April 11, 2019

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

**RE: GEOENVIRONMENTAL PHASE II INVESTIGATION OF PARCEL 2**
**4 Brothers Food Store #302, Beroth Oil Company**
**800 S. State St., Yadkinville, North Carolina**
**ESP Project No. GR22.309**

| | |
|---|---|
| TIP Number: | U-5809 |
| WBS Number: | 44382.1.1 |
| County: | YADKIN |
| Description: | Construct median along US 601 (State Street) from US 421 to SR 1146 (Lee Avenue) and add roundabouts at both ends of project |

Dear Mr. Box:

ESP Associates, Inc. (ESP) is pleased to submit this report on our GeoEnvironmental Phase II Investigation of the subject parcel. This work was performed in accordance with your Request for Proposal (RFP) dated January 25, 2019 and our Cost Proposal dated February 1, 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.

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

DocuSigned by:
Ed Billington
7402544DC925450...

NORTH CAROLINA LICENSED SEAL 1631 GEOLOGIST EDWARD DAVIS BILLINGTON

not considered Final unless all signatures are completed

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## APPENDICES

## 1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is planning to construct a median along US 601 (State Street) from US 421 to SR 1146 (Lee Avenue). Roundabouts will be added at both ends of the project. The NCDOT requested that ESP Associates, Inc. (ESP) perform a Phase II Investigation of the existing right-of-way (ROW) and proposed permanent drainage utility easement (PUE) of Parcel 2 to locate possible underground storage tanks (USTs), sample soil, and delineate potential contaminated soil. Parcel 2 is located at 800 South State Street in Yadkinville, North Carolina (Figure 1). The size of the study area was approximately 0.47 acres.

## 2.0 HISTORY

This site is owned by Beroth Oil Company, Inc. and occupied by an active convenience store/gas station named 4 Brothers Food Store No. 302. There are 5 existing underground storage tanks (USTs) on the west side of the site. The facility ID is 00-0-0000005052. According to the NCDOT RFP, a possible UST fill port was noted previously in the vacant lot on the west side of the active gas station; this was not observed during ESP's field work. Groundwater incident # 5576 is associated with this site. The NCDEQ files for Parcel 2 include the results of a 1989 investigation which report BTEX and MTBE contamination plumes in the shallow groundwater on the site. Groundwater was 8.7 feet depth and 10.3 feet depth in the ROW area at the time of the specific report (1989).

## 3.0 SITE OBSERVATIONS

During our February and March 2019 field work, the site was occupied by a convenience store/gas station (Figure 2). The ground in the study area was covered by asphalt pavement, concrete, and soil/grass. There were 5 active USTs on the west side of the site but outside of the proposed easement: 3 gasoline USTs (8,000 gallons each), one diesel UST (8,000 gallons), and one kerosene UST (6,000 gallons). ESP observed one abandoned monitoring well that had been grouted full on the east side of the site. There are two metal cover plates within the proposed easement on the north side of the site that appear to be associated with the active UST monitoring system. These are noted as monitoring wells on the final survey MicroStation file.

## 4.0 METHODS

ESP performed a geophysical study of the area designated by the NCDOT on February 19, 2019. We performed direct-push drilling, hand augering and sampling of subsurface soils within the existing ROW and proposed easement on March 5, 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 an electromagnetic induction 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 through 6). Location control for the EM61 data was provided in real-time using a differential global positioning system (DGPS). We also used the DGPS to obtain the approximate location of surficial site features for correlation with the EM61 data.

## 4.2 Borings

ESP performed direct-push drilling and hand augering activities within the existing ROW and proposed easement of Parcel 2 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Seven borings were drilled, designated B2-1 through B2-7 (Figure 7). The soil borings were advanced using a GeoProbe 7822DT drill rig. Continuous soil samples were obtained to a depth of approximately 10 feet using two 5-foot long Macro Cores®. Soil cores varied in recovery from 1.0 to 5 feet. A hand auger was used to obtain samples from the upper 5 feet when the Macro Core recovery was low. 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 representative while wearing nitrile disposable gloves. Each sample was placed in a sealed plastic bag and then kept in a warm vehicle approximately 10 minutes prior to measuring volatile organic compound (VOC) levels in the head space of the bag with the PID. The soil samples had PID readings of less than 10 parts per million (ppm) (Table 1).

Nine soil samples were selected for laboratory analysis, as listed in Table 2. 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 during the drilling investigation. Perched water was encountered at 5 feet depth in one boring on the east side of the site (B2-2).

## 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 responses corresponded to known site features, such as buried utilities and metallic features on the ground surface. Based on the EM61 differential response, ground-penetrating radar (GPR) imaging was not required.

The EM61 early time gate response and differential response are shown on the NCDOT plan sheet on Figures 5 and 6, respectively.

### 5.2 Sample Data

The soil sample UVF hydrocarbon analysis results for BTEX, GRO, and DRO are presented in Table 2. The RED Lab laboratory report, which also includes results for TPH, total aromatics, PAHs, 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 indicate that BTEX and GRO were below the laboratory detection limits for the 9 samples tested. DRO was detected in 6 of 9 soil samples tested but was below the NCDEQ action level of 100 ppm.

## 6.0 CONCLUSIONS

### 6.1 Interpretation of Results

The results of the Phase II Investigation of Parcel 2 of NCDOT Project U-5809 indicate the presence of 5 active USTs outside of the existing ROW and proposed easement. The geophysical data did not indicate the presence of abandoned USTs in the study area. The results of the PID field screening and the UVF laboratory testing did not indicate the presence of petroleum hydrocarbon contamination above NCDEQ action levels in the soil in the upper 10 feet within the study area.

### 6.2 Geophysics

The geophysical data did not indicate the presence of abandoned USTs in the study area.

### 6.3 Soil

The results of the PID field screening and the UVF laboratory testing did not indicate the presence of petroleum hydrocarbon contamination above NCDEQ action levels in the soil in the upper 10 feet within the study area.

## 7.0 RECOMMENDATIONS

No limitations on construction activities or special handling of excavated soil are recommended for Parcel 2. Groundwater was not encountered in the upper 10 feet in the study area. However, the groundwater level may fluctuate, based on the 1989 environmental investigation performed by others, and it is possible that contaminated groundwater could be encountered at the time of construction. If groundwater is encountered during construction, it should be handled and disposed of in accordance with NCDEQ regulations.

