April 29, 2019

North Carolina Department of Transportation
Geotechnical Unit
Mail Service Center 1592
Raleigh, North Carolina 27699-1592

Attention: Mr. Craig Haden email: cehaden@ncdot.gov

Reference: **Preliminary Site Assessment Report**
**NCDOT Project I-5986B, WBS Element 47532.1.3**
**Parcel 126-Mid-Atlantic Equipment**
40 George Perry Lee Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175A

Dear Mr. Haden:

S&ME, Inc. (S&ME) is submitting this Preliminary Site Assessment (PSA) Report to the North Carolina Department of Transportation (NCDOT). This report presents the background/project information, field activities, findings, conclusions, and recommendations. These services were performed in general accordance with S&ME Proposal No. 4305-18-175 CO-01 REV-01 dated January 2, 2019, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its January 8, 2019 Notice to Proceed Letter.

## ♦ Background/Project Information

Based on NCDOT's November 2, 2018, Request for Technical and Cost Proposal, the PSA was conducted within the NCDOT right-of-way (ROW) and/or easement as indicated on the preliminary plan sheets provided by NCDOT at the following property:

| NCDOT Parcel No. | Property Owner | Site Address |
|---|---|---|
| 126 | Harvey Strickland | (Mid-Atlantic Equipment)<br>40 George Perry Lee Road, Dunn, NC |

The property is developed with an active heavy equipment repair garage identified as Mid-Atlantic Equipment. The property is not listed with registered petroleum underground storage tanks (USTs) (active or closed). The property is also not listed with North Carolina Department of Environmental Quality (NCDEQ) Incidents associated with petroleum releases from USTs or aboveground storage tanks.

The PSA included a geophysical survey and subsequent limited soil sampling (six soil borings up to 10 feet below ground surface (ft.-bgs.), within accessible areas of the proposed ROW/easement in preparation for construction activities. Groundwater was not encountered during the advancement of soil borings at the site. Therefore,

groundwater sampling was not performed. **Figure 1** shows the vicinity and site location, and **Figure 2** shows the site and boring locations. Soil sampling results are shown on **Figure 3.**

## ♦ Field Services

Prior to field activities, a site specific Health and Safety Plan was prepared as required by the Occupational Health and Safety Act (OSHA). Underground utilities were located and marked by the North Carolina One-Call Service. A private utility locator (Troxler Geologic, Inc.) was also used to locate and mark underground utilities.

## ♦ Geophysical Survey

On February 7, 2019, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 126. S&ME used a combination of the Time Domain Electromagnetic (TDEM) and Ground Penetrating Radar (GPR) methods to explore for buried subsurface features at the site such as underground storage tanks (USTs) and other possible buried obstructions. Brief descriptions of these complementary geophysical techniques are presented in the following paragraphs.

### Time Domain Electromagnetics (TDEM)

TDEM measures the electrical conductivity of subsurface materials and discriminates between moderately conductive earth materials and very conductive metallic targets within the shallow subsurface. The conductivity is determined by transmitting a time-varying magnetic pulse into the subsurface and measuring the amplitude and phase shift of the secondary magnetic field. The secondary magnetic field is created when the conductive materials become an inductor as the primary magnetic field is passed through them. TDEM data are acquired continuously at a walking pace typically along a series of parallel or perpendicular lines. The system generates audible and visual indications when metallic targets are encountered. These measurements can also be supported with a global positioning system (GPS) which is output directly into the TDEM data file.

We used a Geonics Limited EM-61 MK2 TDEM system in general accordance with ASTM D6820-02 (2007) "*Standard Guide for Use of the Time Domain Electromagnetic Method for Subsurface Investigation.*" Data was collected along lines spaced at approximately five feet using a Juniper® Systems Geode™ sub-meter GPS as positioning support. The presence of vehicles/equipment, metal scrap, thick vegetation, and other surficial obstructions within the requested survey area however prevented TDEM data collection in several locations. The approximate TDEM data collection paths are presented in **Figure 4**. Golden Software's Surfer® program was used to grid and plot the data (**Figures 5 and 6**). The TDEM data has been presented as Plots A and B in order to provide both opaque and transparent views, respectively.

### Ground Penetrating Radar (GPR)

GPR transmits electromagnetic waves into the subsurface from an antenna at a specific frequency and measures the time for wave reflections to be received by interfaces between materials with differing material properties (e.g. soil/metal, etc.). The intensity of the reflected GPR wave is a function of the contrast in the material properties (i.e. dielectric permittivity) at the interface, the conductivity of the material that the wave is traveling through, and the frequency of the signal.

We used a Geophysical Survey Systems, Inc. (GSSI) SIR® 3000 GPR system equipped with a 400 MHz antenna in general accordance with ASTM D6432-11 "*Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation*" to further characterize anomalies/features identified during the TDEM survey.

A total of fourteen (14) GPR profiles (Lines 1 through 14) were collected for documentation (**Figure 7**). The data was post-processed using the GSSI Radan® 7 GPR software program for additional analysis.

### Geophysical Findings

Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site. However, two anomalous features (Anomaly A and B) unrelated to known surficial targets were identified in the geophysical data sets (**Figures 5 through 7**). Both anomalies are characterized by several relatively small high amplitude GPR responses within the upper one ft.-bgs and likely related to isolated buried metallic targets/debris. Anomalies were also marked in the field using white spray paint. Example GPR profiles are presented in **Figures 8 and 9**.

## ♦ Soil Sampling

On February 22 and 25, 2019, Troxler Geologic, Inc. (Troxler's) drill crew utilized a track mounted Geoprobe® rig to advance six soil borings (B-1 through B-6) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 126. The approximate location of the soil borings are shown in **Figure 2**. A photographic log is included in **Appendix I.** Troxler's drill crew advanced the Geoprobe® borings to a depth of approximately 10 ft.-bgs. During the advancement of the soil borings, groundwater was not encountered. Soil samples were continuously collected in four-foot long disposable acetate-plastic sleeves that line the hollow stainless-steel sample probes. Soil recovered from the sleeves was classified on-site by S&ME personnel and screened with a Photoionization Detector (PID) at approximately two foot depth intervals to measure relative headspace concentrations of volatile organic compounds (VOCs).

VOC headspace readings were obtained from an aliquot of each soil sample that was placed in a re-sealable bag. Another portion of the sample was placed in a separate re-sealable bag and stored in an insulated container with ice for possible laboratory analyses. After waiting approximately 15 minutes to allow the sample to reach ambient temperature and headspace equilibrium, the PID probe was inserted into the bag to obtain a headspace reading. A summary of the PID readings and logs of the soil borings are included in **Appendix II.**

No petroleum odors, staining or elevated PID readings were noted within the collected soil samples. Therefore, two soil samples (two to four foot depth interval and eight to ten foot depth interval) were selected from each boring and provided to RED Lab, LLC (Red Lab) for on-site analysis. A total of 12 soil samples (two per boring) were analyzed by RED Lab for Total Petroleum Hydrocarbons (TPH)-Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) using ultra-violet fluorescence (UVF) spectroscopy with product (fuel) identification.

Upon completion of the soil sampling, the soil borings were backfilled with bentonite pellets and soil cuttings. Investigative derived wastes (IDW), such as additional soil cuttings generated during the soil boring advancement and decontamination water, were spread on the ground in accordance with the procedures specified by North Carolina Department of Environmental Quality (NCDEQ). Used gloves, re-sealable bags and acetate sleeves were bagged and disposed off-site.

### Soil Analytical Results

Based upon analytical results of soil samples analyzed by RED Lab using UVP spectroscopy, TPH-GRO and TPH-DRO were not reported at concentrations exceeding the North Carolina TPH Action Levels. TPH-DRO was reported at borings B-1, B-2, B-4 and B-6 at the two to four foot depth intervals at concentrations ranging from 0.07 milligrams per kilograms (mg/kg) to 44.4 mg/kg, which are below its North Carolina TPH Action Level of 100 mg/kg. TPH-DRO was also reported at borings B-2 and B-3 at the eight to ten foot depth intervals at concentrations of 0.81 mg/kg and 0.19 mg/kg, respectively. TPH-GRO and TPH-DRO were not reported at concentrations exceeding the laboratory method reporting limits for the remaining soil samples. A summary of the soil analytical results is presented in **Table 1** and shown on **Figure 3.** A copy of the laboratory analytical report provided by RED Lab is presented in **Appendix III.**

## ♦ Conclusion and Recommendations

The geophysical survey identified two anomalous features (Anomaly A and B) which are likely related to isolated buried metallic targets/debris. Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site.

S&ME advanced six soil borings (B-1 through B-6) to a depth of approximately 10 ft.-bgs at the site. No petroleum odors, staining or elevated PID readings were noted within soil samples collected from the soil borings. Selected soil samples from the soil borings were analyzed onsite for TPH-GRO and TPH-DRO using UVF spectroscopy. TPH-DRO was reported in the two to four foot depth interval at four soil borings and in the eight to ten foot depth interval at two soil borings at concentrations slightly above the laboratory method reporting limits, but well below the North Carolina TPH Action Levels. During the soil boring advancement, groundwater was not encountered. Therefore, groundwater sampling was not performed.

S&ME recommends maintaining an awareness level for the presence of marginally impacted petroleum in soil (below TPH Action Levels) at the site for the safety of workers and the public. If petroleum stained or odorous soils are encountered during construction, these soils should be properly handled and disposed at a licensed facility.

## ♦ Limitations

The results of this preliminary investigation are limited to the boring locations presented herein. The results of this Preliminary Site Assessment are not all inclusive and may not represent existing conditions across the entire property. These results only reflect the current conditions at the locations sampled on the date this Preliminary Site Assessment was performed. This report has been prepared in accordance with generally accepted environmental engineering and geophysical practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

The geophysical methods used for this survey have inherent limitations. Site metallic features (e.g., buildings, reinforced concrete, vehicles, etc.) and overhead transmission lines can produce a false electromagnetic response and may mask subsurface features. The depth of exploration of the GPR signal is highly site specific, and is greatly limited by signal attenuation (absorption) of the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high

electrical conductivities such as clay soils, and lowest in relatively low conductivity materials such as unsaturated sand. For this project location, the GPR data sets appear to have a maximum depth of penetration of approximately about five ft.-bgs.

Regardless of the thoroughness of a geophysical study, there is always a possibility that actual conditions may not match the interpretations. The results should be considered accurate only to the degree implied by the methods used and the method's limitations and data coverage. Accordingly, the possibility exists that not all features at a project site will be located due to either subsurface soil conditions or the occurrence of features outside the lateral limits and below the depth of penetration of the methods used. As with most surface geophysical methods, resolution of the subsurface will also decrease with depth. As such, the size and/or contrast of features compared to the imaged subsurface media must be significant enough to produce the anticipated response. The location and/or determination (or the lack thereof) of potential buried features is based on our review of the provided information and of the geophysical survey. Under no circumstances does S&ME assume any responsibility for damages resulting from the presence of subsurface features that may exist but were not identified by our survey.

This Preliminary Site Assessment was performed solely for NCDOT regarding the above-referenced site and assessment area. This report is provided for the sole use of NCDOT. Use of this report by any other parties will be at such party's sole risk. S&ME disclaims liability for any such use or reliance by third parties. The observations presented in this report are indicative of conditions during the time of the assessment and of the specific areas referenced.

## Closing

S&ME appreciates the opportunity to provide these services to you. If you have any questions or comments regarding this report, please contact us at your convenience.

Sincerely,

**S&ME, Inc.**

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4C890EAEC25F488...

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NORTH CAROLINA PROFESSIONAL SEAL 18760 ENGINEER THOMAS P. RAYMOND

5/6/2019

Attachments:

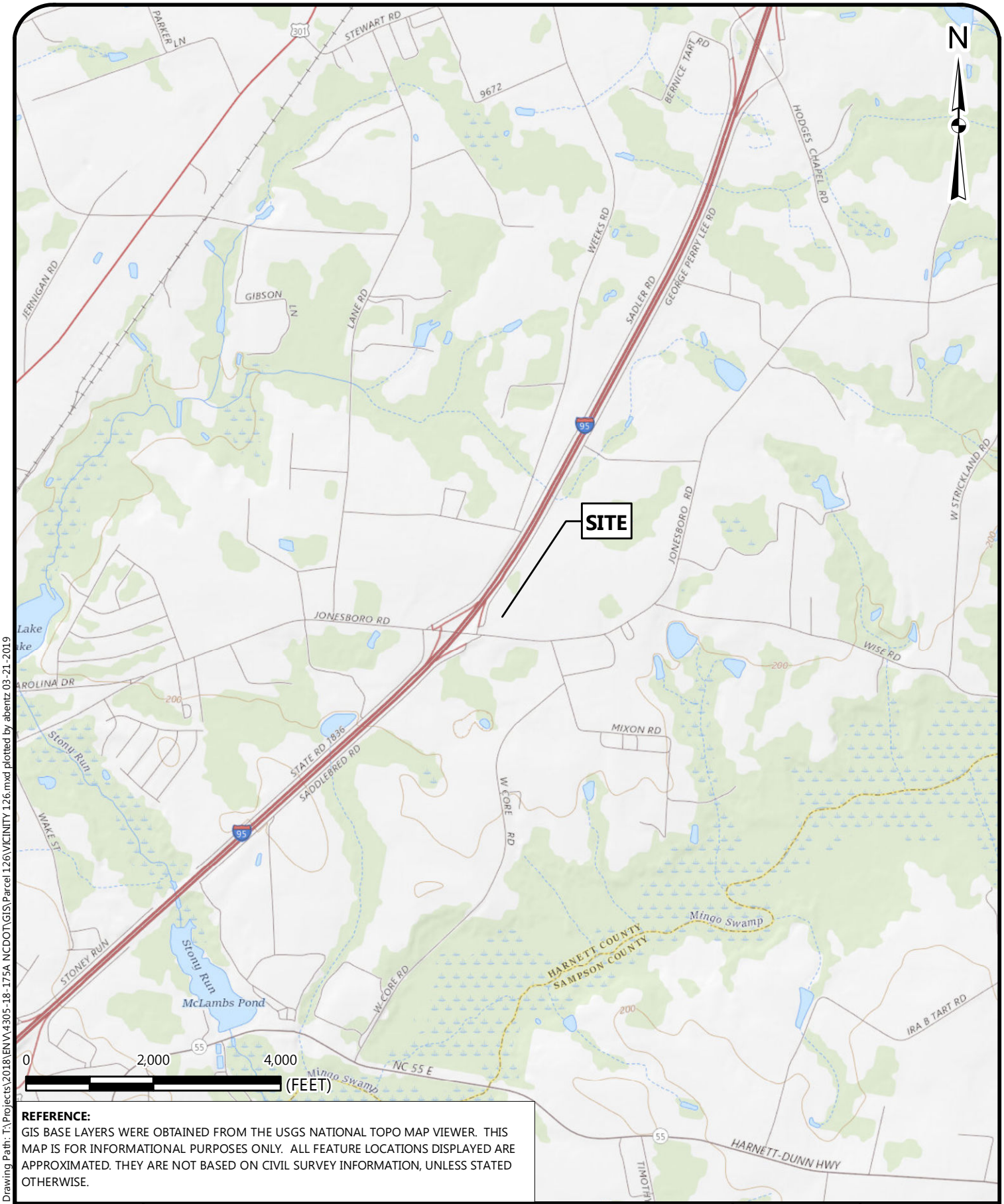
# Tables

**TABLE 1**
**SUMMARY OF SOIL SAMPLING RESULTS**
**NCDOT Project I-5986B**
**Parcel 126 - (Mid-Atlantic Equipment)**
**40 George Perry Lee Road**
**Dunn, Harnett County, North Carolina**
**S&ME Project No. 4305-18-175A**

| Analytical Method→ | | | Total Petroleum Hydrocarbons (TPH) Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) by Ultraviolet Fluorescence (UVF) Spectrometry | |
|---|---|---|---|---|
| **Sample ID** | **Date** | **Contaminant of Concern→** / **Sample Depth (ft.-bgs)** | **TPH-GRO** | **TPH-DRO** |
| B-1 | 2/22/2019 | 2 to 4 | <0.46 | **3.5** |
| | | 8 to 10 | <0.47 | <0.19 |
| B-2 | 2/22/2019 | 2 to 4 | <0.64 | **44.4** |
| | | 8 to 10 | <0.61 | **0.81** |
| B-3 | 2/22/2019 | 2 to 4 | <0.68 | <0.27 |
| | | 8 to 10 | <0.44 | **0.19** |
| B-4 | 2/25/2019 | 2 to 4 | <0.52 | **0.07** |
| | | 8 to 10 | <0.64 | <0.26 |
| B-5 | 2/25/2019 | 2 to 4 | <0.7 | <0.28 |
| | | 8 to 10 | <0.73 | <0.29 |
| B-6 | 2/25/2019 | 2 to 4 | <0.72 | **0.21** |
| | | 8 to 10 | <0.67 | <0.27 |
| **North Carolina TPH Action Levels** | | | **50** | **100** |

Notes:
1. UVF analysis performed by RED Lab, LLC
2. Concentrations are reported in milligrams per kilogram (mg/Kg).
3. ft.-bgs:- feet below ground surface.
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the North Carolina TPH Action Levels are shown in Shaded and **BOLD** fields.

# Figures




**REFERENCE:**
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: T:\Projects\2018\ENV\4305-18-175A NCDOT\GIS\Parcel 126\VICINITY 126.mxd plotted by abentz 03-21-2019

# VICINITY MAP

NCDOT I-5986B
PARCEL NO. 126 (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE RD, DUNN, HARNETT COUNTY, NORTH CAROLINA

| | |
|---|---|
| SCALE: | 1 " = 2,000 ' |
| DATE: | 3-21-19 |
| PROJECT NUMBER | 4305-18-175A |
| FIGURE NO. | 1 |


LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

Map Source: NCDOT Project I-5986B
Image Source: NC ONEMAP, Dated 2016

Known Soil Contamination:

Possible Soil Contamination: — s —

Existing Contamination Known - Water: — w —

0 150 300

GRAPHIC SCALE (IN FEET)

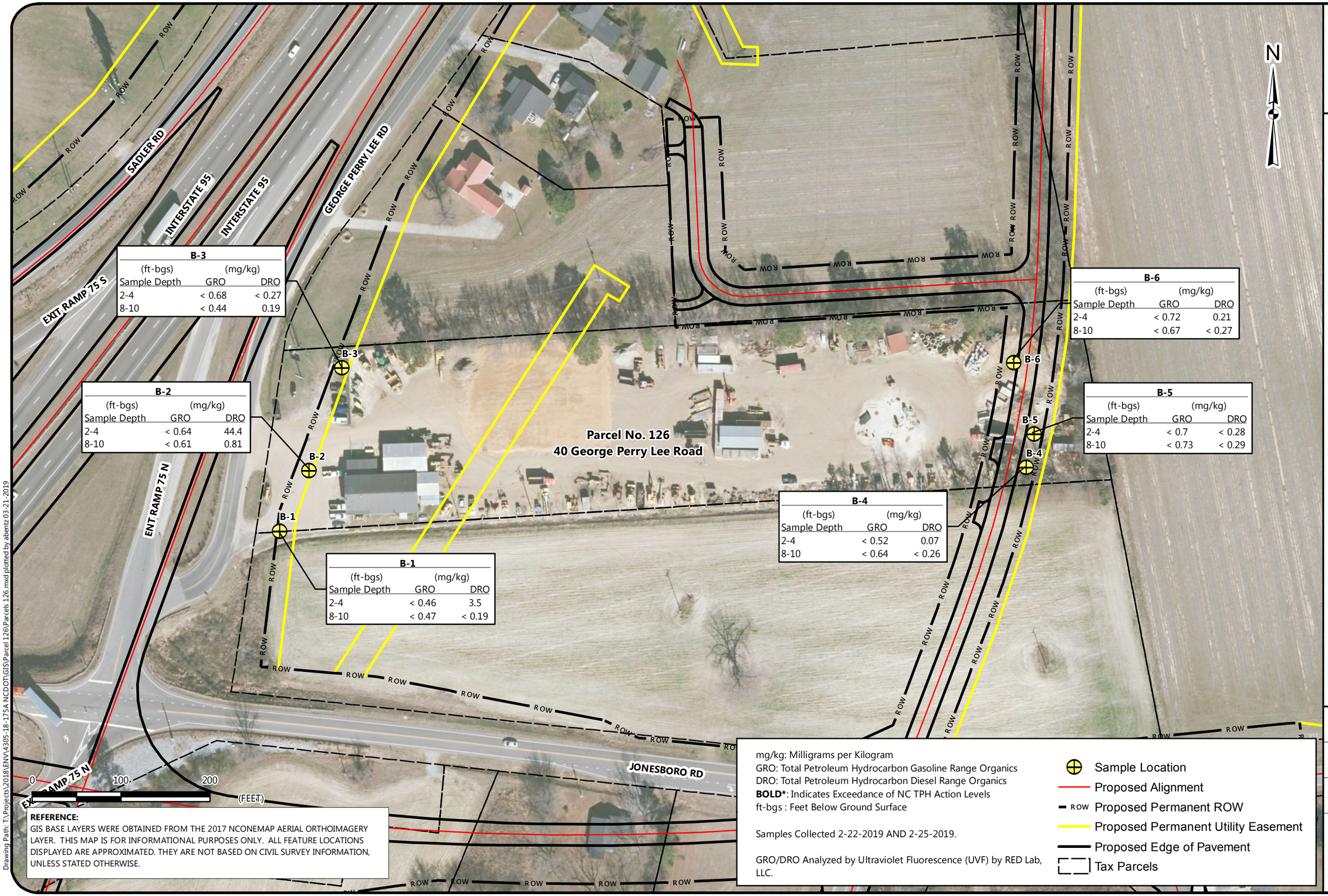
# SITE MAP

NCDOT Project: I-5986B
PARCEL 126 - (MID-ATLANTIC EQUIPMENT)
40 George Perry Lee Road, Dunn, Harnett County, North Carolina

| SCALE: | FIGURE NO. |
|---|---|
| 1" = 150' | 2 |
| DATE: | |
| MARCH 2019 | |
| PROJECT NUMBER | |
| 4305-18-175A | |

# SOIL CONSTITUENT MAP

NCDOT I-5986B
(MID-ATLANTIC EQUIPMENT)
PARCEL NO. 126
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA




**B-3**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.68 | < 0.27 |
| 8-10 | < 0.44 | 0.19 |

**B-2**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.64 | 44.4 |
| 8-10 | < 0.61 | 0.81 |

**B-1**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.46 | 3.5 |
| 8-10 | < 0.47 | < 0.19 |

**B-4**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.52 | 0.07 |
| 8-10 | < 0.64 | < 0.26 |

**B-6**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.72 | 0.21 |
| 8-10 | < 0.67 | < 0.27 |

**B-5**

| (ft-bgs) | (mg/kg) | |
|---|---|---|
| Sample Depth | GRO | DRO |
| 2-4 | < 0.7 | < 0.28 |
| 8-10 | < 0.73 | < 0.29 |

**REFERENCE:**
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONEMAP AERIAL ORTHOIMAGERY LAYER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

mg/kg: Milligrams per Kilogram
GRO: Total Petroleum Hydrocarbon Gasoline Range Organics
DRO: Total Petroleum Hydrocarbon Diesel Range Organics
**BOLD***: Indicates Exceedance of NC TPH Action Levels
ft-bgs : Feet Below Ground Surface

Samples Collected 2-22-2019 AND 2-25-2019.

GRO/DRO Analyzed by Ultraviolet Fluorescence (UVF) by RED Lab, LLC.

- Sample Location
- Proposed Alignment
- ROW Proposed Permanent ROW
- Proposed Permanent Utility Easement
- Proposed Edge of Pavement
- Tax Parcels

SCALE: 1 " = 100 '

DATE: 3-21-19

PROJECT NUMBER: 4305-18-175

FIGURE NO.: 3

Drawing Path: T:\Projects\2018\ENV\4305-18-175A NCDOT\GIS\Parcel 126\Parcels 126.mxd plotted by abentz 03-21-2019

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**LEGEND**

Approximate TDEM Path

Approximate Requested Survey Area

# TDEM PATH LOCATION PLAN

NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**4**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**TDEM DATA PLOT A**

NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**5**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**LEGEND**

Approximate Location of TDEM Anomaly

Approximate Location of Vehicles

**TDEM DATA PLOT B**

NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**6**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**LEGEND**

Approximate Location of TDEM Anomaly

Approximate Location of Vehicles

Approximate Location of Possible Utility

Approximate Location of GPR Profile

# GEOPHYSICAL ANOMALY LOCATION PLAN

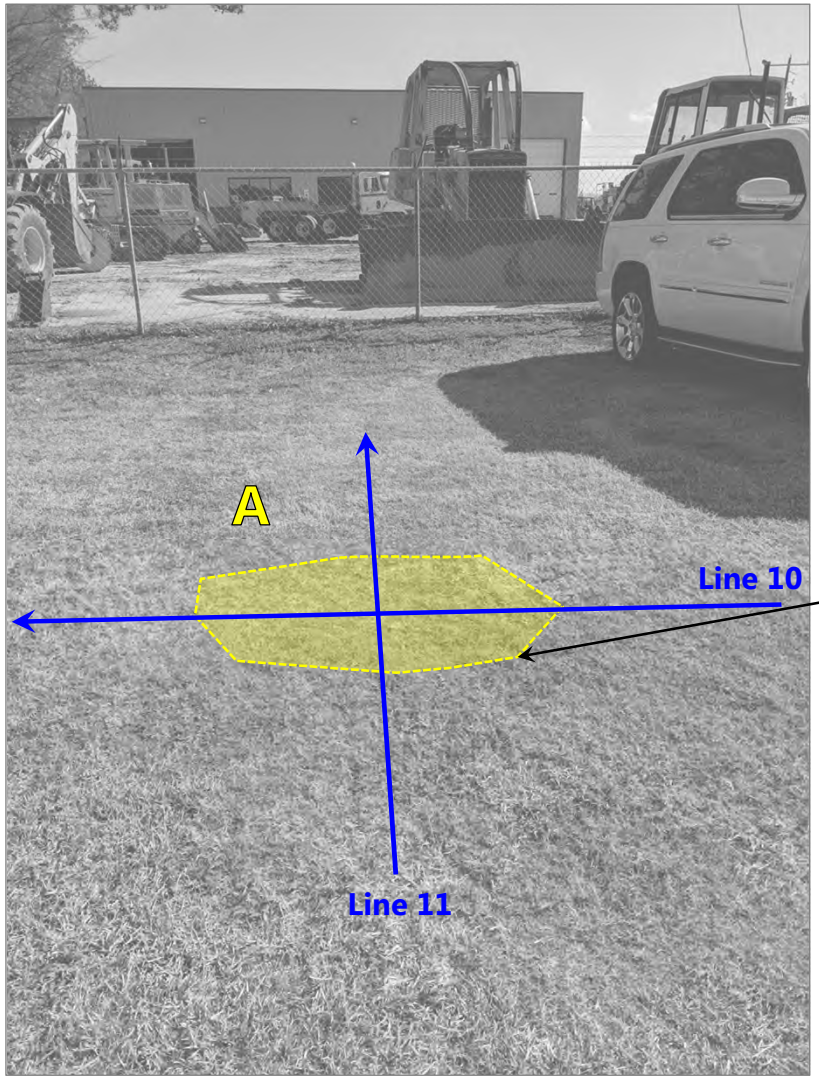
NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/21/2019

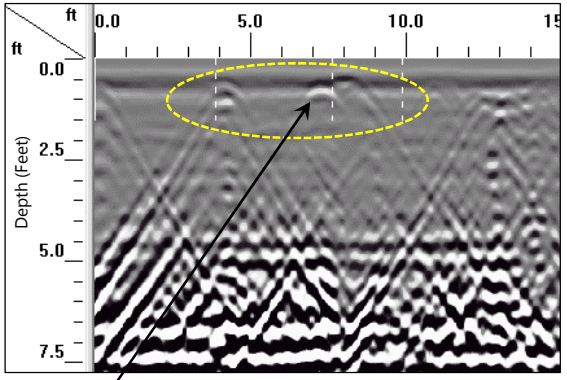
PROJECT NUMBER
4305-18-175A

FIGURE NO.
**7**

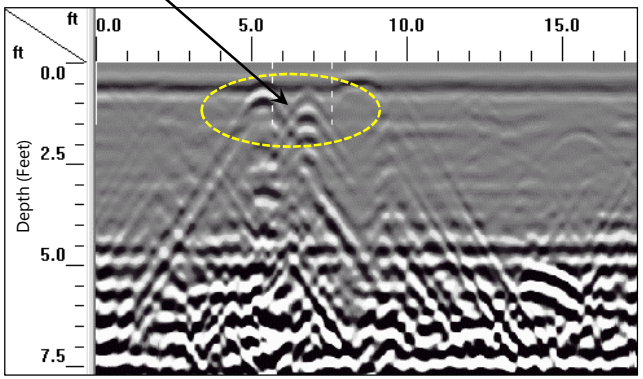



TDEM Anomaly A

Line 10




Line 11




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 10 AND 11**

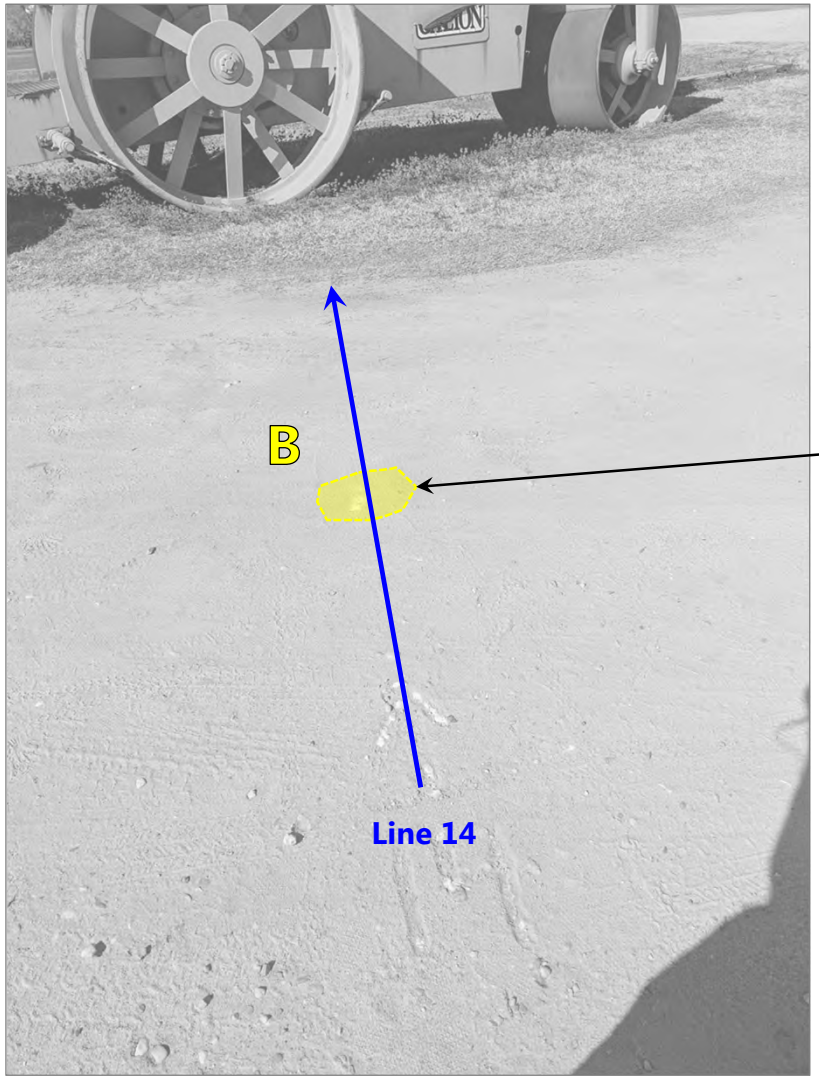
NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 3/21/2019

