



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 331 – 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.: 331
Owner: NCDOT
Address: 4203 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.

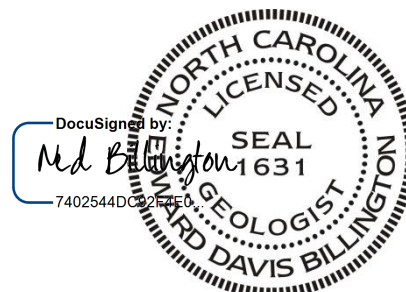
We appreciate the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

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 331 to locate possible underground storage tanks (USTs), sample soil, and delineate potential contaminated soil.

2.0 HISTORY

This parcel has been acquired by the NCDOT and is currently occupied by a vacant lot. The facility is listed in the North Carolina Department of Environmental Quality's (NCDEQ's) UST Section Registry with Facility ID #: 0-016674. Two USTs were reportedly removed in 1975.

3.0 SITE OBSERVATIONS

During our May 2018 field work, the site was a vacant lot (Figure 2). The ground in the study area was covered by gravel and grass.

4.0 METHODS

ESP performed a geophysical study of the area designated by the NCDOT on May 21, 2018. We performed direct-push drilling and sampling of subsurface soils within the proposed easement on September 7, 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.

4.2 Borings

ESP performed direct-push drilling activities within the easement of Parcel 331 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Five borings were drilled, designated B331-1 through B331-5 (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 four 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) (Table 1).

Soil samples selected for laboratory analysis were Sample S-9 (corresponding depth of 9.0-9.5 feet) from all borings. 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 anomaly. The GPR data collected did not indicate the presence of unknown USTs within the study area.

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, GRO, DRO, and PAHs were below the detection limits for all samples.

6.0 CONCLUSIONS

6.1 Interpretation of Results

The results of the PSA for Parcel 331 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 on Parcel 331.

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 study area on Parcel 331 (Figure 7).

7.0 RECOMMENDATIONS

No limitations on construction activities or special handling of excavated soil are recommended for Parcel 331.