## 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

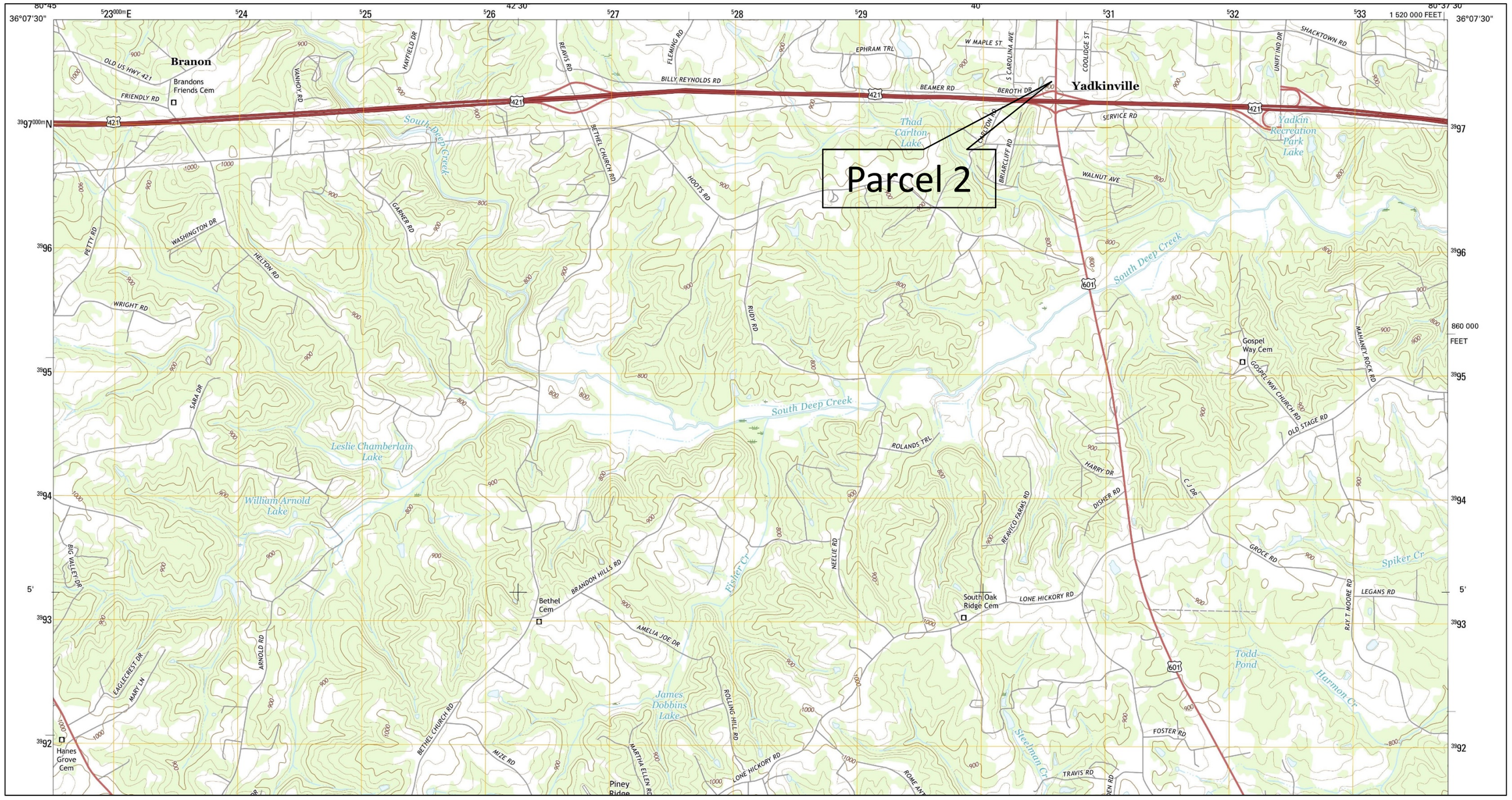
**TABLE 1**
**SOIL SAMPLE PID READINGS**

| Boring | Sample Depth Range with PID > 10 ppm (feet bgs) | Maximum PID Reading (ppm) and Sample Depth (feet bgs) |
|---|---|---|
| B2-1 | none | 1.7 (7.0-7.5) |
| B2-2 | none | 5.3 (8.0-8.5) |
| B2-3 | none | 7.1 (8.0-8.5) |
| B2-4 | none | 4.1 (5.0-5.5) |
| B2-5 | none | 4.8 (9.0-9.5) |
| B2-6 | none | 4.5 (5.0-5.5) |
| B2-7 | none | 4.1 (9.0-9.5) |

**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) |
|---|---|---|---|---|---|
| B2-1 | S2 | 3/5/19 | <0.64 | <0.64 | <0.26 |
| B2-1 | S7 | 3/5/19 | <0.59 | <0.59 | <0.23 |
| B2-2 | S8 | 3/5/19 | <0.5 | <0.5 | 0.39 |
| B2-3 | S5 | 3/5/19 | <0.48 | <0.48 | 3.3 |
| B2-4 | S1 | 3/5/19 | <0.59 | <0.59 | 63.7 |
| B2-5 | S4 | 3/5/19 | <0.59 | <0.59 | 0.59 |
| B2-5 | S9 | 3/5/19 | <0.56 | <0.56 | 0.45 |
| B2-6 | S3 | 3/5/19 | <0.57 | <0.57 | <0.23 |
| B2-7 | S3 | 3/5/19 | <0.6 | <0.6 | 0.83 |

# FIGURES




From: USGS US Topo 7.5 - minute map for LONE HICKORY, NC QUADRANGLE, NC, Date: 2016, Original Scale: 1:24,000

| | |
|---|---|
| PROJECT NO. GR22.309 | ***FIGURE 1 - PARCEL 2, BEROTH OIL CO. INC. SITE VICINITY MAP*** |
| SCALE AS SHOWN | |
| DATE 4/3/19 | ***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA*** |
| BY EDB | |