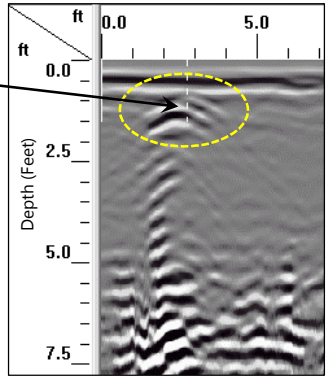
PROJECT NUMBER 4305-18-175A

FIGURE NO. **8**




TDEM
Anomaly B

Line 14




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINE 14**

NCDOT PROJECT: I-5986B
PARCEL 126 – (MID-ATLANTIC EQUIPMENT)
40 GEORGE PERRY LEE ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

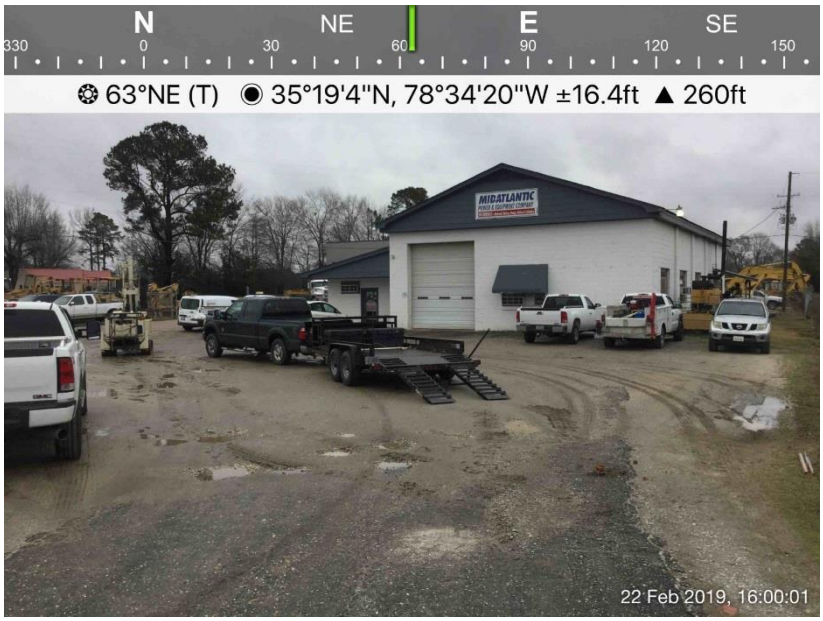
SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**9**

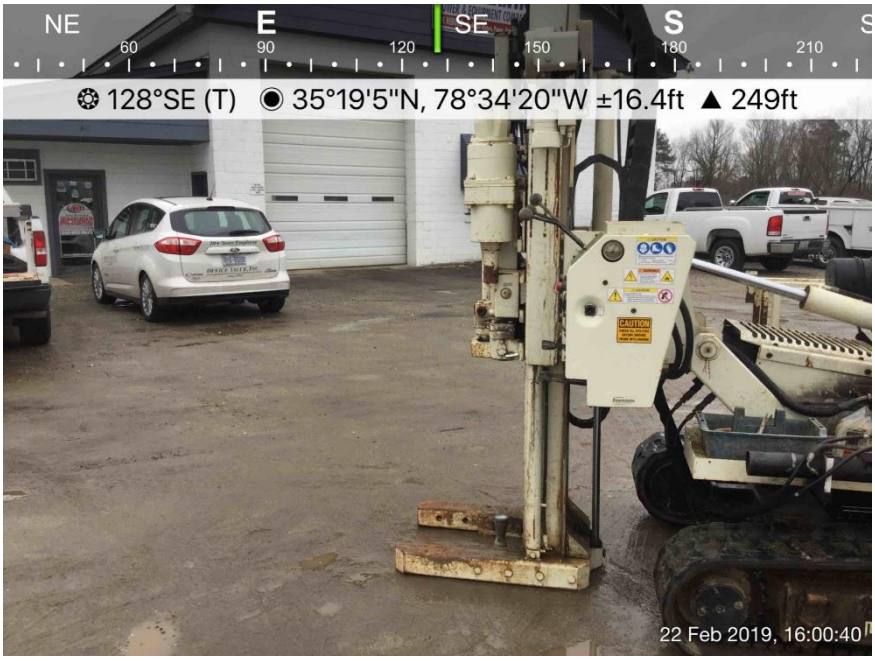
# Appendix I – Photographs




Date: 2/22/2019

Photographer: JTH

| | | |
|---|---|---|
| 1 | **Location / Orientation** | Front view of site looking east. |
| | **Remarks** | None |




Date: 2/22/2019

Photographer: JTH

| | | |
|---|---|---|
| 2 | **Location / Orientation** | Front view of site looking east. |
| | **Remarks** | Note soil boring B-2. |


Date: 2/22/2019

Photographer: JTH

| | | |
|---|---|---|
| 3 | **Location / Orientation** | View of rear portion of site looking east. |
| | **Remarks** | Note flag for soil boring B-4 |

# Appendix II – Boring Logs

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-1** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Clayey Sand, Tan, | | | 0.0 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | | | | 0.1 | No | | | | |
| | | Clayey Sand, Red, Orange, | | | 0.1 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.1 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-2** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Silty Sand, Black, | | | 0.1 | No | | | | |
| | | Clayey Sand, Red, Orange, | | | 0.0 | Yes | | | | |
| 5 | | | | | 0.1 | No | | | | |
| | | | | | 0.0 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.1 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-3** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil, Black, | | | | | | | | |
| | | Silty Sand, Tan, | | | 0.0 | No | | | | |
| | | Clayey Sand, Tan, | | | 0.0 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.0 | No | | | | |
| | | | | | 0.0 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.0 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-4** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 25, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Clayey Sand, Brown, Tan, | | | 0.0 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.1 | No | | | | |
| | | | | | 0.1 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.0 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-5** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 25, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Clayey Sand, Brown, Tan, | | | 0.0 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.1 | No | | | | |
| | | | | | 0.1 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.1 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 126-40 George Perry Lee Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-6** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 25, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Clayey Sand, Brown, Tan, | | | 0.3 | No | | | | |
| | | | | | 0.3 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.1 | No | | | | |
| | | | | | 0.2 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.2 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

# Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Friday, February 22, 2019
**Samples extracted** Friday, February 22, 2019
**Samples analysed** Friday, February 22, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** JENN RYAN

**Project:** 4305-18-175A; PARCEL 126

**H09382**

| 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 | B - 1 (2-4') | 18.4 | <0.46 | <0.46 | 3.5 | 3.5 | 1.8 | 0.13 | 0.001 | 0 | 95.8 | 4.2 | Deg.PHC 71.7%,(FCM),(P) |
| Soil | B - 1 (8-10') | 18.7 | <0.47 | <0.47 | <0.19 | <0.47 | <0.009 | <0.009 | <0.006 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B - 2 (2-4') | 25.5 | <0.64 | <0.64 | 44.4 | 44.4 | 22.3 | 1.6 | 0.002 | 0 | 98.1 | 1.9 | Deg Fuel 74.6%,(FCM) |
| Soil | B - 2 (8-10') | 24.3 | <0.61 | <0.61 | 0.81 | 0.81 | 0.34 | 0.03 | <0.007 | 0 | 100 | 0 | Deg Fuel 89.9%,(FCM) |
| Soil | B - 3 (2-4') | 27.4 | <0.68 | <0.68 | <0.27 | <0.68 | <0.01 | <0.01 | <0.008 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B - 3 (8-10') | 17.5 | <0.44 | <0.44 | 0.19 | 0.19 | 0.18 | 0.02 | <0.005 | 0 | 92.7 | 7.3 | Residual HC |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 98.3%

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

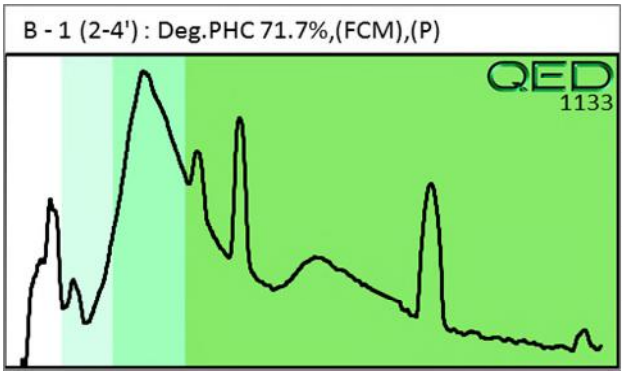
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

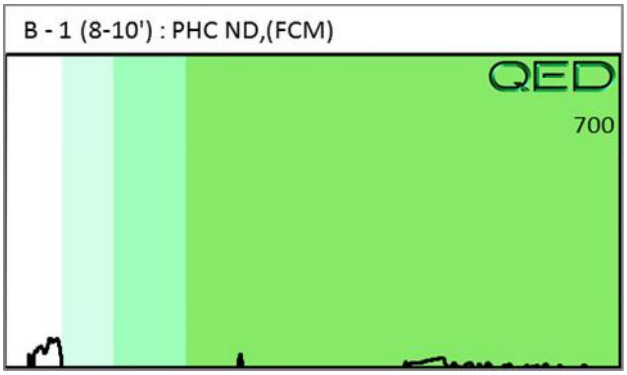
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

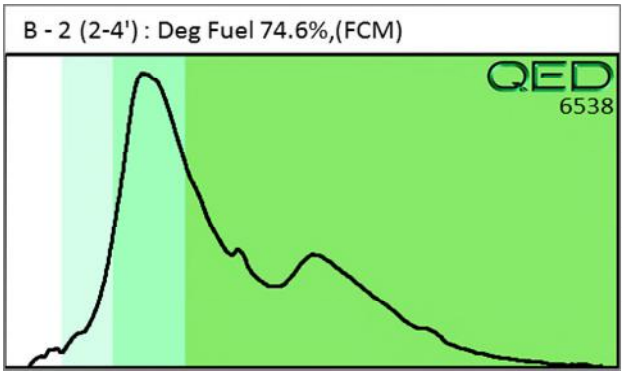
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

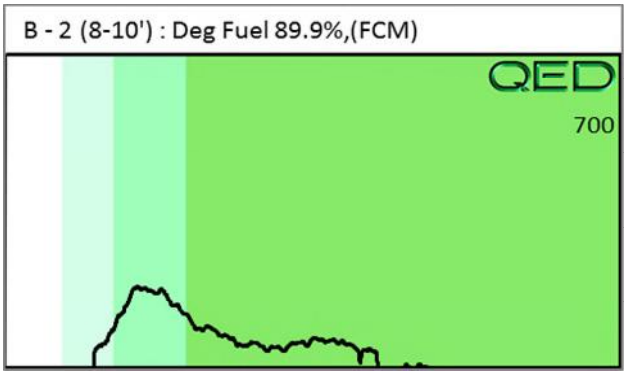
QED Hydrocarbon Fingerprints

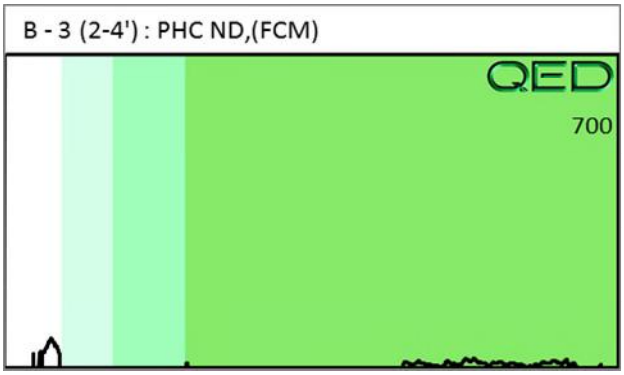
Project: 4305-18-175A; PARCEL 126 ##################

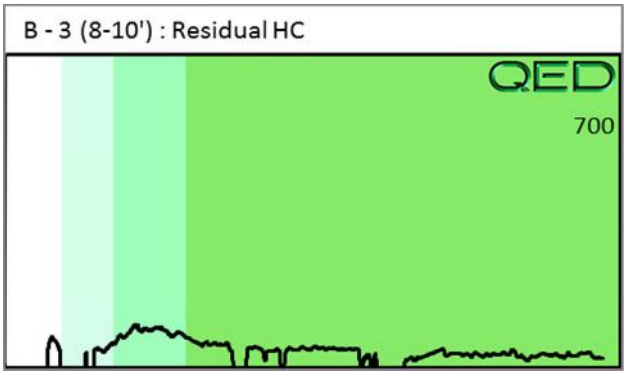


QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Monday, February 25, 2019
**Samples extracted** Monday, February 25, 2019
**Samples analysed** Monday, February 25, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** JENN RYAN

**Project:** 4305-18-175A; PARCEL 126

**H09382**

| 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 | B - 4 (2-4') | 20.6 | <0.52 | <0.52 | 0.07 | 0.07 | 0.07 | 0.005 | <0.006 | 0 | 51.2 | 48.8 | Residual HC,(P) |
| Soil | B - 4 (8-10') | 25.7 | <0.64 | <0.64 | <0.26 | <0.64 | <0.01 | <0.01 | <0.008 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B - 5 (2-4') | 28.0 | <0.7 | <0.7 | <0.28 | <0.7 | <0.01 | <0.01 | <0.008 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B - 5 (8-10') | 29.2 | <0.73 | <0.73 | <0.29 | <0.73 | <0.01 | <0.01 | <0.009 | 0 | 0 | 0 | PHC ND,(FCM) |
| Soil | B - 6 (2-4') | 28.9 | <0.72 | <0.72 | 0.21 | 0.21 | 0.2 | 0.02 | <0.009 | 0 | 100 | 0 | Residual HC |
| Soil | B - 6 (8-10') | 26.8 | <0.67 | <0.67 | <0.27 | <0.67 | <0.01 | <0.01 | <0.008 | 0 | 0 | 0 | PHC ND,(FCM) |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 94.0%

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.

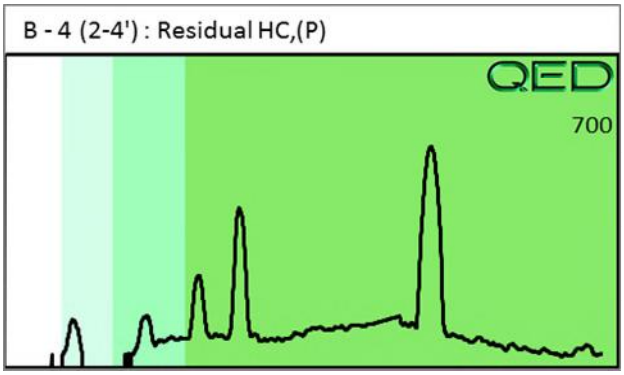
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

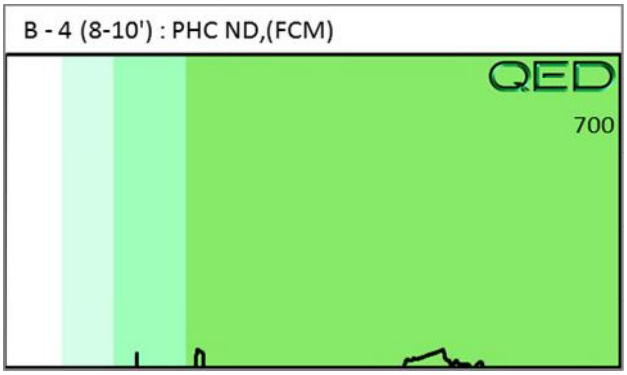
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

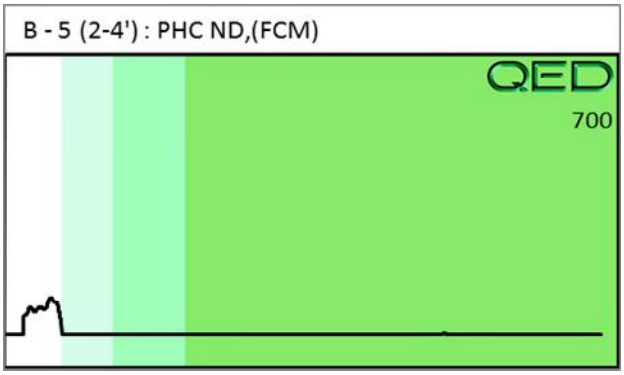
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

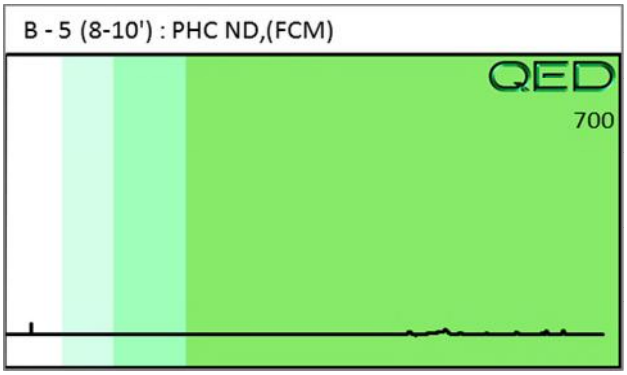
QED Hydrocarbon Fingerprints

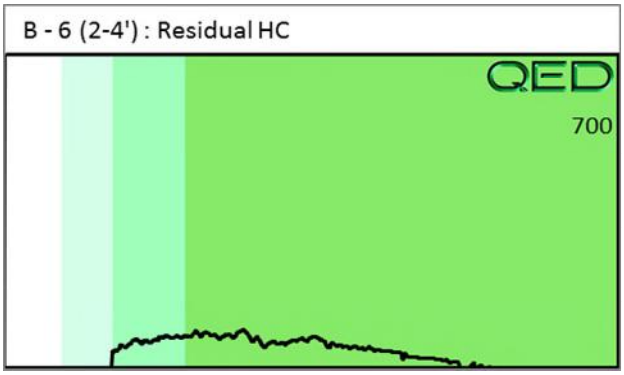
Project: 4305-18-175A; PARCEL 126 ##################

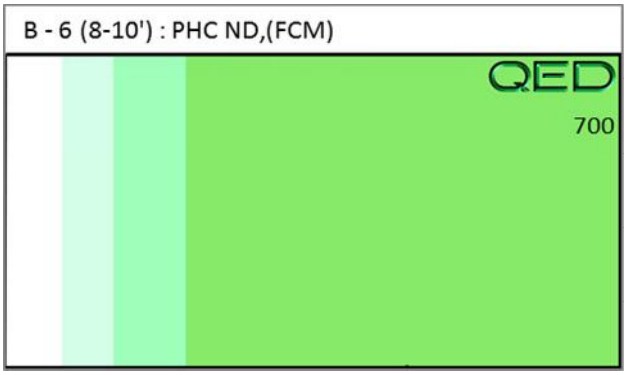


April 29, 2019

North Carolina Department of Transportation
Geotechnical Unit
Mail Service Center 1592
Raleigh, North Carolina 27699-1592

Attention: Mr. Craig Haden email: cehaden@ncdot.gov

Reference: **Preliminary Site Assessment Report**
**NCDOT Project I-5986B, WBS Element 47532.1.3**
**Parcel 138-Love's Truck Stop**
3948 Hodges Chapel Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175A

Dear Mr. Haden:

S&ME, Inc. (S&ME) is submitting this Preliminary Site Assessment (PSA) Report to the North Carolina Department of Transportation (NCDOT). This report presents the background/project information, field activities, findings, conclusions, and recommendations. These services were performed in general accordance with S&ME Proposal No. 4305-18-175 CO-01 REV-01 dated January 2, 2019, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its January 8, 2019 Notice to Proceed Letter.

## ♦ Background/Project Information

Based on NCDOT's November 2, 2018, Request for Technical and Cost Proposal, the PSA was conducted within the NCDOT right-of-way (ROW) and/or easement as indicated on the preliminary plan sheets provided by NCDOT at the following property:

| NCDOT Parcel No. | Property Owner | Site Address |
|---|---|---|
| 138 | Love's Travel Stops, Inc. | (Love's Truck Stop)<br>3948 Hodges Chapel Road, Dunn, NC |

The property is developed with an active truck stop identified as Love's Truck Stop, which utilizes several petroleum underground storage tanks (USTs). Information regarding the UST systems listed for this site is provided in the following table:

UST Facility ID No. 0-00-000021717

| Number of Tanks | Contents | Capacity (gallons) | Date Installed | Date Removed |
|---|---|---|---|---|
| 3 | Gasoline | 10,000 | 1987 | Active |
| 2 | Diesel | 20,000 | 1987 | Active |
| 1 | Diesel | 4,000 | 1987 | Active |
| 1 | Other | 3,000 | 1987 | Active |
| 1 | Other | 10,000 | 2012 | Active |
| 1 | Bio-Diesel | 20,000 | 2015 | Active |

The property is listed with three North Carolina Department of Environmental Quality (NCDEQ) Incidents (Incident #16993, #29244 and #29985) associated with petroleum releases from USTs which occurred in 1996, 2004 and 2016, respectively. The property is not listed with NCDEQ Incidents associated with petroleum releases from aboveground storage tanks.

The PSA included a geophysical survey and subsequent limited soil sampling (six soil borings up to 10 feet below ground surface (ft.-bgs.), within accessible areas of the proposed ROW/easement in preparation for construction activities. Groundwater was not encountered during the advancement of soil borings at the site. Therefore, groundwater sampling was not performed. **Figure 1** shows the vicinity and site location, and **Figure 2** shows the site and boring locations. Soil sampling results are shown on **Figure 3.**

## ♦ Field Services

Prior to field activities, a site specific Health and Safety Plan was prepared as required by the Occupational Health and Safety Act (OSHA). Underground utilities were located and marked by the North Carolina One-Call Service. A private utility locator (Troxler Geologic, Inc.) was also used to locate and mark underground utilities.

## ♦ Geophysical Survey

On February 5, 2019, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 138. S&ME used a combination of the Time Domain Electromagnetic (TDEM) and Ground Penetrating Radar (GPR) methods to explore for buried subsurface features at the site such as underground storage tanks (USTs) and other possible buried obstructions. Brief descriptions of these complementary geophysical techniques are presented in the following paragraphs.

### Time Domain Electromagnetics (TDEM)

TDEM measures the electrical conductivity of subsurface materials and discriminates between moderately conductive earth materials and very conductive metallic targets within the shallow subsurface. The conductivity is

determined by transmitting a time-varying magnetic pulse into the subsurface and measuring the amplitude and phase shift of the secondary magnetic field. The secondary magnetic field is created when the conductive materials become an inductor as the primary magnetic field is passed through them. TDEM data are acquired continuously at a walking pace typically along a series of parallel or perpendicular lines. The system generates audible and visual indications when metallic targets are encountered. These measurements can also be supported with a global positioning system (GPS) which is output directly into the TDEM data file.

We used a Geonics Limited EM-61 MK2 TDEM system in general accordance with ASTM D6820-02 (2007) "*Standard Guide for Use of the Time Domain Electromagnetic Method for Subsurface Investigation.*" Data was collected along lines spaced at approximately five feet using a Juniper® Systems Geode™ sub-meter GPS as positioning support. The presence of vehicles, equipment, ditches, and other surficial obstructions within the requested survey area however prevented TDEM data collection in several locations. The approximate TDEM data collection paths are presented in **Figure 4**. Golden Software's Surfer® program was used to grid and plot the data (**Figures 5 and 6**). The TDEM data has been presented as Plots A and B in order to provide both opaque and transparent views, respectively.

### Ground Penetrating Radar (GPR)

GPR transmits electromagnetic waves into the subsurface from an antenna at a specific frequency and measures the time for wave reflections to be received by interfaces between materials with differing material properties (e.g. soil/metal, etc.). The intensity of the reflected GPR wave is a function of the contrast in the material properties (i.e. dielectric permittivity) at the interface, the conductivity of the material that the wave is traveling through, and the frequency of the signal.

We used a Geophysical Survey Systems, Inc. (GSSI) SIR® 3000 GPR system equipped with a 400 MHz antenna in general accordance with ASTM D6432-11 "*Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation*" to further characterize anomalies/features identified during the TDEM survey.

A total of four (4) GPR profiles (Lines 1 through 4) were collected for documentation (**Figure 7**). The data was post-processed using the GSSI Radan® 7 GPR software program for additional analysis.

### Geophysical Findings

Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site. However, two anomalous features unrelated to known surficial targets were identified in the geophysical data sets (TDEM Anomaly A and GPR Anomaly I; **Figures 5 through 7**). Anomalies A and I are characterized by high amplitude GPR responses located within the upper two feet and likely related to isolated buried targets/debris; metallic and non-metallic, respectively. Anomalies were also marked in the field using white spray paint. Example GPR profiles are presented in **Figures 8 and 9**.

## ♦ Soil Sampling

On February 22, 2019, Troxler Geologic, Inc. (Troxler's) drill crew utilized a track mounted Geoprobe® rig to advance six soil borings (B-1 through B-6) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 138. The approximate location of the soil borings are shown in **Figure 2**. A

photographic log is included in **Appendix I.** Troxler's drill crew advanced the Geoprobe® borings to a depth of approximately 10 ft.-bgs. During the advancement of the soil borings, groundwater was not encountered. Soil samples were continuously collected in four-foot long disposable acetate-plastic sleeves that line the hollow stainless-steel sample probes. Soil recovered from the sleeves was classified on-site by S&ME personnel and screened with a Photoionization Detector (PID) at approximately two foot depth intervals to measure relative headspace concentrations of volatile organic compounds (VOCs).

VOC headspace readings were obtained from an aliquot of each soil sample that was placed in a re-sealable bag. Another portion of the sample was placed in a separate re-sealable bag and stored in an insulated container with ice for possible laboratory analyses. After waiting approximately 15 minutes to allow the sample to reach ambient temperature and headspace equilibrium, the PID probe was inserted into the bag to obtain a headspace reading. A summary of the PID readings and logs of the soil borings are included in **Appendix II.**

No petroleum odors, staining or elevated PID readings were noted within the collected soil samples. Therefore, two soil samples (two to four foot depth interval and eight to ten foot depth interval) were selected from each boring and provided to RED Lab, LLC (Red Lab) for on-site analysis. A total of 12 soil samples (two per boring) were analyzed by RED Lab for Total Petroleum Hydrocarbons (TPH)-Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) using ultra-violet fluorescence (UVF) spectroscopy with product (fuel) identification.

Upon completion of the soil sampling, the soil borings were backfilled with bentonite pellets and soil cuttings. Investigative derived wastes (IDW), such as additional soil cuttings generated during the soil boring advancement and decontamination water, were spread on the ground in accordance with the procedures specified by North Carolina Department of Environmental Quality (NCDEQ). Used gloves, re-sealable bags and acetate sleeves were bagged and disposed off-site.

### Soil Analytical Results

Based upon analytical results of soil samples analyzed by RED Lab using UVP spectroscopy, TPH-GRO and TPH-DRO were not reported at concentrations exceeding the North Carolina TPH Action Levels. TPH-DRO was reported at borings B-1, B-3, B-4, B-5 and B-6 at the two to four foot depth intervals at concentrations ranging from 0.13 milligrams per kilograms (mg/kg) to 6.8 mg/kg, which are below its North Carolina TPH Action Level of 100 mg/kg. TPH-DRO was also reported at borings B-1, B-2, B-3, B-5 and B-6 at the eight to ten foot depth intervals at concentrations ranging from 0.18 mg/kg to 15.6 mg/kg. TPH-GRO was reported at boring B-3 at the eight to ten foot depth interval at a concentration of 3.3 mg/kg, which is below its TPH Action Level of 50 mg/kg. TPH-GRO and TPH-DRO were not reported at concentrations exceeding the laboratory method reporting limits for the remaining soil samples. A summary of the soil analytical results is presented in **Table 1** and shown on **Figure 3.** A copy of the laboratory analytical report provided by RED Lab is presented in **Appendix III.**

## ♦ Conclusion and Recommendations

The geophysical survey identified two anomalous features (Anomaly A and I) which are likely related to isolated buried targets/debris; metallic and non-metallic, respectively. Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site.

S&ME advanced six soil borings (B-1 through B-6) to a depth of approximately 10 ft.-bgs at the site. No petroleum odors, staining or elevated PID readings were noted within soil samples collected from the soil borings. Selected soil samples from the soil borings were analyzed onsite for TPH-GRO and TPH-DRO using UVF spectroscopy. TPH-DRO was reported in the two to four foot depth interval and eight to ten foot depth interval at five soil borings. TPH-GRO was reported in the eight to ten foot depth interval at one soil boring. TPH-GRO and TPH-DRO were reported at concentrations slightly above the laboratory method reporting limits, but well below the North Carolina TPH Action Levels. During the soil boring advancement, groundwater was not encountered. Therefore, groundwater sampling was not performed.

S&ME recommends maintaining an awareness level for the presence of marginally impacted petroleum in soil (below TPH Action Levels) at the site for the safety of workers and the public. If petroleum stained or odorous soils are encountered during construction, these soils should be properly handled and disposed at a licensed facility.