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

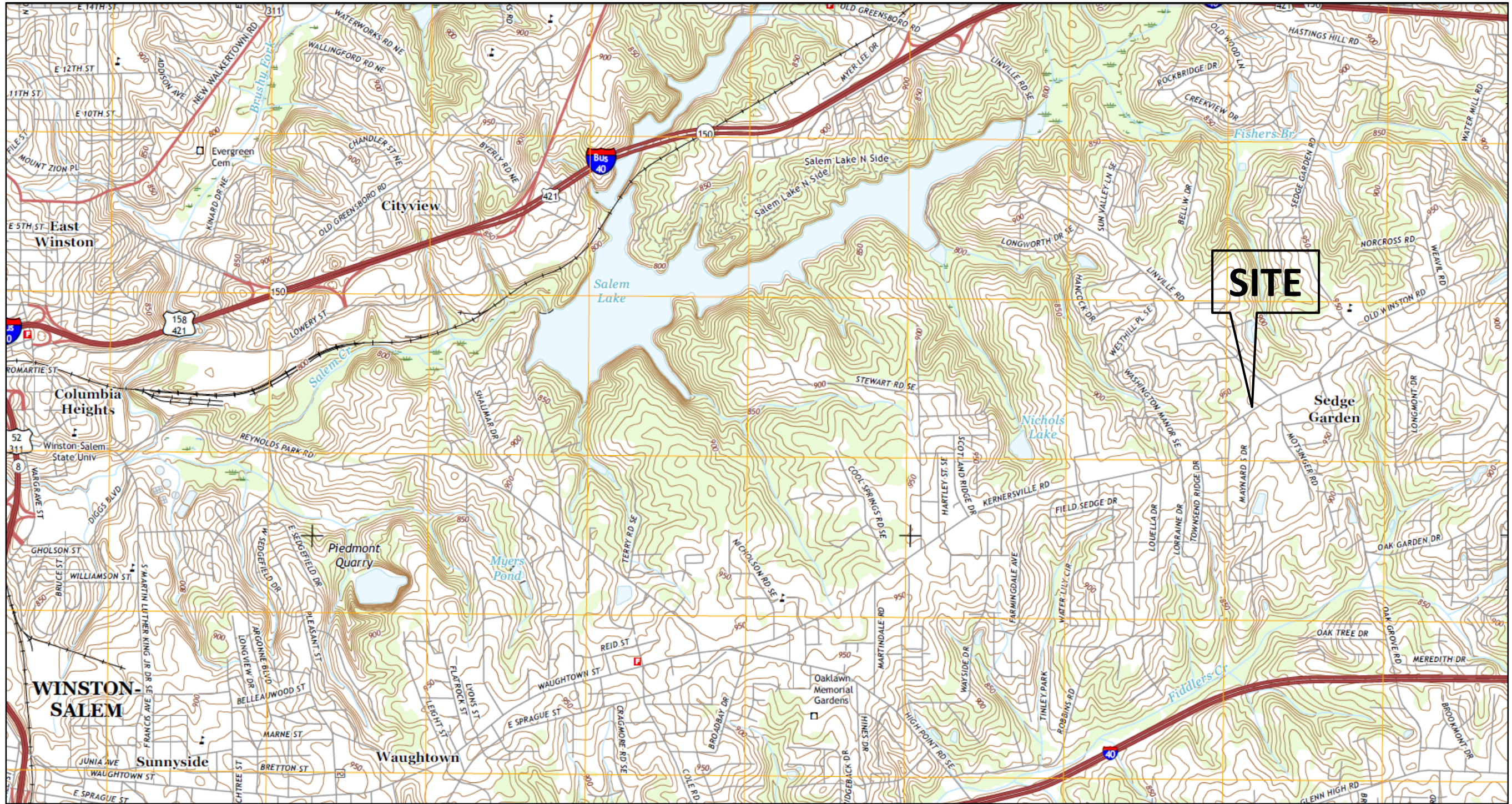
TABLE 1
SOIL SAMPLE PID READINGS

Boring	Sample Depth Range with PID > 10 ppm (feet bgs)	Maximum PID Reading (ppm) and Sample Depth (feet bgs)
B331-1	none	4.1 (5.0-5.5)
B331-2	none	4.6 (2.0-2.5)
B331-3	none	4.7 (7.0-7.5)
B331-4	none	4.8 (7.0-7.5)
B331-5	none	3.9 (2.0-2.5)

TABLE 2
SOIL SAMPLE UVF RESULTS SUMMARY

Boring	Sample ID (depth in feet bgs)	Date Collected	BTEX (C6-C9) (mg/kg)	GRO (C5-C10) (mg/kg)	DRO (C10-C35) (mg/kg)	PAHs (mg/kg)
