May 28, 2019
June 9, 2019 Revision

Mr. Gordon Box, LG
Geotechnical Engineering Unit
North Carolina Department of Transportation
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: **PHASE II ENVIRONMENTAL ASSESSMENT OF PARCEL 39**
4240 Kernersville Road, Kernersville, NC
Harrell, Paul E; Harrell, Margaret
ESP Project No. GR22.313

TIP No.: U-2579AB
WBS N0.: 34839.1.8
County: Forsyth
Description: Winston-Salem - Northern Beltway Eastern Section (Future I-74) from I-40 to I-40 Business/US 421

Dear Mr. Box:

ESP Associates, Inc. (ESP) is pleased to submit this report on our Phase II Environmental Assessment of the subject parcel. This work was performed in accordance with your Request for Proposal dated April 1, 2019 and our Cost Proposal dated April 15, 2019.

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.

DocuSigned by:
Edward D Billington
7402544DC02F4EC...

NORTH CAROLINA LICENSED SEAL 1631 GEOLOGIST EDWARD DAVIS BILLINGTON

Edward D. Billington, PG
Senior Geologist/Geophysicist
EDB/NAZ

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 Phase II Environmental Assessment of the proposed Right of Way (ROW)/easement of Parcel 39 to locate possible underground storage tanks (USTs), sample soil, and delineate potentially contaminated soil.

2.0 HISTORY

Parcel 39 is owned by Paul E. Harrell and Margaret Harrell and includes a commercial building that reportedly was formerly a gasoline service station and a residential building. Our online search of NCDEQ records did not indicate any registered USTs or groundwater incidents for this site.

3.0 SITE OBSERVATIONS

During our April and May 2019 field work, the site included a commercial building and an occupied residence (Figure 2). The commercial building was divided into three businesses; the center business was operating as a consignment store and the other two businesses were vacant. Mr. Harrell stated that a former grease pit was present in the western business but he filled it in when he purchased the property. He had no knowledge of any USTs related to the business. The ground in the study area was covered by an asphalt parking lot, concrete sidewalks, and grassy areas. A possible vent pipe was observed at the rear of the residence.

4.0 METHODS

ESP performed a geophysical study of the area designated by the NCDOT on April 17, 18 and 23, 2019. We performed direct-push drilling and sampling of subsurface soils within the proposed ROW/easement on May 2, 2019. 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. 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 and reinforced concrete areas 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 proposed ROW/easement of Parcel 39 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Five borings were drilled within

the proposed ROW/easement of the parcel on May 2, 2019 using direct-push drilling and hand-augering (B39-1 through B39-5, Figure 8). The soil borings were advanced using a GeoProbe 54DT direct-push rig. Continuous soil samples were obtained to a depth of approximately ten feet using four-foot long Macro-Core® tubes. Soil cores had a recovery of 2.0 to 4.0 feet. Due to the presence of nearby buried utilities, a hand auger was used for the first 3 to 4 feet of B39-5. 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 PID readings were less than 10 parts per million (ppm) for each soil sample.

For samples selected for laboratory analysis, 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 5 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 early time gate response and differential response are shown on the plan sheet on Figures 6 and 7, respectively.

The EM61 differential results indicated several anomalies (response above background) that did not correspond to known site features. GPR data were collected over selected EM61 anomalies. The GPR data indicated the presence of two probable USTs in the northwest portion of the site, in front of the commercial building, and one probable UST behind the residence (Figure 5).

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 also 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 GRO were below the detection limits for the 6 samples tested. DRO was detected in 5 of the 6 samples tested but the concentrations were below the NCDEQ action level of 100 ppm. PAHs were detected in 2 of the 6 samples tested with values of 0.75 and 0.44 ppm for Samples B39-1/S4 and B39-4/S4, respectively

6.0 CONCLUSIONS

6.1 Interpretation of Results

The results of the Phase II investigation of Parcel 39 for NCDOT Project U-2579AB indicates the presence of two probable USTs within the proposed ROW/easement. These two probable USTs appear to be abandoned from the previous gasoline service station operation. The results of the soil sample testing indicate that there is not any petroleum hydrocarbon soil contamination at or above NCDEQ action levels within the proposed ROW/easement.

A third probable UST was found at the rear of the residence, just outside of the proposed easement. This probable UST is likely an abandoned heating oil tank.

6.2 Geophysics

The geophysical data indicate the presence of two abandoned USTs in the northwest portion of the proposed ROW. Each of these probable USTs are approximately 5 feet diameter by 15 feet long and buried about 4.5 feet below ground surface. These dimensions indicate that the abandoned USTs are each approximately 2,000 gallons in size.

The third abandoned UST at the rear of the residence is approximately 5 feet diameter by 10 feet long and buried about 2.5 feet below ground surface. These dimensions indicate that the abandoned UST is approximately 1,500 gallons in size.

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 ROW/easement on Parcel 39 (Figure 9).

7.0 RECOMMENDATIONS

Two probable USTs are present within the proposed ROW on Parcel 39 and should be removed prior to construction and in accordance with NCDEQ guidelines for UST closure. A third probable UST is just outside of the proposed construction easement and should be considered for closure prior to project construction. Other than the probable USTs, no limitations on construction activities or special handling of excavated soil are recommended for Parcel 39.

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	Date Collected	Sample Depth Range with PID > 10 ppm (feet bgs)	Maximum PID Reading (ppm) and Sample Depth (feet bgs)
B39-1	5/2/19	none	1.9 (4.0-4.5)
B39-2	5/2/19	none	1.3 (4.0-4.5, 6.0-6.5)
B39-3	5/2/19	none	2.7 (8.0-8.5)
B39-4	5/2/19	none	1.3 (4.0-4.5, 5.0-5.5)
B39-5	5/2/19	none	1.5 (5.0-5.5)