## ♦ Limitations

The results of this preliminary investigation are limited to the boring locations presented herein. The results of this Preliminary Site Assessment are not all inclusive and may not represent existing conditions across the entire property. These results only reflect the current conditions at the locations sampled on the date this Preliminary Site Assessment was performed. This report has been prepared in accordance with generally accepted environmental engineering and geophysical practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

The geophysical methods used for this survey have inherent limitations. Site metallic features (e.g., buildings, reinforced concrete, vehicles, etc.) and overhead transmission lines can produce a false electromagnetic response and may mask subsurface features. The depth of exploration of the GPR signal is highly site specific, and is greatly limited by signal attenuation (absorption) of the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clay soils, and lowest in relatively low conductivity materials such as unsaturated sand. For this project location, the GPR data sets appear to have a maximum depth of penetration of approximately about five ft.-bgs.

Regardless of the thoroughness of a geophysical study, there is always a possibility that actual conditions may not match the interpretations. The results should be considered accurate only to the degree implied by the methods used and the method's limitations and data coverage. Accordingly, the possibility exists that not all features at a project site will be located due to either subsurface soil conditions or the occurrence of features outside the lateral limits and below the depth of penetration of the methods used. As with most surface geophysical methods, resolution of the subsurface will also decrease with depth. As such, the size and/or contrast of features compared to the imaged subsurface media must be significant enough to produce the anticipated response. The location and/or determination (or the lack thereof) of potential buried features is based on our review of the provided information and of the geophysical survey. Under no circumstances does S&ME assume any responsibility for damages resulting from the presence of subsurface features that may exist but were not identified by our survey.

This Preliminary Site Assessment was performed solely for NCDOT regarding the above-referenced site and assessment area. This report is provided for the sole use of NCDOT. Use of this report by any other parties will be

at such party's sole risk. S&ME disclaims liability for any such use or reliance by third parties. The observations presented in this report are indicative of conditions during the time of the assessment and of the specific areas referenced.

## Closing

S&ME appreciates the opportunity to provide these services to you. If you have any questions or comments regarding this report, please contact us at your convenience.

Sincerely,

**S&ME, Inc.**

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5/6/2019

NORTH CAROLINA PROFESSIONAL SEAL 18760 ENGINEER THOMAS P. RAYMOND

Attachments:

**Table 1:** Summary of Soil Sampling Results

**Figure 1:** Vicinity Map
**Figure 2:** Site Map
**Figure 3:** Soil Constituent Map
**Figure 4:** TDEM Path Location Plan
**Figure 5:** TDEM Data Plot A
**Figure 6:** TDEM Data Plot B
**Figure 7:** Geophysical Anomaly Location Plan
**Figure 8:** Example GPR Data – Lines 3 and 4
**Figure 9:** Example GPR Data-Lines 1and 2

**Appendix I:** Photographs
**Appendix II:** Boring Logs
**Appendix III:** Laboratory Analytical Reports and Chain of Custody

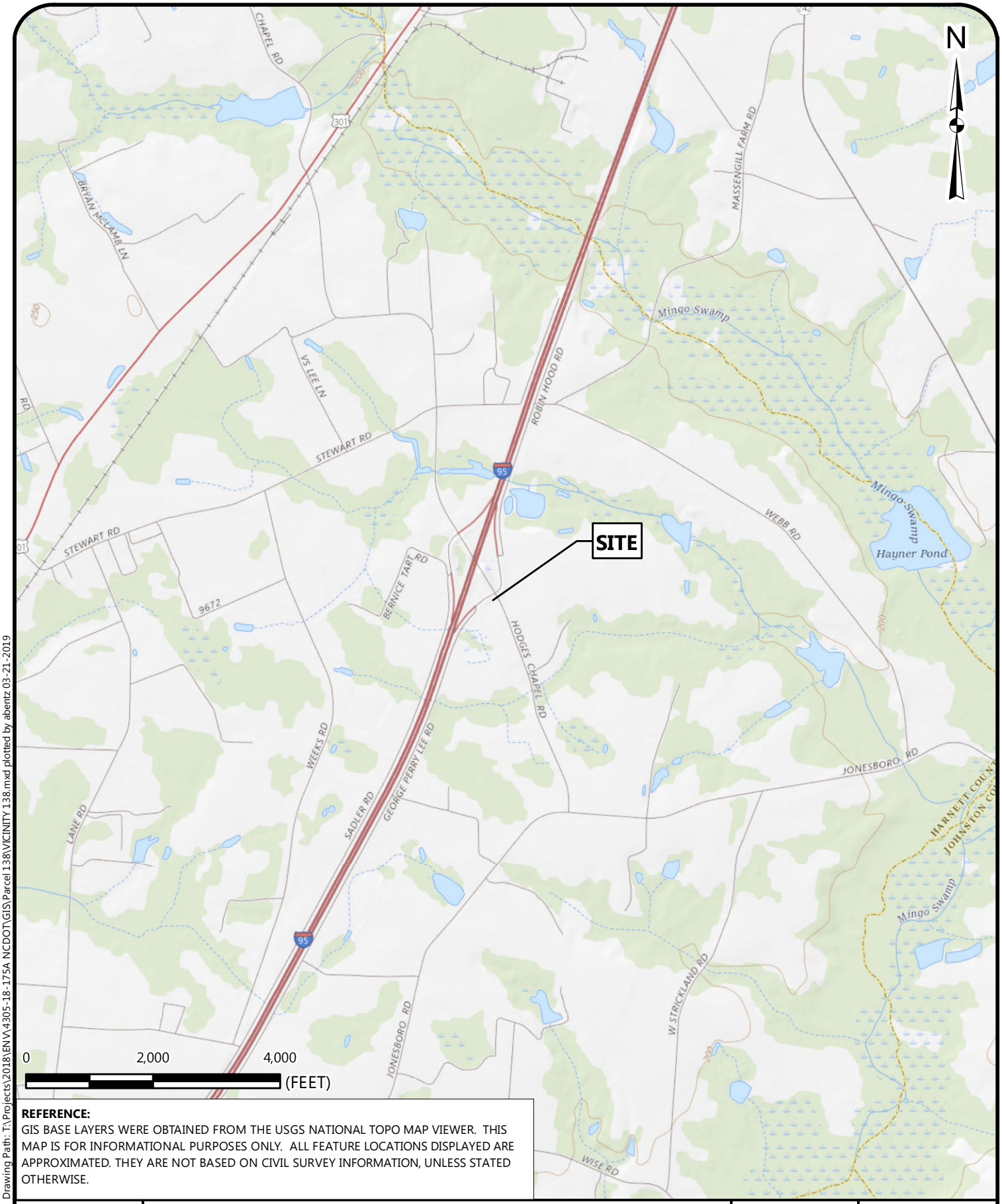
# Tables

**TABLE 1**
**SUMMARY OF SOIL SAMPLING RESULTS**
**NCDOT Project I-5986B**
**Parcel 138 - (Love's Truck Stop)**
**3948 Hodges Chapel Road**
**Dunn, Harnett County, North Carolina**
**S&ME Project No. 4305-18-175A**

| Analytical Method→ | | | Total Petroleum Hydrocarbons (TPH) Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) by Ultraviolet Fluorescence (UVF) Spectrometry | |
|---|---|---|---|---|
| **Sample ID** | **Date** | **Contaminant of Concern→** / **Sample Depth (ft.-bgs)** | **TPH-GRO** | **TPH-DRO** |
| B-1 | 2/22/2019 | 2 to 4 | <0.49 | **0.13** |
| | | 8 to 10 | <0.64 | **0.18** |
| B-2 | 2/22/2019 | 2 to 4 | <0.4 | <0.16 |
| | | 8 to 10 | <0.78 | **0.8** |
| B-3 | 2/22/2019 | 2 to 4 | <0.66 | **5** |
| | | 8 to 10 | **3.3** | **15.6** |
| B-4 | 2/22/2019 | 2 to 4 | <0.56 | **6.8** |
| | | 8 to 10 | <0.43 | <0.17 |
| B-5 | 2/22/2019 | 2 to 4 | <0.43 | **2.5** |
| | | 8 to 10 | <0.5 | **0.4** |
| B-6 | 2/22/2019 | 2 to 4 | <0.43 | **0.75** |
| | | 8 to 10 | <0.49 | **3.6** |
| **North Carolina TPH Action Levels** | | | **50** | **100** |

Notes:
1. UVF analysis performed by RED Lab, LLC
2. Concentrations are reported in milligrams per kilogram (mg/Kg).
3. ft.-bgs:- feet below ground surface.
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the North Carolina TPH Action Levels are shown in Shaded and **BOLD** fields.

# Figures




**REFERENCE:**
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: T:\Projects\2018\ENV\4305-18-175A NCDOT\GIS\Parcel 138\VICINITY 138.mxd plotted by abentz 03-21-2019

# VICINITY MAP

NCDOT I-5986B
PARCEL NO. 138 (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL RD, DUNN, HARNETT COUNTY, NORTH CAROLINA

| | |
|---|---|
| SCALE: | 1 " = 2,000 ' |
| DATE: | 3-21-19 |
| PROJECT NUMBER | 4305-18-175A |
| FIGURE NO. | 1 |


## LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

Map Source: NCDOT Project I-5986B
Image Source: NC ONEMAP, Dated 2016

Known Soil Contamination:

Possible Soil Contamination: — S —

Existing Contamination Known - Water: — W —

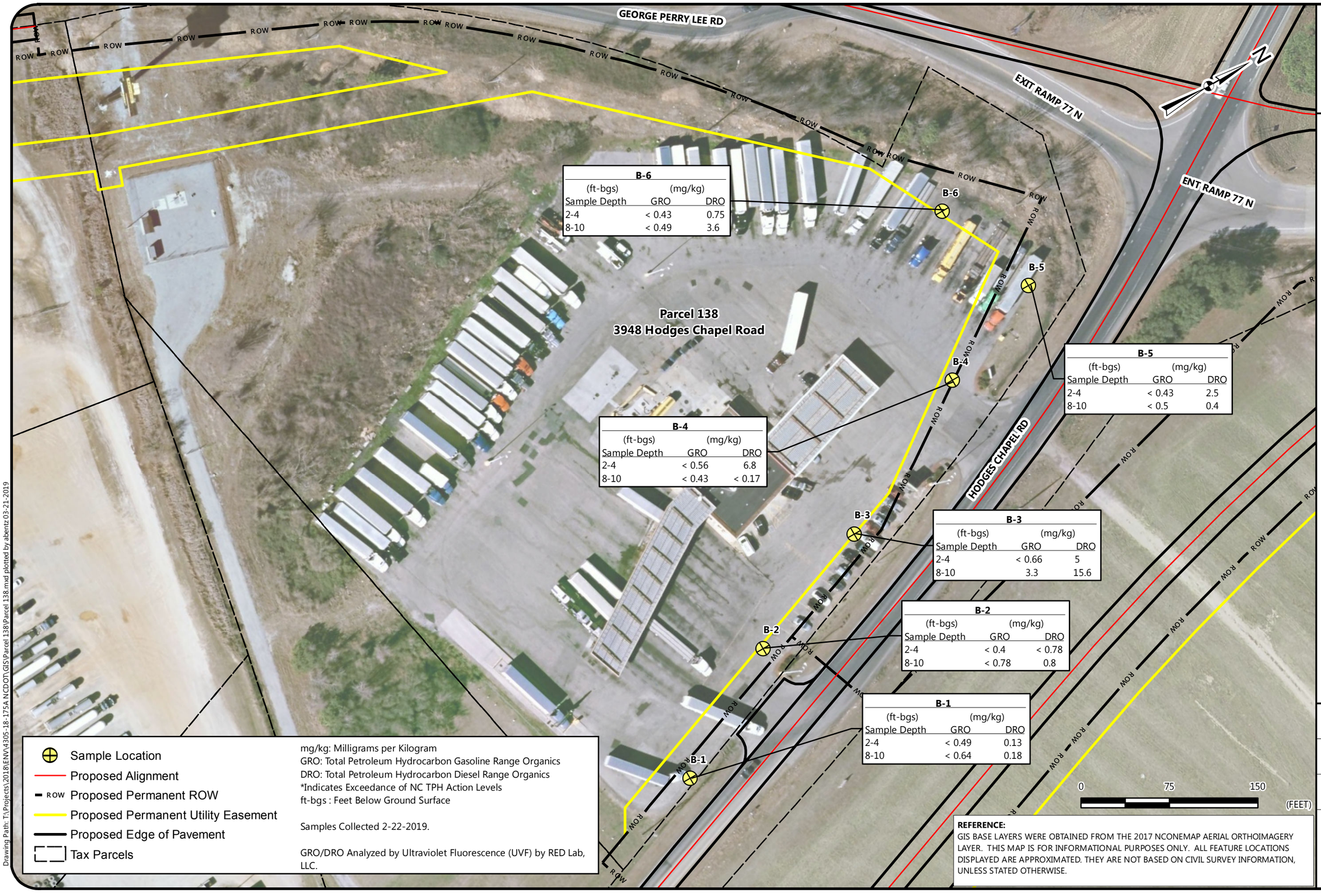
0 100 200

GRAPHIC SCALE (IN FEET)

# SITE MAP

NCDOT Project: I-5986B
PARCEL 138 - (LOVE'S TRUCK STOP)
3948 Hodges Chapel Road, Dunn, Harnett County, North Carolina

| SCALE: | FIGURE NO. |
|---|---|
| 1" = 100' | 2 |
| DATE: | |
| MARCH 2019 | |
| PROJECT NUMBER | |
| 4305-18-175A | |




Drawing Path: T:\Projects\2018\ENV\4305-18-175A NCDOT\GIS\Parcel 138\Parcel 138.mxd plotted by abentz 03-21-2019

# SOIL CONSTITUENT MAP

NCDOT I-5986B
PARCEL NO. 138 (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

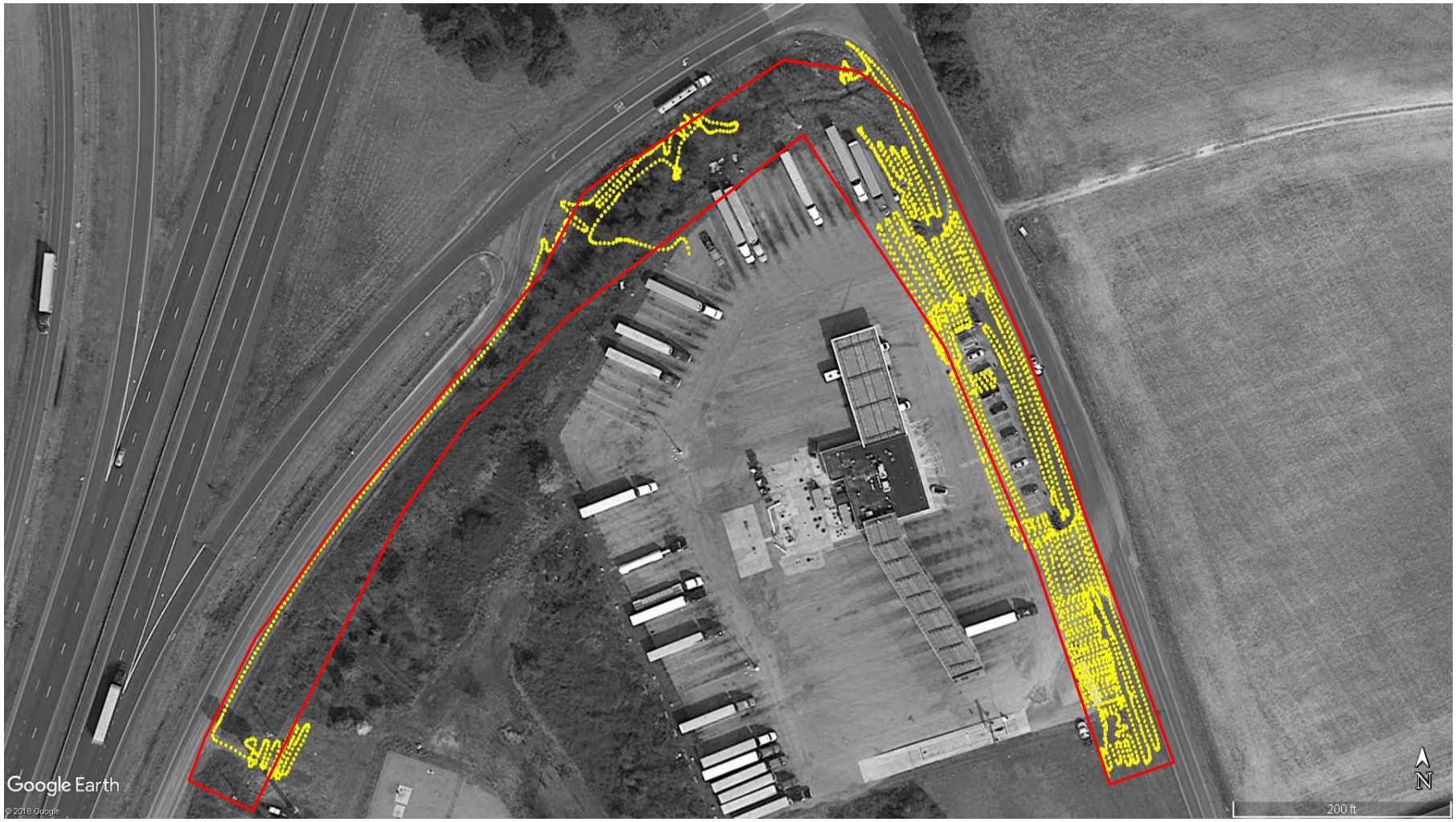
SCALE:
1 " = 75 '

DATE:
3-21-19

PROJECT NUMBER
4305-18-175

FIGURE NO.
3

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)




**LEGEND**

Approximate TDEM Path

Approximate Requested Survey Area

# TDEM PATH LOCATION PLAN

NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**4**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**TDEM DATA PLOT A**

NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

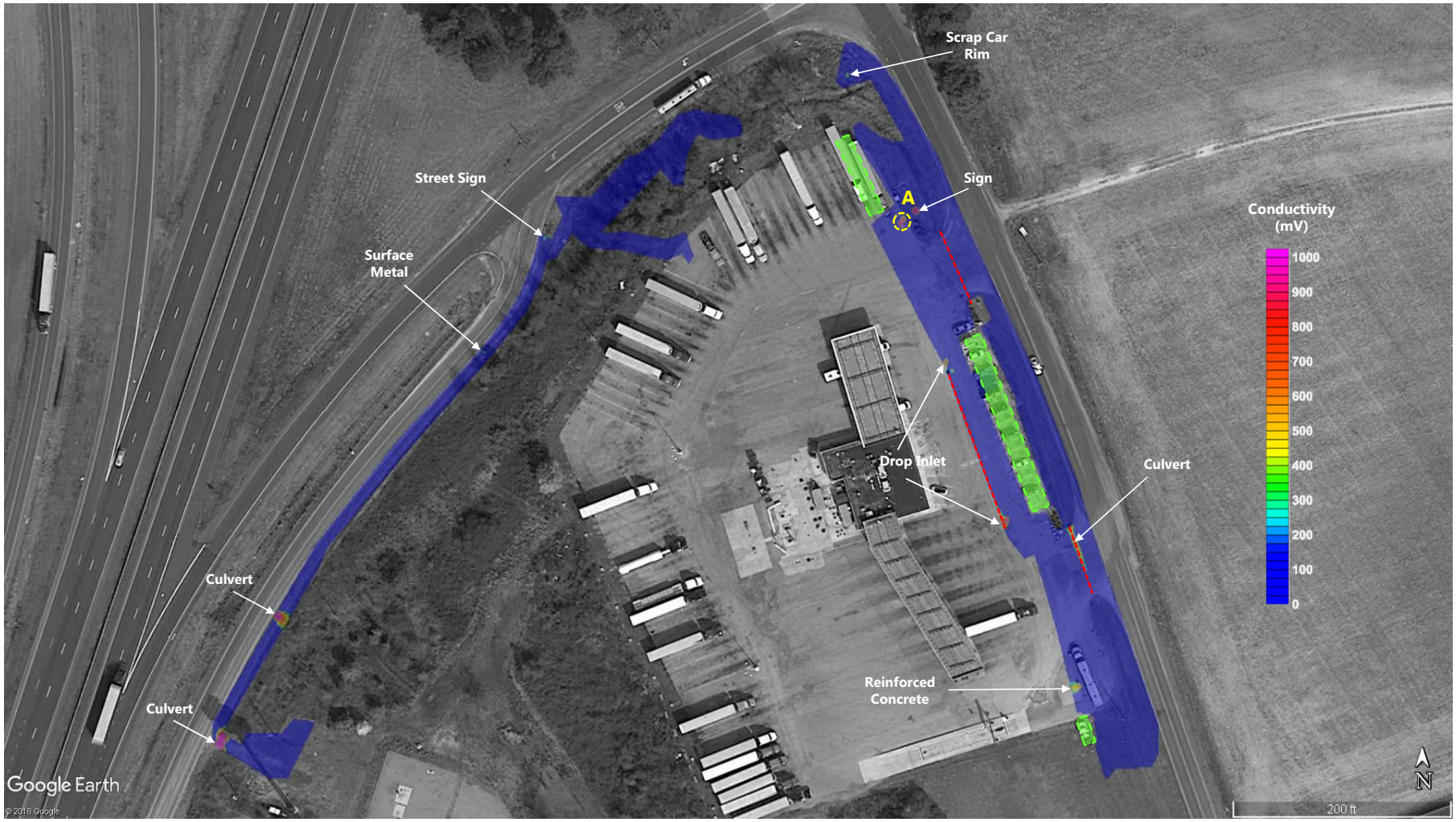
SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**5**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)




**LEGEND**

Approximate Location of TDEM Anomaly

Approximate Location of Vehicle

Approximate Location of Possible Utility

**TDEM DATA PLOT B**

NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

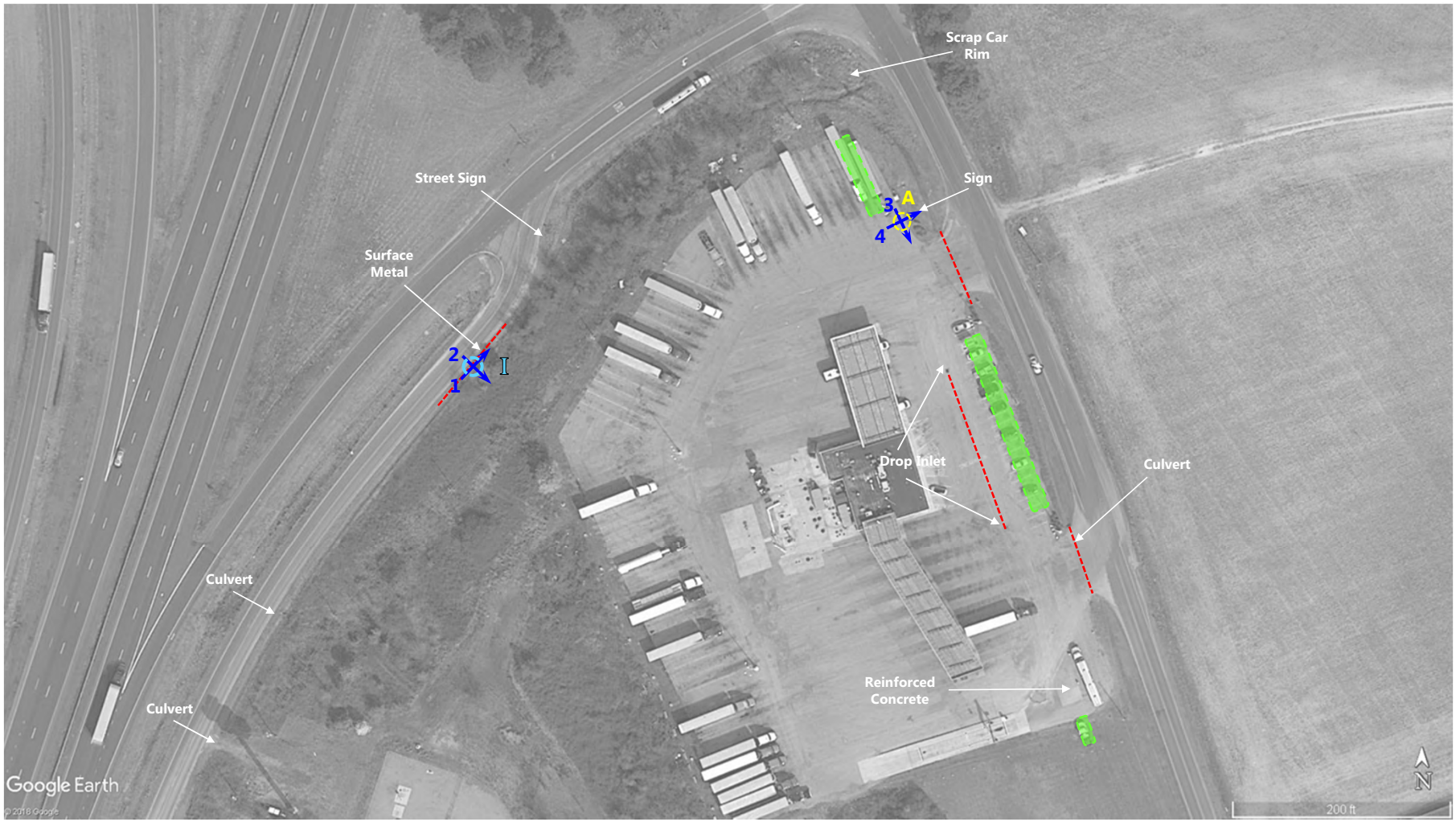
SCALE:
AS SHOWN

DATE:
3/21/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**6**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)



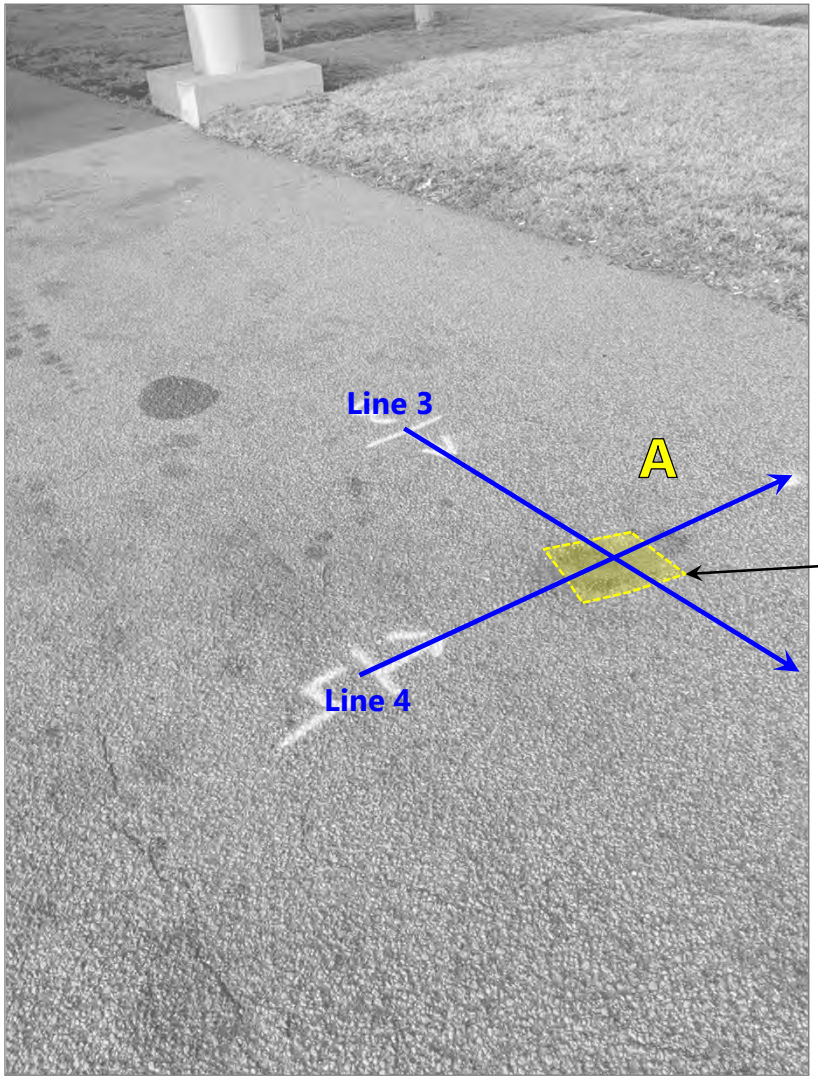

**LEGEND**

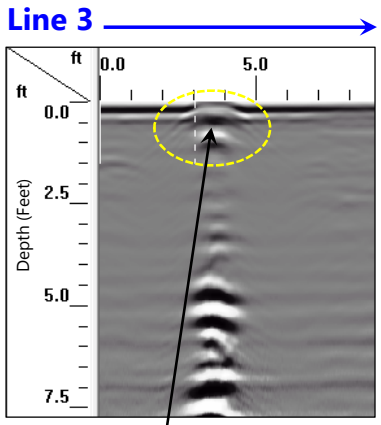
- Approximate Location of TDEM Anomaly
- Approximate Location of GPR Anomaly
- Approximate Location of Vehicle
- Approximate Location of GPR Profile
- Approximate Location of Possible Utility

**GEOPHYSICAL ANOMALY LOCATION PLAN**

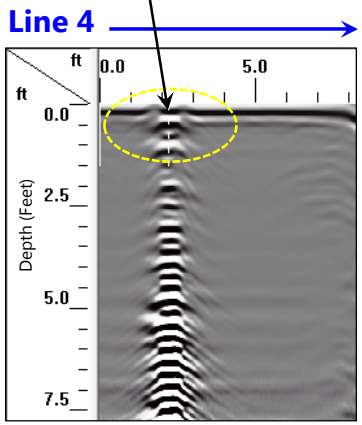
NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN
DATE: 3/21/2019
PROJECT NUMBER: 4305-18-175A
FIGURE NO.: 7