B331-1	S-9 (9.0-9.5)	9/10/18	<0.53	<0.53	<0.53	<0.17
B331-2	S-9 (9.0-9.5)	9/10/18	<0.49	<0.49	<0.49	<0.16
B331-3	S-9 (9.0-9.5)	9/10/18	<0.47	<0.47	<0.47	<0.15
B331-4	S-9 (9.0-9.5)	9/10/18	<0.31	<0.31	<0.31	<0.1
B331-5	S-9 (9.0-9.5)	9/10/18	<0.38	<0.38	<0.38	<0.12

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 331, NCDOT
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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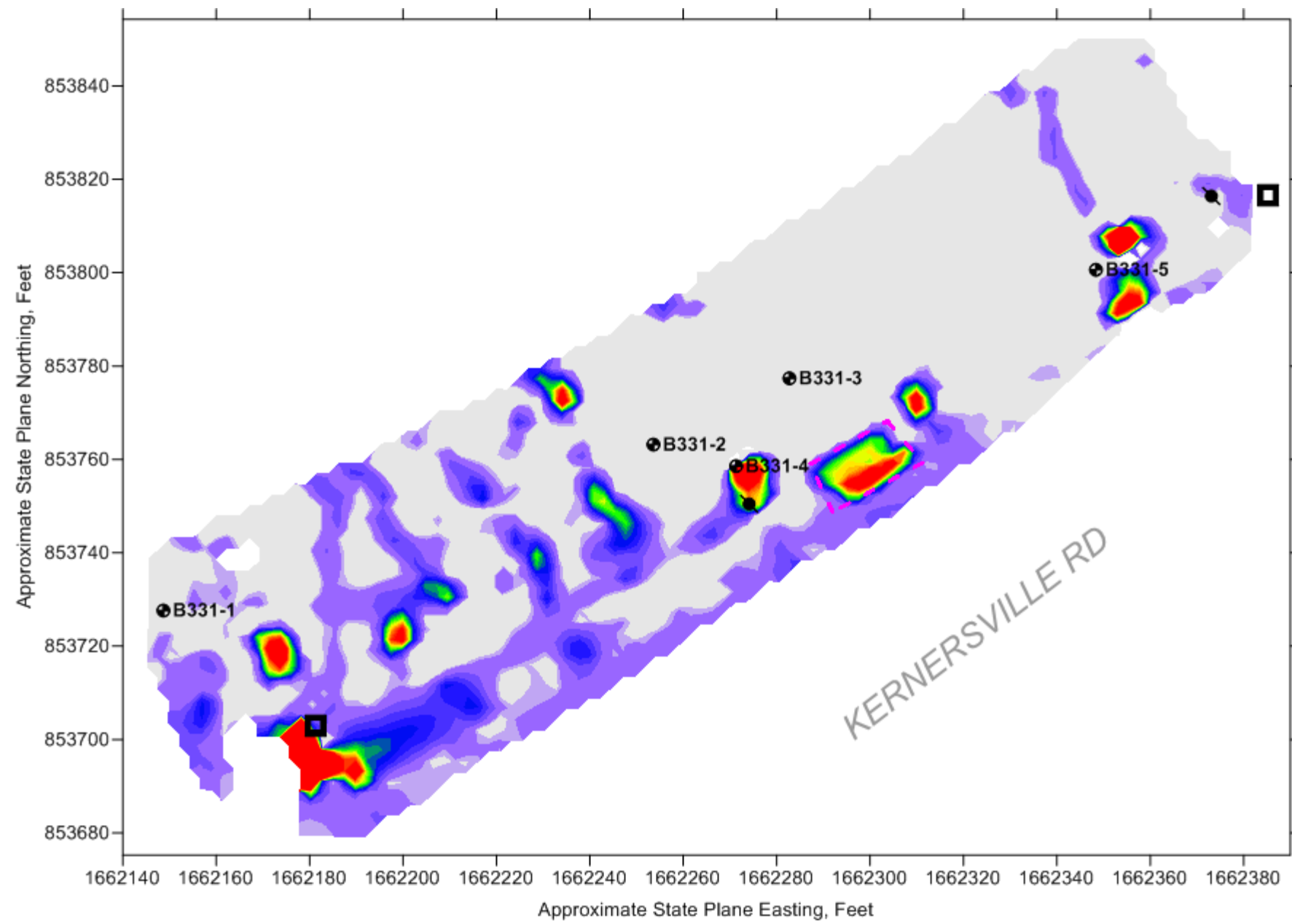