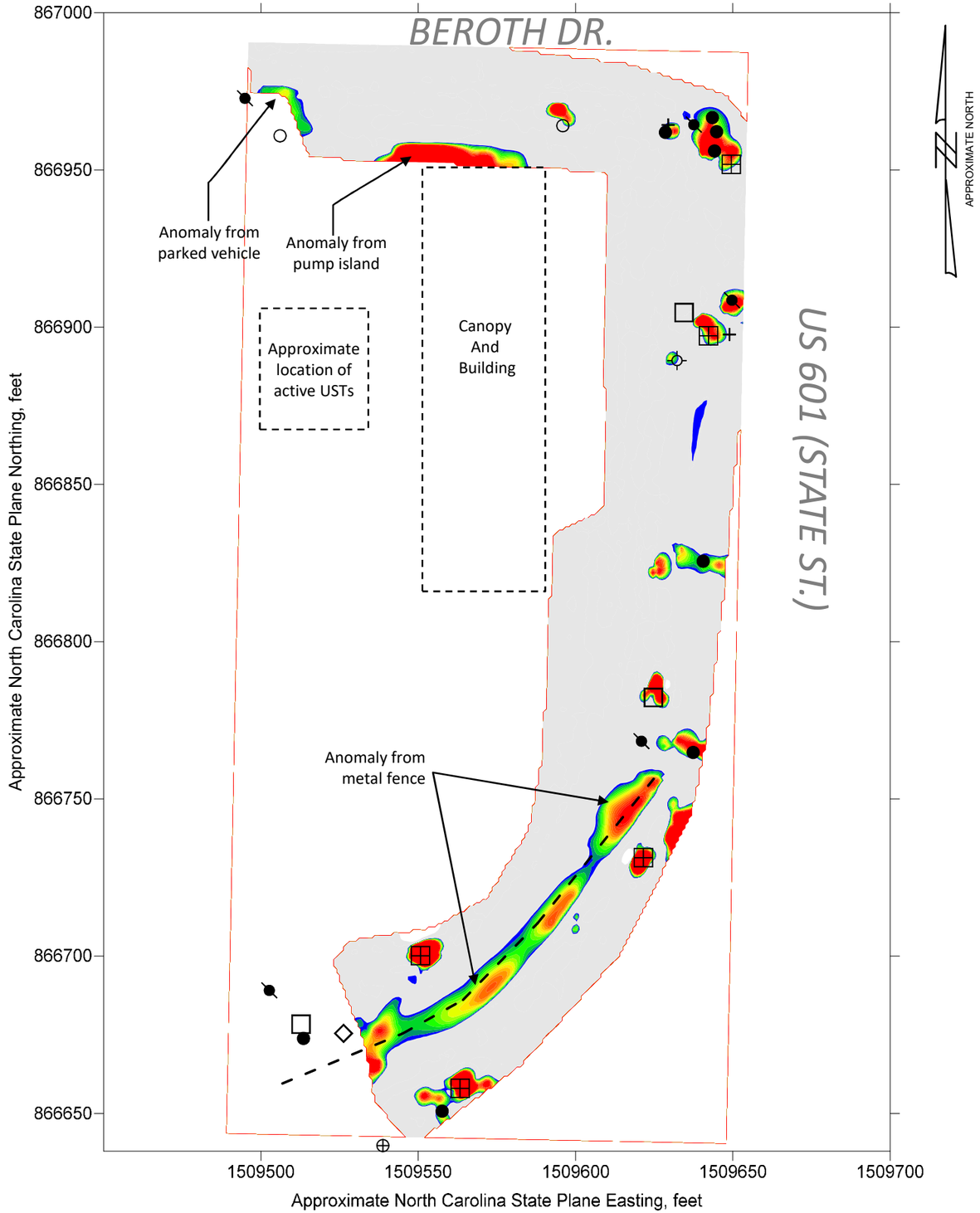
ESP Associates, Inc.
7011 Albert Pick Rd., Suite E
Greensboro, NC 27409
336.334.7724
www.espassociates.com

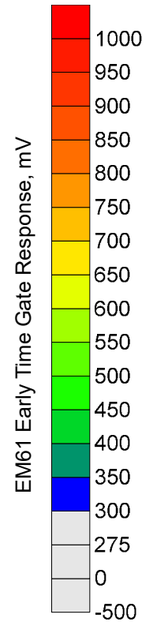

A. Photo from southwest corner of site, looking northeast.

B. Photo from northeast corner of site, looking south.

C. Photo from northeast corner of site, looking west.

| | | |
|---|---|---|
| PROJECT NO. GR22.309 | ***FIGURE 1 - PARCEL 2, BEROTH OIL CO. INC. SITE PHOTOGRAPHS*** | ESP Associates, Inc. 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com |
| SCALE NTS | | |
| DATE 4/3/19 | ***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA*** | |
| BY EDB | | |




EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Drop Inlet or Catch Basin
- Manhole
- Power pole
- Guy wire anchor
- Sign pole, other pole
- UST System Monitoring
- Monitoring well, abandoned
- EM61 Data Collection Areas
- GPR Data Collection Areas
- UST — Approximate location of known UST

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. | GR22.309 |
| SCALE | AS SHOWN |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 3 - PARCEL 2, BEROTH OIL CO. INC.***
***EM61 EARLY TIME GATE RESPONSE***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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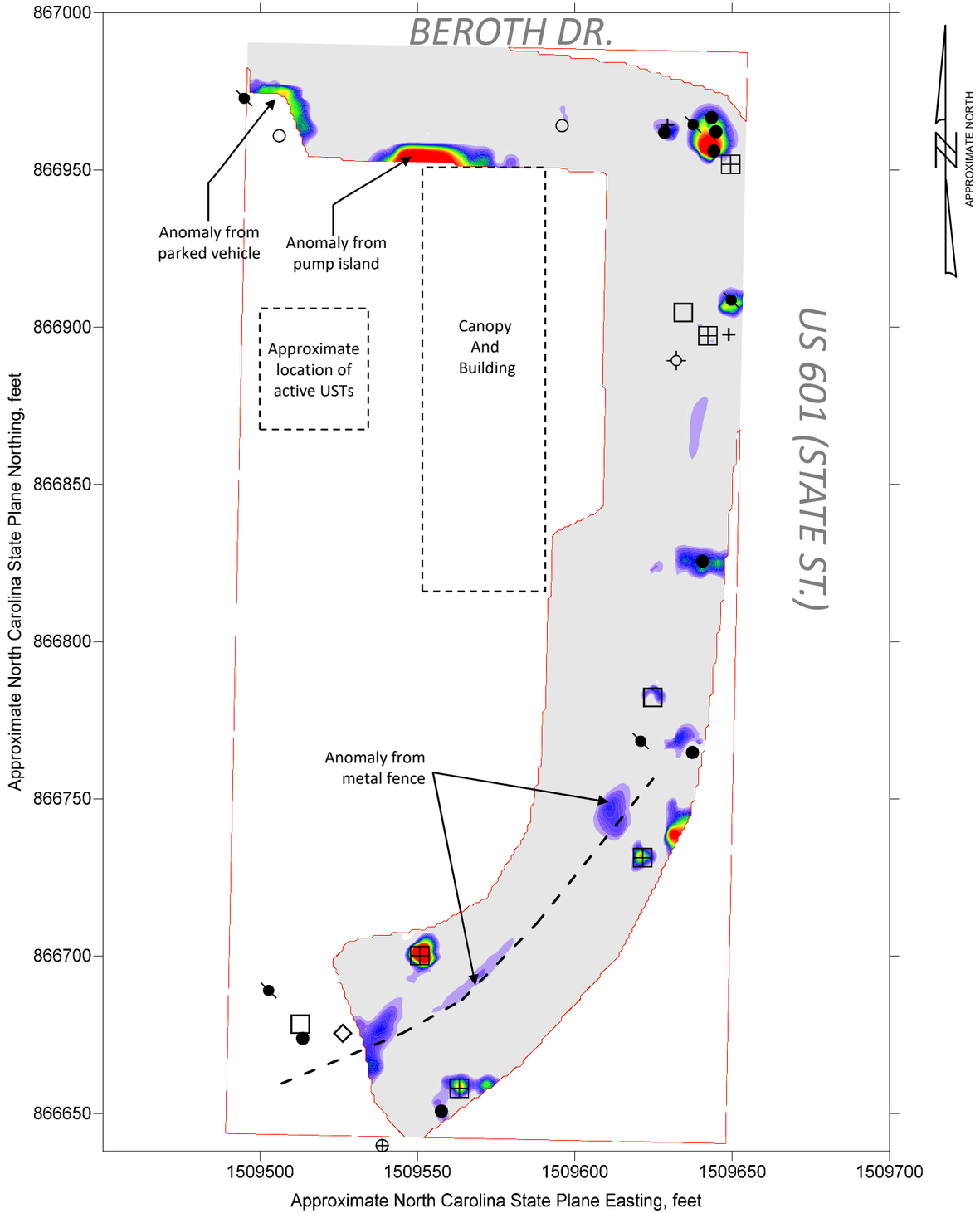