TABLE 2
SOIL SAMPLE UVF RESULTS SUMMARY

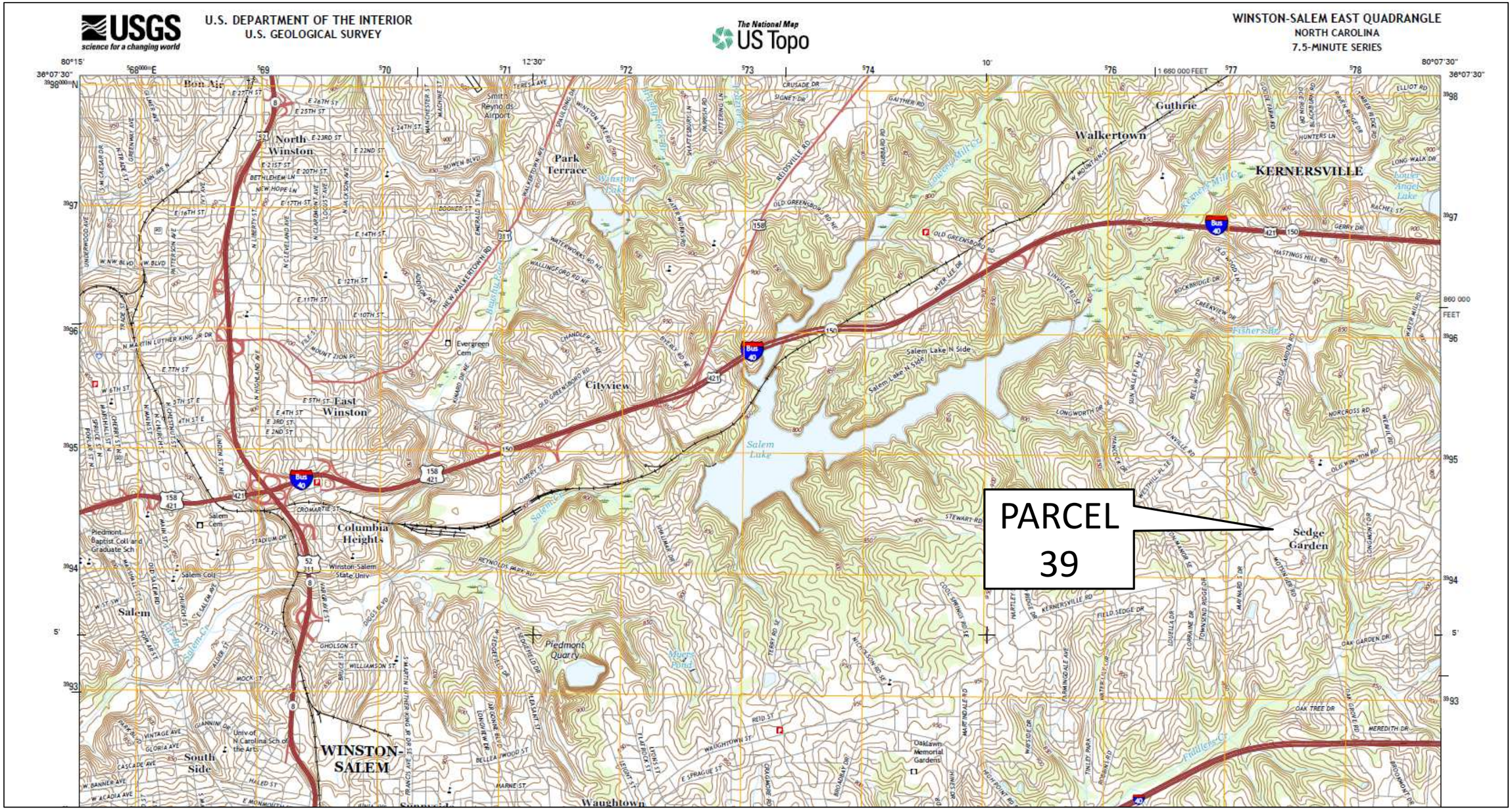
Boring	Sample ID (depth in feet bgs)	Date Collected	BTEX (C6-C9) (mg/kg)	GRO (C5-C10) (mg/kg)	DRO (C10-C35) (mg/kg)	PAHs (mg/kg)
B39-1	S4 (4.0-4.5)	5/2/19	<0.59	<0.59	33.5	0.75
B39-2	S9 (9.0-9.5)	5/2/19	<0.55	<0.55	1.5	<0.17
B39-3	S8 (8.0-8.5)	5/2/19	<0.57	<0.57	1.2	<0.18
B39-4	S4 (4.0-4.5)	5/2/19	<0.52	<0.52	16.4	0.44
	S9 (9.0-9.5)	5/2/19	<0.59	<0.59	1.6	<0.19
B39-5	S5 (5.0-5.5)	5/2/19	<0.35	<0.35	<0.35	<0.11

FIGURES

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map US Topo

WINSTON-SALEM EAST QUADRANGLE
NORTH CAROLINA
7.5-MINUTE SERIES



From USGS US Topo 7.5 – minute map for Winston-Salem East QUADRANGLE, NC, Date: 2016, Original Scale 1:24,000

PROJECT NO. GS22.313	***FIGURE 1 – PARCEL 39, PAUL E. HARRELL SITE VICINITY MAP***
SCALE N/A	***NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA***
DATE 6/9/19	
BY SBM/EDB	

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A. Photograph of front of Parcel 39 business and study area, facing southwest.

B. Photograph of rear of the business, facing north.

C. Photograph of marked location of two probable USTs in the northwest part of the site, facing south.

D. Photograph of front of Parcel 39 residence and survey area, facing south.

E. Photograph of rear of Parcel 39 residence, facing northeast. Note heating oil AST.

F. Photograph of rear of residence showing marked location of probable abandoned heating oil UST with apparent vent or fill pipe indicated by white arrow.

PROJECT NO. GS22.313	***FIGURE 2 – PARCEL 39, PAUL E. HARRELL SITE PHOTOGRAPHS***
SCALE N/A	
DATE 6/9/19	***NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA***
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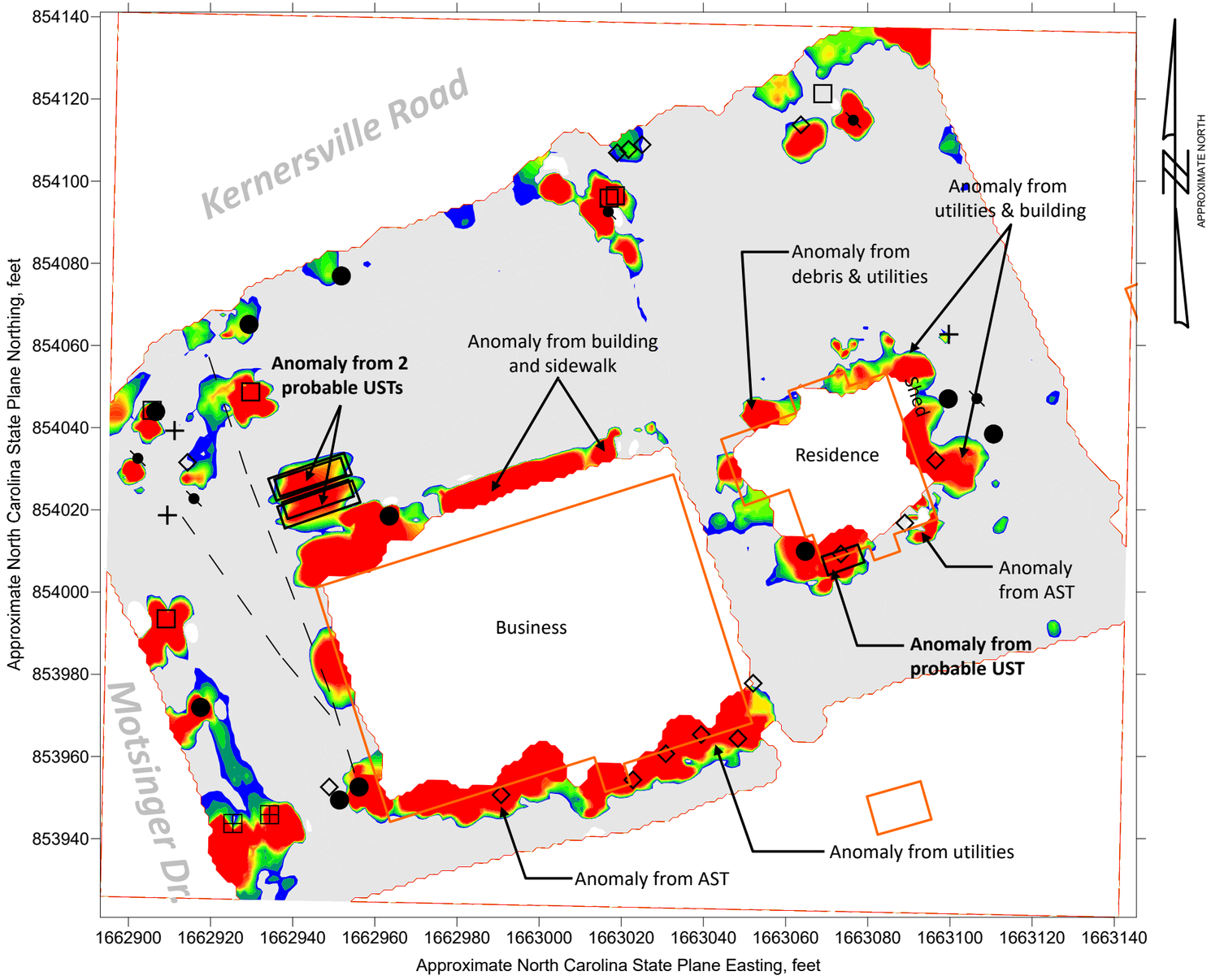