TDEM Anomaly A




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 3 AND 4**

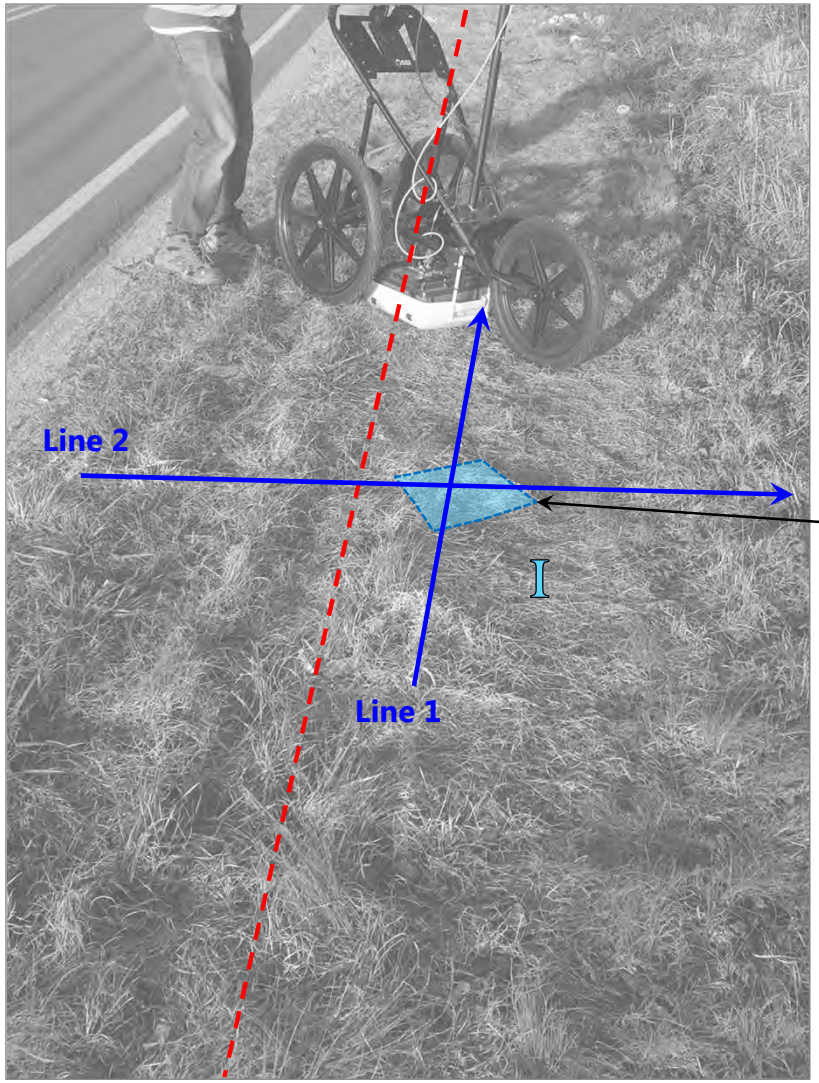
NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

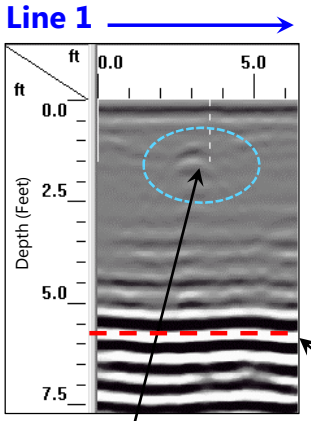
SCALE: AS SHOWN

DATE: 3/21/2019

PROJECT NUMBER 4305-18-175A

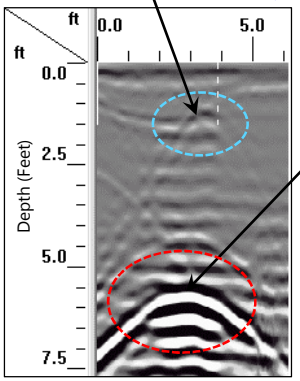
FIGURE NO. **8**




GPR Anomaly I

Possible Utility




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 1 AND 2**

NCDOT PROJECT: I-5986B
PARCEL 138 – (LOVE'S TRUCK STOP)
3948 HODGES CHAPEL ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 3/21/2019

PROJECT NUMBER 4305-18-175A

FIGURE NO. **9**

# Appendix I – Photographs


Date: 2/22/2019

Photographer: JTH

| | | |
|---|---|---|
| **1** | **Location / Orientation** | Front view of site looking northwest. |
| | **Remarks** | Note soil boring B-2. |


Date: 2/22/2019

Photographer: JTH

| | | |
|---|---|---|
| **2** | **Location / Orientation** | View of northern portion of site looking northwest. |
| | **Remarks** | Note soil boring B-6. |

# Appendix II – Boring Logs

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-1** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 1.3 | No | | | | |
| | | Clayey Sand, Tan, | | | 1.4 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 1.3 | No | | | | |
| | | | | | 1.8 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 1.4 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-2** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 1.5 | No | | | | |
| | | Clayey Sand, Red, Orange, | | | 1.7 | Yes | | | | |
| 5 | | | | | 2.0 | No | | | | |
| | | | | | 2.3 | No | | | | |
| | | Clayey Sand, Red, Orange, Gray, | | | | | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 1.8 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-3** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 1.0 | No | | | | |
| | | | | | 1.6 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 1.8 | No | | | | |
| | | | | | 0.5 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 2.9 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-4** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 0.0 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.0 | No | | | | |
| | | | | | 0.0 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.1 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-5** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 0.0 | No | | | | |
| | | | | | 0.4 | Yes | | | | |
| 5 | | Clayey Sand, Red, Orange, Gray, | | | 0.8 | Yes | | | | |
| | | | | | 0.0 | No | | | | |
| 10 | | | | | 0.1 | No | | | | |
| | | Boring Terminated at 10 Ft-BGS | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 138-3948 Hodges Chapel Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-6** |
|---|---|---|---|
| DATE DRILLED: | Friday, February 22, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Silty Sand, Tan, Brown, | | | 0.1 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | | | | 0.6 | No | | | | |
| | | Clayey Sand, Red, Orange, Gray, | | | 0.1 | No | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | 0.1 | Yes | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

# Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Friday, February 22, 2019
**Samples extracted** Friday, February 22, 2019
**Samples analysed** Friday, February 22, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** JENN RYAN

**Project:** 4305-18-175A; PARCEL 138

**H09382**

| 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 | B - 2 (2-4') | 15.9 | <0.4 | <0.4 | <0.16 | <0.4 | <0.008 | <0.008 | <0.005 | 0 | 0 | 100 | Residual HC,(P) |
| Soil | B - 2 (8-10') | 31.3 | <1.6 | <0.78 | 0.8 | 0.8 | 0.44 | 0.03 | <0.009 | 0 | 100 | 0 | Deg Fuel 87.7%,(FCM) |
| Soil | B - 1 (2-4') | 19.4 | <0.49 | <0.49 | 0.13 | 0.13 | 0.12 | 0.01 | <0.006 | 0 | 87.5 | 12.5 | Residual HC |
| Soil | B - 1 (8-10') | 25.5 | <0.64 | <0.64 | 0.18 | 0.18 | 0.17 | 0.02 | <0.008 | 0 | 88.7 | 11.3 | Residual HC |
| Soil | B - 3 (2-4') | 26.3 | <0.66 | <0.66 | 5 | 5 | 1.3 | 0.07 | <0.001 | 0 | 96 | 4 | Bit.Road Tar 94.1%,(FCM) |
| Soil | B - 3 (8-10') | 28.6 | <1.4 | 3.3 | 15.6 | 18.9 | 2.8 | 0.56 | 0.002 | 32.4 | 66.5 | 1.1 | Deg.Fuel 79%,(FCM) |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 97.9%

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.

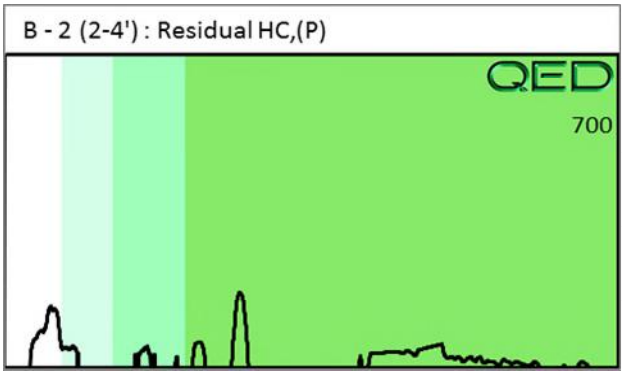
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

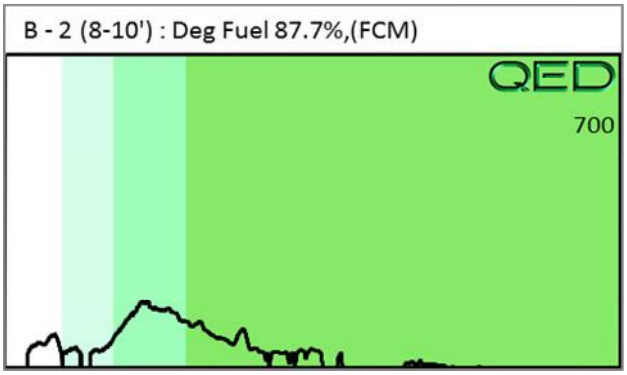
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

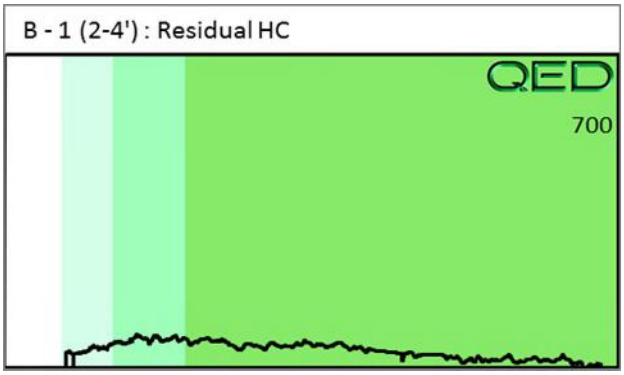
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

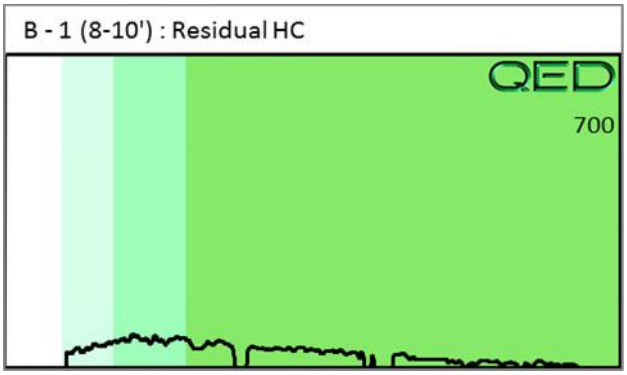
QED Hydrocarbon Fingerprints

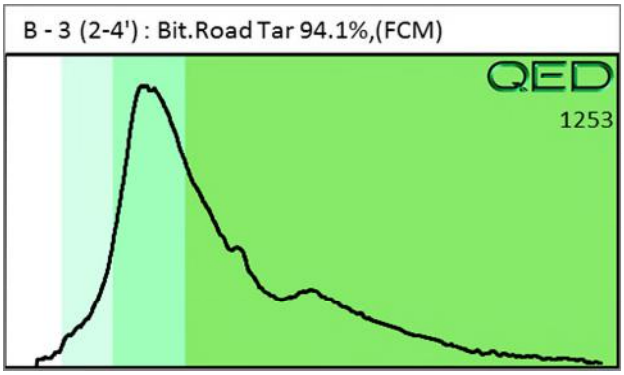
Project: 4305-18-175A; PARCEL 138 ##################

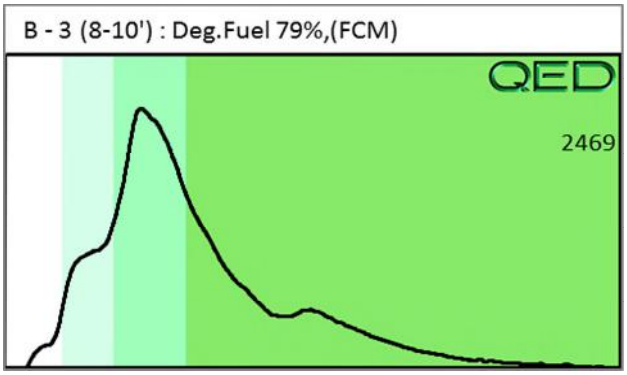


QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Friday, February 22, 2019
**Samples extracted** Friday, February 22, 2019
**Samples analysed** Friday, February 22, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** JENN RYAN

**Project:** 4305-18-175A; PARCEL 138

**H09382**

| 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 | B - 4 (2-4') | 22.2 | <0.56 | <0.56 | 6.8 | 6.8 | 1.5 | 0.24 | 0.001 | 0 | 97.7 | 2.3 | Deg Fuel 90.9%,(FCM) |
| Soil | B - 4 (8-10') | 17.3 | <0.43 | <0.43 | <0.17 | 0.01 | 0.01 | 0.002 | <0.005 | 0 | 100 | 0 | Residual HC,(P) |
| Soil | B - 5 (2-4') | 17.3 | <0.43 | <0.43 | 2.5 | 2.5 | 1.2 | 0.06 | 0.001 | 0 | 91.6 | 8.4 | V.Deg.PHC 76.5%,(FCM) |
| Soil | B - 5 (4-6') | 19.8 | <0.5 | <0.5 | 0.4 | 0.4 | 0.17 | 0.01 | <0.006 | 0 | 100 | 0 | V.Deg.PHC 62.7%,(FCM) |
| Soil | B - 6 (2-4') | 17.2 | <0.43 | <0.43 | 0.75 | 0.75 | 0.36 | 0.02 | 0.001 | 0 | 94 | 6 | V.Deg.PHC 76.3%,(FCM) |
| Soil | B - 6 (8-10') | 19.5 | <0.49 | <0.49 | 3.6 | 3.6 | 0.93 | 0.13 | 0.001 | 0 | 97.4 | 2.6 | Deg Fuel 89.4%,(FCM),(P) |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 103.3%

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

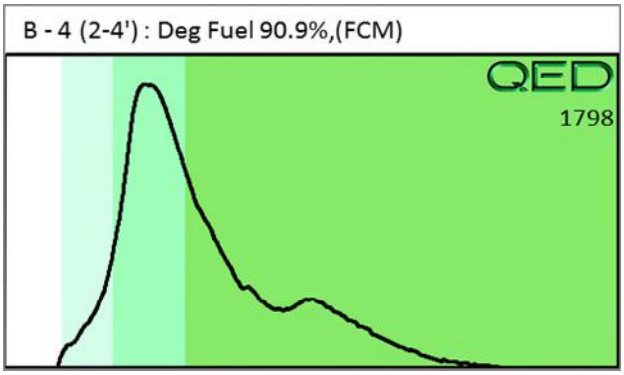
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

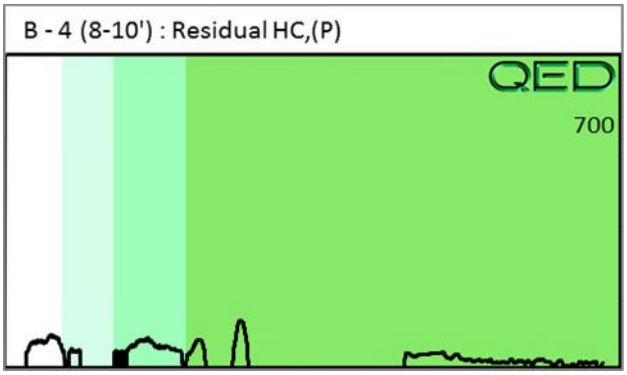
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

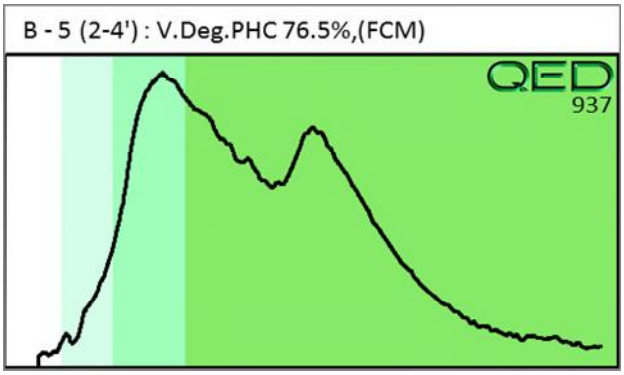
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

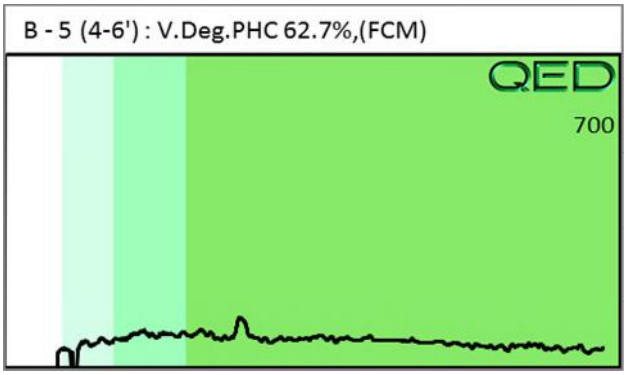
QED Hydrocarbon Fingerprints

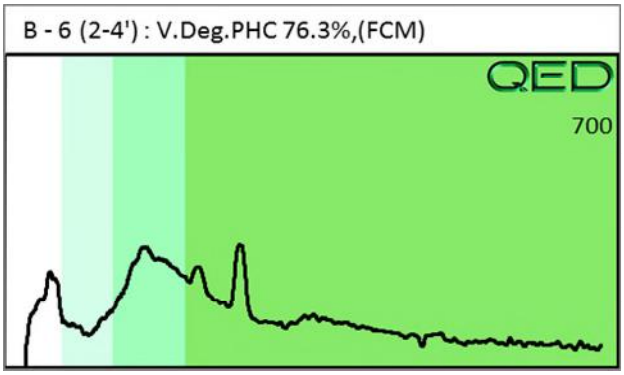
Project: 4305-18-175A; PARCEL 138 ##################

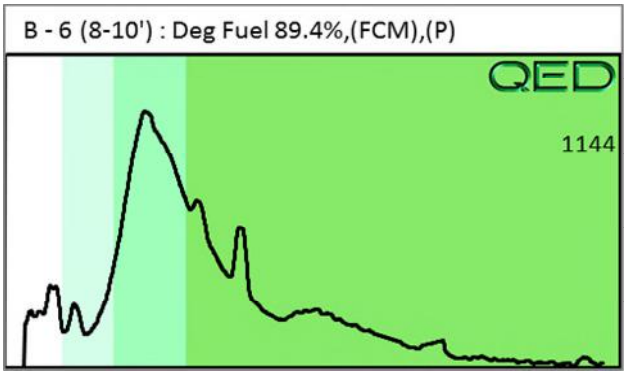


April 29, 2019

North Carolina Department of Transportation
Geotechnical Unit
Mail Service Center 1592
Raleigh, North Carolina 27699-1592

Attention: Mr. Craig Haden email: cehaden@ncdot.gov

Reference: **Preliminary Site Assessment Report**
**NCDOT Project I-5986B, WBS Element 47532.1.3**
**Parcel 140-Former Robin Hood Truck Stop**
60 Robin Hood Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175A

Dear Mr. Haden:

S&ME, Inc. (S&ME) is submitting this Preliminary Site Assessment (PSA) Report to the North Carolina Department of Transportation (NCDOT). This report presents the background/project information, field activities, findings, conclusions, and recommendations. These services were performed in general accordance with S&ME Proposal No. 4305-18-175 CO-01 REV-01 dated January 2, 2019, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its January 8, 2019 Notice to Proceed Letter.

## ♦ Background/Project Information

Based on NCDOT's November 2, 2018, Request for Technical and Cost Proposal, the PSA was conducted within the NCDOT right-of-way (ROW) and/or easement as indicated on the preliminary plan sheets provided by NCDOT at the following property:

| NCDOT Parcel No. | Property Owner | Site Address |
|---|---|---|
| 140 | Robin Whitely Hood, II | (Former Robin Hood Truck Stop)<br>60 Robin Hood Road, Dunn, NC |

The property is the site of a former truck stop identified as Robin Hood Truck Stop. The truck stop facility has been razed and the petroleum underground storage tanks (USTs) that the facility operated have been removed. Information regarding the former UST systems listed for this site is provided in the following table:

UST Facility ID No. 0-00-000017933

| Number of Tanks | Contents | Capacity (gallons) | Date Installed | Date Removed |
|---|---|---|---|---|
| 1 | Gasoline | 8,000 | 1964 | 2010 |
| 1 | Gasoline | 6,000 | 1964 | 2010 |
| 1 | Diesel | 20,000 | 1981 | 2010 |
| 1 | Other | 20,000 | 1981 | 2010 |
| 3 | Gasoline | 6,000 | 1981 | 2010 |

The property is listed with one North Carolina Department of Environmental Quality (NCDEQ) Incident (Incident #29655) associated with petroleum releases from USTs which occurred in 2010. The property is not listed with NCDEQ Incidents associated with petroleum releases from aboveground storage tanks.

The PSA included a geophysical survey, subsequent limited soil sampling (eight soil borings up to 10 feet below ground surface (ft.-bgs.) and limited groundwater sampling (two groundwater samples), within accessible areas of the proposed ROW/easement in preparation for construction activities. **Figure 1** shows the vicinity and site location, and **Figure 2** shows the site and boring locations. Soil and groundwater sampling results are shown on **Figure 3.**

## ♦ Field Services

Prior to field activities, a site specific Health and Safety Plan was prepared as required by the Occupational Health and Safety Act (OSHA). Underground utilities were located and marked by the North Carolina One-Call Service. A private utility locator (Troxler Geologic, Inc.) was also used to locate and mark underground utilities.

## ♦ Geophysical Survey

From February 5 through 7, 2019, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 140. S&ME used a combination of the Time Domain Electromagnetic (TDEM) and Ground Penetrating Radar (GPR) methods to explore for buried subsurface features at the site such as underground storage tanks (USTs) and other possible buried obstructions. Brief descriptions of these complementary geophysical techniques are presented in the following paragraphs.

### Time Domain Electromagnetics (TDEM)

TDEM measures the electrical conductivity of subsurface materials and discriminates between moderately conductive earth materials and very conductive metallic targets within the shallow subsurface. The conductivity is determined by transmitting a time-varying magnetic pulse into the subsurface and measuring the amplitude and phase shift of the secondary magnetic field. The secondary magnetic field is created when the conductive materials become an inductor as the primary magnetic field is passed through them. TDEM data are acquired

continuously at a walking pace typically along a series of parallel or perpendicular lines. The system generates audible and visual indications when metallic targets are encountered. These measurements can also be supported with a global positioning system (GPS) which is output directly into the TDEM data file.

We used a Geonics Limited EM-61 MK2 TDEM system in general accordance with ASTM D6820-02 (2007) "*Standard Guide for Use of the Time Domain Electromagnetic Method for Subsurface Investigation.*" Data was collected along lines spaced at approximately five feet using a Juniper® Systems Geode™ sub-meter GPS as positioning support. The presence of vehicles, thick vegetation and other surficial obstructions within the requested survey area however prevented TDEM data collection in several locations. The approximate TDEM data collection paths are presented in **Figure 4**. Golden Software's Surfer® program was used to grid and plot the data (**Figures 5 and 6**). The TDEM data has been presented as Plots A and B in order to provide both opaque and transparent views, respectively.

### Ground Penetrating Radar (GPR)

GPR transmits electromagnetic waves into the subsurface from an antenna at a specific frequency and measures the time for wave reflections to be received by interfaces between materials with differing material properties (e.g. soil/metal, etc.). The intensity of the reflected GPR wave is a function of the contrast in the material properties (i.e. dielectric permittivity) at the interface, the conductivity of the material that the wave is traveling through, and the frequency of the signal.

We used a Geophysical Survey Systems, Inc. (GSSI) SIR® 3000 GPR system equipped with a 400 MHz antenna in general accordance with ASTM D6432-11 "*Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation*" to further characterize anomalies/features identified during the TDEM survey.

A total of 15 GPR profiles (Lines 1 through 15) were collected for documentation (**Figure 7**). The data was post-processed using the GSSI Radan® 7 GPR software program for additional analysis.

### Geophysical Findings

However, four anomalous features unrelated to known surficial targets were identified in the geophysical data sets (Anomalies A through D; **Figures 5 through 7**). Anomalies A, B, and C are characterized by high amplitude GPR responses located in the upper one ft-bgs and likely related to isolated buried metallic targets/debris. Anomaly D is characterized by two relative high isolated TDEM responses located within the existing curb area along the frontage road to the west. These feature were only identified in the TDEM data during post-processing and not in the field, and as such, GPR data was not collected over these features so interpretations regarding possible size and depth cannot not be determined. Possible steel reinforcement within the concrete curb may have masked the slightly higher responses while in the field. Anomalies A, B, and C were also marked in the field using white spray paint. Example GPR profiles are presented in **Figures 7 through 10**.

## ♦ Soil Sampling

On February 18, 2019, Troxler Geologic, Inc. (Troxler's) drill crew utilized a track mounted Geoprobe® rig to advance eight soil borings (B-1 through B-8) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 140. The approximate location of the soil borings are shown in **Figure 2**. A

photographic log is included in **Appendix I.** Troxler's drill crew advanced the Geoprobe® borings up to a depth of approximately 10 ft.-bgs. During the advancement of the soil borings, groundwater was encountered at depths ranging from approximately four ft.-bgs to 6.5 ft.-bgs. Soil samples were continuously collected in four-foot long disposable acetate-plastic sleeves that line the hollow stainless-steel sample probes. Soil recovered from the sleeves was classified on-site by S&ME personnel and screened with a Photoionization Detector (PID) at approximately two foot depth intervals to measure relative headspace concentrations of volatile organic compounds (VOCs).

VOC headspace readings were obtained from an aliquot of each soil sample that was placed in a re-sealable bag. Another portion of the sample was placed in a separate re-sealable bag and stored in an insulated container with ice for possible laboratory analyses. After waiting approximately 15 minutes to allow the sample to reach ambient temperature and headspace equilibrium, the PID probe was inserted into the bag to obtain a headspace reading. A summary of the PID readings and logs of the soil borings are included in **Appendix II.**

Petroleum odors and elevated PID readings were noted at soil borings B-7 and B-8 at the four to six foot depth intervals, which are either below or within the vadose zone of the groundwater encountered at these borings. Groundwater was encountered at boring B-7 and B-8 at depths of five ft-bgs and four ft.-bgs, respectively. Petroleum odors or elevated PID readings were not noted at the other soil borings on the site. Therefore, various soil samples at varying depth intervals were selected from each boring and provided to RED Lab, LLC (Red Lab) for on-site analysis. A total of ten soil samples were analyzed by RED Lab for Total Petroleum Hydrocarbons (TPH)-Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) using ultra-violet fluorescence (UVF) spectroscopy with product (fuel) identification.

### Soil Analytical Results

TPH-GRO and TPH-DRO were not reported at concentrations exceeding the North Carolina TPH Action Levels. TPH-DRO was reported at borings B-1, B-2, B-4, B-5, B-6 and B-8 at the two to four foot depth intervals at concentrations ranging from 0.16 milligrams per kilograms (mg/kg) to 9.8 mg/kg, which are below its North Carolina TPH Action Level of 100 mg/kg. TPH-DRO was also reported at borings B-7 and B-8 at the four to six foot depth interval at concentrations of 62.8 mg/kg and 72.7l mg/kg, respectively. TPH-GRO was reported at borings B-3 and B-4 at the two to four foot depth interval at a concentration of 3.5 mg/kg and 6 mg/kg, respectively, which are below its North Carolina TPH Action Level of 50 mg/kg. TPH-GRO and TPH-DRO were not reported at concentrations exceeding the laboratory method reporting limits at the remaining soil samples. A summary of the soil analytical results is presented in **Table 1** and shown on **Figure 3.** A copy of the laboratory analytical report provided by RED Lab is presented in **Appendix III.**

## ♦ Groundwater Sampling

During the advancement of the soil borings, groundwater was encountered within approximately 10 ft.-bgs. Therefore, the Geoprobe® was used to advance two of the soil borings into the groundwater table for the collection of groundwater samples. Based on petroleum odors, elevated PID readings and analytical results of soil samples, soil borings B-7 and B-8 were selected for the collection of groundwater samples. The collection of a groundwater sample was attempted at boring B-7 by extending the Geoprobe® groundwater sampling screen into the borehole from a depth of approximately four to eight ft.-bgs. However, the collection of a groundwater sample was unsuccessful at this depth due to clayey material within the boring. The sampling screen was

advanced within boring B-7 to a depth of approximately 12 ft.-bgs and a groundwater sample was collected. A groundwater sample was collected at boring B-8 by advancing the Geoprobe® groundwater sampling screen into the borehole and extending the screen from a depth of approximately four to eight ft.-bgs. Groundwater was purged from the screens until relatively clear using disposable tubing attached to a peristaltic pump. The flow rates were reduced and laboratory supplied containers were filled directly from the tubing, labeled as B-7/TW-1 and B-8/TW-2, respectively and placed in an insulated cooler with ice for transport to Con-Test Laboratories for analysis of VOCs by EPA Method 8260 and polycyclic aromatic compounds (PAHs) by EPA Method 8270.

Upon completion of the soil and groundwater sampling, the sampling equipment was removed and the soil borings backfilled with bentonite pellets and soil cuttings. Investigative derived wastes (IDW), such as additional soil cuttings generated during the soil boring advancement, purge water and decontamination water, were spread on the ground in accordance with the procedures specified by North Carolina Department of Environmental Quality (NCDEQ). Used gloves, tubing, re-sealable bags and acetate sleeves were bagged and disposed off-site.

### Groundwater Analytical Results

Based upon analytical results of groundwater samples analyzed by Con-Test Laboratories, benzene, naphthalene, and 2-methylnaphthalene were reported at B-7/TW-1 at concentrations exceeding their 15A NCAC 2L Groundwater Quality Standards (2L Standards). Benzene, naphthalene, 2-methylnaphthalene and benzo (a) anthracene were reported at B-8/TW-2 at concentrations exceeding their 2L Standards. A summary of the groundwater analytical results is presented in **Table 2** and shown on **Figure 3.** A copy of the laboratory analytical report provided by Con-Test Laboratories is presented in **Appendix III.**

## ♦ Conclusion and Recommendations

Four anomalous features unrelated to known surficial targets were identified in the geophysical data sets (Anomalies A through D). Anomalies A, B, and C are likely related to isolated buried metallic targets/debris. However, Anomaly D was characterized by two relatively high isolated TDEM responses located within the existing curb area along the frontage road to the west. These feature were only identified in the TDEM data during post-processing and not in the field, and as such, GPR data was not collected over these features so interpretations regarding possible size and depth cannot not be determined. Possible steel reinforcement within the curb may have masked the slightly higher responses while in the field. Due to the lack of GPR data at Anomaly D, it is uncertain if Anomaly D is associated with a potential UST. Borings B-5 and B-6 were installed near Anomaly D where field observations and lab data for assessment of petroleum impacted soil did not indicate a petroleum release in this area. Workers in the area of Anomaly D should be aware of the possibility of a UST or buried metallic objects or debris.