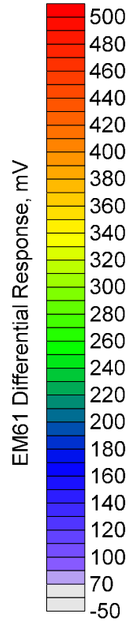


EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
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| | |
|---|---|
| PROJECT NO. | GR22.309 |
| SCALE | AS SHOWN |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 4 – PARCEL 2, BEROTH OIL CO. INC. EM61 DIFFERENTIAL RESPONSE***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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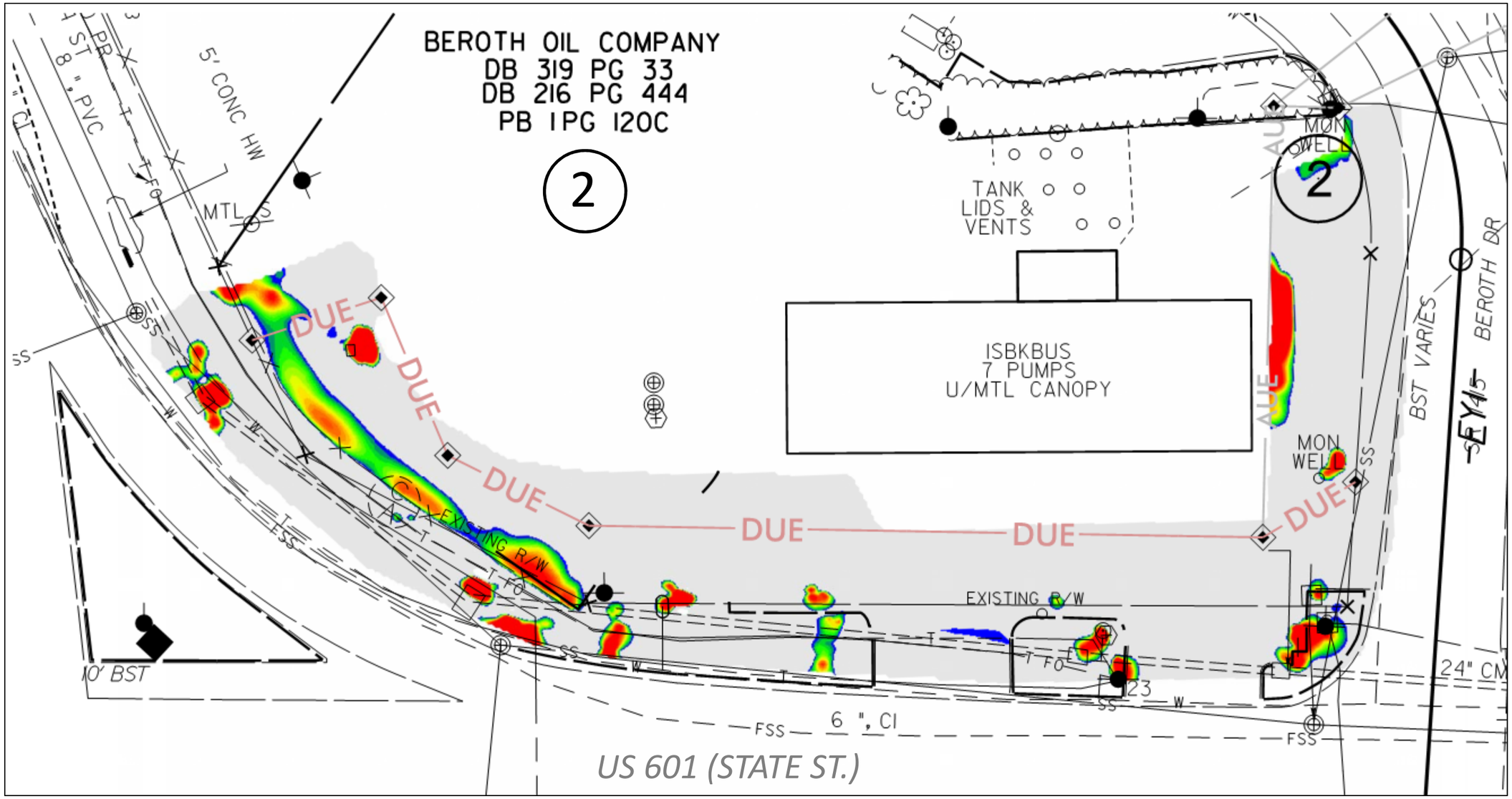
APPROXIMATE NORTH