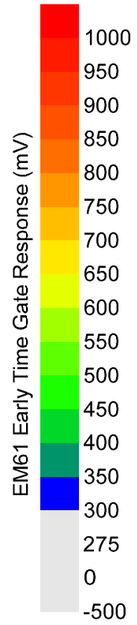

EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Storm drain
- Utility pole
- Guy wire anchor
- Sign pole, other pole
- UST Valve Cover or Fill Port
- Buried utility line (marked by others)
- Existing Building (per NCDOT file)
- EM61 Data Collection Areas
- GPR Data Collection Areas
- Underground Storage Tank

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

PROJECT NO.	GS22.313
SCALE	AS SHOWN
DATE	6/9/19
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FIGURE 3 – PARCEL 39, PAUL E. HARRELL EM61 EARLY TIME GATE RESPONSE

NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA

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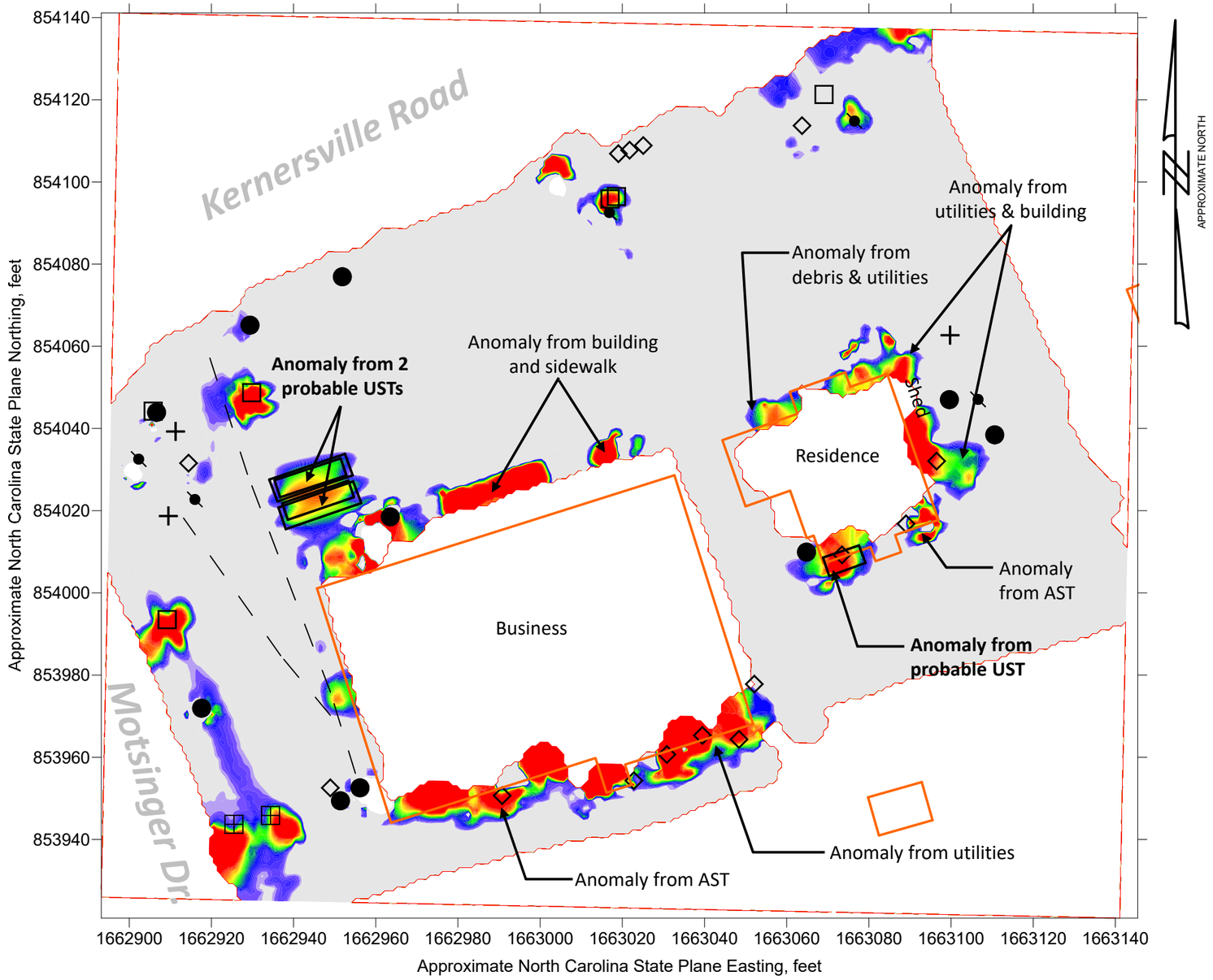

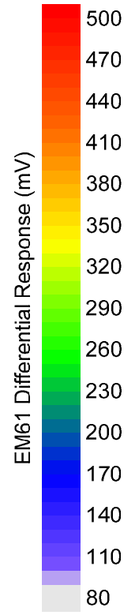

EXPLANATION

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- Utility Box (water meter, electrical outlet, etc.)
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PROJECT NO.	GS22.313
SCALE	AS SHOWN
DATE	6/9/19
BY	SBM/EDB

