mg/kg, ppm)

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 8 for explanation of symbols and line types

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SCALE	1" = 30'
DATE	11/6/18
BY	DMN

**FIGURE 7 – PARCEL 054, GEORGE NICK ANGLE  
SOIL ANALYTICAL RESULTS 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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# 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—
Proposed Woven Wire Fence	—•—•—
Proposed Chain Link Fence	—□—□—
Proposed Barbed Wire Fence	—◇—◇—
Existing Wetland Boundary	—w—w—
Proposed Wetland Boundary	—w—w—
Existing Endangered Animal Boundary	—a—
Existing Endangered Plant Boundary	—p—
Existing Historic Property Boundary	—h—
Known Contamination Area: Soil	—X—X—
Potential Contamination Area: Soil	—X—X—
Known Contamination Area: Water	—W—W—
Potential Contamination Area: Water	—W—W—
Contaminated Site: Known or Potential	—X—X—

## 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—w—
Proposed Lateral, Tail, Head Ditch	—d—d—
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	—f—
Proposed Slope Stakes Fill	—f—
Proposed Curb Ramp	—CR—
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	—A/G Water—

## 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	—A/G Gas—

## SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	—
Above Ground Sanitary Sewer	—A/G 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 8  
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.**

B54-1

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366LOCATION: West side of site, grassy area near mailboxesTYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 10.0 ftDRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ftDRILL 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
				0.0-0.2 Topsoil 0.2-10.0 Orange-brown sandy, clayey silt	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	0.6		
2	S-2	2.0-2.5	0.2		
3	S-3	3.0-3.5	0.4		
4	S-4	4.0-4.5	0.4		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	1.3		
6	S-6	6.0-6.5	0.4		
7	S-7	7.0-7.5	0.6		
8	S-8	8.0-8.5	0.3		
9	S-9	9.0-9.5	0.4		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



# FIELD BORING LOG

**BORING NO.**

B54-2

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: East side of building in parking lot  
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 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
				0.0-0.3 Asphalt 0.3-8.6 Orange-brown sandy silt	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	0.6		
2	S-2	2.0-2.5	0.6		
3	S-3	3.0-3.5	0.5		
4	S-4	4.0-4.5	0.6		Core 2 Rec 4.0'/5.0'
5	S-5	5.0-5.5	0.7		
6	S-6	6.0-6.5	0.5		
7	S-7	7.0-7.5	0.5		
8	S-8	8.0-8.5	1.0	8.6-9.0 White-tan silty sand	
9					
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



# FIELD BORING LOG

**BORING NO.**

B54-3

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: East side of building in parking lot  
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 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
				0.0-0.3 Asphalt 0.3-10.0 Brown to gray silty sand	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	0.7		
2	S-2	2.0-2.5	0.7		
3	S-3	3.0-3.5	0.9		
4	S-4	4.0-4.5	0.7		Core 2 Rec 4.0'/5.0'
5	S-5	5.0-5.5	0.5		
6	S-6	6.0-6.5	0.5		
7	S-7	7.0-7.5	0.3		
8	S-8	8.0-8.5	0.5		
9	S-9	9.0-9.5	2.1		
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**B54-4**LOCATION: East side of building in parking lotTYPE OF BORING: Direct PushDATE STARTED: 9/6/18SHEET: 1 of 1DRILLING FIRM: SAEDACCODATE FINISHED: 9/6/18TOTAL DEPTH: 7.5 ftDRILLER: Brian EwingSAMPLE METHOD: 5' Macro CoreDEPTH TO GW: Dry ftDRILL RIG: Geoprobe 7822 DTLOGGED BY: D. Nance

COMMENT: \_\_\_\_\_

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.3 Asphalt 0.3-10.0 Brown to gray silty sand w/ rock frags	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	0.6		
2	S-2	2.0-2.5	0.7		
3	S-3	3.0-3.5	0.9		
4	S-4	4.0-4.5	0.7		Core 2 Rec 3.0'/5.0'
5	S-5	5.0-5.5	1.1		
6	S-6	6.0-6.5	1.0		
7	S-7	7.0-7.5	0.6		Refusal at 8.0'
8					
9					
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis





# FIELD BORING LOG

**BORING NO.**

B54-5

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366  
 LOCATION: Adjacent to Sedge Garden Rd. north of building  
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1  
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 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
				0.0-0.1 Topsoil 0.3-10.0 Brown to gray silty sand	Core 1 Rec 3.5'/5.0'
1	S-1	1.0-1.5	1.6	0.1-7.5 Brown to gray sandy silt	
2	S-2	2.0-2.5	1.1		
3	S-3	3.0-3.5	1.2		
4	S-4	No Rec	N/A		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	1.0		
6	S-6	6.0-6.5	0.6		
7	S-7	7.0-7.5	0.5	7.5-10.0 Brown to white-gray silty sand	
8	S-8	8.0-8.5	0.7		
9	S-9	9.0-9.5	0.7		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis

**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	B54-1 (S-9)	20.3	<0.51	<0.51	<0.51	<0.51	<0.1	<0.16	<0.02	0	0	0	PHC not detected
s	B54-2 (S-8)	18.2	<0.45	<0.45	1.3	1.3	1.2	<0.15	<0.018	0	62.8	37.2	V.Deg.PHC 71.2%,(FCM),(BO)
s	B54-3 (S-9)	32.9	<0.82	<0.82	10	10	5.1	<0.26	<0.033	9.9	71.1	19	Deg.PHC 73.6%,(FCM)
s	B54-4 (S-7)	25.5	<0.64	<0.64	<0.64	<0.64	<0.13	<0.2	<0.025	0	0	0	PHC not detected
s	B54-5 (S-9)	11.6	<0.29	<0.29	<0.29	<0.29	<0.06	<0.09	<0.012	0	0	0	.(FCM)
s	B36-5 (S-7)	22.2	<0.56	<0.56	<0.56	<0.56	<0.11	<0.18	<0.022	0	73.3	26.7	Residual HC,(BO),(P)
s	B36-4 (S-9)	21.9	<0.55	<0.55	0.75	0.75	0.72	<0.18	<0.022	0	74.1	25.9	Residual HC,(BO),(P)
s	B36-3 (S-9)	47.2	<1.2	<1.2	2.5	2.5	<0.24	<0.38	<0.047	0	100	0	Deg.Diesel 45.3%,(FCM)
s	B36-2 (S-9)	35.0	<0.88	1.9	5.2	7.1	3	<0.28	<0.035	49.8	43.9	6.2	Deg.Fuel 74.3%,(FCM)
s	B36-1 (S-9)	23.0	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	27.9	72.1	Residual HC,(BO)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

101.1 %

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-2579 AB  
 Email: d.nance@espsociates.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	B331-5 S-9	✓		49.2	43.9	5.3
				B331-4 S-9			52.7	45.6	8.1
				B331-3 S-9			51.6	44.1	7.5
				B331-2 S-9			53.0	45.8	7.2
				B331-1 S-9			52.0	45.4	6.6
				B352-3 S-9		47.4	52.7	43.7	3.7
				B352-2 S-9			52.8	43.7	9.1
				B352-1 S-9			51.9	43.8	8.1
				B342-6 S-3			49.8	44.4	5.4
				B342-5 S-9			52.2	44.1	8.1
				B342-4 S-5			51.8	44.4	6.9
				B342-4 S-9			52.0	44.4	8.0
				B342-3 S-9			52.1	44.4	7.7
				B342-2 S-9			50.7	43.7	7.0
				B342-1 S-9			50.1	43.9	6.2
				B54-1 S-9			51.0	44.1	6.9
				B54-2 S-8			51.2	43.5	7.7
				B54-3 S-9			51.9	44.0	7.9
				B54-4 S-7			49.8	44.3	5.5
				B54-5 S-9			51.2	44.3	

Comments: **\*most samples underweight. Soil matrix representation affected - data results largely unaffected. (NH 9/12)**

RED Lab USE ONLY

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