See Figure 9 for explanation of symbols and line types

List of NCDOT reference files

- U-5809_Geo_env_ESP.dgn
  - u5809_ls_fs.dgn
  - U-5809_hyd_dm.dgn

30' 0' 30'
GRAPHIC SCALE

| | |
|---|---|
| PROJECT NO. | GR22.309 |
| SCALE | 1" = 50' |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 5 – PARCEL 2, BEROTH OIL CO. INC. EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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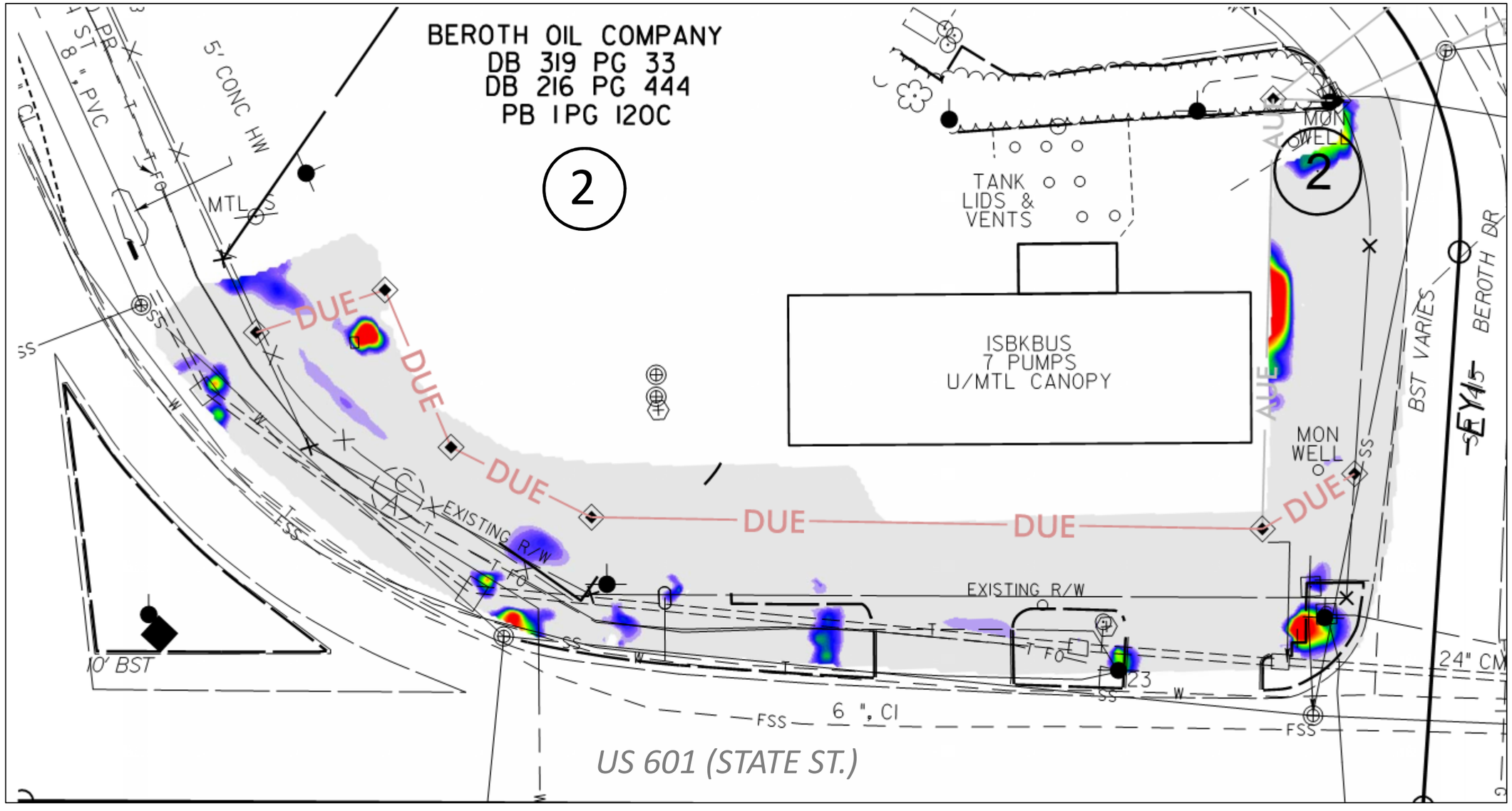
APPROXIMATE NORTH




List of NCDOT reference files

- U-5809_Geo_env_ESP.dgn
  - u5809_ls_fs.dgn
  - U-5809_hyd_dm.dgn

See Figure 9 for explanation of symbols and line types

30′ 0′ 30′
GRAPHIC SCALE

| | |
|---|---|
| PROJECT NO. | GR22.309 |
| SCALE | 1" = 50' |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 6 – PARCEL 2, BEROTH OIL CO. INC. EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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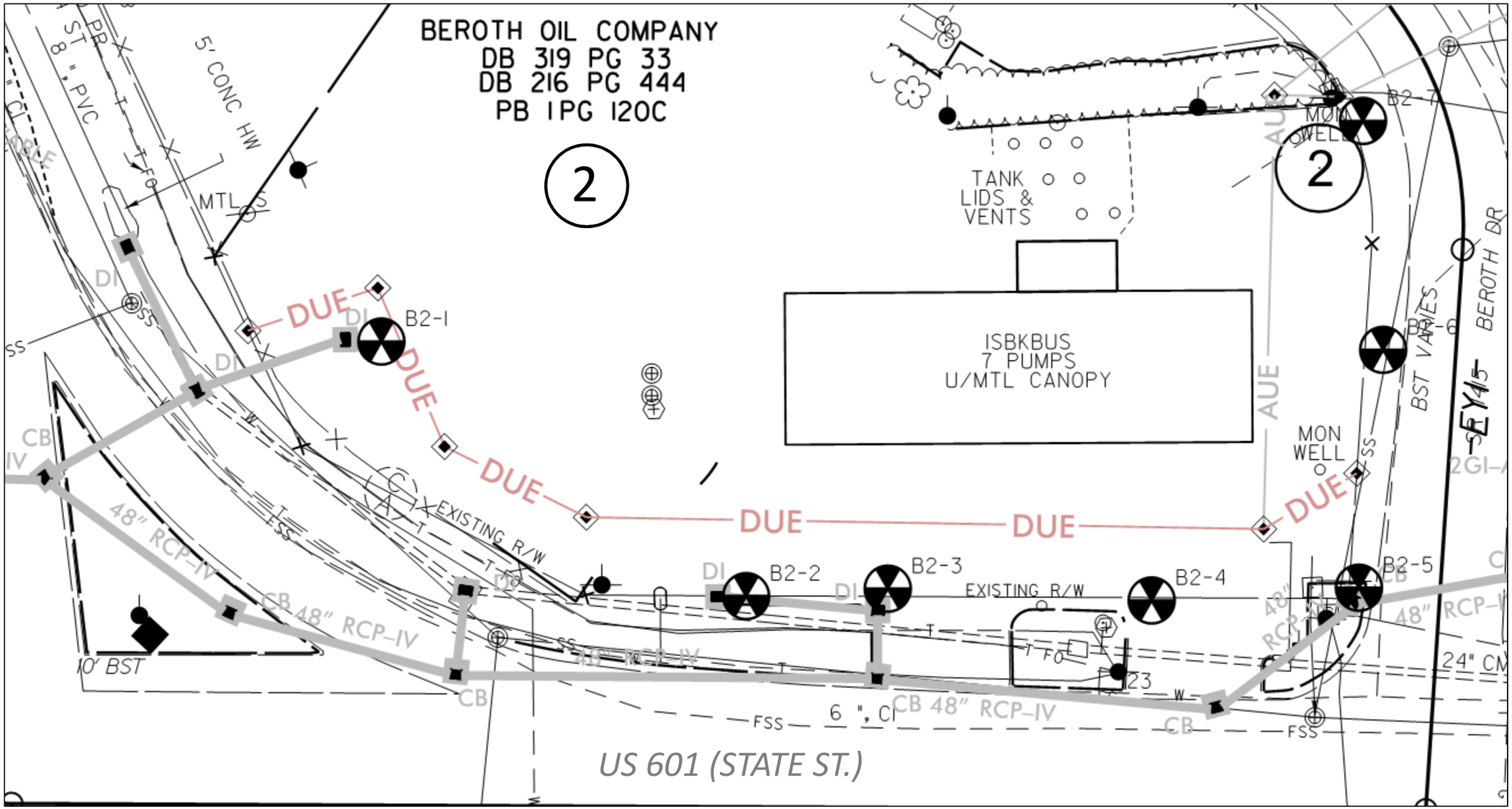