FIGURE 4 – PARCEL 39, PAUL E. HARRELL EM61 DIFFERENTIAL RESPONSE

NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA

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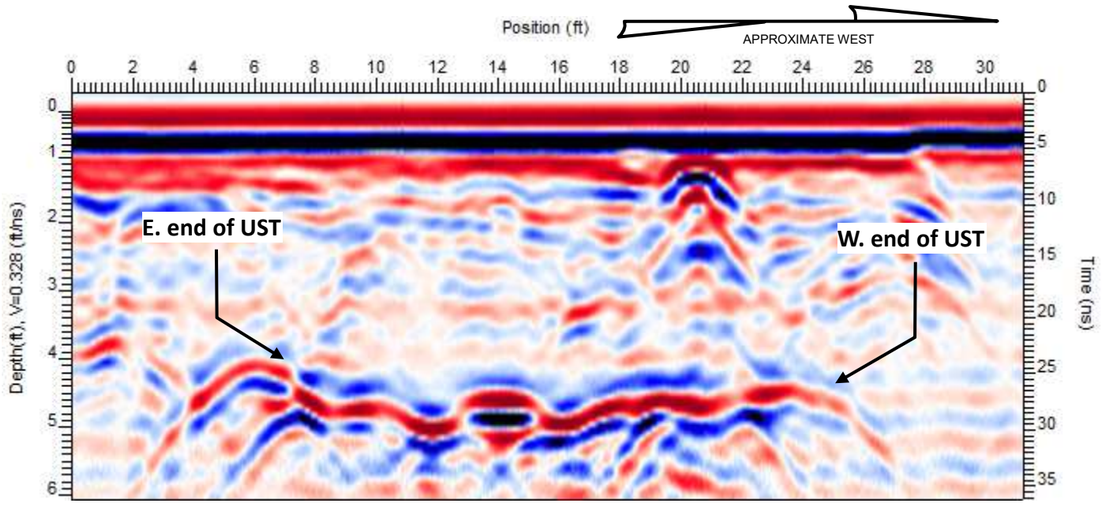
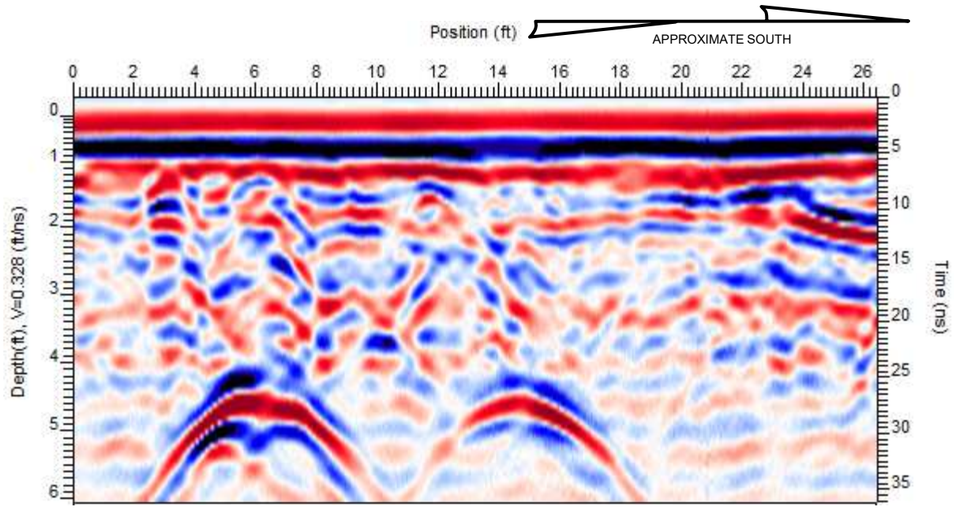
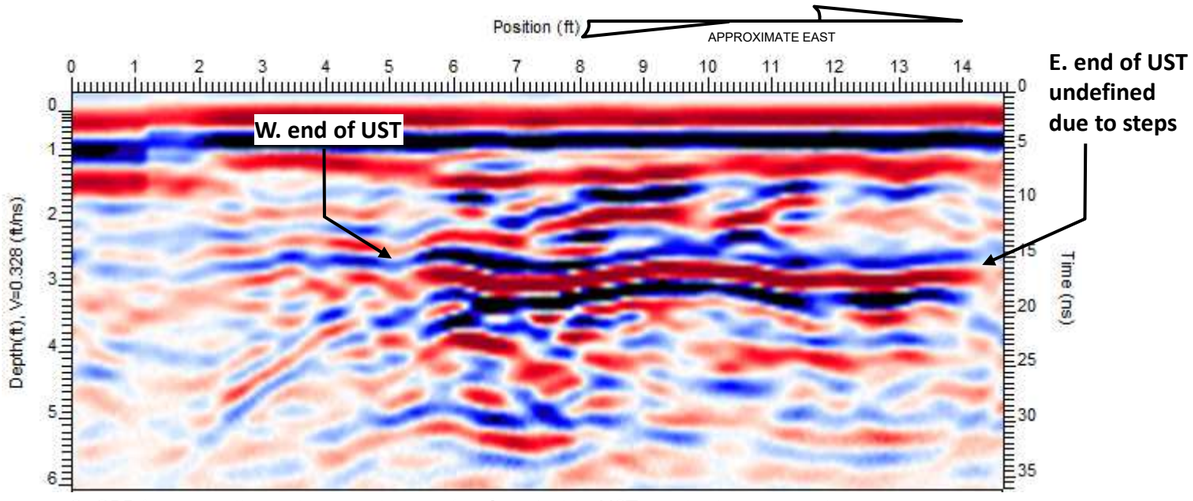


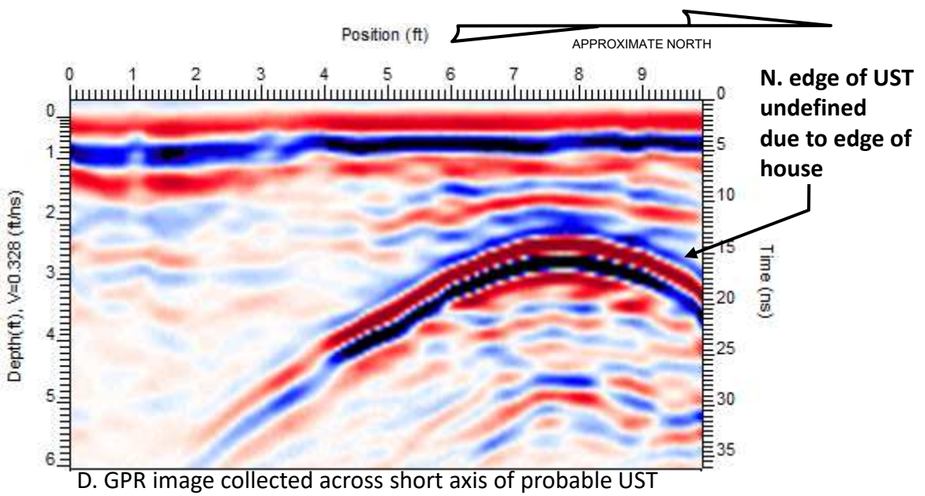
A. GPR image collected across long axis of one of 2 probable USTs marked near west side of business.