a. Photo from northeast side of site looking southwest.



b. Photo from southwest side of site looking northeast.

PROJECT NO. CS34.366	FIGURE 2 – PARCEL 331, NCDOT SITE PHOTOGRAPHS	U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421 FORSYTH COUNTY, NORTH CAROLINA	 ESP	7011 Albert Pick Rd., Suite E Greensboro, NC 27409
SCALE AS SHOWN				336.334.7724
DATE 11/6/18				www.espassociates.com
BY DMN				



EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Power pole
- 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.

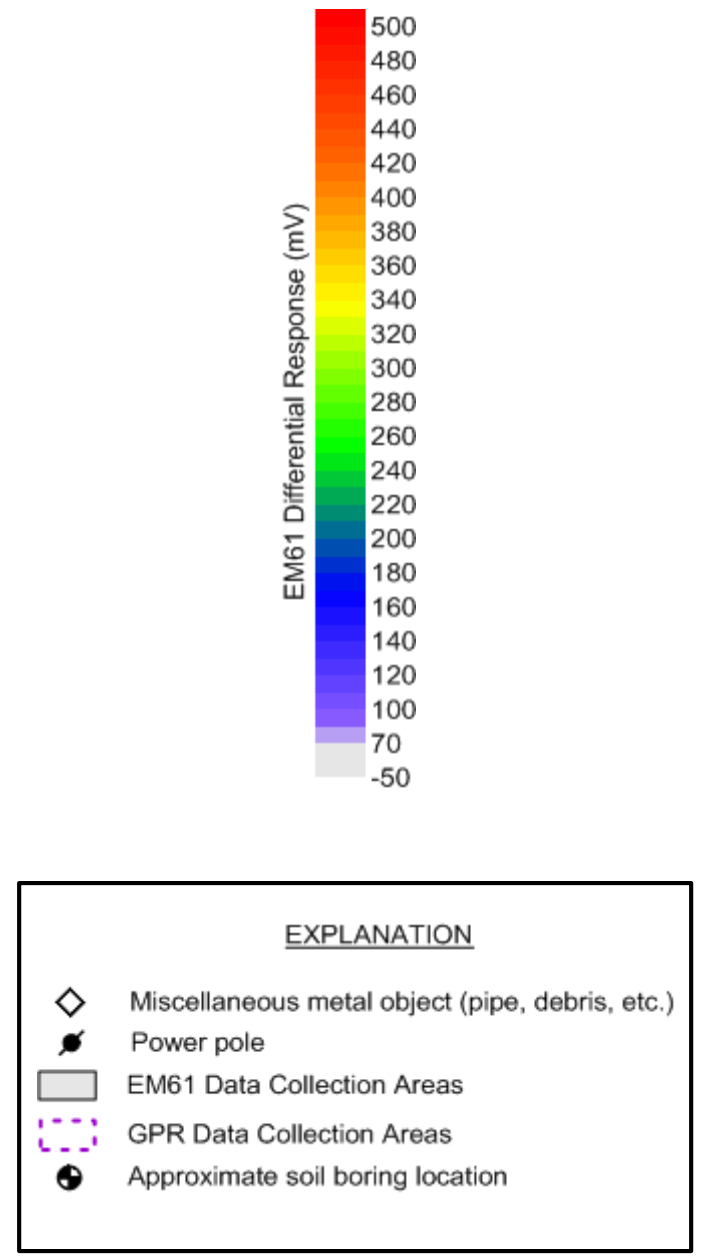
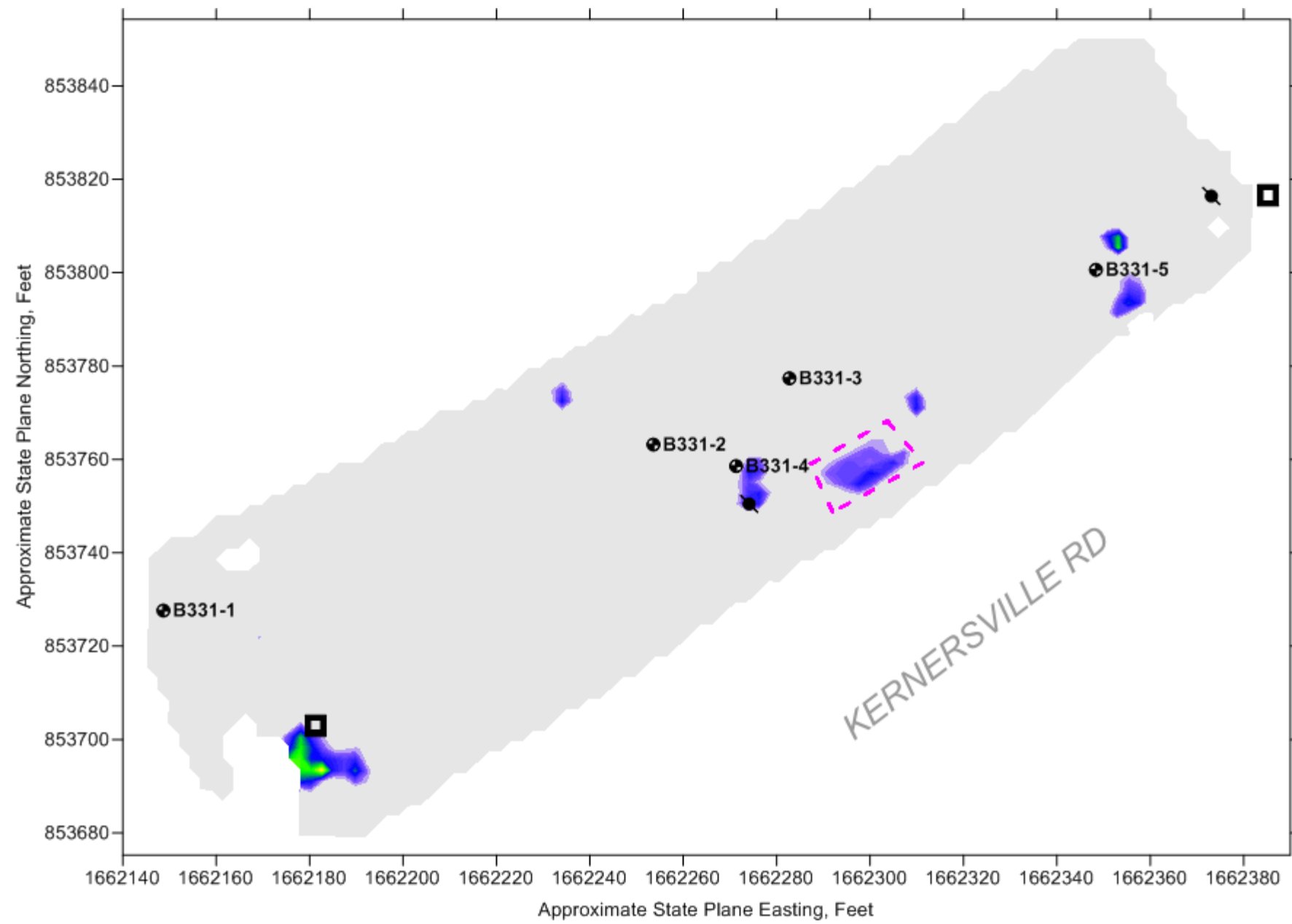
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DATE	11/6/18
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FIGURE 3 – PARCEL 331, NCDOT
EM61 EARLY TIME GATE RESPONSE