List of NCDOT reference files

- U-5809_Geo_env_ESP.dgn
  - u5809_ls_fs.dgn
  - U-5809_hyd_dm.dgn

See Figure 9 for explanation of symbols and line types

30' 0' 30'
GRAPHIC SCALE

| | |
|---|---|
| PROJECT NO. | GR22.309 |
| SCALE | 1" = 50' |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 7 – PARCEL 2, BEROTH OIL CO. INC. BORING LOCATIONS ON PLAN SHEET***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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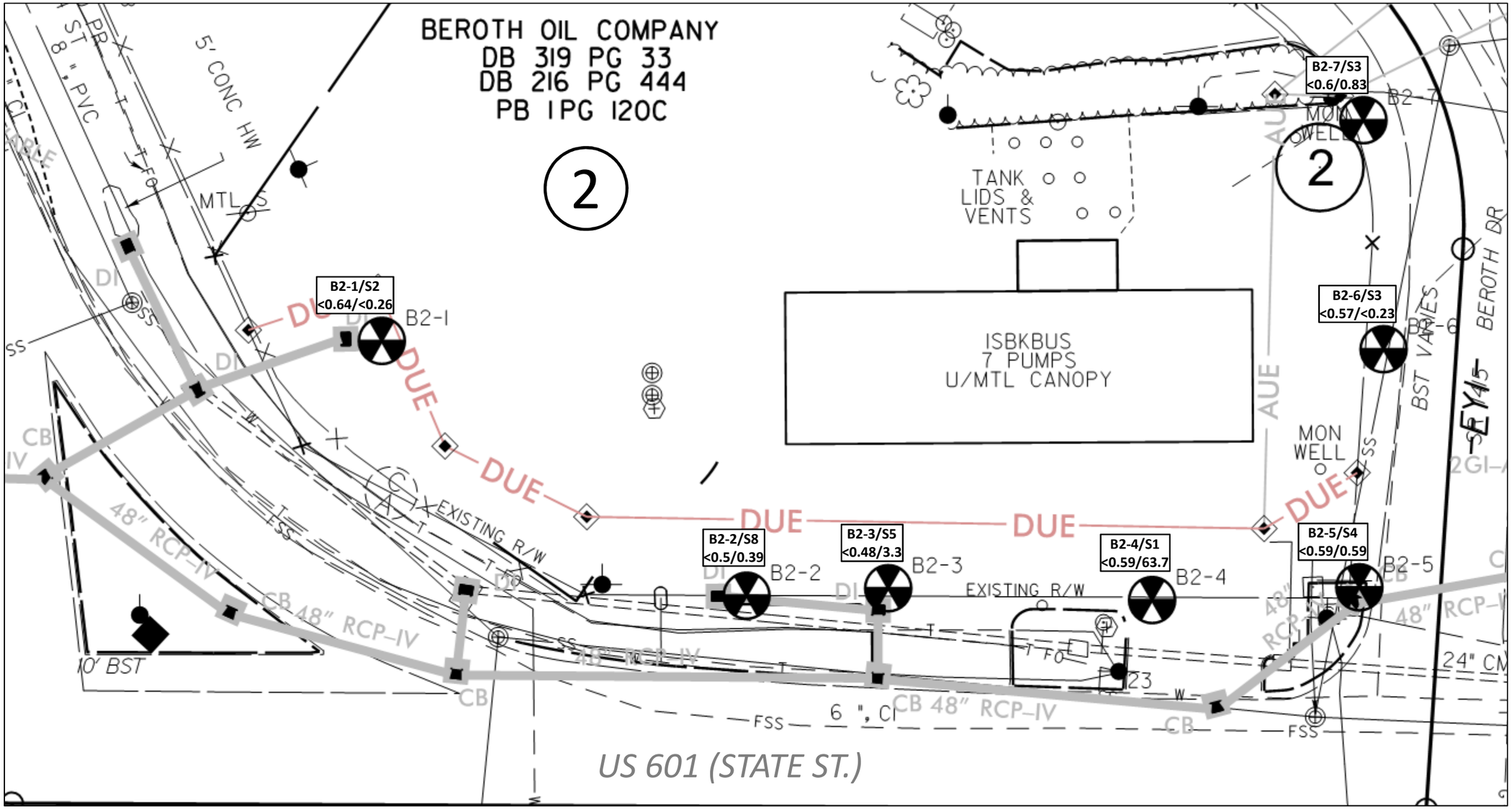


List of NCDOT reference files

- U-5809_Geo_env_ESP.dgn
  - u5809_ls_fs.dgn
  - U-5809_hyd_dm.dgn

Explanation

**Maximum Analytical Results per Boring**

B2-1/S2 <0.64/<0.26 Boring No./Sample No. GRO/DRO (mg/kg, ppm)

30' 0' 30'

GRAPHIC SCALE

See Figure 9 for explanation of symbols and line types

| | |
|---|---|
| PROJECT NO. | GR22.309 |
| SCALE | 1" = 50' |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 8 – PARCEL 2, BEROTH OIL CO. INC. SOIL ANALYTICAL RESULTS ON PLAN SHEET***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, NORTH CAROLINA***

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04/26/19

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 (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 (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (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 (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 (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 (Vineyard)

## EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer

## UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- 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 (T)
- 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 (W)
- 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 (C)
- TV Tower
- U/G TV Cable Hand Hole (H)
- 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. (UST)
- 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. | GR22.309 |
| SCALE | N/A |
| DATE | 4/3/19 |
| BY | EDB |

***FIGURE 9 – PARCEL 2, BEROTH OIL CO. INC. LEGEND FOR PLAN SHEET FIGURES***

***U-5809, CONSTRUCT MEDIAN ALONG US 601 (STATE STREET) FROM US 421 TO SR 1146 (LEE AVENUE) AND ADD ROUNDABOUTS YADKIN COUNTY, 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.** B2-1