B. GPR image collected across short axis of two probable USTs marked near west side of business.



C. GPR image collected across long axis of probable UST marked near southwest corner of the house.



D. GPR image collected across short axis of probable UST marked near southwest corner of the house.

PROJECT NO. GS22.313	***FIGURE 5 – PARCEL 39, PAUL E. HARRELL GPR IMAGES OF PROBABLE USTS***
SCALE AS SHOWN	
DATE 6/9/19	***NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA***
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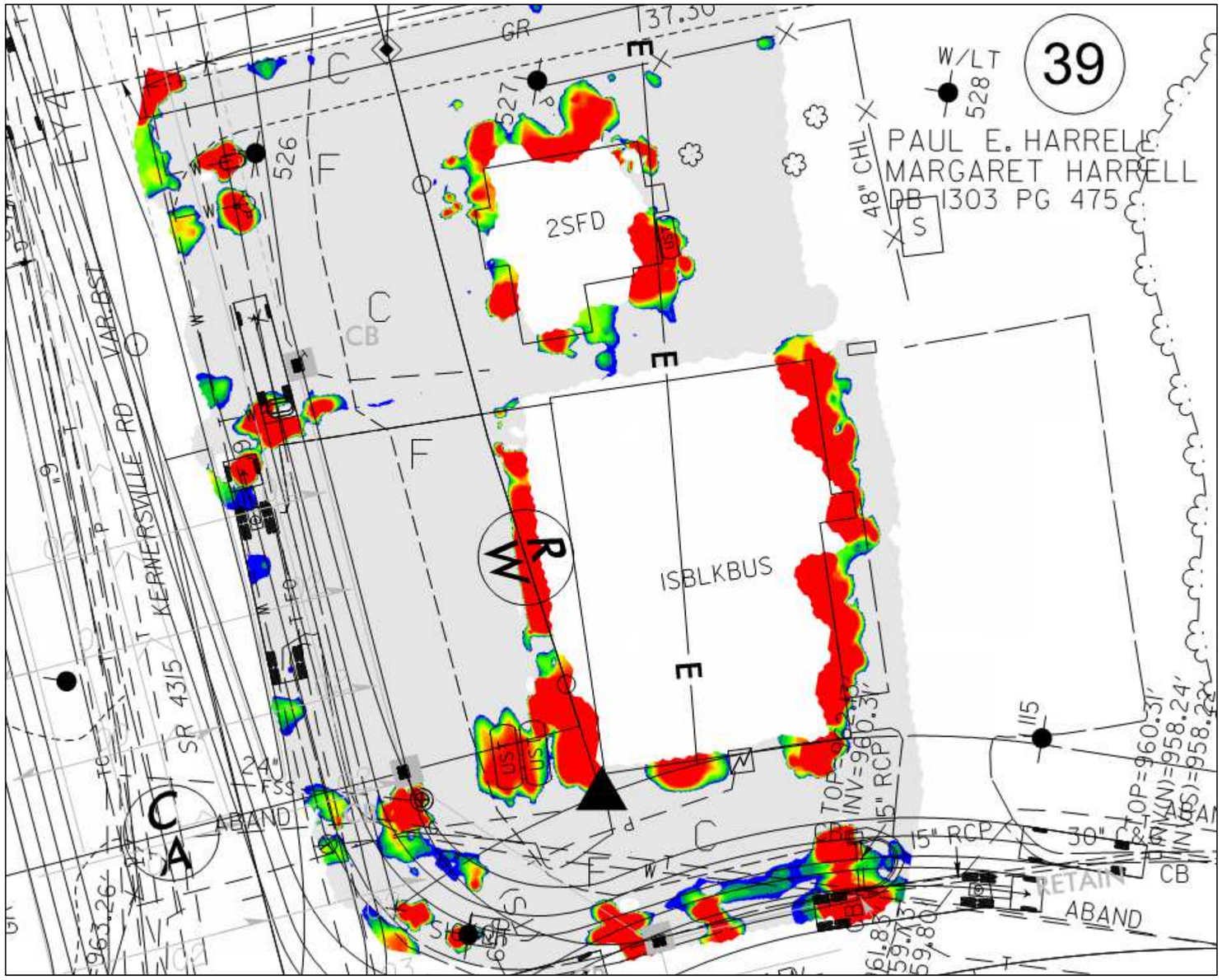

List of NCDOT reference files

- U2579ab_Geo_env_ESP.dgn
  - U2579AB_ncdot_fs.dgn
  - u2579ab_rdy_row.dgn
  - u2579ab_rdy_ss.dgn
  - U2579AB_hyd_dm.dgn
  - u2579ab_rdy_dsn.dgn

See Figure 10 for explanation of symbols and line types

30′ 0′ 30′
GRAPHIC SCALE

PROJECT NO. GS22.313	***FIGURE 6 – PARCEL 39, PAUL E. HARRELL EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET***
SCALE 1” = 30’	
DATE 6/9/19	***NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA***
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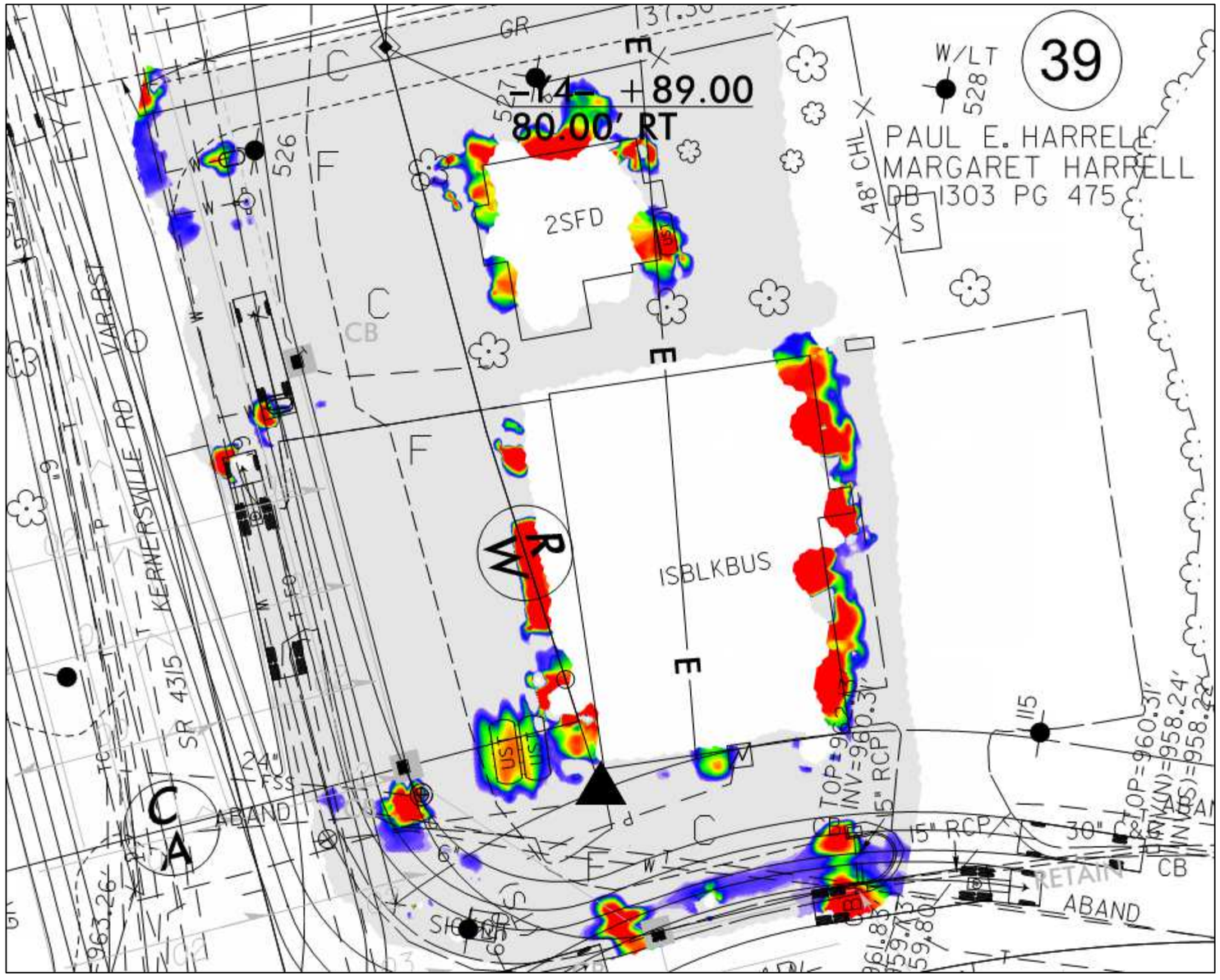