*U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
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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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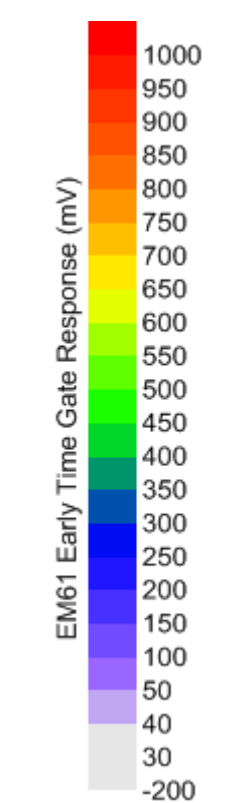
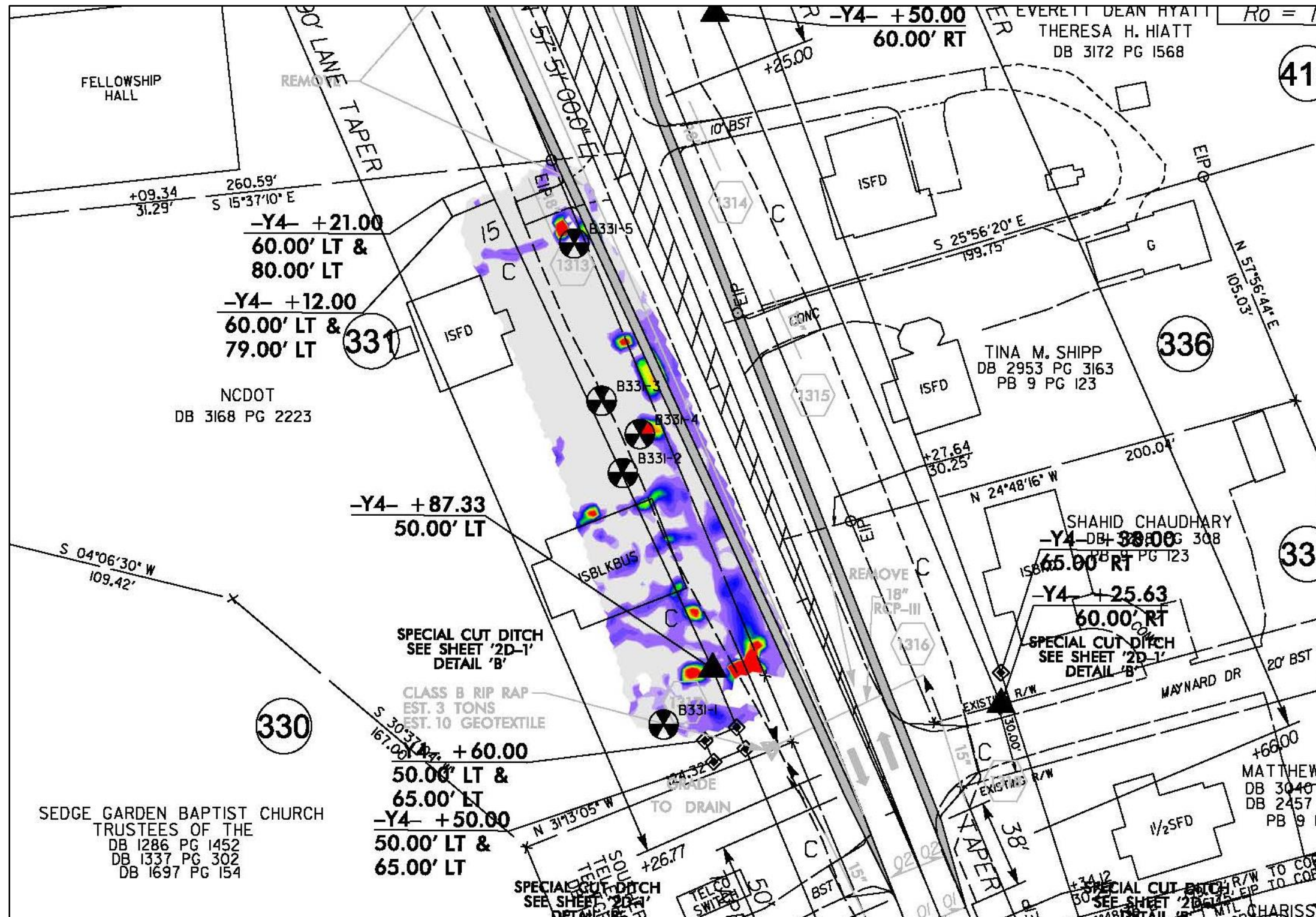
**FIGURE 4 – PARCEL 331, NCDOT
EM61 DIFFERENTIAL RESPONSE**