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309

LOCATION: By storm drain at S. end of parcel on edge of asphalt

TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1

DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft

DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822DT | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.6, Dk grey gravel to sand (asphalt and road base) | Core 1 Rec 3.0'/5.0' |
| | | | | 0.6 - 10.0, tan, brown, and white sandy silt | residual soil |
| 1 | S-1 | 1.0-1.5 | 0.0 | | |
| 2 | S-2 | 2.0-2.5 | 0.0 | | |
| 3 | ~~S-3~~ | ~~3.0-3.5~~ | | | |
| 4 | ~~S-4~~ | ~~4.0-4.5~~ | | | |
| **5** | S-5 | 5.0-5.5 | 0.2 | | Core 2 Rec 3.3'/5.0' |
| 6 | S-6 | 6.0-6.5 | 1.2 | | |
| 7 | S-7 | 7.0-7.5 | 1.7 | | |
| 8 | S-8 | 8.0-8.5 | 1.5 | | |
| 9 | ~~S-9~~ | ~~9.0-9.5~~ | | | |
| **10** | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| **15** | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-2

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309

LOCATION: Grassy strip approx. 30' S of S. entrance on E side

TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1

DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft

DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822DT | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.1,Root mat | Core 1 Rec 3.2'/5.0' |
| | | | | 0.1 - 5.0, Brown, sandy silt, moist | |
| 1 | S-1 | 1.0-1.5 | 2.6 | 1.0, 3-inch seam of coarse sand | |
| 2 | S-2 | 2.0-2.5 | 2.6 | | |
| 3 | S-3 | 3.0-3.5 | 2.8 | | |
| 4 | ~~S-4~~ | ~~4.0-4.5~~ | | | |
| **5** | ~~S-5~~ | ~~5.0-5.5~~ | | 5.0 - 7.9, Light brown silty/clayey sand, wet | Core 2 Rec 3.3'/5.0' |
| | | | | | Perched water at 5'D |
| 6 | ~~S-6~~ | ~~6.0-6.5~~ | | | |
| 7 | S-7 | 7.0-7.5 | 3.2 | | |
| 8 | S-8 | 8.0-8.5 | 5.3 | 7.9 - 10.0, Light brown clayey sand | |
| 9 | S-9 | 9.0-9.5 | 2.9 | | |
| **10** | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| **15** | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-3

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309
LOCATION: on edge asphalt, S end of S entrance E side
TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 7822DT, hand auger | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 1.1,Dark grey to grey-brown gravel to sand (asphalt and road base) | Core 1 Rec 2.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 3.4 | 1.1 - 2.0, Brown, sandy clay | due to low recovery offset and hand auger 1 - 5' D |
| 2 | S-2 HA | 2.0-2.5 | 3.6 | 2.0 - 4.5, Brown sandy silt | |
| 3 | S-3 HA | 3.0-3.5 | 3.3 | | Driller hit wood at 5.0' depth, offset boring |
| 4 | S-4 HA | 4.0-4.5 | 2.8 | | |
| | | | | 4.5 - 10.0, Brown silty, sand, very moist | |
| 5 | S-5 | 5.0-5.5 | 4.5 | | Core 2 Rec 3.5'/5.0' |
| 6 | S-6 | 6.0-6.5 | 1.2 | | |
| 7 | S-7 | 7.0-7.5 | 6.6 | | |
| 8 | S-8 | 8.0-8.5 | 7.1 | | |
| 9 | S-9 | 9.0-9.5 | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-4

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309

LOCATION: S side, N entrance on E side of parcel, edge of asphalt

TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1

DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft

DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822DT, hand auger | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.4,Dk grey gravel to sand (asphalt and road base) | Core 1 Rec 1.5'/5.0' |
| 1 | S-1 HA | 1.0-1.5 | 3.1 | 0.4 - 2.0 Brown, grey brown sandy silt | driller offset and hand augered 1-5'D |
| 2 | S-2 HA | 2.0-2.5 | 2.4 | 2.0 - 8.0, Grey brown silty sand to clayey sand | |
| 3 | S-3 HA | 3.0-3.5 | 3.1 | | |
| 4 | S-4 HA | 4.0-4.5 | 3.1 | | |
| 5 | S-5 HA | 5.0-5.5 | 4.1 | | Core 2 Rec 2.8'/5.0' |
| 6 | ~~S-6~~ | ~~6.0-6.5~~ | | | Recovery from bottom 7.2 - 10.0' |
| 7 | S-7 | 7.0-7.5 | 3.3 | | |
| 8 | S-8 | 8.0-8.5 | 2.8 | 8.0 - 10.0, grey brown clayey sand | |
| 9 | S-9 | 9.0-9.5 | 3.3 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-5

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309

LOCATION: NE corner of parcel, grassy island

TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1

DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft

DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822DT, hand auger | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.1, Root mat | Core 1 Rec 2.2'/5.0' |
| | | | | 0.1 - 0.9 Dark grey, sandy gravel (old road base) | |
| 1 | S-1 | 1.0-1.5 | 1.6 | 0.9 - 7.0 Brown sandy silt | Hand augered 3-5' |
| 2 | S-2 | 2.0-2.5 | 1.5 | | |
| 3 | S-3 HA | 3.0-3.5 | 2.3 | | |
| 4 | S-4 HA | 4.0-4.5 | 3.1 | | |
| 5 | S-5 HA | 5.0-5.5 | 2.5 | | Core 2 Rec 3.0'/5.0' |
| | | | | | Recovery 7-10' |
| 6 | ~~S-6~~ | ~~6.0-6.5~~ | | | |
| 7 | S-7 | 7.0-7.5 | 2.6 | 7.0 - 10.0, grey to brown clay, sand, moist | |
| 8 | S-8 | 8.0-8.5 | 2.5 | | |
| 9 | S-9 | 9.0-9.5 | 4.8 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-6

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309

LOCATION: Middle N side parcel by road

TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1

DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft

DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822DT, hand auger | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.6, grey sand with gravel (asphalt) | Core 1 Rec 3.1'/5.0' |
| | | | | 0.6 - 10.0 Grey-brown to brown sandy clay | |
| 1 | S-1 | 1.0-1.5 | 0.9 | | |
| 2 | S-2 | 2.0-2.5 | 2.4 | | |
| 3 | S-3 | 3.0-3.5 | 3.3 | | |
| 4 | S-4 | 4.0-4.5 | | | |
| 5 | S-5 | 5.0-5.5 | 4.5 | 5.0 - grading to tan | Core 2 Rec 5.0'/5.0' |
| 6 | S-6 | 6.0-6.5 | 2.0 | | |
| 7 | S-7 | 7.0-7.5 | 1.5 | | |
| 8 | S-8 | 8.0-8.5 | 1.9 | | |
| 9 | S-9 | 9.0-9.5 | 2.7 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

# FIELD BORING LOG

**BORING NO.** B2-7

PROJECT NAME: NCDOT U-5809 PSA | PROJ. NO.: GR22.309
LOCATION: NW Corner of Parcel
TYPE OF BORING: Direct Push | DATE STARTED: 3/5/19 | SHEET: 1 of 1
DRILLING FIRM: SAEDACCO | DATE FINISHED: 3/5/19 | TOTAL DEPTH: 10.0 ft
DRILLER: Brian Ewing | SAMPLE METHOD: 5' Macro Core | DEPTH TO GW: N/A ft
DRILL RIG: Geoprobe 7822DT | LOGGED BY: E. Billington | COMMENT:

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|---|---|---|---|---|---|
| | | | | 0.0 - 0.7, grey sand with gravel (asphalt and road base) | Core 1 Rec 3.0'/5.0' |
| | | | | 0.7 - 10.0 Red-brown to mottled brown, white and tan sandy silt | Residual |
| 1 | S-1 | 1.0-1.5 | 3.6 | | |
| 2 | S-2 | 2.0-2.5 | 2.4 | | |
| 3 | S-3 | 3.0-3.5 | 3.8 | | |
| 4 | ~~S-4~~ | ~~4.0-4.5~~ | | | Core 2 Rec 4.0'/5.0' |
| | | | | | Recovery from 6-10' |
| 5 | ~~S-5~~ | ~~5.0-5.5~~ | | | |
| 6 | ~~S-6~~ | ~~6.0-6.5~~ | | | |
| 7 | S-7 | 7.0-7.5 | 3.0 | | |
| 8 | S-8 | 8.0-8.5 | 4.0 | | |
| 9 | S-9 | 9.0-9.5 | 4.1 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

# APPENDIX B

# RED LAB LABORATORY TESTING REPORT

QED

AQROS

# Hydrocarbon Analysis Results

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

**Contact:** NED BILLINGTON

**Project:** GR22.309

**Samples taken** Tuesday, March 5, 2019
**Samples extracted** Tuesday, March 5, 2019
**Samples analysed** Tuesday, March 12, 2019

**Operator** CAROLINE STEVENS

**U00902**

| 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 | |
| Soil | B2-1 S2 | 25.7 | <0.64 | <0.64 | <0.26 | 0.02 | 0.02 | 0.002 | <0.008 | 0 | 0 | 100 | Residual HC |
| Soil | B2-1 S7 | 23.4 | <0.59 | <0.59 | <0.23 | <0.59 | <0.01 | <0.01 | <0.007 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B2-2 S8 | 20.2 | <0.5 | <0.5 | 0.39 | 0.39 | 0.37 | 0.04 | <0.006 | 0 | 95.1 | 4.9 | Residual PHC |
| Soil | B2-3 S5 | 19.3 | <0.48 | <0.48 | 3.3 | 3.3 | 2.2 | 0.05 | <0.001 | 0 | 93.3 | 6.7 | Bit.Road Tar 93.5%,(FCM) |
| Soil | B2-4 S1 | 23.6 | <0.59 | <0.59 | 63.7 | 63.7 | 34.6 | 0.95 | 0.009 | 0 | 93.1 | 6.9 | Bit.Road Tar 95.3%,(FCM) |
| Soil | B2-5 S4 | 23.6 | <0.59 | <0.59 | 0.59 | 0.59 | 0.35 | 0.006 | <0.007 | 0 | 91.1 | 8.9 | V.Deg.PHC 88.3%,(FCM) |
| Soil | B2-5 S9 | 22.2 | <0.56 | <0.56 | 0.45 | 0.45 | 0.36 | 0.04 | <0.007 | 0 | 97.2 | 2.8 | PHC ND,(FCM) |
| Soil | B2-6 S3 | 22.6 | <0.57 | <0.57 | <0.23 | <0.57 | <0.01 | <0.01 | <0.007 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B2-7 S3 | 24.1 | <0.6 | <0.6 | 0.83 | 0.83 | 0.51 | 0.01 | <0.001 | 0 | 95.6 | 4.4 | Bit.Road Tar 90.3%,(FCM) |

Initial Calibrator QC check OK Final FCM QC Check OK 96.2%

Analysis by QED HC-1 Analyser

Concentration values in mg/kg for soil 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 for hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only : % Ratios estimated carbon number proportions : (OCR)/(Q) = Outside cal range, values and HC match estimates : ND = Not Detected

(B) = Blank Drift : (M) = Adjusted value : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : SB = sample selected as site background

# APPENDIX C
# CHAIN-OF-CUSTODY FORM

| | |
|---|---|
| t Name: | ESP Associates, Inc. |
| ess: | 7011 Albert Pick Rd, Suite E Greensboro, NC 27409 |
| act: | Ned Billington |
| ect Ref.: | GR22.309 |
| il: | nbillington@espassociates.com |
| ne #: | 336-420-5452 |
| ected by: | same |

# 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

| ple Collection Date/Time | TAT Requested 24 Hour | TAT Requested 48 Hour | Initials | "Sample" Sample ID | Total Wt. | Tare Wt. | Sample Wt. |
|---|---|---|---|---|---|---|---|
| 3/5/19 | | | EDR | B2-1, S2 | 54.2 | 44.1 | 10.1 |
| 3/5/19 | | | | B2-1, S7 | 55.4 | 44.3 | 11.1 |
| 3/5/19 | | | | B2-2, S8 | 57.2 | 44.3 | 12.9 |
| 3/5/19 | | | | B2-3, S5 | 57.2 | 43.7 | 13.5 |
| 3/5/19 | | | | B2-4, S1 | 55.0 | 44.0 | 11.0 |
| 3/5/19 | | | | B2-5, S4 | 54.8 | 43.8 | 11.0 |
| 3/5/19 | | | | B2-5, S9 | 55.8 | 44.1 | 11.7 |
| 3/5/19 | | | | B2-6, S3 | 55.4 | 43.9 | 11.5 |
| 3/5/19 | | | | B2-7, S3 | 54.7 | 43.9 | 10.8 |
| 3/5/19 | | | | B5-1, S6 | 55.5 | 44.2 | 11.3 |
| 3/6/19 | | | | B5-2, S3 | 55.2 | 44.8 | 10.4 |
| 3/6/19 | | | | B5-3, S7 | 58.2 | 46.2 | 12.0 |
| 3/6/19 | | | | B5-4, S8 | 56.3 | 46.0 | 10.3 |
| 3/6/19 | | | | B6-1, S3 | 56.7 | 44.4 | 12.3 |
| 3/6/19 | | | | B6-2, S5 | 55.5 | 44.2 | 11.3 |
| 3/6/19 | | | | B6-2, S9 | 56.5 | 44.9 | 11.6 |
| 3/6/19 | | | | B6-4, S7 | 56.6 | 44.4 | 12.2 |
| 3/6/19 | | | | B6-3, S3 | 55.2 | 44.4 | 10.8 |
| 3/6/19 | | | | B6-2, S1 | 56.2 | 44.3 | 11.9 |
| | | | | | | | |

UVF

**RED Lab USE ONLY**

19

Comments:

| Relinquished by | Date/Time | Accepted by | Date/Time |
|---|---|---|---|
| | 3/11/19 | | 3/12/19 12p |
| Relinquished by | Date/Time | Accepted by | Date/Time |
| | | | |