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  - u2579ab_rdy_row.dgn
  - u2579ab_rdy_ss.dgn
  - U2579AB_hyd_dm.dgn
  - u2579ab_rdy_dsn.dgn

See Figure 10 for explanation of symbols and line types

30′ 0′ 30′
GRAPHIC SCALE

PROJECT NO.	GS22.313
SCALE	1" = 30'
DATE	6/9/19
BY	SBM/EDB

FIGURE 7 – PARCEL 39, PAUL E. HARRELL
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET

NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA

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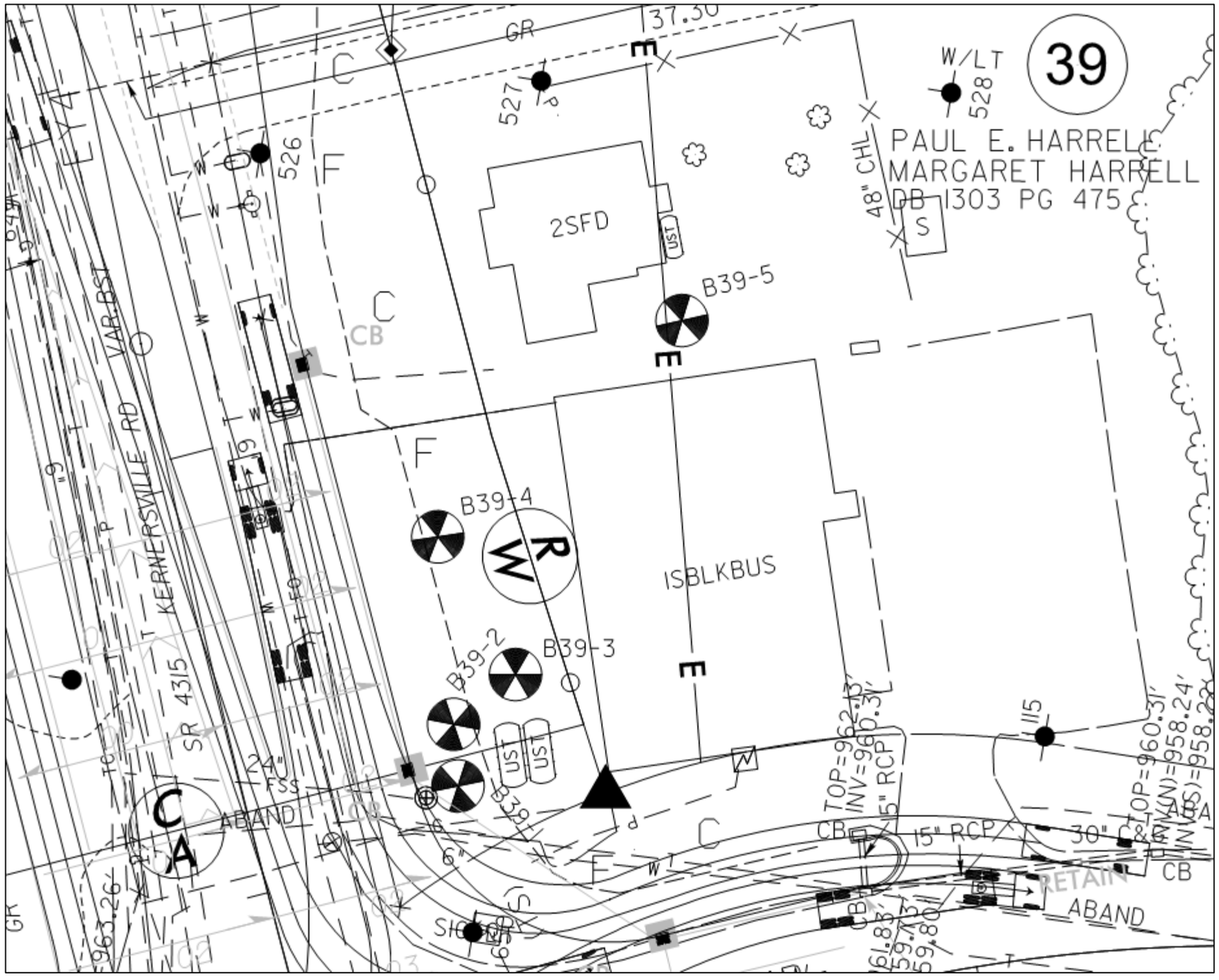

APPROXIMATE NORTH

List of NCDOT reference files

- U2579ab_Geo_env_ESP.dgn
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  - u2579ab_rdy_row.dgn
  - u2579ab_rdy_ss.dgn
  - U2579AB_hyd_dm.dgn
  - u2579ab_rdy_dsn.dgn