S&ME advanced eight soil borings (B-1 through B-8) to a depth of up to approximately 10 ft.-bgs at the site. Petroleum odors and elevated PID readings were noted within collected soil samples at soil borings B-7 and B-8 at the four to six foot depth intervals, which are either below or within the vadose zone of the groundwater encountered at these borings. Groundwater was encountered at borings B-7 and B-8 at depths of five ft-bgs and four ft.-bgs, respectively.

Selected soil samples from the soil borings were analyzed onsite for TPH-GRO and TPH-DRO using UVF spectroscopy. TPH-DRO was reported at borings B-1, B-2, B-4, B-5, B-6 and B-8 at the two to four foot depth

intervals. TPH-DRO was also reported at borings B-7 and B-8 at the four to six foot depth interval. TPH-GRO was reported at borings B-3 and B-4 at the two to four foot depth interval. However, TPH-DRO and TPH-GRO were not reported at concentrations exceeding their North Carolina TPH Action Levels. During the soil boring advancement, groundwater was encountered at depths ranging from approximately four ft.-bgs to 6.5 ft.-bgs across the site. Temporary well (TW-1) was installed at soil boring B-7 and temporary well TW-2 was installed at soil boring B-8. Groundwater at TW-1 and TW-2 analyzed by Con-Test Laboratories for VOCs by EPA Method 8260 and PAHs by EPA Method 8270. Benzene, naphthalene, and 2-methylnaphthalene were reported at B-7/TW-1 at concentrations exceeding their 2L Standards. Benzene, naphthalene, 2-methylnaphthalene and benzo (a) anthracene were reported at B-8/TW-2 at concentrations exceeding their 2L Standards.

Based on the analytical results of soil and groundwater samples, it is likely that during construction, NCDOT may encounter soil and groundwater impacted with petroleum at the site. Saturated petroleum impacted soil at concentrations below the North Carolina TPH Action Levels soil may be encountered within the vicinity of soil borings B-7 and B-8 near the groundwater at a depth of approximately four to five ft.-bgs. Assuming that a section of petroleum impacted soil approximately two feet thick and 40 feet in diameter at B-7 and B-8 at a depth of four to six ft.-bgs, which is near the groundwater table; up to 200 cubic yards of soil near borings B-7 and B-8 may be impacted.

If petroleum stained or odorous soils are encountered during construction, these soils should be properly handled and disposed at a licensed facility. If construction dewatering is required, petroleum impacted groundwater must be properly disposed or treated at a licensed facility.

S&ME recommends maintaining an awareness level for the presence of petroleum in the soil and groundwater at the site for the safety of workers and the public.

## ♦ Limitations

The results of this preliminary investigation are limited to the boring locations presented herein. The results of this Preliminary Site Assessment are not all inclusive and may not represent existing conditions across the entire property. These results only reflect the current conditions at the locations sampled on the date this Preliminary Site Assessment was performed. This report has been prepared in accordance with generally accepted environmental engineering and geophysical practice for specific application to this project. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, expressed or implied, is made.

The geophysical methods used for this survey have inherent limitations. Site metallic features (e.g., buildings, reinforced concrete, vehicles, etc.) and overhead transmission lines can produce a false electromagnetic response and may mask subsurface features. The depth of exploration of the GPR signal is highly site specific, and is greatly limited by signal attenuation (absorption) of the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clay soils, and lowest in relatively low conductivity materials such as unsaturated sand. For this project location, the GPR data sets appear to have a maximum depth of penetration of approximately about five ft.-bgs.

Regardless of the thoroughness of a geophysical study, there is always a possibility that actual conditions may not match the interpretations. The results should be considered accurate only to the degree implied by the methods used and the method's limitations and data coverage. Accordingly, the possibility exists that not all features at a project site will be located due to either subsurface soil conditions or the occurrence of features outside the lateral limits and below the depth of penetration of the methods used. As with most surface geophysical methods, resolution of the subsurface will also decrease with depth. As such, the size and/or contrast of features compared to the imaged subsurface media must be significant enough to produce the anticipated response. The location and/or determination (or the lack thereof) of potential buried features is based on our review of the provided information and of the geophysical survey. Under no circumstances does S&ME assume any responsibility for damages resulting from the presence of subsurface features that may exist but were not identified by our survey.

This Preliminary Site Assessment was performed solely for NCDOT regarding the above-referenced site and assessment area. This report is provided for the sole use of NCDOT. Use of this report by any other parties will be at such party's sole risk. S&ME disclaims liability for any such use or reliance by third parties. The observations presented in this report are indicative of conditions during the time of the assessment and of the specific areas referenced.

## Closing

S&ME appreciates the opportunity to provide these services to you. If you have any questions or comments regarding this report, please contact us at your convenience.

Sincerely,

**S&ME, Inc.**

DocuSigned by:
Jamie Honeycutt
4C890EAEC25F488...

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NORTH CAROLINA PROFESSIONAL SEAL 18760 ENGINEER THOMAS P. RAYMOND

Thomas P. Raymond, P.E., P.M.P.
Senior Consultant
traymond@smeinc.com

5/6/2019

Attachments:

**Table 1:** Summary of Soil Sampling Results
**Table 2:** Summary of Groundwater Sampling Results

**Figure 1:** Vicinity Map

# Tables

**TABLE 1**
**SUMMARY OF SOIL SAMPLING RESULTS**
**NCDOT Project I-5986B**
**Parcel 140 - (Former Robin Hood Truck Stop)**
**60 Robin Hood Road**
**Dunn, Harnett County, North Carolina**
**S&ME Project No. 4305-18-175A**

| Analytical Method→ | | | Total Petroleum Hydrocarbons (TPH) Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) by Ultraviolet Fluorescence (UVF) Spectrometry | |
|---|---|---|---|---|
| Sample ID | Date | Contaminant of Concern→ / Sample Depth (ft.-bgs) | TPH-GRO | TPH-DRO |
| B-1 | 2/18/2019 | 2 to 4 | <0.65 | **0.52** |
| B-2 | 2/18/2019 | 2 to 4 | <0.48 | **0.16** |
| B-3 | 2/18/2019 | 2 to 4 | **3.5** | <0.22 |
| B-4 | 2/18/2019 | 2 to 4 | **6** | **9.8** |
| B-5 | 2/18/2019 | 2 to 4 | <0.59 | **0.78** |
| B-6 | 2/18/2019 | 2 to 4 | <0.44 | **1.5** |
| B-7 | 2/18/2019 | 2 to 4 | <0.49 | <0.19 |
| | | 4 to 6 | <0.51 | **62.8** |
| B-8 | 2/18/2019 | 2 to 4 | <0.84 | **1.9** |
| | | 4 to 6 | <0.47 | **72.7** |
| **North Carolina TPH Action Levels** | | | **50** | **100** |

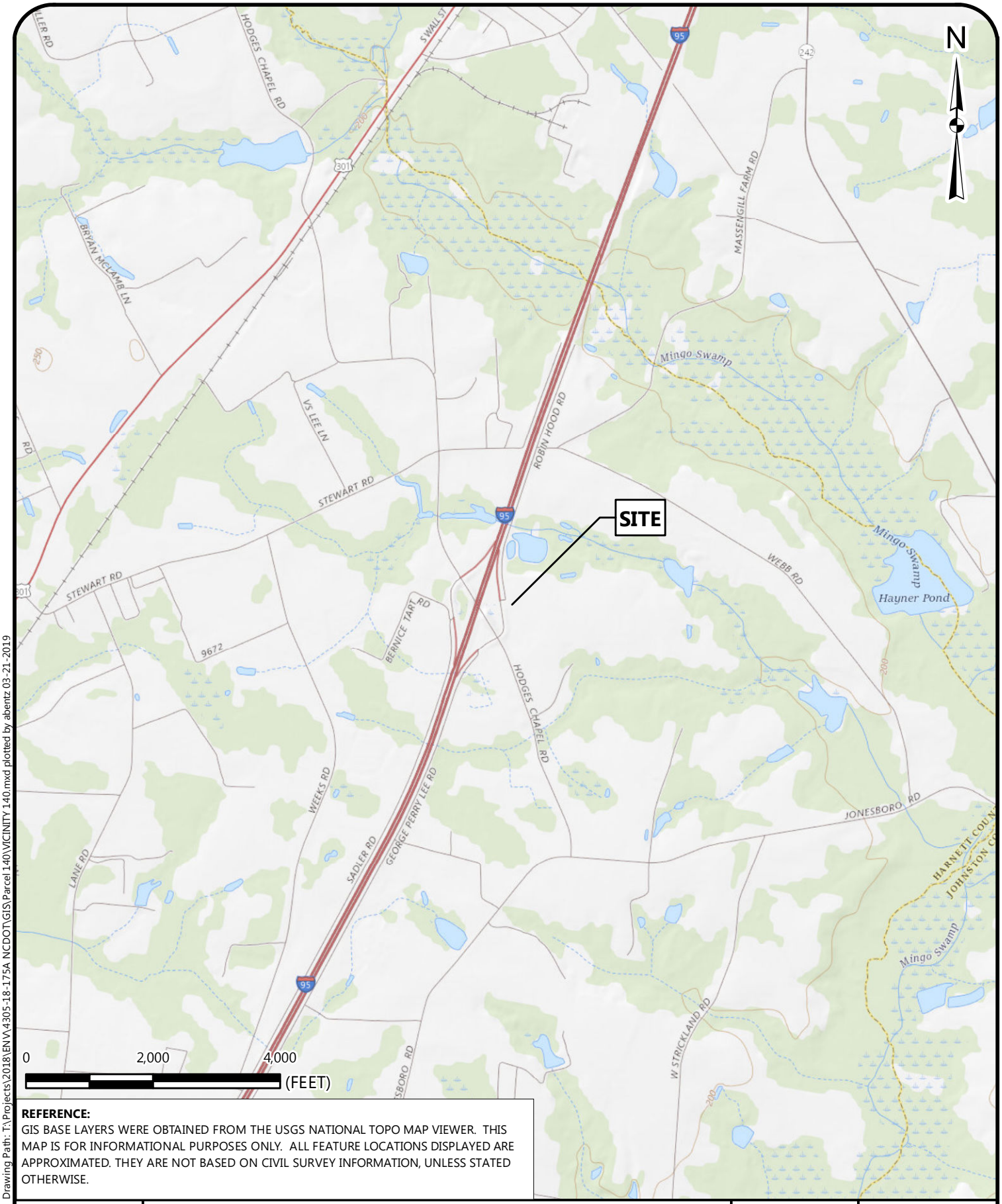
Notes:
1. UVF analysis performed by RED Lab, LLC
2. Concentrations are reported in milligrams per kilogram (mg/Kg).
3. ft.-bgs:- feet below ground surface.
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the North Carolina TPH Action Levels are shown in Shaded and **BOLD** fields.

**TABLE 2**
**SUMMARY OF GROUNDWATER SAMPLING RESULTS**
**NCDOT Project I-5986B**
**Parcel 140 - (Former Robin Hood Truck Stop)**
**60 Robin Hood Road**
**Dunn, Harnett County, North Carolina**
**S&ME Project No. 4305-18-175A**

| Analytical Method→ | | Volatile Organic Compounds by EPA Method 8260 | | | | | | | | | | | | | | Polycyclic Aromatic Compounds (PAHs) by EPA Method 8270 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | Contaminant of Concern→ / Date | Benzene | Ethylbenzene | Isopropylbenzene | MTBE | Naphthalene | n-Butylbenzene | sec-Butylbenzene | tert-Amyl Methyl Ether | n-Propylbenzene | p-isopropyltoluene | Toluene | 1,2,4-Trimethylbenzene | 1,3,5-Trimethylbenzene | Total Xylenes | Acenaphthene | Anthracene | Benzo (a) anthracene | Acenaphthylene | Chrysene | Fluoranthene | Fluorene | Naphthalene | Pyrene | Phenanthrene | 2-Methylnaphthalene |
| B-7/TW-1 | 2/18/2019 | **27** | **120** | **5** | **3.4** | **110** | **2.2** | **1.3 J** | **2.5** | **8.5** | **0.94 J** | **41** | **69** | **16** | **370** | **1.2 J** | <5.0 | <1.2 | <5.0 | <5.0 | <12 | **1.6 J** | **55** | <25 | **1.6** | **39** |
| B-8/TW-2 | 2/18/2019 | <2.0 | **0.66 J** | **1.3 J** | <2.0 | **87** | **5.3** | **7.6** | **0.58 J** | **3.2** | **4.6** | <2.0 | <2.0 | <2.0 | <4.0 | **13** | **6.7** | **0.20 J** | **5** | **0.36 J** | **0.81 J** | **31** | **38** | **4.4 J** | **76** | **160** |
| **2L Standard (µg/L)** | | **1** | **600** | **70** | **20** | **6** | **70** | **70** | **128** | **70** | **25** | **600** | **400** | **400** | **500** | **80** | **2,000** | **0.05** | **200** | **5** | **300** | **300** | **6** | **200** | **200** | **30** |
| **GCL (µg/L)** | | **5,000** | **84,500** | **25,000** | **20,000** | **6,000** | **6,900** | **8,500** | **128,000** | **30,000** | **11,700** | **260,000** | **28,500** | **25,000** | **85,500** | **2,120** | **2,000** | **4.7** | **1,965** | **5** | **300** | **990** | **6,000** | **200** | **410** | **12,500** |

Notes:
1. Analytes that are not shown for the method were not detected.
2. Concentrations are reported in micrograms per liter (µg/L).
3. 2L Standard: North Carolina Groundwater Quality Standards: 15A NCAC 2L.0202
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the 2L Standards are shown in Shaded and **BOLD** fields.
6. GCL: Gross Contamination Level.
7. J: Estimated concentration detected below the reporting limit.

# Figures




Drawing Path: T:\Projects\2018\ENV\4305-18-175A NCDOT\GIS\Parcel 140\VICINITY 140.mxd plotted by abentz 03-21-2019

**REFERENCE:**
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

# VICINITY MAP

NCDOT I-5986B
PARCEL NO. 140 (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

| SCALE: | FIGURE NO. |
|---|---|
| 1 " = 2,000 ' | 1 |
| DATE: 3-21-19 | |
| PROJECT NUMBER 4305-18-175A | |

PARCEL 140
FORMER ROBIN HOOD TRUCK STOP

B-8/TW-2
B-7/TW-1
B-6
B-5
B-4
B-3
B-2
B-1

LEGEND

Geoenvironmental Boring:
Underground Storage Tank (UST): UST

Known Soil Contamination:
Possible Soil Contamination:
Existing Contamination Known - Water:

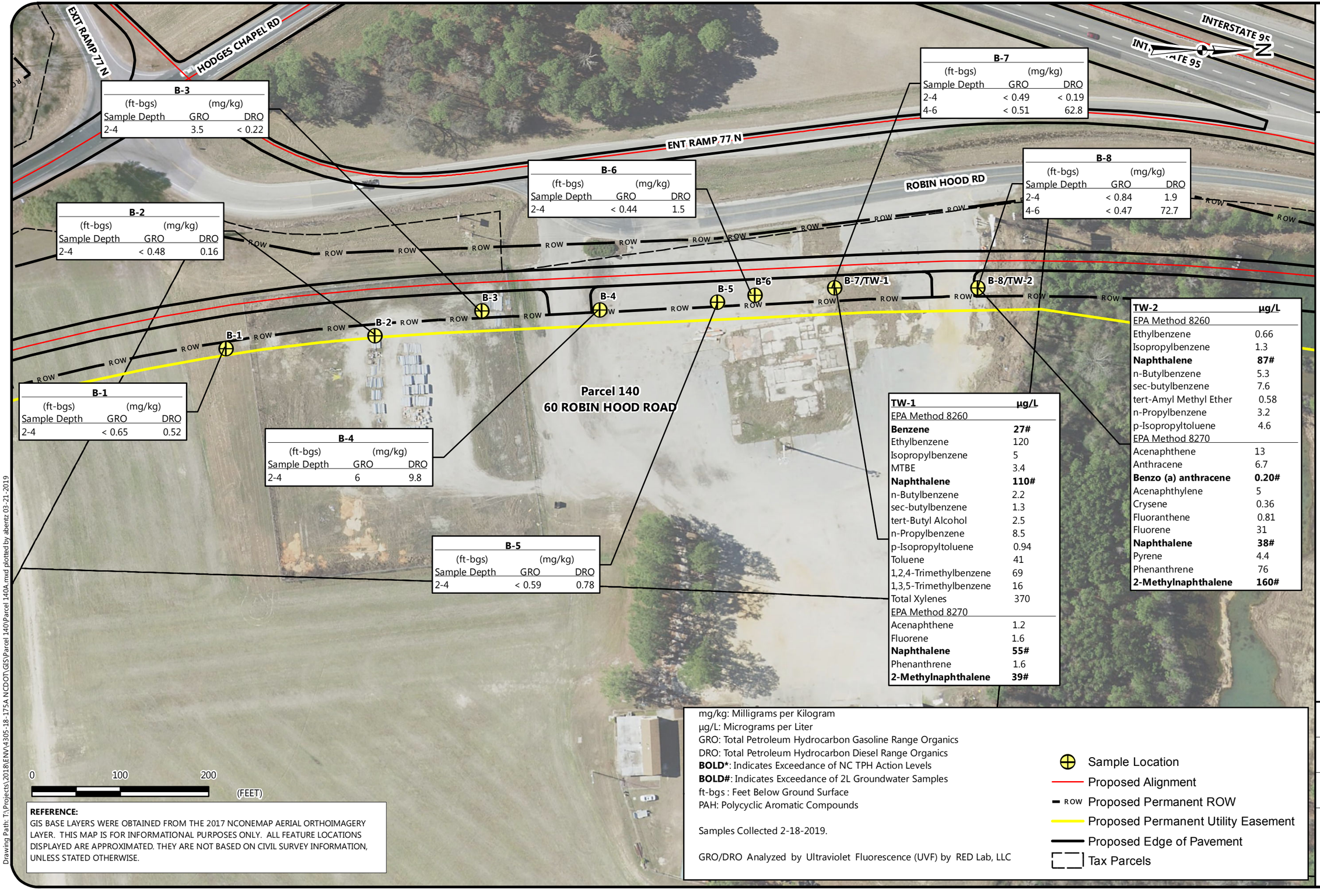
Map Source: NCDOT Project I-5986B
Image Source: NC ONEMAP, Dated 2016

0 100 200
GRAPHIC SCALE (IN FEET)

# SITE MAP

NCDOT Project: I-5986B
PARCEL 140 - (FORMER ROBIN HOOD TRUCK STOP)
60 Robin Hood Road, Dunn, Harnett County, North Carolina

| SCALE: | FIGURE NO. |
|---|---|
| 1" = 100' | 2 |
| DATE: | |
| MARCH 2019 | |
| PROJECT NUMBER | |
| 4305-18-175A | |




**REFERENCE:**
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONEMAP AERIAL ORTHOIMAGERY LAYER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

mg/kg: Milligrams per Kilogram
µg/L: Micrograms per Liter
GRO: Total Petroleum Hydrocarbon Gasoline Range Organics
DRO: Total Petroleum Hydrocarbon Diesel Range Organics
**BOLD***: Indicates Exceedance of NC TPH Action Levels
**BOLD#**: Indicates Exceedance of 2L Groundwater Samples
ft-bgs : Feet Below Ground Surface
PAH: Polycyclic Aromatic Compounds

Samples Collected 2-18-2019.

GRO/DRO Analyzed by Ultraviolet Fluorescence (UVF) by RED Lab, LLC

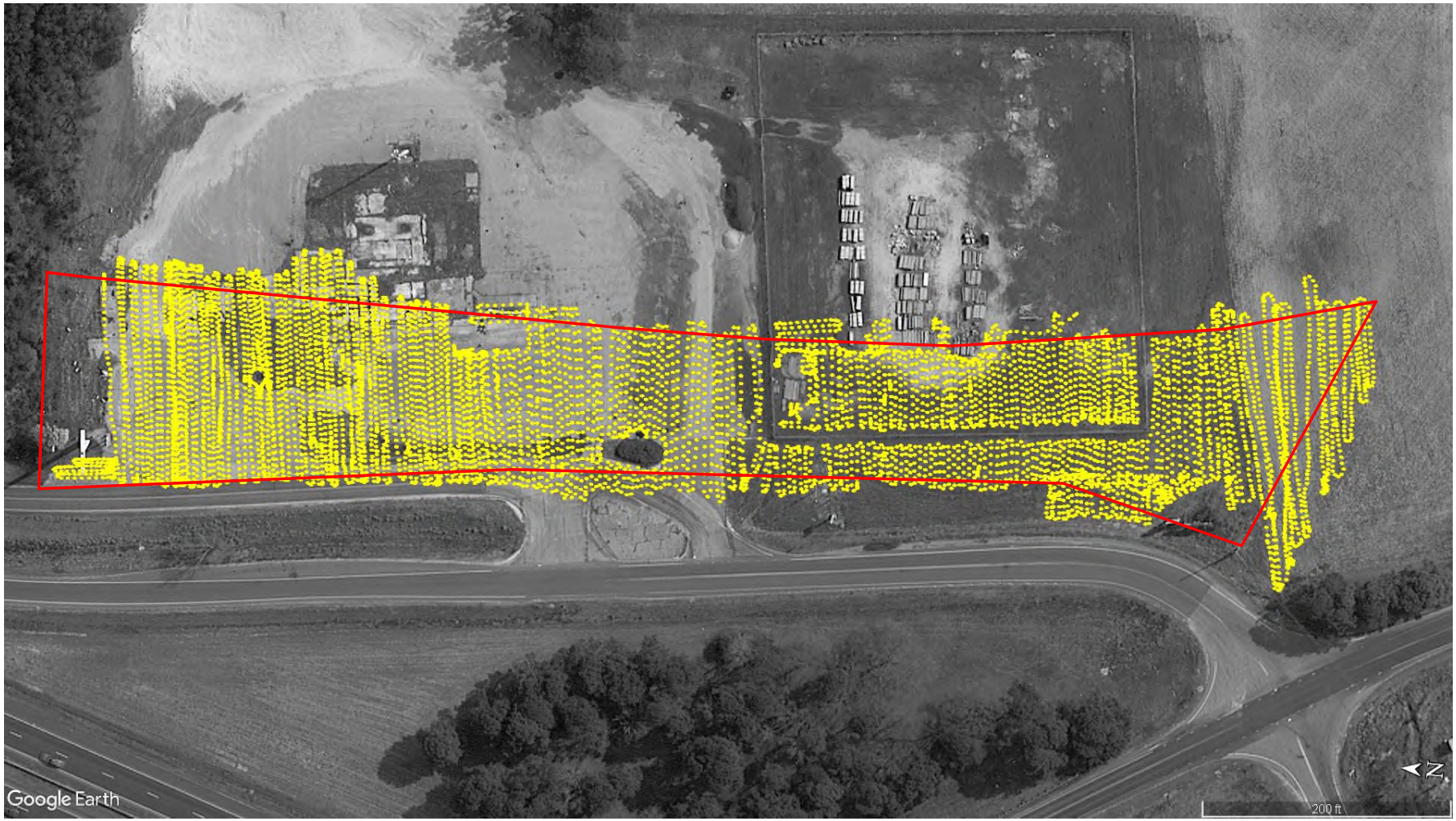
Sample Location
Proposed Alignment
ROW Proposed Permanent ROW
Proposed Permanent Utility Easement
Proposed Edge of Pavement
Tax Parcels

# SOIL AND GROUNDWATER CONSTITUENT MAP

NCDOT I-5986B
PARCEL NO. 140 (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD , DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: 1 " = 100 '
DATE: 3-21-19
PROJECT NUMBER 4305-18-175
FIGURE NO. 3

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)




**LEGEND**

Approximate TDEM Path

Approximate Requested Survey Area

# TDEM PATH LOCATION PLAN

NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

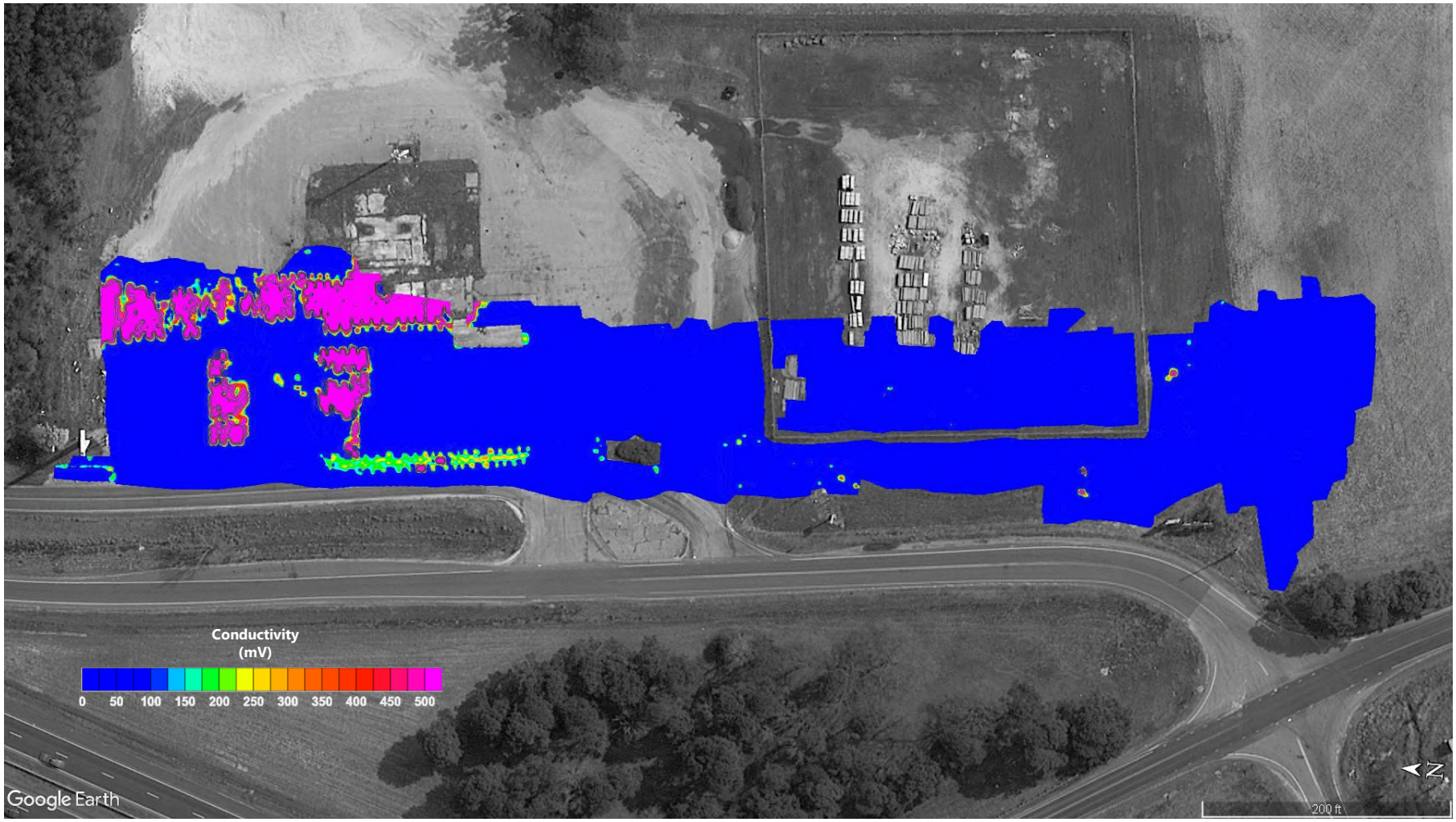
SCALE:
AS SHOWN

DATE:
3/22/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**4**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)




**TDEM DATA PLOT A**

NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

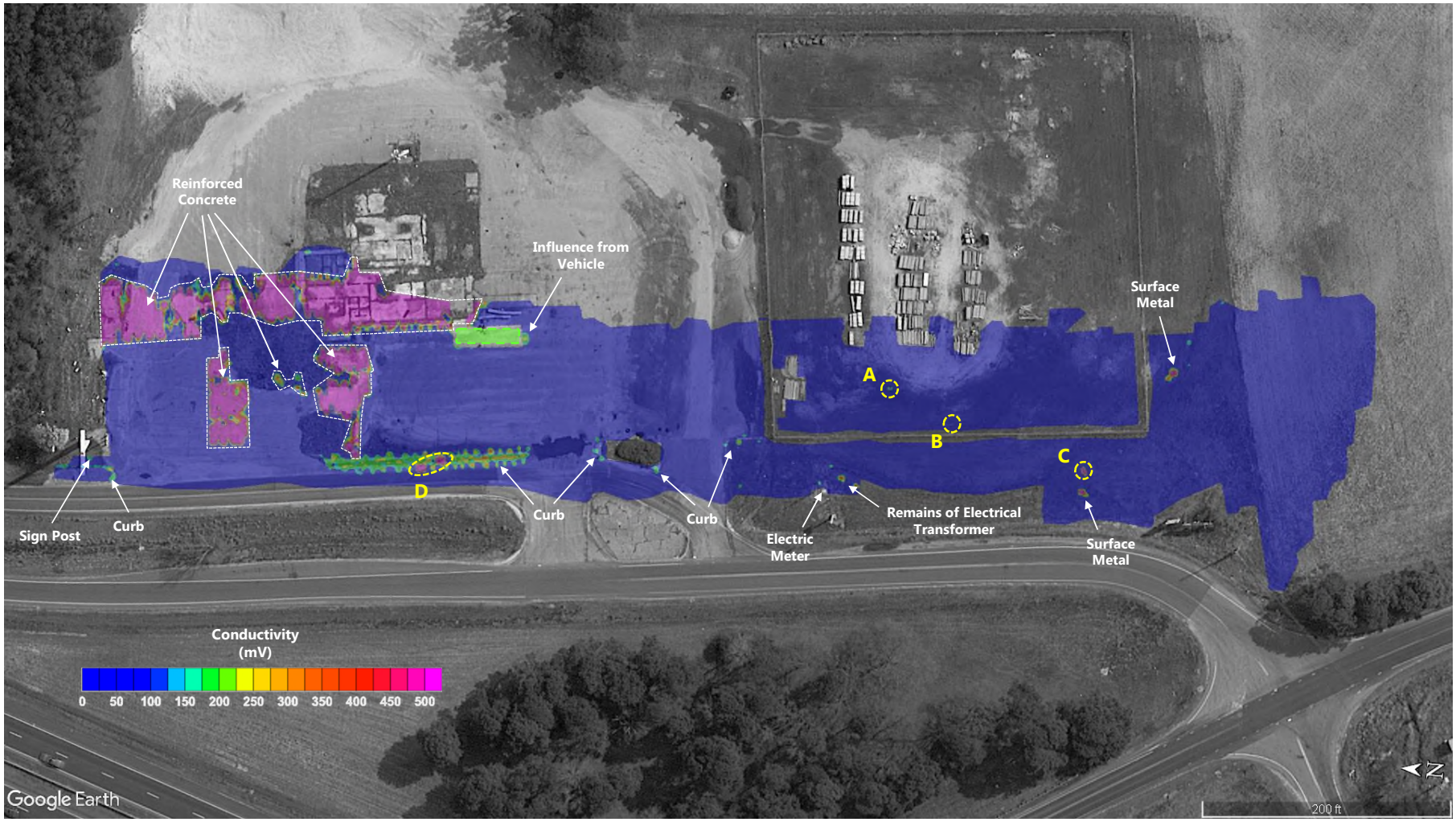
SCALE:
AS SHOWN

DATE:
3/22/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**5**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)