*U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
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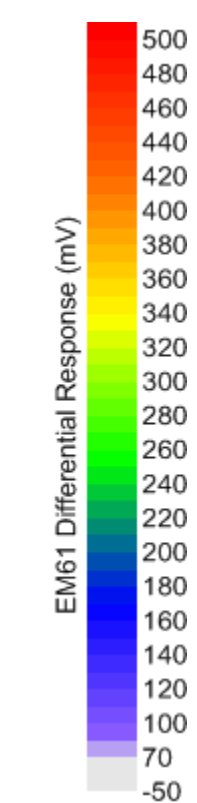
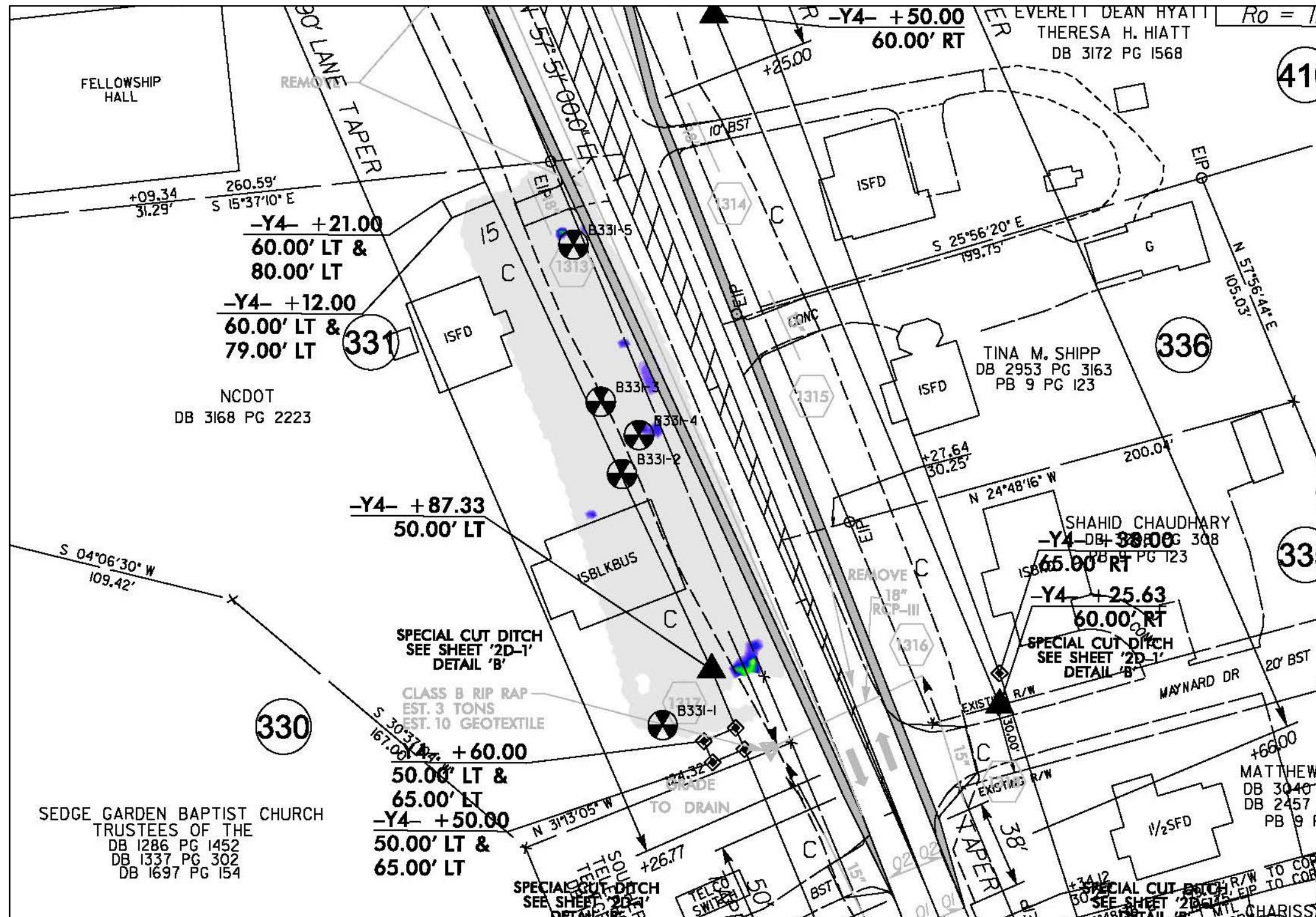
- List of NCDOT reference files
- u2579ab_rdy_dsn.dgn
 - SS, u2579ab_rdy_ss.dgn
 - ROW, u2579ab_rdy_row.dgn
 - FinalSurvey\U2579AB_ncdot_fs.dgn
 - U2579AB_hyd_dm.dgn