30′ 0′ 30′

GRAPHIC SCALE

See Figure 10 for explanation of symbols and line types

PROJECT NO. GS22.313	***FIGURE 8 – PARCEL 39, PAUL E. HARRELL BORING LOCATIONS ON PLAN SHEET***
SCALE 1" = 30'	***NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA***
DATE 6/9/19	
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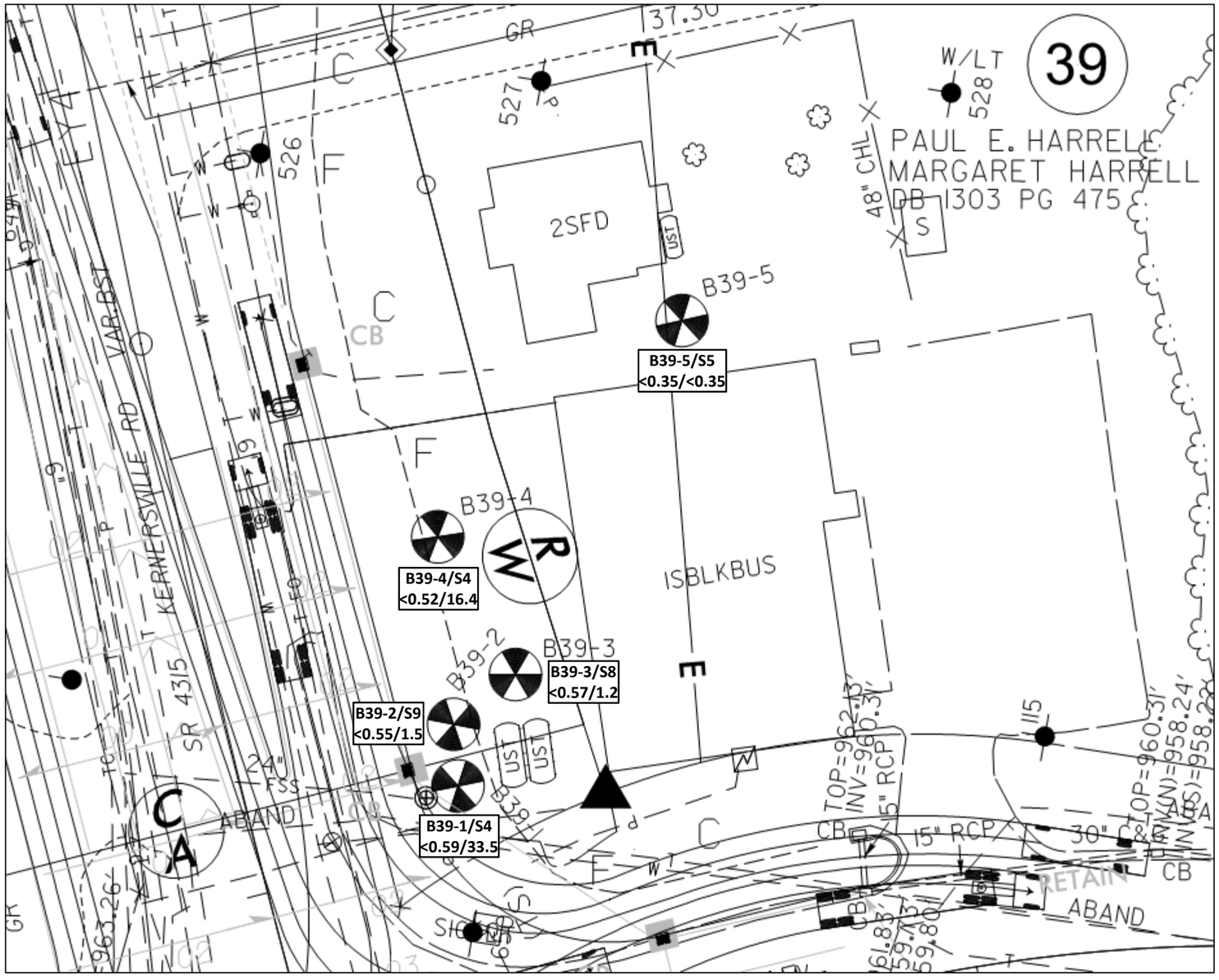

Explanation

Maximum Analytical Results per Boring

B39-1/S4
<0.59/33.5

Boring No./Sample No.
GRO/DRO (mg/kg, ppm)

List of NCDOT reference files

- U2579ab_Geo_env_ESP.dgn
  - U2579AB_ncdot_fs.dgn
  - u2579ab_rdy_row.dgn
  - u2579ab_rdy_ss.dgn
  - U2579AB_hyd_dm.dgn
  - u2579ab_rdy_dsn.dgn

30′ 0′ 30′
GRAPHIC SCALE

See Figure 10 for explanation of symbols and line types

PROJECT NO.	GS22.313
SCALE	1" = 30'
DATE	6/9/19
BY	SBM/EDB

FIGURE 9 – PARCEL 39, PAUL E. HARRELL SOIL ANALYTICAL RESULTS ON PLAN SHEET

NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA

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04/26/15

PROJECT REFERENCE NO. | SHEET NO.

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
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

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
- Buffer Zone 1
- Buffer Zone 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 R/W 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.	GS22.313
SCALE	N/A
DATE	6/9/19
BY	SBM/EDB

FIGURE 10
LEGEND FOR PLAN SHEET FIGURES

NCDOT PROJECT U-2579AB, N. BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US 421 WINSTON-SALEM, NORTH CAROLINA

ESP Associates, Inc.
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. B39-1

PROJECT NAME: NCDOT U-2579AB | PROJ. NO.: GR22.313
LOCATION: Northwest corner of USTs in front of business
TYPE OF BORING: Direct Push | DATE STARTED: 5/2/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 5/2/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Stefan Smith | SAMPLE METHOD: 4' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 54DT | LOGGED BY: N. Billington/ S. Montgomery | COMMENT:

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0 - 0.2 Asphalt, gravel base	Core 1 Rec 2.3'/4.0'
				0.2 - 1.0 Medium brown sandy clay, dry	
1	S-1	1.0-1.5	0.6	1.0 - 4.0 Brown silty sand, dry	
2	S-2	2.0-2.5	1.7		
3	S-3	3.0-3.5			
4	S-4	4.0-4.5	1.9		
				4.0 - 10.0 Medium brown sandy clay, dry	Core 2 Rec 4.0'/4.0'
5	S-5	5.0-5.5	0.4		
6	S-6	6.0-6.5	0.1		
7	S-7	7.0-7.5	0.5		
8	S-8	8.0-8.5	1.2		
					Core 3 Rec 2.0'/2.0'
9	S-9	9.0-9.5	1.8		
10					
11					
12					
13					
14					
15					

FIELD BORING LOG

BORING NO. B39-2

PROJECT NAME: NCDOT U-2579AB | PROJ. NO.: GR22.313
LOCATION: Northeast corner of USTs in front of business
TYPE OF BORING: Direct Push | DATE STARTED: 5/2/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 5/2/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Stefan Smith | SAMPLE METHOD: 4' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 54DT | LOGGED BY: N. Billington/ S. Montgomery | COMMENT:

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0 - 0.2 Asphalt, gravel base	Core 1 Rec 3.1'/4.0'
				0.2 - 9.0 Brown sandy clay, dry	
1	S-1	1.0-1.5	0.5		
2	S-2	2.0-2.5	0.5		
3	S-3	3.0-3.5			
4	S-4	4.0-4.5	1.3		
				4.0 - Grading to reddish-brown, dry	Core 2 Rec 4.0'/4.0'
5	S-5	5.0-5.5	0.8		
6	S-6	6.0-6.5	1.3		
7	S-7	7.0-7.5	0.8		
8	S-8	8.0-8.5	0.4		Core 3 Rec 2.0'/2.0'
9	S-9	9.0-9.5	1.0	9.0 - 10.0 Light brown silty sand	
10					
11					
12					
13					
14					
15					