**LEGEND**

Approximate Location of TDEM Anomaly

Approximate Location of Vehicles

Approximate Location of Possible Utility

**TDEM DATA PLOT B**

NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
3/22/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**6**

**REFERENCE:**
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)


**LEGEND**

Approximate Location of TDEM Anomaly

Approximate Location of Vehicles

Approximate Location of Possible Utility

Approximate Location of GPR Profile

# GEOPHYSICAL ANOMALY LOCATION PLAN

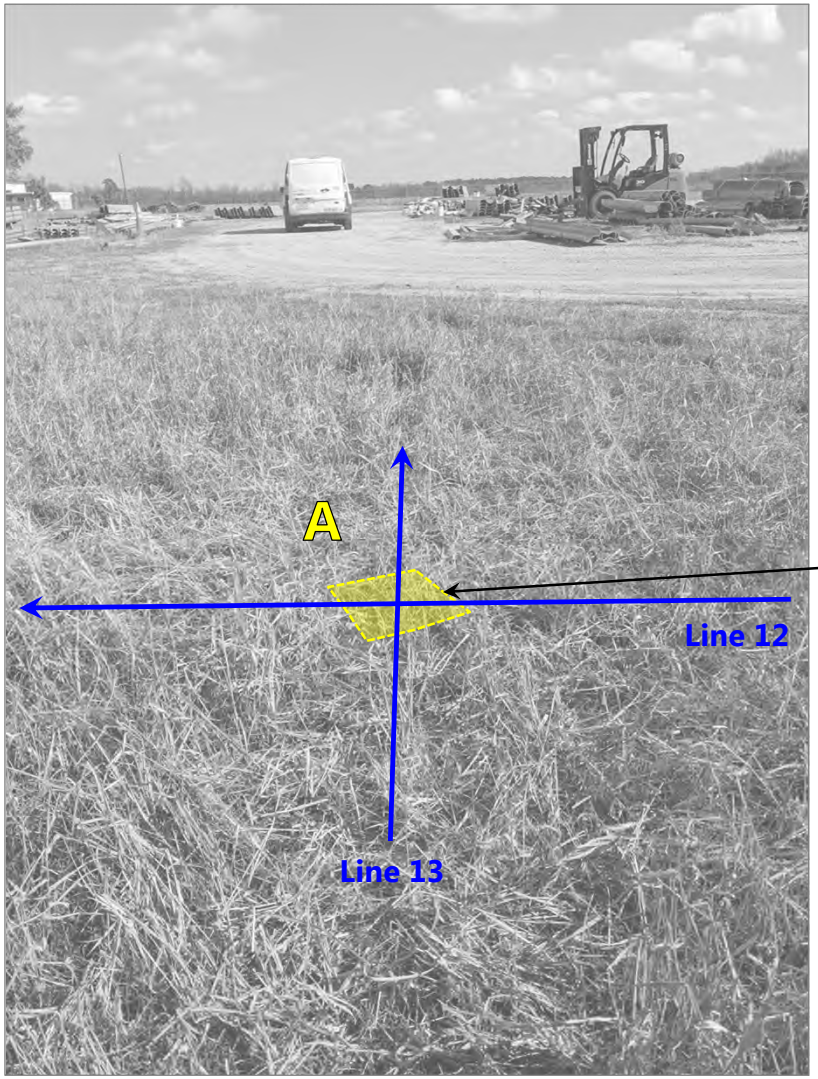
NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

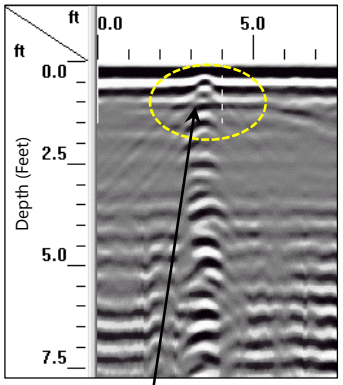
DATE: 3/22/2019

PROJECT NUMBER 4305-18-175A

FIGURE NO. **7**

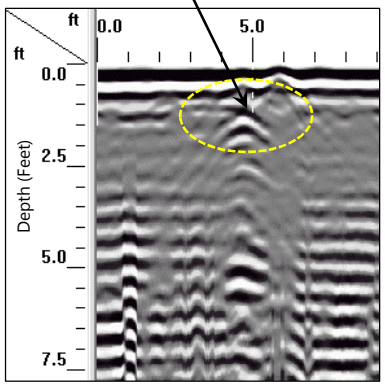



Line 12




TDEM Anomaly A

Line 13




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 12 AND 13**

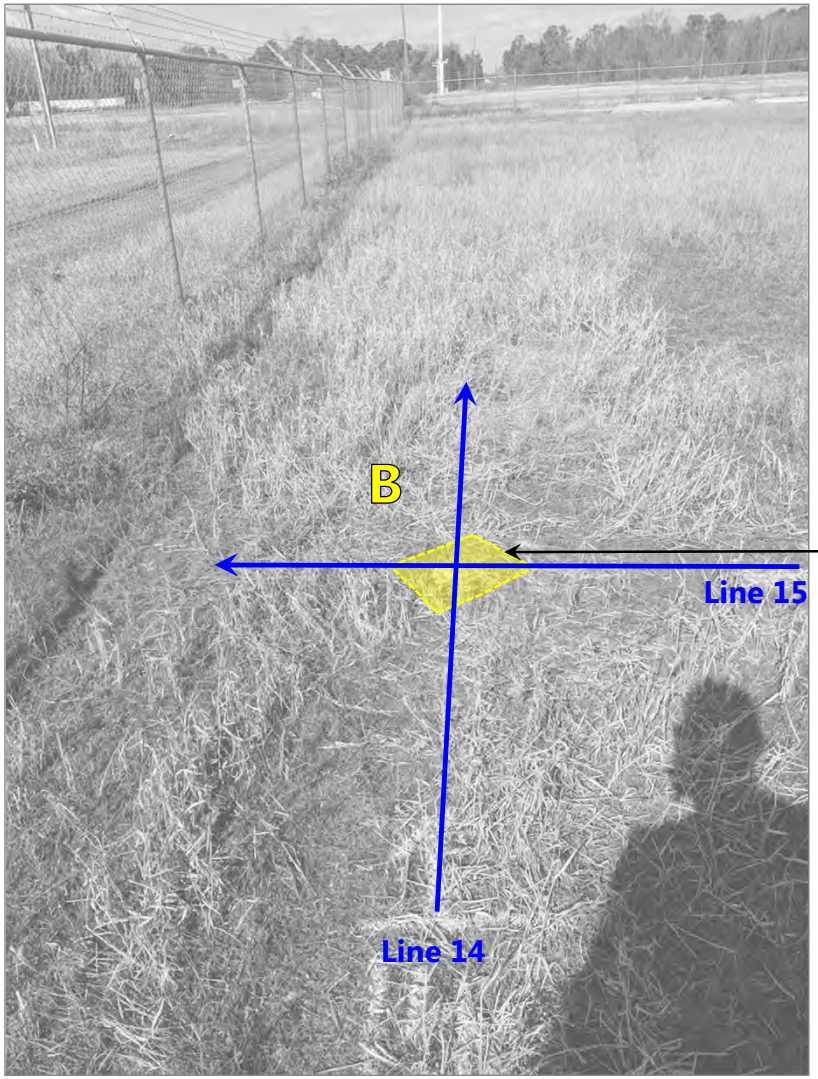
NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

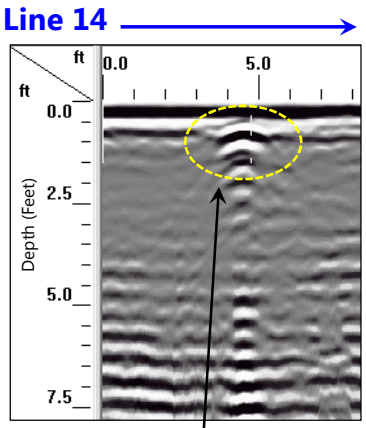
SCALE: AS SHOWN

DATE: 3/22/2019

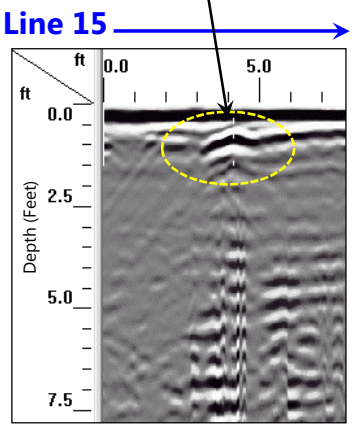
PROJECT NUMBER 4305-18-175A

FIGURE NO. **8**




TDEM Anomaly B




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 14 AND 15**

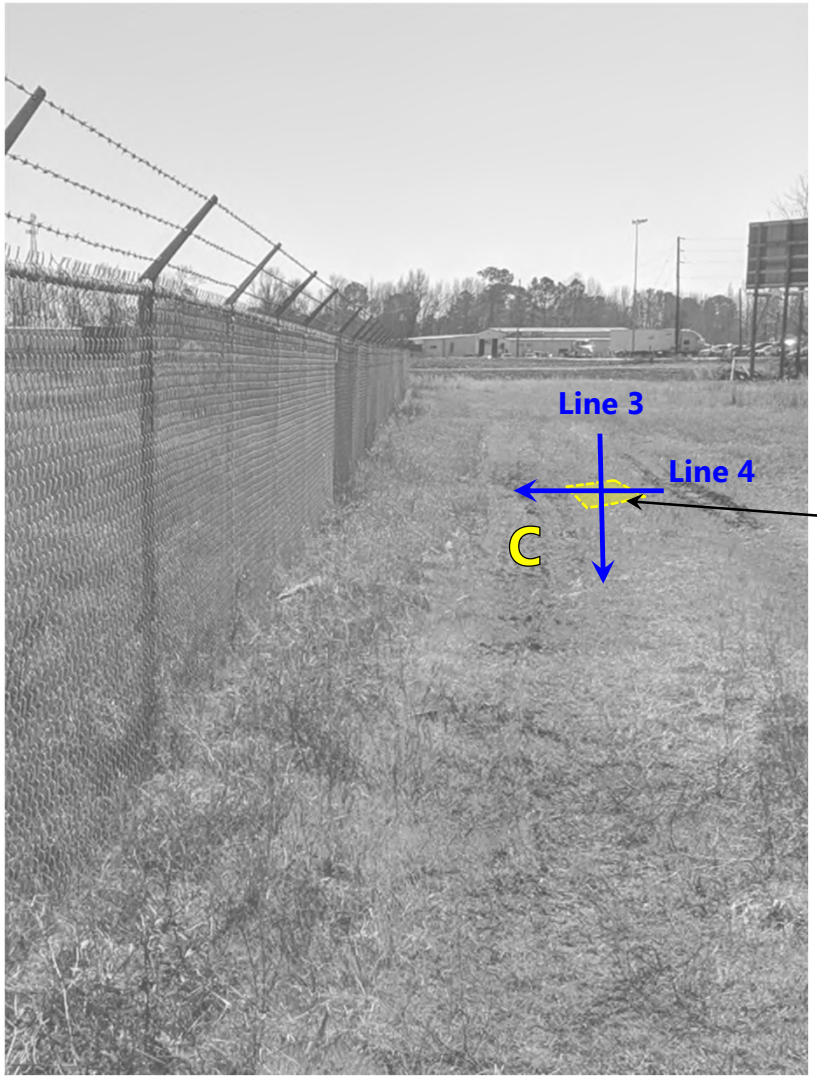
NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

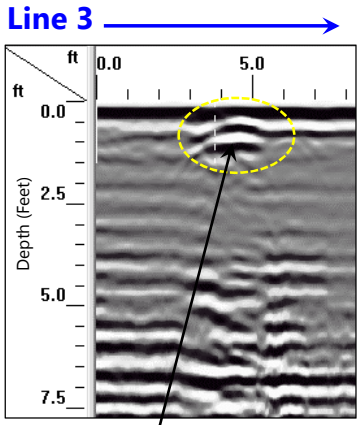
SCALE: AS SHOWN

DATE: 3/22/2019

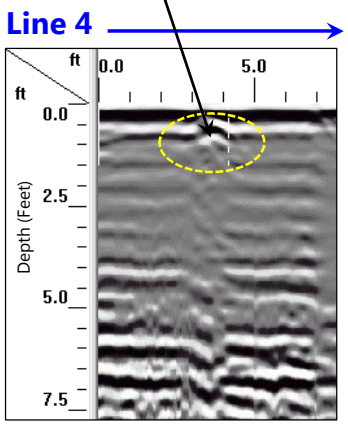
PROJECT NUMBER 4305-18-175A

FIGURE NO. **9**




TDEM
Anomaly C




Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

**EXAMPLE GPR DATA – LINES 3 AND 4**

NCDOT PROJECT: I-5986B
PARCEL 140 – (FORMER ROBIN HOOD TRUCK STOP)
60 ROBIN HOOD ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

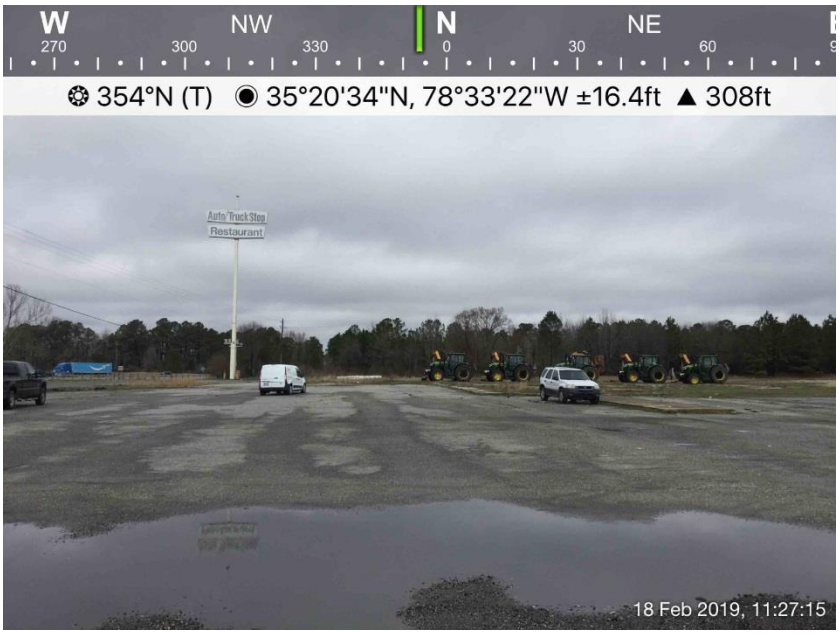
SCALE:
AS SHOWN

DATE:
3/22/2019

PROJECT NUMBER
4305-18-175A

FIGURE NO.
**10**

# Appendix I – Photographs




Date: 2/18/2019

Photographer: JTH

| | | |
|---|---|---|
| 1 | **Location / Orientation** | View of northern portion of the site looking north. |
| | **Remarks** | Former truck stop area. |


Date: 2/18/2019

Photographer: JTH

| | | |
|---|---|---|
| 2 | **Location / Orientation** | View looking east of B-7/TW-1. |
| | **Remarks** | None |

# Appendix II – Boring Logs

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-1** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 4 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Topsoil, Brown, | | | | | | | | |
| | | Sandy Clay, Gray, | | | 0.0 | No | | | | |
| 5 | | | ▼ | | 0.0 | Yes | | | | |
| | | Clayey Sand, Gray, Red, | | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-2** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 4 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Sandy Clay, Gray, | | | 0.0 | No | | | | |
| 5 | | Clayey Sand, Gray, | ▼ | | 0.1 | Yes | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-3** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 4 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Gravel, | | | | | | | | |
| | | Silty Sand, Black, | | | | | | | | |
| | | Sandy Clay, Orange, Gray, | | | 0.0 | No | | | | |
| | | | | | 0.1 | Yes | | | | |
| 5 | | Clayey Sand, Orange, Gray, Gray, | ▼ | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-4** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 6.5 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Sandy Clay, Gray, Tan, | | | 0.4 | No | | | | |
| | | | | | 0.3 | Yes | | | | |
| 5 | | | | | 0.3 | No | | | | |
| | | | ▼ | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-5** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 5 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Clayey Sand, Brown, Orange, | | | 0.1 | No | | | | |
| | | Sandy Clay, Gray, Tan, | | | 0.5 | Yes | | | | |
| 5 | | Clayey Sand, Gray, Orange, | ▼ | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | **BORING LOG: B-6** |
|---|---|---|

| | | | |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 5 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Clayey Sand, Brown, Gray, | | | 0.4 | No | | | | |
| | | Clayey Sand, Gray, Orange, | ▼ | | 0.5 | Yes | | | | |
| 5 | | | | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-7/TW-1** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 8 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 5 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Silty Sand, Tan, Orange, Brown, | | | 0.0 | No | | | | |
| | | | | | 0.3 | Yes | | | | |
| 5 | | Sandy Clay, Gray, Tan, | ▼ | | | | | | | |
| | | | | | 7.6 | Yes | | | | |
| | | Sandy Clay, Gray, Tan, Petroleum Odors | | | | | | | | |
| | | Boring Terminated at 8 Ft-BGS | | | | | | | | |
| 10 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

| PROJECT: | **NCDOT I-5986B**<br>Parcel 140-60 Robin Hood Road, Dunn, NC<br>S&ME Project No. 4305-18-175A | | **BORING LOG: B-8/TW-2** |
|---|---|---|---|
| DATE DRILLED: | Monday, February 18, 2019 | BORING DEPTH (FT): | 10 |
| DRILL RIG: | Geoprobe 6620 DT | WATER LEVEL: | 4 |
| DRILLER: | Troxler Geologic, Inc. | CAVE-IN DEPTH: | Not Applicable |
| HAMMER TYPE: | Not Applicable | LOGGED BY: | J. Honeycutt |
| SAMPLING METHOD: | Macro-Core Sampler | NORTHING: | |
| DRILLING METHOD: | Macro-Core Sampler (3-in. OD) | EASTING: | |

| DEPTH (feet) | GRAPHIC LOG | MATERIAL DESCRIPTION | WATER LEVEL | SAMPLE | PID READING (PPM) | LABORATORY ANALYSES | Sample Time / 1st 6in | 2nd 6in | 3rd 6in | N VALUE |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Asphalt, Gravel, | | | | | | | | |
| | | Silty Sand, Gray, | | | 7.2 | No | | | | |
| | | Clayey Sand, Gray, Petroleum Odors | ▼ | | 1.4 | Yes | | | | |
| 5 | | | | | 19.7 | Yes | | | | |
| | | Sandy Clay, Gray, White, | | | | | | | | |
| 10 | | Boring Terminated at 10 Ft-BGS | | | | | | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 30 | | | | | | | | | | |

# Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

REDLAB
RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Monday, February 18, 2019
**Samples extracted** Monday, February 18, 2019
**Samples analysed** Monday, February 18, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** MAX MOYER

**Project:** 4305-18-175A ; PARCEL 140

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 | |
| Soil | B-1 (2-4') | 26.0 | <0.65 | <0.65 | 0.52 | 0.52 | 0.49 | 0.02 | <0.008 | 0 | 91 | 9 | Residual Deg.PHC |
| Soil | B-2 (2-4') | 19.1 | <0.48 | <0.48 | 0.16 | 0.16 | 0.15 | 0.02 | <0.006 | 0 | 71.3 | 28.7 | Residual HC |
| Soil | B-3 (2-4') | 21.8 | <0.55 | 3.5 | <0.22 | 3.5 | <0.01 | <0.01 | <0.007 | 100 | 0 | 0 | PHC ND,(FCM) |
| Soil | B-4 (2-4') | 23.0 | <1.2 | 6 | 9.8 | 15.8 | 3.7 | 0.18 | 0.003 | 66.2 | 30.5 | 3.3 | Deg Fuel 73.3%,(FCM) |
| Soil | B-5 (2-4') | 23.4 | <0.59 | <0.59 | 0.78 | 0.78 | 0.74 | 0.08 | <0.007 | 0 | 91.9 | 8.1 | Residual Deg.PHC |
| Soil | B-6 (2-4') | 17.4 | <0.44 | <0.44 | 1.5 | 1.5 | 0.72 | 0.04 | 0.001 | 0 | 80.4 | 19.6 | V.Deg.PHC 91%,(FCM) |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 103.4%

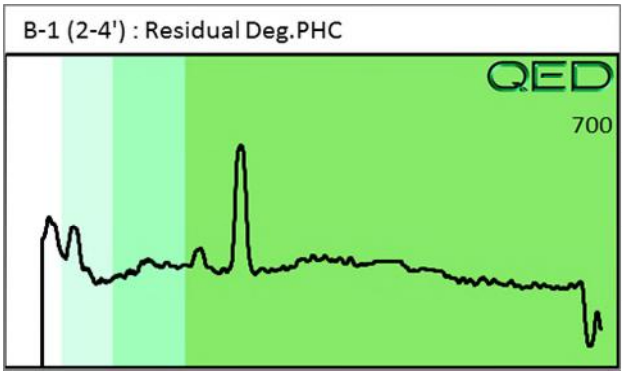
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

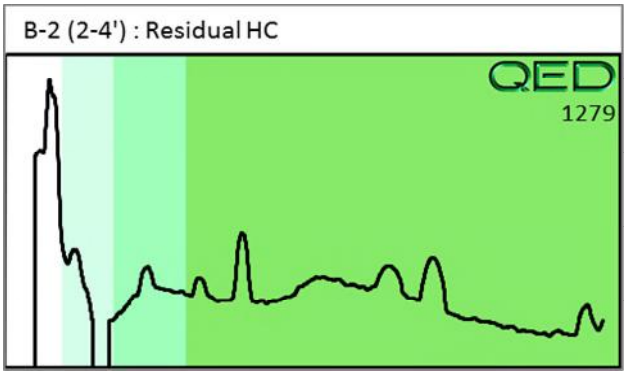
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

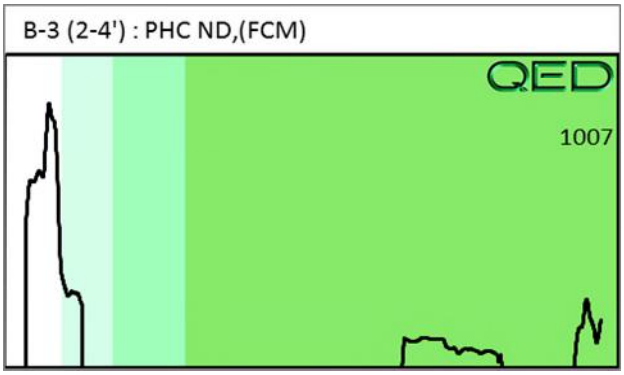
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

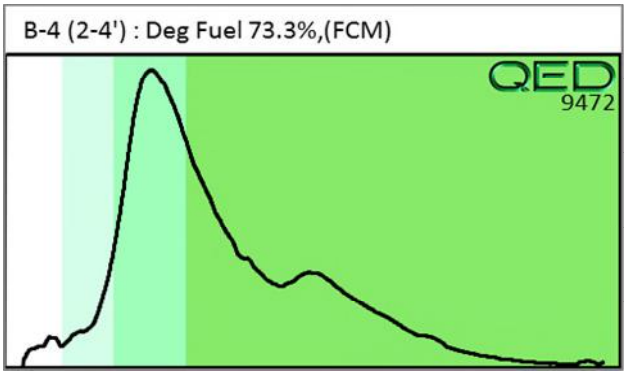
QED Hydrocarbon Fingerprints

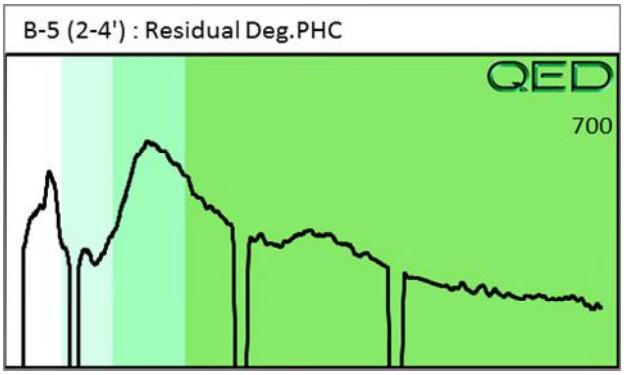
Project: 4305-18-175A ; PARCEL 140 ##################

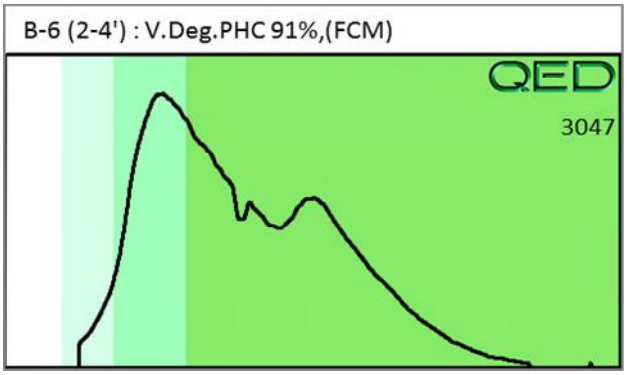


QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Monday, February 18, 2019
**Samples extracted** Monday, February 18, 2019
**Samples analysed** Monday, February 18, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** MAX MOYER

**Project:** 4305-18-175A ; PARCEL 140

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 | |
| Soil | B-7 (4-6') | 20.5 | <0.51 | <0.51 | 62.8 | 62.8 | 31.1 | 1.1 | <0.001 | 0 | 99.4 | 0.6 | Deg.Diesel 92.3%,(FCM) |
| Soil | B-7 (2-4') | 19.4 | <0.49 | <0.49 | <0.19 | 0.03 | 0.03 | 0.004 | <0.006 | 0 | 100 | 0 | Residual HC |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 103.0%

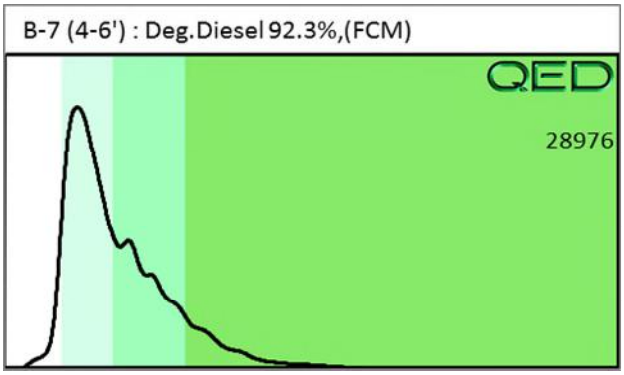
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

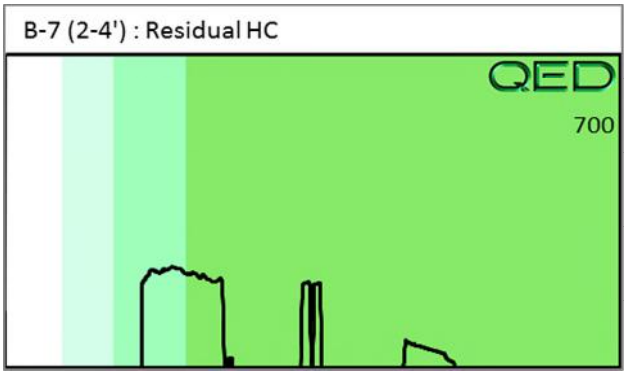
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

QED Hydrocarbon Fingerprints

Project: 4305-18-175A ; PARCEL 140 ##################



QED

REDLAB
RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

# Hydrocarbon Analysis Results

**Client:** S&ME
**Address:**

**Samples taken** Monday, February 18, 2019
**Samples extracted** Monday, February 18, 2019
**Samples analysed** Monday, February 18, 2019

**Contact:** JAMIE HONEYCUTT

**Operator** MAX MOYER

**Project:** 4305-18-175A ; PARCEL 140

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 | |
| Soil | B-8 (2-4') | 33.7 | <0.84 | <0.84 | 1.9 | 1.9 | 1.2 | 0.06 | <0.01 | 0 | 97.8 | 2.2 | Deg Fuel 73.6%,(FCM) |
| Soil | B-8 (4-6') | 18.7 | <0.47 | <0.47 | 72.7 | 72.7 | 31.5 | 1.2 | <0.006 | 0 | 99.5 | 0.5 | Deg.Diesel 95.1%,(FCM) |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |

Initial Calibrator QC check OK

Final FCM QC Check OK 100.5%

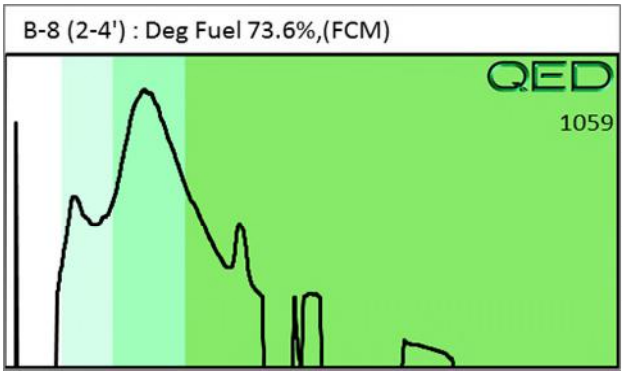
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

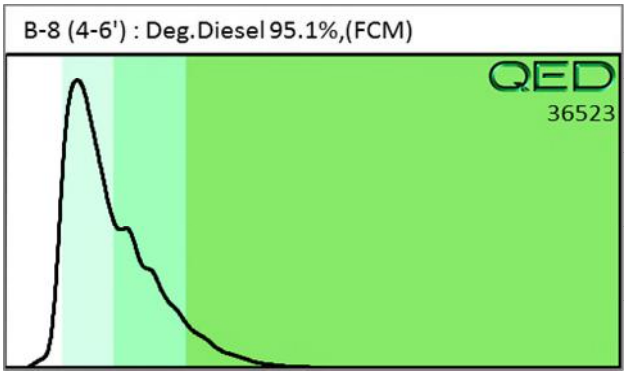
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

QED Hydrocarbon Fingerprints

Project: 4305-18-175A ; PARCEL 140 ##################



con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

March 1, 2019

Jamie Honeycutt
S&ME, Inc - Raleigh, NC
3201 Spring Forest Rd.
Raleigh, NC 27616

Project Location: 60 Robin Hood Road, Dunn, NC
Client Job Number:
Project Number: 4305-18-175A
Laboratory Work Order Number: 19B0931

Enclosed are results of analyses for samples received by the laboratory on February 20, 2019. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kerry K. McGee
Project Manager

# Table of Contents

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

S&ME, Inc - Raleigh, NC
3201 Spring Forest Rd.
Raleigh, NC 27616
ATTN: Jamie Honeycutt

REPORT DATE: 3/1/2019

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 4305-18-175A

**ANALYTICAL SUMMARY**

WORK ORDER NUMBER: 19B0931

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 60 Robin Hood Road, Dunn, NC

| FIELD SAMPLE # | LAB ID: | MATRIX | SAMPLE DESCRIPTION | TEST | SUB LAB |
|---|---|---|---|---|---|
| B-7/ TW-1 | 19B0931-01 | Ground Water | | SW-846 8260D | |
| | | | | SW-846 8270D | |
| B-8/ TW-2 | 19B0931-02 | Ground Water | | SW-846 8260D | |
| | | | | SW-846 8270D | |

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

## EXECUTIVE SUMMARY

Client ID: **B-7/ TW-1** Lab ID: **19B0931-01**

| Analyte | Results/Qual | | DL | RL | Units | Method |
|---|---|---|---|---|---|---|
| 1,2,4-Trimethylbenzene | 69 | | 0.36 | 2.0 | µg/L | SW-846 8260D |
| 1,3,5-Trimethylbenzene | 16 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| Benzene | 27 | | 0.24 | 2.0 | µg/L | SW-846 8260D |
| Ethylbenzene | 120 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| Isopropylbenzene (Cumene) | 5.0 | | 0.24 | 2.0 | µg/L | SW-846 8260D |
| m+p Xylene | 230 | | 0.51 | 4.0 | µg/L | SW-846 8260D |
| Methyl tert-Butyl Ether (MTBE) | 3.4 | | 0.18 | 2.0 | µg/L | SW-846 8260D |
| Naphthalene | 110 | | 0.24 | 10 | µg/L | SW-846 8260D |
| n-Butylbenzene | 2.2 | | 0.30 | 2.0 | µg/L | SW-846 8260D |
| n-Propylbenzene | 8.5 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| o-Xylene | 140 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| p-Isopropyltoluene (p-Cymene) | 0.94 | J | 0.30 | 2.0 | µg/L | SW-846 8260D |
| sec-Butylbenzene | 1.3 | J | 0.26 | 2.0 | µg/L | SW-846 8260D |
| tert-Amyl Methyl Ether (TAME) | 2.5 | | 0.21 | 1.0 | µg/L | SW-846 8260D |
| Toluene | 41 | | 0.34 | 2.0 | µg/L | SW-846 8260D |
| 2-Methylnaphthalene (SIM) | 39 | | 1.6 | 25 | µg/L | SW-846 8270D |
| Acenaphthene (SIM) | 1.2 | J | 0.82 | 7.5 | µg/L | SW-846 8270D |
| Fluorene (SIM) | 1.6 | J | 0.85 | 25 | µg/L | SW-846 8270D |
| Naphthalene (SIM) | 55 | | 6.4 | 25 | µg/L | SW-846 8270D |
| Phenanthrene (SIM) | 1.6 | | 0.75 | 1.2 | µg/L | SW-846 8270D |

Client ID: **B-8/ TW-2** Lab ID: **19B0931-02**

| Analyte | Results/Qual | | DL | RL | Units | Method |
|---|---|---|---|---|---|---|
| Ethylbenzene | 0.66 | J | 0.26 | 2.0 | µg/L | SW-846 8260D |
| Isopropylbenzene (Cumene) | 1.3 | J | 0.24 | 2.0 | µg/L | SW-846 8260D |
| Naphthalene | 87 | | 0.24 | 10 | µg/L | SW-846 8260D |
| n-Butylbenzene | 5.3 | | 0.30 | 2.0 | µg/L | SW-846 8260D |
| n-Propylbenzene | 3.2 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| p-Isopropyltoluene (p-Cymene) | 4.6 | | 0.30 | 2.0 | µg/L | SW-846 8260D |
| sec-Butylbenzene | 7.6 | | 0.26 | 2.0 | µg/L | SW-846 8260D |
| tert-Butylbenzene | 0.58 | J | 0.24 | 2.0 | µg/L | SW-846 8260D |
| 2-Methylnaphthalene (SIM) | 160 | | 3.2 | 51 | µg/L | SW-846 8270D |
| Acenaphthene (SIM) | 13 | | 0.34 | 3.1 | µg/L | SW-846 8270D |
| Acenaphthylene (SIM) | 5.0 | | 0.36 | 2.0 | µg/L | SW-846 8270D |
| Anthracene (SIM) | 6.7 | | 0.33 | 2.0 | µg/L | SW-846 8270D |
| Benzo(a)anthracene (SIM) | 0.20 | J | 0.16 | 0.51 | µg/L | SW-846 8270D |
| Chrysene (SIM) | 0.36 | J | 0.15 | 2.0 | µg/L | SW-846 8270D |
| Fluoranthene (SIM) | 0.81 | J | 0.26 | 5.1 | µg/L | SW-846 8270D |
| Fluorene (SIM) | 31 | | 0.35 | 10 | µg/L | SW-846 8270D |
| Naphthalene (SIM) | 38 | | 2.6 | 10 | µg/L | SW-846 8270D |
| Phenanthrene (SIM) | 76 | | 0.31 | 0.51 | µg/L | SW-846 8270D |
| Pyrene (SIM) | 4.4 | J | 0.23 | 10 | µg/L | SW-846 8270D |

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**CASE NARRATIVE SUMMARY**

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

For method 8270, only PAHs were requested and reported.

For method 8260D, elevated reporting limits for sample(s) 19B0931-01 due to a high concentration of target compounds.

For method 8260D, elevated reporting limits for sample(s) 19B0931-02 due to a high concentration of non-target compounds.

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**SW-846 8260D**

**Qualifications:**

**L-07A**

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound.

**Analyte & Samples(s) Qualified:**

**Vinyl Acetate**

B224172-BS1

**R-05**

Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound.

**Analyte & Samples(s) Qualified:**

**Acetone**

19B0931-01[B-7/ TW-1], 19B0931-02[B-8/ TW-2], B224172-BLK1, B224172-BS1, B224172-BSD1, S032911-CCV1

**Vinyl Acetate**

B224172-BLK1, B224172-BS1, B224172-BSD1, S032911-CCV1

**RL-11**

Elevated reporting limit due to high concentration of target compounds.

**Analyte & Samples(s) Qualified:**

19B0931-01[B-7/ TW-1]

**RL-13**

Elevated reporting limit due to high concentration of non-target compounds.

**Analyte & Samples(s) Qualified:**

19B0931-02[B-8/ TW-2]

**V-16**

Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result.

**Analyte & Samples(s) Qualified:**

**1,4-Dioxane**

19B0931-01[B-7/ TW-1], 19B0931-02[B-8/ TW-2], B224172-BLK1, B224172-BS1, B224172-BSD1, S032911-CCV1

**V-20**

Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

**Analyte & Samples(s) Qualified:**

**Bromochloromethane**

B224172-BS1, B224172-BSD1, S032911-CCV1

**V-36**

Initial calibration verification (ICV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

**Analyte & Samples(s) Qualified:**

**Carbon Disulfide**

B224172-BS1, B224172-BSD1, S032911-CCV1

**SW-846 8270D**

**Qualifications:**

**I-02**

Result not attainable due to sample matrix interferences (a chemical or physical interference which could not be eliminated).

**Analyte & Samples(s) Qualified:**

**Acenaphthene-d10**

19B0931-02RE1[B-8/ TW-2]

**S-02**

The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract.

**Analyte & Samples(s) Qualified:**

**2-Fluorobiphenyl**

19B0931-02RE1[B-8/ TW-2]

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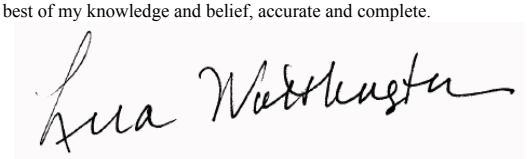
The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.
I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



Lisa A. Worthington
Project Manager

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 60 Robin Hood Road, Dunn, NC  Sample Description:  Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-7/ TW-1**  Sampled: 2/18/2019 14:15

**Sample ID: 19B0931-01**

Sample Matrix: Ground Water

Sample Flags: RL-11

**Volatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | ND | 100 | 19 | µg/L | 2 | R-05 | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Acrylonitrile | ND | 10 | 1.2 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| tert-Amyl Methyl Ether (TAME) | 2.5 | 1.0 | 0.21 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Benzene | 27 | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Bromobenzene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Bromochloromethane | ND | 2.0 | 0.45 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Bromodichloromethane | ND | 1.0 | 0.59 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Bromoform | ND | 2.0 | 0.42 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Bromomethane | ND | 4.0 | 1.9 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 2-Butanone (MEK) | ND | 40 | 4.7 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| tert-Butyl Alcohol (TBA) | ND | 40 | 4.3 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| n-Butylbenzene | 2.2 | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| sec-Butylbenzene | 1.3 | 2.0 | 0.26 | µg/L | 2 | J | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| tert-Butylbenzene | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| tert-Butyl Ethyl Ether (TBEE) | ND | 1.0 | 0.19 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Carbon Disulfide | ND | 8.0 | 2.0 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Carbon Tetrachloride | ND | 10 | 0.49 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Chlorobenzene | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Chlorodibromomethane | ND | 1.0 | 0.21 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Chloroethane | ND | 4.0 | 0.56 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Chloroform | ND | 4.0 | 0.44 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Chloromethane | ND | 4.0 | 1.1 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 2-Chlorotoluene | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 4-Chlorotoluene | ND | 2.0 | 0.28 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2-Dibromo-3-chloropropane (DBCP) | ND | 10 | 0.74 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2-Dibromoethane (EDB) | ND | 1.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Dibromomethane | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2-Dichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,3-Dichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,4-Dichlorobenzene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| trans-1,4-Dichloro-2-butene | ND | 4.0 | 0.62 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Dichlorodifluoromethane (Freon 12) | ND | 4.0 | 0.57 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1-Dichloroethane | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2-Dichloroethane | ND | 2.0 | 0.39 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1-Dichloroethylene | ND | 2.0 | 0.42 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| cis-1,2-Dichloroethylene | ND | 2.0 | 0.29 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| trans-1,2-Dichloroethylene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2-Dichloropropane | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,3-Dichloropropane | ND | 1.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 2,2-Dichloropropane | ND | 2.0 | 0.43 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1-Dichloropropene | ND | 4.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| cis-1,3-Dichloropropene | ND | 1.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| trans-1,3-Dichloropropene | ND | 1.0 | 0.22 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Diethyl Ether | ND | 4.0 | 0.44 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 60 Robin Hood Road, Dunn, NC Sample Description: Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-7/ TW-1** Sampled: 2/18/2019 14:15

**Sample ID: 19B0931-01**

Sample Matrix: Ground Water

Sample Flags: RL-11

**Volatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Diisopropyl Ether (DIPE) | ND | 1.0 | 0.36 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,4-Dioxane | ND | 100 | 53 | µg/L | 2 | V-16 | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Ethylbenzene | 120 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Hexachlorobutadiene | ND | 2.0 | 1.2 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 2-Hexanone (MBK) | ND | 20 | 3.0 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Isopropylbenzene (Cumene) | 5.0 | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| p-Isopropyltoluene (p-Cymene) | 0.94 | 2.0 | 0.30 | µg/L | 2 | J | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Methyl tert-Butyl Ether (MTBE) | 3.4 | 2.0 | 0.18 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Methylene Chloride | ND | 10 | 6.4 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 4-Methyl-2-pentanone (MIBK) | ND | 20 | 2.9 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Naphthalene | 110 | 10 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| n-Propylbenzene | 8.5 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Styrene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1,1,2-Tetrachloroethane | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1,2,2-Tetrachloroethane | ND | 1.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Tetrachloroethylene | ND | 2.0 | 0.54 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Tetrahydrofuran | ND | 20 | 2.1 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Toluene | 41 | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2,3-Trichlorobenzene | ND | 10 | 0.28 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2,4-Trichlorobenzene | ND | 2.0 | 0.38 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,3,5-Trichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1,1-Trichloroethane | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1,2-Trichloroethane | ND | 2.0 | 0.47 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Trichloroethylene | ND | 2.0 | 0.40 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Trichlorofluoromethane (Freon 11) | ND | 4.0 | 0.29 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2,3-Trichloropropane | ND | 4.0 | 0.43 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | ND | 2.0 | 0.39 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,2,4-Trimethylbenzene | 69 | 2.0 | 0.36 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| 1,3,5-Trimethylbenzene | 16 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| Vinyl Chloride | ND | 4.0 | 0.27 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| m+p Xylene | 230 | 4.0 | 0.51 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |
| o-Xylene | 140 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 5:29 | LBD |

| Surrogates | % Recovery | Recovery Limits | Flag/Qual | |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 91.9 | 70-130 | | 2/27/19 5:29 |
| Toluene-d8 | 99.8 | 70-130 | | 2/27/19 5:29 |
| 4-Bromofluorobenzene | 100 | 70-130 | | 2/27/19 5:29 |

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 60 Robin Hood Road, Dunn, NC  Sample Description:  Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-7/ TW-1**  Sampled: 2/18/2019 14:15

**Sample ID: 19B0931-01**

Sample Matrix: Ground Water

**Semivolatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene (SIM) | 1.2 | 7.5 | 0.82 | µg/L | 25 | J | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Acenaphthylene (SIM) | ND | 5.0 | 0.88 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Anthracene (SIM) | ND | 5.0 | 0.80 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Benzo(a)anthracene (SIM) | ND | 1.2 | 0.40 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Benzo(a)pyrene (SIM) | ND | 2.5 | 0.30 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Benzo(b)fluoranthene (SIM) | ND | 1.2 | 0.38 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Benzo(g,h,i)perylene (SIM) | ND | 12 | 0.45 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Benzo(k)fluoranthene (SIM) | ND | 5.0 | 0.30 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Chrysene (SIM) | ND | 5.0 | 0.38 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Dibenz(a,h)anthracene (SIM) | ND | 2.5 | 0.42 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Fluoranthene (SIM) | ND | 12 | 0.62 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Fluorene (SIM) | 1.6 | 25 | 0.85 | µg/L | 25 | J | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Indeno(1,2,3-cd)pyrene (SIM) | ND | 2.5 | 0.45 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| 2-Methylnaphthalene (SIM) | 39 | 25 | 1.6 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Naphthalene (SIM) | 55 | 25 | 6.4 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Phenanthrene (SIM) | 1.6 | 1.2 | 0.75 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |
| Pyrene (SIM) | ND | 25 | 0.58 | µg/L | 25 | | SW-846 8270D | 2/23/19 | 2/27/19 13:56 | CLA |

| Surrogates | % Recovery | Recovery Limits | Flag/Qual | |
|---|---|---|---|---|
| Nitrobenzene-d5 (SIM) | 67.8 | 30-130 | | 2/27/19 13:56 |
| 2-Fluorobiphenyl | 48.6 | 30-130 | | 2/27/19 13:56 |
| p-Terphenyl-d14 | 44.7 | 30-130 | | 2/27/19 13:56 |

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Project Location: 60 Robin Hood Road, Dunn, NC  Sample Description:  Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-8/ TW-2**  Sampled: 2/18/2019 15:15

**Sample ID: 19B0931-02**

Sample Matrix: Ground Water

Sample Flags: RL-13

**Volatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | ND | 100 | 19 | µg/L | 2 | R-05 | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Acrylonitrile | ND | 10 | 1.2 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| tert-Amyl Methyl Ether (TAME) | ND | 1.0 | 0.21 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Benzene | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Bromobenzene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Bromochloromethane | ND | 2.0 | 0.45 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Bromodichloromethane | ND | 1.0 | 0.59 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Bromoform | ND | 2.0 | 0.42 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Bromomethane | ND | 4.0 | 1.9 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 2-Butanone (MEK) | ND | 40 | 4.7 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| tert-Butyl Alcohol (TBA) | ND | 40 | 4.3 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| n-Butylbenzene | 5.3 | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| sec-Butylbenzene | 7.6 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| tert-Butylbenzene | 0.58 | 2.0 | 0.24 | µg/L | 2 | J | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| tert-Butyl Ethyl Ether (TBEE) | ND | 1.0 | 0.19 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Carbon Disulfide | ND | 8.0 | 2.0 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Carbon Tetrachloride | ND | 10 | 0.49 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Chlorobenzene | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Chlorodibromomethane | ND | 1.0 | 0.21 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Chloroethane | ND | 4.0 | 0.56 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Chloroform | ND | 4.0 | 0.44 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Chloromethane | ND | 4.0 | 1.1 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 2-Chlorotoluene | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 4-Chlorotoluene | ND | 2.0 | 0.28 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2-Dibromo-3-chloropropane (DBCP) | ND | 10 | 0.74 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2-Dibromoethane (EDB) | ND | 1.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Dibromomethane | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2-Dichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,3-Dichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,4-Dichlorobenzene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| trans-1,4-Dichloro-2-butene | ND | 4.0 | 0.62 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Dichlorodifluoromethane (Freon 12) | ND | 4.0 | 0.57 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1-Dichloroethane | ND | 2.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2-Dichloroethane | ND | 2.0 | 0.39 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1-Dichloroethylene | ND | 2.0 | 0.42 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| cis-1,2-Dichloroethylene | ND | 2.0 | 0.29 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| trans-1,2-Dichloroethylene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2-Dichloropropane | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,3-Dichloropropane | ND | 1.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 2,2-Dichloropropane | ND | 2.0 | 0.43 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1-Dichloropropene | ND | 4.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| cis-1,3-Dichloropropene | ND | 1.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| trans-1,3-Dichloropropene | ND | 1.0 | 0.22 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Diethyl Ether | ND | 4.0 | 0.44 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 60 Robin Hood Road, Dunn, NC Sample Description: Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-8/ TW-2** Sampled: 2/18/2019 15:15

**Sample ID: 19B0931-02**

Sample Matrix: Ground Water

Sample Flags: RL-13

**Volatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Diisopropyl Ether (DIPE) | ND | 1.0 | 0.36 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,4-Dioxane | ND | 100 | 53 | µg/L | 2 | V-16 | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Ethylbenzene | 0.66 | 2.0 | 0.26 | µg/L | 2 | J | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Hexachlorobutadiene | ND | 2.0 | 1.2 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 2-Hexanone (MBK) | ND | 20 | 3.0 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Isopropylbenzene (Cumene) | 1.3 | 2.0 | 0.24 | µg/L | 2 | J | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| p-Isopropyltoluene (p-Cymene) | 4.6 | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Methyl tert-Butyl Ether (MTBE) | ND | 2.0 | 0.18 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Methylene Chloride | ND | 10 | 6.4 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 4-Methyl-2-pentanone (MIBK) | ND | 20 | 2.9 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Naphthalene | 87 | 10 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| n-Propylbenzene | 3.2 | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Styrene | ND | 2.0 | 0.30 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1,1,2-Tetrachloroethane | ND | 2.0 | 0.24 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1,2,2-Tetrachloroethane | ND | 1.0 | 0.32 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Tetrachloroethylene | ND | 2.0 | 0.54 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Tetrahydrofuran | ND | 20 | 2.1 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Toluene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2,3-Trichlorobenzene | ND | 10 | 0.28 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2,4-Trichlorobenzene | ND | 2.0 | 0.38 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,3,5-Trichlorobenzene | ND | 2.0 | 0.34 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1,1-Trichloroethane | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1,2-Trichloroethane | ND | 2.0 | 0.47 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Trichloroethylene | ND | 2.0 | 0.40 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Trichlorofluoromethane (Freon 11) | ND | 4.0 | 0.29 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2,3-Trichloropropane | ND | 4.0 | 0.43 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | ND | 2.0 | 0.39 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,2,4-Trimethylbenzene | ND | 2.0 | 0.36 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| 1,3,5-Trimethylbenzene | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| Vinyl Chloride | ND | 4.0 | 0.27 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| m+p Xylene | ND | 4.0 | 0.51 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |
| o-Xylene | ND | 2.0 | 0.26 | µg/L | 2 | | SW-846 8260D | 2/22/19 | 2/27/19 4:58 | LBD |

| Surrogates | % Recovery | Recovery Limits | Flag/Qual | |
|---|---|---|---|---|
| 1,2-Dichloroethane-d4 | 95.9 | 70-130 | | 2/27/19 4:58 |
| Toluene-d8 | 98.4 | 70-130 | | 2/27/19 4:58 |
| 4-Bromofluorobenzene | 105 | 70-130 | | 2/27/19 4:58 |

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 60 Robin Hood Road, Dunn, NC Sample Description: Work Order: 19B0931

Date Received: 2/20/2019

**Field Sample #: B-8/ TW-2** Sampled: 2/18/2019 15:15

**Sample ID: 19B0931-02**

Sample Matrix: Ground Water

**Semivolatile Organic Compounds by GC/MS**

| Analyte | Results | RL | DL | Units | Dilution | Flag/Qual | Method | Date Prepared | Date/Time Analyzed | Analyst |
|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene (SIM) | 13 | 3.1 | 0.34 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Acenaphthylene (SIM) | 5.0 | 2.0 | 0.36 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Anthracene (SIM) | 6.7 | 2.0 | 0.33 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Benzo(a)anthracene (SIM) | 0.20 | 0.51 | 0.16 | µg/L | 10 | J | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Benzo(a)pyrene (SIM) | ND | 1.0 | 0.12 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Benzo(b)fluoranthene (SIM) | ND | 0.51 | 0.15 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Benzo(g,h,i)perylene (SIM) | ND | 5.1 | 0.18 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Benzo(k)fluoranthene (SIM) | ND | 2.0 | 0.12 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Chrysene (SIM) | 0.36 | 2.0 | 0.15 | µg/L | 10 | J | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Dibenz(a,h)anthracene (SIM) | ND | 1.0 | 0.17 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Fluoranthene (SIM) | 0.81 | 5.1 | 0.26 | µg/L | 10 | J | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Fluorene (SIM) | 31 | 10 | 0.35 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Indeno(1,2,3-cd)pyrene (SIM) | ND | 1.0 | 0.18 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| 2-Methylnaphthalene (SIM) | 160 | 51 | 3.2 | µg/L | 50 | | SW-846 8270D | 2/23/19 | 2/27/19 15:50 | CLA |
| Naphthalene (SIM) | 38 | 10 | 2.6 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Phenanthrene (SIM) | 76 | 0.51 | 0.31 | µg/L | 10 | | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |
| Pyrene (SIM) | 4.4 | 10 | 0.23 | µg/L | 10 | J | SW-846 8270D | 2/23/19 | 2/27/19 14:24 | CLA |

| Surrogates | % Recovery | Recovery Limits | Flag/Qual | |
|---|---|---|---|---|
| Nitrobenzene-d5 (SIM) | 60.9 | 30-130 | | 2/27/19 14:24 |
| Nitrobenzene-d5 (SIM) | 57.0 | 30-130 | | 2/27/19 15:50 |
| **2-Fluorobiphenyl** | * | 30-130 | S-02 | 2/27/19 14:24 |
| 2-Fluorobiphenyl | 37.9 | 30-130 | | 2/27/19 15:50 |
| p-Terphenyl-d14 | 42.5 | 30-130 | | 2/27/19 14:24 |
| p-Terphenyl-d14 | 38.5 | 30-130 | | 2/27/19 15:50 |

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## Sample Extraction Data

**Prep Method: SW-846 5030B-SW-846 8260D**

| Lab Number [Field ID] | Batch | Initial [mL] | Final [mL] | Date |
|---|---|---|---|---|
| 19B0931-01 [B-7/ TW-1] | B224172 | 2.5 | 5.00 | 02/22/19 |
| 19B0931-02 [B-8/ TW-2] | B224172 | 2.5 | 5.00 | 02/22/19 |

**Prep Method: SW-846 3510C-SW-846 8270D**

| Lab Number [Field ID] | Batch | Initial [mL] | Final [mL] | Date |
|---|---|---|---|---|
| 19B0931-01RE1 [B-7/ TW-1] | B224345 | 1000 | 1.00 | 02/23/19 |
| 19B0931-02RE1 [B-8/ TW-2] | B224345 | 980 | 1.00 | 02/23/19 |
| 19B0931-02RE2 [B-8/ TW-2] | B224345 | 980 | 1.00 | 02/23/19 |

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**QUALITY CONTROL**

**Volatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224172 - SW-846 5030B** | | | | | | | | | | |
| **Blank (B224172-BLK1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | |
| Acetone | ND | 50 | µg/L | | | | | | | R-05 |
| Acrylonitrile | ND | 5.0 | µg/L | | | | | | | |
| tert-Amyl Methyl Ether (TAME) | ND | 0.50 | µg/L | | | | | | | |
| Benzene | ND | 1.0 | µg/L | | | | | | | |
| Bromobenzene | ND | 1.0 | µg/L | | | | | | | |
| Bromochloromethane | ND | 1.0 | µg/L | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | | | | | | | |
| Bromoform | ND | 1.0 | µg/L | | | | | | | |
| Bromomethane | ND | 2.0 | µg/L | | | | | | | |
| 2-Butanone (MEK) | ND | 20 | µg/L | | | | | | | |
| tert-Butyl Alcohol (TBA) | ND | 20 | µg/L | | | | | | | |
| n-Butylbenzene | ND | 1.0 | µg/L | | | | | | | |
| sec-Butylbenzene | ND | 1.0 | µg/L | | | | | | | |
| tert-Butylbenzene | ND | 1.0 | µg/L | | | | | | | |
| tert-Butyl Ethyl Ether (TBEE) | ND | 0.50 | µg/L | | | | | | | |
| Carbon Disulfide | ND | 4.0 | µg/L | | | | | | | |
| Carbon Tetrachloride | ND | 5.0 | µg/L | | | | | | | |
| Chlorobenzene | ND | 1.0 | µg/L | | | | | | | |
| Chlorodibromomethane | ND | 0.50 | µg/L | | | | | | | |
| Chloroethane | ND | 2.0 | µg/L | | | | | | | |
| Chloroform | ND | 2.0 | µg/L | | | | | | | |
| Chloromethane | ND | 2.0 | µg/L | | | | | | | |
| 2-Chlorotoluene | ND | 1.0 | µg/L | | | | | | | |
| 4-Chlorotoluene | ND | 1.0 | µg/L | | | | | | | |
| 1,2-Dibromo-3-chloropropane (DBCP) | ND | 5.0 | µg/L | | | | | | | |
| 1,2-Dibromoethane (EDB) | ND | 0.50 | µg/L | | | | | | | |
| Dibromomethane | ND | 1.0 | µg/L | | | | | | | |
| 1,2-Dichlorobenzene | ND | 1.0 | µg/L | | | | | | | |
| 1,3-Dichlorobenzene | ND | 1.0 | µg/L | | | | | | | |
| 1,4-Dichlorobenzene | ND | 1.0 | µg/L | | | | | | | |
| trans-1,4-Dichloro-2-butene | ND | 2.0 | µg/L | | | | | | | |
| Dichlorodifluoromethane (Freon 12) | ND | 2.0 | µg/L | | | | | | | |
| 1,1-Dichloroethane | ND | 1.0 | µg/L | | | | | | | |
| 1,2-Dichloroethane | ND | 1.0 | µg/L | | | | | | | |
| 1,1-Dichloroethylene | ND | 1.0 | µg/L | | | | | | | |
| cis-1,2-Dichloroethylene | ND | 1.0 | µg/L | | | | | | | |
| trans-1,2-Dichloroethylene | ND | 1.0 | µg/L | | | | | | | |
| 1,2-Dichloropropane | ND | 1.0 | µg/L | | | | | | | |
| 1,3-Dichloropropane | ND | 0.50 | µg/L | | | | | | | |
| 2,2-Dichloropropane | ND | 1.0 | µg/L | | | | | | | |
| 1,1-Dichloropropene | ND | 2.0 | µg/L | | | | | | | |
| cis-1,3-Dichloropropene | ND | 0.50 | µg/L | | | | | | | |
| trans-1,3-Dichloropropene | ND | 0.50 | µg/L | | | | | | | |
| Diethyl Ether | ND | 2.0 | µg/L | | | | | | | |
| Diisopropyl Ether (DIPE) | ND | 0.50 | µg/L | | | | | | | |
| 1,4-Dioxane | ND | 50 | µg/L | | | | | | | V-16 |
| Ethylbenzene | ND | 1.0 | µg/L | | | | | | | |
| Hexachlorobutadiene | ND | 0.60 | µg/L | | | | | | | |
| 2-Hexanone (MBK) | ND | 10 | µg/L | | | | | | | |
| Isopropylbenzene (Cumene) | ND | 1.0 | µg/L | | | | | | | |
| p-Isopropyltoluene (p-Cymene) | ND | 1.0 | µg/L | | | | | | | |
| Methyl tert-Butyl Ether (MTBE) | ND | 1.0 | µg/L | | | | | | | |