See Figure 8 for explanation of symbols and line types

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FIGURE 5 – PARCEL 331, NCDOT
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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- 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	AS SHOWN
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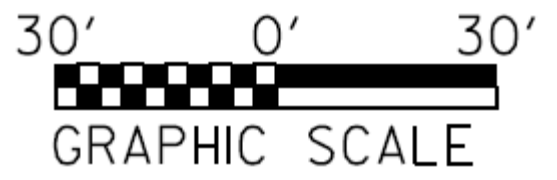
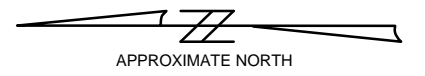
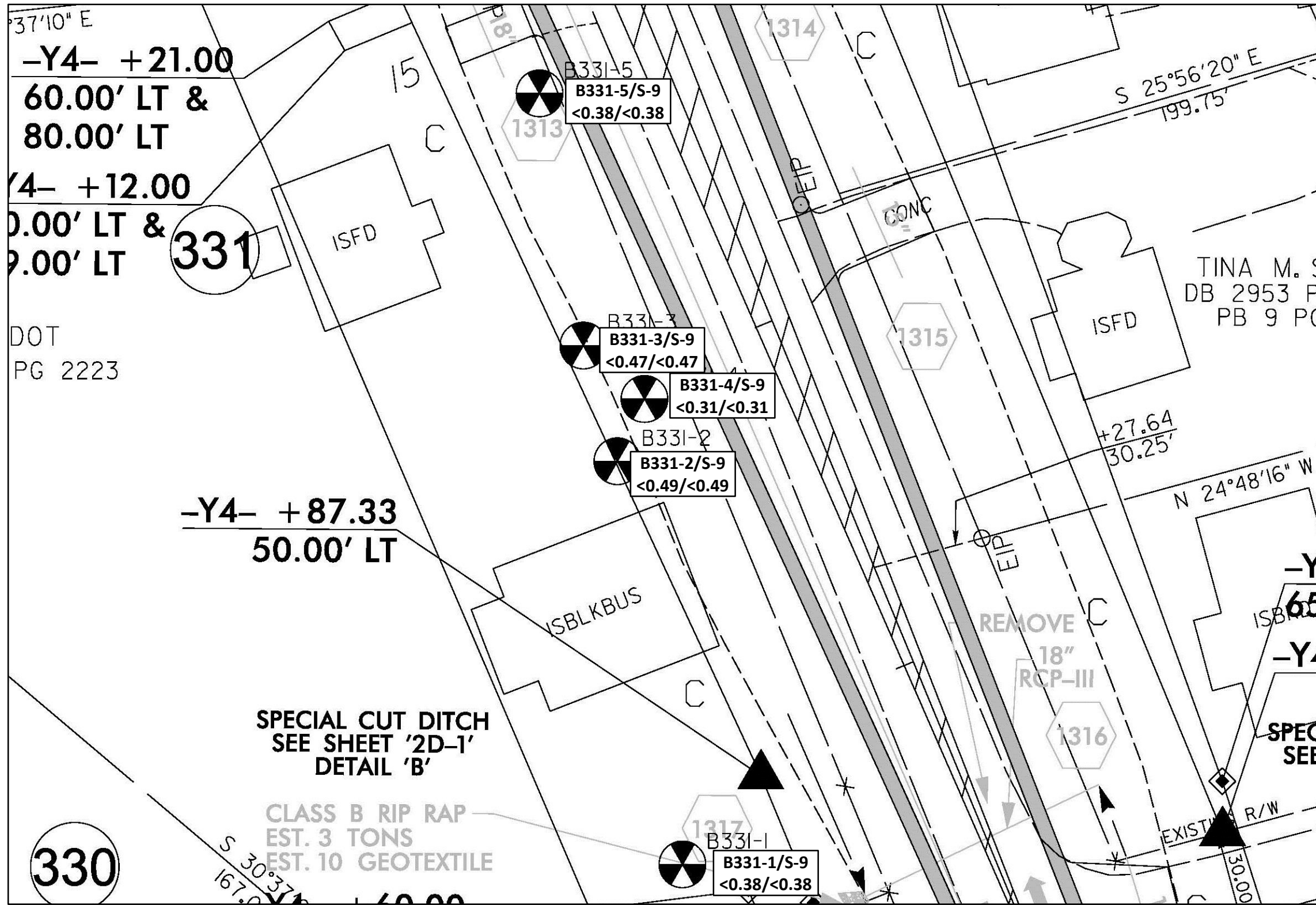
FIGURE 6- PARCEL 331, NCDOT
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET

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



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Explanation	
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> B331-1/S-9 <0.38/<0.38 </div>	Maximum Analytical Results per Boring 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

PROJECT NO.	CS34.366
SCALE	1" = 30'
DATE	11/6/18
BY	DMN

**FIGURE 7 – PARCEL 331, NCDOT
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-x-
Proposed Woven Wire Fence	-o-o-o-
Proposed Chain Link Fence	-s-s-s-
Proposed Barbed Wire Fence	-d-d-d-
Existing Wetland Boundary	-w-w-w-
Proposed Wetland Boundary	-w-w-w-
Existing Endangered Animal Boundary	-a-a-a-
Existing Endangered Plant Boundary	-p-p-p-
Existing Historic Property Boundary	-h-h-h-
Known Contamination Area: Soil	-s-s-s-
Potential Contamination Area: Soil	-s-s-s-
Known Contamination Area: Water	-w-w-w-
Potential Contamination Area: Water	-w-w-w-
Contaminated Site: Known or Potential	-s-s-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	_____
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 C/A Marker	_____
Existing Control of Access	_____
Proposed Control of Access	_____
Existing Easement Line	_____
Proposed Temporary Construction Easement	_____
Proposed Temporary Drainage Easement	_____
Proposed Permanent Drainage Easement	_____
Proposed Permanent Drainage / Utility Easement	_____
Proposed Permanent Utility Easement	_____
Proposed Temporary Utility Easement	_____
Proposed Aerial Utility Easement	_____
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 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**



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APPENDIX A
SOIL BORING LOGS



FIELD BORING LOG

BORING NO.