FIELD BORING LOG

BORING NO. B39-3

PROJECT NAME: NCDOT U-2579AB | PROJ. NO.: GR22.313
LOCATION: East end of USTs in front of business
TYPE OF BORING: Direct Push | DATE STARTED: 5/2/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 5/2/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Stefan Smith | SAMPLE METHOD: 4' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 54DT | LOGGED BY: E. Billington/ S. Montgomery | COMMENT:

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0 - 0.5 Asphalt, gravel base	Core 1 Rec 4.0'/4.0'
				0.5 - 2.3 Dark brown fine sand with small amount of clay, dry	
1	S-1	1.0-1.5	0.8		
2	S-2	2.0-2.5	1.0		
				2.3 - 9.0 Medium brown sandy clay, dry	
3	S-3	3.0-3.5	1.4		
4	S-4	4.0-4.5	1.0	4.0 - Grading to reddish brown	
					Core 2 Rec 4.0'/4.0'
5	S-5	5.0-5.5	1.9		
6	S-6	6.0-6.5	1.6		
7	S-7	7.0-7.5	0.7		
8	S-8	8.0-8.5	2.7		
					Core 3 Rec 2.0'/2.0'
9	S-9	9.0-9.5	1.9	9.0 - 10.0 Light brown sandy silt, dry	
10					
11					
12					
13					
14					
15					

FIELD BORING LOG

BORING NO. B39-4

PROJECT NAME: NCDOT U-2579AB | PROJ. NO.: GR22.313
LOCATION: East end of the parking lot in front of business
TYPE OF BORING: Direct Push | DATE STARTED: 5/2/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 5/2/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Stefan Smith | SAMPLE METHOD: 4' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 54DT | LOGGED BY: E. Billington/ S. Montgomery | COMMENT:

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0 - 0.2 Asphalt, gravel base	Core 1 Rec 4.0'/4.0'
				0.2 - 2.0 Light brown sandy silt, dry	
1	S-1	1.0-1.5	1.0		
2	S-2	2.0-2.5	1.1	2.0 - 8.0 Medium red brown sandy clay, dry	
3	S-3	3.0-3.5	0.9		
					Core 2 Rec 4.0'/4.0'
4	S-4	4.0-4.5	1.3		
5	S-5	5.0-5.5	1.3		
6	S-6	6.0-6.5	0.6		
7	S-7	7.0-7.5	0.4		
					Core 3 Rec 2.0'/2.0'
8	S-8	8.0-8.5	0.4	8.0 - 10.0 Medium red-brown sandy silt, dry	
9	S-9	9.0-9.5	1.0		
10					
11					
12					
13					
14					
15					

FIELD BORING LOG

BORING NO. B39-5

PROJECT NAME: NCDOT U-2579AB | PROJ. NO.: GR22.313
LOCATION: Near southwest corner of residence
TYPE OF BORING: Direct Push | DATE STARTED: 5/2/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 5/2/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Stefan Smith | SAMPLE METHOD: 4' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 54DT, Hand Auger (H.A.) | LOGGED BY: E. Billington/ S. Montgomery | COMMENT:

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0 - 0.1 Grass, root mat	H.A. 0-4.0'
				0.1 - 3.0 Red brown fine sandy clay, dry	
1	S-1 H.A.	1.0-1.5	0.6		
2	S-2 H.A.	2.0-2.5	0.9		
3	S-3 H.A.	3.0-3.5	0.8	3.0 - 4.5 Red brown to light brown clayey sand, dry	
					Core 2 Rec 4.0'/4.0'
4	S-4	4.0-4.5	0.7		
				4.5 - 10.0 Red brown clayey silt, dry	
5	S-5	5.0-5.5	1.5		
6	S-6	6.0-6.5	0.9		
7	S-7	7.0-7.5	0.7		
					Core 3 Rec 2.0'/2.0'
8	S-8	8.0-8.5	1.2		
9	S-9	9.0-9.5	1.2		
10					
11					
12					
13					
14					
15					

APPENDIX B

RED LAB LABORATORY TESTING REPORT

QED

REDLAB™ RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: ESP ASSOCIATES
Address: GREENSBORO, NC

Samples taken Thursday, May 2, 2019
Samples extracted Thursday, May 2, 2019
Samples analysed Tuesday, May 7, 2019

Contact: NED BILLINGTON

Operator CAROLINE STEVENS

Project: GR22.313 GROUP 1

F03640

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	B39-1 S4	23.6	<0.59	<0.59	33.5	33.5	22.2	0.75	<0.024	0	81.7	18.3	Deg Fuel 89.8%,(FCM)
s	B39-2 S9	21.8	<0.55	<0.55	1.5	1.5	1	<0.17	<0.022	0	79.7	20.3	Deg Fuel 77.5%,(FCM)
s	B39-3 S8	22.6	<0.57	<0.57	1.2	1.2	1	<0.18	<0.023	0	52.2	47.8	V.Deg.PHC 71.8%,(FCM)
s	B39-4 S4	21.0	<0.52	<0.52	16.4	16.4	12.7	0.44	<0.021	0	82.3	17.7	Deg Fuel 91.7%,(FCM)
s	B39-4 S9	23.6	<0.59	<0.59	1.6	1.6	1.1	<0.19	<0.024	0	81.1	18.9	Deg Fuel 74.6%,(FCM)
s	B39-5 S5	14.1	<0.35	<0.35	<0.35	<0.35	<0.07	<0.11	<0.014	0	0	0	,(FCM),(BO)

Initial Calibrator QC check OK

Final FCM QC Check OK 99.4 %

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

APPENDIX C
CHAIN-OF-CUSTODY FORM

Client Name:	ESP Assoc.
Address:	Greensboro
Contact:	Ned Billington
Project Ref.:	GR22.313
Email:	on file
Phone #:	
Collected by:	S. Montgomery

REDLAB™
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 24 Hour	TAT Requested 48 Hour	Initials	Sample ID			Total Wt.	Tare Wt.	Sample Wt.
5/2/19		✓	CJS	B39-1	54	Group 1	55.9	44.9	11
5/2/19		✓	EDS	B39-2	59		57.1	45.2	11.9
5/2/19		✓	EDS	B39-3	58		56.2	44.7	11.5
5/2/19		✓	EDS	B39-4	54		56.9	44.5	12.4
5/2/19		✓	EDS	B39-4	59		55.7	44.7	11
5/2/19		✓	EDS	B39-5	55		54.8	44.9	9.9
5/2/19		✓	EDS	B342-7	54	Group 2	55.5	44.9	10.6
5/2/19		✓	EDS	B342-8	58		54.4	44.8	9.6
5/2/19		✓	EDS	B342-9	55		55.0	44.8	10.2
5/2/19		✓	EDS	B342-10	59		54.3	44.6	9.7

Comments: UVF, pls report each group separately

Relinquished by	Date/Time	Accepted by	Date/Time
Ned Billington	5/6/19		
Relinquished by	Date/Time	Accepted by	Date/Time

RED Lab USE ONLY

10

B