B331-1

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: SW corner of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/7/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/7/18 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 Topsoil	Core 1 Rec 4.0/5.0'
1	S-1	1.0-1.5	0.3	0.5-8.3 Red-brown sandy silt	
2	S-2	2.0-2.5	0.1		
3	S-3	3.0-3.5	1.0		
4	S-4	No Rec	N/A		Core 2 Rec 5.0/5.0'
5	S-5	5.0-5.5	4.1		
6	S-6	6.0-6.5	2.2		
7	S-7	7.0-7.5	2.4		
8	S-8	8.0-8.5	1.9	8.3-10.0 Tan-gray sandy silt	
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.

B331-2

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: Center of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/7/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/7/18 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
				0.0-0.7 Gravel	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	4.0	0.7-3.4 Orange-red silty clay	
2	S-2	2.0-2.5	4.6		
3	S-3	3.0-3.5	4.0		
				3.4-10.0 Red-brown sandy, clayey silt	
4	S-4	4.0-4.5	3.7		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	3.6		
6	S-6	6.0-6.5	2.5		
7	S-7	7.0-7.5	4.0		
8	S-8	8.0-8.5	4.3		
9	S-9	9.0-9.5	3.6		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B331-3

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: Center of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/7/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/7/18 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 Gravel	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	2.9	0.5-3.1 Orange-red silty clay	
2	S-2	2.0-2.5	3.4		
3	S-3	3.0-3.5	3.8		
				3.1-10.0 Red-brown sandy, clayey silt	
4	S-4	4.0-4.5	4.5		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	3.0		
6	S-6	6.0-6.5	3.6		
7	S-7	7.0-7.5	4.7		
8	S-8	8.0-8.5	3.5		
9	S-9	9.0-9.5	4.1		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B331-4

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: Center of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/7/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/7/18 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 Gravel	Core 1 Rec 5.0/5.0'
1	S-1	1.0-1.5	2.4	0.3-3.7 Orange-red silty clay	
2	S-2	2.0-2.5	3.3		
3	S-3	3.0-3.5	3.0		
				3.7-10.0 Orange-red sandy, clayey silt	
4	S-4	4.0-4.5	2.3		Core 2 Rec 5.0/5.0'
5	S-5	5.0-5.5	2.6		
6	S-6	6.0-6.5	3.8		
7	S-7	7.0-7.5	4.8		
8	S-8	8.0-8.5	3.7		
9	S-9	9.0-9.5	3.4		
10					
11					
12					
13					
14					
15					

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B331-5

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: NW Corner of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/7/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/7/18 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 Topsoil	Core 1 Rec 5.0'/5.0'
1	S-1	1.0-1.5	3.3	0.3-3.5 Orange-red silty clay	
2	S-2	2.0-2.5	3.9		
3	S-3	3.0-3.5	3.5		
				3.5-8.3 Red-brown sandy, clayey silt	
4	S-4	4.0-4.5	3.5		Core 2 Rec 5.0'/5.0'
5	S-5	5.0-5.5	2.8		
6	S-6	6.0-6.5	2.6		
7	S-7	7.0-7.5	3.1		
8	S-8	8.0-8.5	3.8	8.3-10.0 Tan-gray silty sand	
9	S-9	9.0-9.5	3.2		
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	B331-5 (S-9)	15.1	<0.38	<0.38	<0.38	<0.38	<0.08	<0.12	<0.015	0	100	0	,(FCM),(P)
s	B331-4 (S-9)	12.3	<0.31	<0.31	<0.31	<0.31	<0.06	<0.1	<0.012	0	0	0	,(FCM)
s	B331-3 (S-9)	18.7	<0.47	<0.47	<0.47	<0.47	<0.09	<0.15	<0.019	0	0	0	,(FCM),(P)
s	B331-2 (S-9)	19.4	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.019	0	0	0	,(FCM)
s	B331-1 (S-9)	21.2	<0.53	<0.53	<0.53	<0.53	<0.11	<0.17	<0.021	0	0	0	,(FCM)
s	B352-3 (S-9)	37.8	<0.95	<0.95	<0.95	<0.95	<0.19	<0.3	<0.038	0	100	0	,(FCM),(P)
s	B352-2 (S-8)	15.4	<0.38	<0.38	1.6	1.6	0.83	<0.12	<0.015	0	56.6	43.4	Deg.PHC 53.1%,(FCM),(BO)
s	B352-1 (S-9)	17.3	<0.43	1.7	<0.43	1.7	0.43	<0.14	<0.017	91.4	4.9	3.7	V.Deg.PHC 60.6%,(FCM),(BO)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

100.8 %

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	44.0	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