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**QUALITY CONTROL**

**Volatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224172 - SW-846 5030B** | | | | | | | | | | | |
| **Blank (B224172-BLK1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | |
| Methylene Chloride | ND | 5.0 | µg/L | | | | | | | | |
| 4-Methyl-2-pentanone (MIBK) | ND | 10 | µg/L | | | | | | | | |
| Naphthalene | ND | 2.0 | µg/L | | | | | | | | |
| n-Propylbenzene | ND | 1.0 | µg/L | | | | | | | | |
| Styrene | ND | 1.0 | µg/L | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | ND | 1.0 | µg/L | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | ND | 0.50 | µg/L | | | | | | | | |
| Tetrachloroethylene | ND | 1.0 | µg/L | | | | | | | | |
| Tetrahydrofuran | ND | 10 | µg/L | | | | | | | | |
| Toluene | ND | 1.0 | µg/L | | | | | | | | |
| 1,2,3-Trichlorobenzene | ND | 5.0 | µg/L | | | | | | | | |
| 1,2,4-Trichlorobenzene | ND | 1.0 | µg/L | | | | | | | | |
| 1,3,5-Trichlorobenzene | ND | 1.0 | µg/L | | | | | | | | |
| 1,1,1-Trichloroethane | ND | 1.0 | µg/L | | | | | | | | |
| 1,1,2-Trichloroethane | ND | 1.0 | µg/L | | | | | | | | |
| Trichloroethylene | ND | 1.0 | µg/L | | | | | | | | |
| Trichlorofluoromethane (Freon 11) | ND | 2.0 | µg/L | | | | | | | | |
| 1,2,3-Trichloropropane | ND | 2.0 | µg/L | | | | | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | ND | 1.0 | µg/L | | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 1.0 | µg/L | | | | | | | | |
| 1,3,5-Trimethylbenzene | ND | 1.0 | µg/L | | | | | | | | |
| Vinyl Acetate | ND | 20 | µg/L | | | | | | | R-05 | |
| Vinyl Chloride | ND | 2.0 | µg/L | | | | | | | | |
| m+p Xylene | ND | 2.0 | µg/L | | | | | | | | |
| o-Xylene | ND | 1.0 | µg/L | | | | | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | *23.4* | | µg/L | 25.0 | | 93.8 | 70-130 | | | | |
| Surrogate: Toluene-d8 | *24.6* | | µg/L | 25.0 | | 98.5 | 70-130 | | | | |
| Surrogate: 4-Bromofluorobenzene | *25.5* | | µg/L | 25.0 | | 102 | 70-130 | | | | |
| **LCS (B224172-BS1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | |
| Acetone | 125 | 50 | µg/L | 100 | | 125 | 70-160 | | | R-05 | † |
| Acrylonitrile | 9.46 | 5.0 | µg/L | 10.0 | | 94.6 | 70-130 | | | | |
| tert-Amyl Methyl Ether (TAME) | 10.7 | 0.50 | µg/L | 10.0 | | 107 | 70-130 | | | | |
| Benzene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | 70-130 | | | | |
| Bromobenzene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | 70-130 | | | | |
| Bromochloromethane | 12.0 | 1.0 | µg/L | 10.0 | | 120 | 70-130 | | | V-20 | |
| Bromodichloromethane | 10.6 | 0.50 | µg/L | 10.0 | | 106 | 70-130 | | | | |
| Bromoform | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | | | | |
| Bromomethane | 5.35 | 2.0 | µg/L | 10.0 | | 53.5 | 40-160 | | | | † |
| 2-Butanone (MEK) | 98.5 | 20 | µg/L | 100 | | 98.5 | 40-160 | | | | † |
| tert-Butyl Alcohol (TBA) | 92.4 | 20 | µg/L | 100 | | 92.4 | 40-160 | | | | † |
| n-Butylbenzene | 9.08 | 1.0 | µg/L | 10.0 | | 90.8 | 70-130 | | | | |
| sec-Butylbenzene | 9.48 | 1.0 | µg/L | 10.0 | | 94.8 | 70-130 | | | | |
| tert-Butylbenzene | 9.57 | 1.0 | µg/L | 10.0 | | 95.7 | 70-130 | | | | |
| tert-Butyl Ethyl Ether (TBEE) | 9.76 | 0.50 | µg/L | 10.0 | | 97.6 | 70-130 | | | | |
| Carbon Disulfide | 11.6 | 4.0 | µg/L | 10.0 | | 116 | 70-130 | | | V-36 | |
| Carbon Tetrachloride | 10.9 | 5.0 | µg/L | 10.0 | | 109 | 70-130 | | | | |
| Chlorobenzene | 10.4 | 1.0 | µg/L | 10.0 | | 104 | 70-130 | | | | |
| Chlorodibromomethane | 11.4 | 0.50 | µg/L | 10.0 | | 114 | 70-130 | | | | |
| Chloroethane | 10.0 | 2.0 | µg/L | 10.0 | | 100 | 70-130 | | | | |
| Chloroform | 10.5 | 2.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| Chloromethane | 7.80 | 2.0 | µg/L | 10.0 | | 78.0 | 40-160 | | | | † |

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**QUALITY CONTROL**

**Volatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224172 - SW-846 5030B** | | | | | | | | | | | |
| **LCS (B224172-BS1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | |
| 2-Chlorotoluene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| 4-Chlorotoluene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | 70-130 | | | | |
| 1,2-Dibromo-3-chloropropane (DBCP) | 8.31 | 5.0 | µg/L | 10.0 | | 83.1 | 70-130 | | | | |
| 1,2-Dibromoethane (EDB) | 11.0 | 0.50 | µg/L | 10.0 | | 110 | 70-130 | | | | |
| Dibromomethane | 11.3 | 1.0 | µg/L | 10.0 | | 113 | 70-130 | | | | |
| 1,2-Dichlorobenzene | 9.99 | 1.0 | µg/L | 10.0 | | 99.9 | 70-130 | | | | |
| 1,3-Dichlorobenzene | 10.0 | 1.0 | µg/L | 10.0 | | 100 | 70-130 | | | | |
| 1,4-Dichlorobenzene | 9.73 | 1.0 | µg/L | 10.0 | | 97.3 | 70-130 | | | | |
| trans-1,4-Dichloro-2-butene | 9.34 | 2.0 | µg/L | 10.0 | | 93.4 | 70-130 | | | | |
| Dichlorodifluoromethane (Freon 12) | 8.72 | 2.0 | µg/L | 10.0 | | 87.2 | 40-160 | | | | † |
| 1,1-Dichloroethane | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| 1,2-Dichloroethane | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | | | | |
| 1,1-Dichloroethylene | 10.4 | 1.0 | µg/L | 10.0 | | 104 | 70-130 | | | | |
| cis-1,2-Dichloroethylene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | | | | |
| trans-1,2-Dichloroethylene | 10.8 | 1.0 | µg/L | 10.0 | | 108 | 70-130 | | | | |
| 1,2-Dichloropropane | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | | | | |
| 1,3-Dichloropropane | 10.5 | 0.50 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| 2,2-Dichloropropane | 9.51 | 1.0 | µg/L | 10.0 | | 95.1 | 40-130 | | | | † |
| 1,1-Dichloropropene | 10.7 | 2.0 | µg/L | 10.0 | | 107 | 70-130 | | | | |
| cis-1,3-Dichloropropene | 10.2 | 0.50 | µg/L | 10.0 | | 102 | 70-130 | | | | |
| trans-1,3-Dichloropropene | 10.0 | 0.50 | µg/L | 10.0 | | 100 | 70-130 | | | | |
| Diethyl Ether | 10.3 | 2.0 | µg/L | 10.0 | | 103 | 70-130 | | | | |
| Diisopropyl Ether (DIPE) | 9.31 | 0.50 | µg/L | 10.0 | | 93.1 | 70-130 | | | | |
| 1,4-Dioxane | 94.9 | 50 | µg/L | 100 | | 94.9 | 40-130 | | | V-16 | † |
| Ethylbenzene | 9.99 | 1.0 | µg/L | 10.0 | | 99.9 | 70-130 | | | | |
| Hexachlorobutadiene | 9.55 | 0.60 | µg/L | 10.0 | | 95.5 | 70-130 | | | | |
| 2-Hexanone (MBK) | 95.9 | 10 | µg/L | 100 | | 95.9 | 70-160 | | | | † |
| Isopropylbenzene (Cumene) | 10.6 | 1.0 | µg/L | 10.0 | | 106 | 70-130 | | | | |
| p-Isopropyltoluene (p-Cymene) | 9.60 | 1.0 | µg/L | 10.0 | | 96.0 | 70-130 | | | | |
| Methyl tert-Butyl Ether (MTBE) | 10.7 | 1.0 | µg/L | 10.0 | | 107 | 70-130 | | | | |
| Methylene Chloride | 9.81 | 5.0 | µg/L | 10.0 | | 98.1 | 70-130 | | | | |
| 4-Methyl-2-pentanone (MIBK) | 91.0 | 10 | µg/L | 100 | | 91.0 | 70-160 | | | | † |
| Naphthalene | 8.58 | 2.0 | µg/L | 10.0 | | 85.8 | 40-130 | | | | † |
| n-Propylbenzene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| Styrene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| 1,1,1,2-Tetrachloroethane | 11.1 | 1.0 | µg/L | 10.0 | | 111 | 70-130 | | | | |
| 1,1,2,2-Tetrachloroethane | 10.0 | 0.50 | µg/L | 10.0 | | 100 | 70-130 | | | | |
| Tetrachloroethylene | 11.4 | 1.0 | µg/L | 10.0 | | 114 | 70-130 | | | | |
| Tetrahydrofuran | 8.68 | 10 | µg/L | 10.0 | | 86.8 | 70-130 | | | J | |
| Toluene | 10.6 | 1.0 | µg/L | 10.0 | | 106 | 70-130 | | | | |
| 1,2,3-Trichlorobenzene | 9.96 | 5.0 | µg/L | 10.0 | | 99.6 | 70-130 | | | | |
| 1,2,4-Trichlorobenzene | 9.88 | 1.0 | µg/L | 10.0 | | 98.8 | 70-130 | | | | |
| 1,3,5-Trichlorobenzene | 10.1 | 1.0 | µg/L | 10.0 | | 101 | 70-130 | | | | |
| 1,1,1-Trichloroethane | 10.7 | 1.0 | µg/L | 10.0 | | 107 | 70-130 | | | | |
| 1,1,2-Trichloroethane | 11.1 | 1.0 | µg/L | 10.0 | | 111 | 70-130 | | | | |
| Trichloroethylene | 11.4 | 1.0 | µg/L | 10.0 | | 114 | 70-130 | | | | |
| Trichlorofluoromethane (Freon 11) | 9.37 | 2.0 | µg/L | 10.0 | | 93.7 | 70-130 | | | | |
| 1,2,3-Trichloropropane | 10.1 | 2.0 | µg/L | 10.0 | | 101 | 70-130 | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | | | | |
| 1,2,4-Trimethylbenzene | 9.12 | 1.0 | µg/L | 10.0 | | 91.2 | 70-130 | | | | |
| 1,3,5-Trimethylbenzene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | | | | |

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**QUALITY CONTROL**

**Volatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | | %REC Limits | RPD | | RPD Limit | Notes | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224172 - SW-846 5030B** | | | | | | | | | | | | | |
| **LCS (B224172-BS1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | | | |
| **Vinyl Acetate** | 65.2 | 20 | µg/L | 100 | | **65.2** | * | 70-130 | | | | R-05, L-07A | |
| Vinyl Chloride | 8.95 | 2.0 | µg/L | 10.0 | | 89.5 | | 40-160 | | | | | † |
| m+p Xylene | 20.6 | 2.0 | µg/L | 20.0 | | 103 | | 70-130 | | | | | |
| o-Xylene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | | 70-130 | | | | | |
| Surrogate: 1,2-Dichloroethane-d4 | *23.7* | | µg/L | 25.0 | | 94.7 | | 70-130 | | | | | |
| Surrogate: Toluene-d8 | *24.5* | | µg/L | 25.0 | | 97.9 | | 70-130 | | | | | |
| Surrogate: 4-Bromofluorobenzene | *25.2* | | µg/L | 25.0 | | 101 | | 70-130 | | | | | |
| **LCS Dup (B224172-BSD1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | | | |
| Acetone | 94.8 | 50 | µg/L | 100 | | 94.8 | | 70-160 | **27.3** | * | 25 | R-05 | † |
| Acrylonitrile | 9.77 | 5.0 | µg/L | 10.0 | | 97.7 | | 70-130 | 3.22 | | 25 | | |
| tert-Amyl Methyl Ether (TAME) | 10.3 | 0.50 | µg/L | 10.0 | | 103 | | 70-130 | 3.43 | | 25 | | |
| Benzene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | | 70-130 | 0.388 | | 25 | | |
| Bromobenzene | 10.6 | 1.0 | µg/L | 10.0 | | 106 | | 70-130 | 2.20 | | 25 | | |
| Bromochloromethane | 12.4 | 1.0 | µg/L | 10.0 | | 124 | | 70-130 | 3.36 | | 25 | V-20 | |
| Bromodichloromethane | 10.9 | 0.50 | µg/L | 10.0 | | 109 | | 70-130 | 3.07 | | 25 | | |
| Bromoform | 10.3 | 1.0 | µg/L | 10.0 | | 103 | | 70-130 | 0.586 | | 25 | | |
| Bromomethane | 6.67 | 2.0 | µg/L | 10.0 | | 66.7 | | 40-160 | 22.0 | | 25 | | † |
| 2-Butanone (MEK) | 90.8 | 20 | µg/L | 100 | | 90.8 | | 40-160 | 8.10 | | 25 | | † |
| tert-Butyl Alcohol (TBA) | 92.1 | 20 | µg/L | 100 | | 92.1 | | 40-160 | 0.358 | | 25 | | † |
| n-Butylbenzene | 9.28 | 1.0 | µg/L | 10.0 | | 92.8 | | 70-130 | 2.18 | | 25 | | |
| sec-Butylbenzene | 9.52 | 1.0 | µg/L | 10.0 | | 95.2 | | 70-130 | 0.421 | | 25 | | |
| tert-Butylbenzene | 9.52 | 1.0 | µg/L | 10.0 | | 95.2 | | 70-130 | 0.524 | | 25 | | |
| tert-Butyl Ethyl Ether (TBEE) | 9.75 | 0.50 | µg/L | 10.0 | | 97.5 | | 70-130 | 0.103 | | 25 | | |
| Carbon Disulfide | 11.1 | 4.0 | µg/L | 10.0 | | 111 | | 70-130 | 3.96 | | 25 | V-36 | |
| Carbon Tetrachloride | 10.6 | 5.0 | µg/L | 10.0 | | 106 | | 70-130 | 2.14 | | 25 | | |
| Chlorobenzene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | | 70-130 | 0.287 | | 25 | | |
| Chlorodibromomethane | 11.4 | 0.50 | µg/L | 10.0 | | 114 | | 70-130 | 0.351 | | 25 | | |
| Chloroethane | 9.72 | 2.0 | µg/L | 10.0 | | 97.2 | | 70-130 | 3.24 | | 25 | | |
| Chloroform | 10.3 | 2.0 | µg/L | 10.0 | | 103 | | 70-130 | 1.83 | | 25 | | |
| Chloromethane | 7.75 | 2.0 | µg/L | 10.0 | | 77.5 | | 40-160 | 0.643 | | 25 | | † |
| 2-Chlorotoluene | 10.6 | 1.0 | µg/L | 10.0 | | 106 | | 70-130 | 0.190 | | 25 | | |
| 4-Chlorotoluene | 10.4 | 1.0 | µg/L | 10.0 | | 104 | | 70-130 | 0.386 | | 25 | | |
| 1,2-Dibromo-3-chloropropane (DBCP) | 8.81 | 5.0 | µg/L | 10.0 | | 88.1 | | 70-130 | 5.84 | | 25 | | |
| 1,2-Dibromoethane (EDB) | 11.1 | 0.50 | µg/L | 10.0 | | 111 | | 70-130 | 0.903 | | 25 | | |
| Dibromomethane | 11.1 | 1.0 | µg/L | 10.0 | | 111 | | 70-130 | 1.78 | | 25 | | |
| 1,2-Dichlorobenzene | 10.1 | 1.0 | µg/L | 10.0 | | 101 | | 70-130 | 1.19 | | 25 | | |
| 1,3-Dichlorobenzene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | | 70-130 | 0.990 | | 25 | | |
| 1,4-Dichlorobenzene | 9.70 | 1.0 | µg/L | 10.0 | | 97.0 | | 70-130 | 0.309 | | 25 | | |
| trans-1,4-Dichloro-2-butene | 9.55 | 2.0 | µg/L | 10.0 | | 95.5 | | 70-130 | 2.22 | | 25 | | |
| Dichlorodifluoromethane (Freon 12) | 8.54 | 2.0 | µg/L | 10.0 | | 85.4 | | 40-160 | 2.09 | | 25 | | † |
| 1,1-Dichloroethane | 10.2 | 1.0 | µg/L | 10.0 | | 102 | | 70-130 | 2.80 | | 25 | | |
| 1,2-Dichloroethane | 10.4 | 1.0 | µg/L | 10.0 | | 104 | | 70-130 | 2.04 | | 25 | | |
| 1,1-Dichloroethylene | 9.88 | 1.0 | µg/L | 10.0 | | 98.8 | | 70-130 | 4.84 | | 25 | | |
| cis-1,2-Dichloroethylene | 10.3 | 1.0 | µg/L | 10.0 | | 103 | | 70-130 | 1.07 | | 25 | | |
| trans-1,2-Dichloroethylene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | | 70-130 | 2.63 | | 25 | | |
| 1,2-Dichloropropane | 10.0 | 1.0 | µg/L | 10.0 | | 100 | | 70-130 | 1.78 | | 25 | | |
| 1,3-Dichloropropane | 10.4 | 0.50 | µg/L | 10.0 | | 104 | | 70-130 | 0.479 | | 25 | | |
| 2,2-Dichloropropane | 9.41 | 1.0 | µg/L | 10.0 | | 94.1 | | 40-130 | 1.06 | | 25 | | † |
| 1,1-Dichloropropene | 10.5 | 2.0 | µg/L | 10.0 | | 105 | | 70-130 | 1.98 | | 25 | | |
| cis-1,3-Dichloropropene | 10.2 | 0.50 | µg/L | 10.0 | | 102 | | 70-130 | 0.784 | | 25 | | |
| trans-1,3-Dichloropropene | 10.1 | 0.50 | µg/L | 10.0 | | 101 | | 70-130 | 0.894 | | 25 | | |

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**QUALITY CONTROL**

**Volatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | | RPD Limit | Notes | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224172 - SW-846 5030B** | | | | | | | | | | | | |
| **LCS Dup (B224172-BSD1)** | | | | Prepared: 02/22/19 Analyzed: 02/26/19 | | | | | | | | |
| Diethyl Ether | 10.0 | 2.0 | µg/L | 10.0 | | 100 | 70-130 | 2.75 | | 25 | | |
| Diisopropyl Ether (DIPE) | 9.40 | 0.50 | µg/L | 10.0 | | 94.0 | 70-130 | 0.962 | | 25 | | |
| 1,4-Dioxane | 87.0 | 50 | µg/L | 100 | | 87.0 | 40-130 | 8.75 | | 50 | V-16 | † ‡ |
| Ethylbenzene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | 2.57 | | 25 | | |
| Hexachlorobutadiene | 9.49 | 0.60 | µg/L | 10.0 | | 94.9 | 70-130 | 0.630 | | 25 | | |
| 2-Hexanone (MBK) | 93.8 | 10 | µg/L | 100 | | 93.8 | 70-160 | 2.21 | | 25 | | † |
| Isopropylbenzene (Cumene) | 10.8 | 1.0 | µg/L | 10.0 | | 108 | 70-130 | 1.21 | | 25 | | |
| p-Isopropyltoluene (p-Cymene) | 9.59 | 1.0 | µg/L | 10.0 | | 95.9 | 70-130 | 0.104 | | 25 | | |
| Methyl tert-Butyl Ether (MTBE) | 10.7 | 1.0 | µg/L | 10.0 | | 107 | 70-130 | 0.187 | | 25 | | |
| Methylene Chloride | 9.45 | 5.0 | µg/L | 10.0 | | 94.5 | 70-130 | 3.74 | | 25 | | |
| 4-Methyl-2-pentanone (MIBK) | 94.0 | 10 | µg/L | 100 | | 94.0 | 70-160 | 3.17 | | 25 | | † |
| Naphthalene | 8.74 | 2.0 | µg/L | 10.0 | | 87.4 | 40-130 | 1.85 | | 25 | | † |
| n-Propylbenzene | 10.4 | 1.0 | µg/L | 10.0 | | 104 | 70-130 | 0.478 | | 25 | | |
| Styrene | 10.6 | 1.0 | µg/L | 10.0 | | 106 | 70-130 | 1.33 | | 25 | | |
| 1,1,1,2-Tetrachloroethane | 10.8 | 1.0 | µg/L | 10.0 | | 108 | 70-130 | 2.84 | | 25 | | |
| 1,1,2,2-Tetrachloroethane | 11.1 | 0.50 | µg/L | 10.0 | | 111 | 70-130 | 10.6 | | 25 | | |
| Tetrachloroethylene | 11.2 | 1.0 | µg/L | 10.0 | | 112 | 70-130 | 1.59 | | 25 | | |
| Tetrahydrofuran | 9.65 | 10 | µg/L | 10.0 | | 96.5 | 70-130 | 10.6 | | 25 | J | |
| Toluene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | 0.951 | | 25 | | |
| 1,2,3-Trichlorobenzene | 10.3 | 5.0 | µg/L | 10.0 | | 103 | 70-130 | 3.16 | | 25 | | |
| 1,2,4-Trichlorobenzene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | 2.89 | | 25 | | |
| 1,3,5-Trichlorobenzene | 10.1 | 1.0 | µg/L | 10.0 | | 101 | 70-130 | 0.198 | | 25 | | |
| 1,1,1-Trichloroethane | 10.6 | 1.0 | µg/L | 10.0 | | 106 | 70-130 | 0.659 | | 25 | | |
| 1,1,2-Trichloroethane | 11.0 | 1.0 | µg/L | 10.0 | | 110 | 70-130 | 1.17 | | 25 | | |
| Trichloroethylene | 10.5 | 1.0 | µg/L | 10.0 | | 105 | 70-130 | 8.21 | | 25 | | |
| Trichlorofluoromethane (Freon 11) | 9.02 | 2.0 | µg/L | 10.0 | | 90.2 | 70-130 | 3.81 | | 25 | | |
| 1,2,3-Trichloropropane | 10.6 | 2.0 | µg/L | 10.0 | | 106 | 70-130 | 5.02 | | 25 | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | 9.91 | 1.0 | µg/L | 10.0 | | 99.1 | 70-130 | 5.50 | | 25 | | |
| 1,2,4-Trimethylbenzene | 9.23 | 1.0 | µg/L | 10.0 | | 92.3 | 70-130 | 1.20 | | 25 | | |
| 1,3,5-Trimethylbenzene | 10.2 | 1.0 | µg/L | 10.0 | | 102 | 70-130 | 0.391 | | 25 | | |
| Vinyl Acetate | 91.2 | 20 | µg/L | 100 | | 91.2 | 70-130 | **33.3** | * | 25 | R-05 | |
| Vinyl Chloride | 8.77 | 2.0 | µg/L | 10.0 | | 87.7 | 40-160 | 2.03 | | 25 | | † |
| m+p Xylene | 20.6 | 2.0 | µg/L | 20.0 | | 103 | 70-130 | 0.194 | | 25 | | |
| o-Xylene | 10.4 | 1.0 | µg/L | 10.0 | | 104 | 70-130 | 1.06 | | 25 | | |
| Surrogate: 1,2-Dichloroethane-d4 | *23.6* | | µg/L | 25.0 | | 94.2 | 70-130 | | | | | |
| Surrogate: Toluene-d8 | *24.9* | | µg/L | 25.0 | | 99.6 | 70-130 | | | | | |
| Surrogate: 4-Bromofluorobenzene | *26.2* | | µg/L | 25.0 | | 105 | 70-130 | | | | | |

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

**QUALITY CONTROL**

**Semivolatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224345 - SW-846 3510C** | | | | | | | | | | |
| **Blank (B224345-BLK1)** | | | | Prepared: 02/23/19 Analyzed: 02/26/19 | | | | | | |
| Acenaphthene (SIM) | ND | 0.30 | µg/L | | | | | | | |
| Acenaphthylene (SIM) | ND | 0.20 | µg/L | | | | | | | |
| Anthracene (SIM) | ND | 0.20 | µg/L | | | | | | | |
| Benzo(a)anthracene (SIM) | ND | 0.050 | µg/L | | | | | | | |
| Benzo(a)pyrene (SIM) | ND | 0.10 | µg/L | | | | | | | |
| Benzo(b)fluoranthene (SIM) | ND | 0.050 | µg/L | | | | | | | |
| Benzo(g,h,i)perylene (SIM) | ND | 0.50 | µg/L | | | | | | | |
| Benzo(k)fluoranthene (SIM) | ND | 0.20 | µg/L | | | | | | | |
| Chrysene (SIM) | ND | 0.20 | µg/L | | | | | | | |
| Dibenz(a,h)anthracene (SIM) | ND | 0.10 | µg/L | | | | | | | |
| Fluoranthene (SIM) | ND | 0.50 | µg/L | | | | | | | |
| Fluorene (SIM) | ND | 1.0 | µg/L | | | | | | | |
| Indeno(1,2,3-cd)pyrene (SIM) | ND | 0.10 | µg/L | | | | | | | |
| 2-Methylnaphthalene (SIM) | ND | 1.0 | µg/L | | | | | | | |
| Naphthalene (SIM) | ND | 1.0 | µg/L | | | | | | | |
| Phenanthrene (SIM) | ND | 0.050 | µg/L | | | | | | | |
| Pyrene (SIM) | ND | 1.0 | µg/L | | | | | | | |
| Surrogate: Nitrobenzene-d5 (SIM) | *77.0* | | µg/L | 100 | | 77.0 | 30-130 | | | |
| Surrogate: 2-Fluorobiphenyl | *56.4* | | µg/L | 100 | | 56.4 | 30-130 | | | |
| Surrogate: p-Terphenyl-d14 | *59.9* | | µg/L | 100 | | 59.9 | 30-130 | | | |
| **LCS (B224345-BS1)** | | | | Prepared: 02/23/19 Analyzed: 02/26/19 | | | | | | |
| Acenaphthene (SIM) | 34.4 | 7.5 | µg/L | 50.0 | | 68.9 | 40-140 | | | |
| Acenaphthylene (SIM) | 34.0 | 5.0 | µg/L | 50.0 | | 68.0 | 40-140 | | | |
| Anthracene (SIM) | 37.6 | 5.0 | µg/L | 50.0 | | 75.1 | 40-140 | | | |
| Benzo(a)anthracene (SIM) | 32.0 | 1.2 | µg/L | 50.0 | | 64.0 | 40-140 | | | |
| Benzo(a)pyrene (SIM) | 37.0 | 2.5 | µg/L | 50.0 | | 74.1 | 40-140 | | | |
| Benzo(b)fluoranthene (SIM) | 37.3 | 1.2 | µg/L | 50.0 | | 74.6 | 40-140 | | | |
| Benzo(g,h,i)perylene (SIM) | 38.5 | 12 | µg/L | 50.0 | | 77.0 | 40-140 | | | |
| Benzo(k)fluoranthene (SIM) | 36.9 | 5.0 | µg/L | 50.0 | | 73.8 | 40-140 | | | |
| Chrysene (SIM) | 34.2 | 5.0 | µg/L | 50.0 | | 68.3 | 40-140 | | | |
| Dibenz(a,h)anthracene (SIM) | 41.5 | 2.5 | µg/L | 50.0 | | 83.0 | 40-140 | | | |
| Fluoranthene (SIM) | 34.3 | 12 | µg/L | 50.0 | | 68.6 | 40-140 | | | |
| Fluorene (SIM) | 34.4 | 25 | µg/L | 50.0 | | 68.8 | 40-140 | | | |
| Indeno(1,2,3-cd)pyrene (SIM) | 40.7 | 2.5 | µg/L | 50.0 | | 81.4 | 40-140 | | | |
| 2-Methylnaphthalene (SIM) | 33.5 | 25 | µg/L | 50.0 | | 67.0 | 40-140 | | | |
| Naphthalene (SIM) | 31.4 | 25 | µg/L | 50.0 | | 62.8 | 40-140 | | | |
| Phenanthrene (SIM) | 35.6 | 1.2 | µg/L | 50.0 | | 71.1 | 40-140 | | | |
| Pyrene (SIM) | 31.8 | 25 | µg/L | 50.0 | | 63.7 | 40-140 | | | |
| Surrogate: Nitrobenzene-d5 (SIM) | *63.0* | | µg/L | 100 | | 63.0 | 30-130 | | | |
| Surrogate: 2-Fluorobiphenyl | *48.4* | | µg/L | 100 | | 48.4 | 30-130 | | | |
| Surrogate: p-Terphenyl-d14 | *47.8* | | µg/L | 100 | | 47.8 | 30-130 | | | |

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**QUALITY CONTROL**

**Semivolatile Organic Compounds by GC/MS - Quality Control**

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch B224345 - SW-846 3510C** | | | | | | | | | | |
| **LCS Dup (B224345-BSD1)** | | | | Prepared: 02/23/19 Analyzed: 02/26/19 | | | | | | |
| Acenaphthene (SIM) | 34.5 | 7.5 | µg/L | 50.0 | | 69.0 | 40-140 | 0.217 | 20 | |
| Acenaphthylene (SIM) | 34.0 | 5.0 | µg/L | 50.0 | | 68.1 | 40-140 | 0.221 | 20 | |
| Anthracene (SIM) | 37.1 | 5.0 | µg/L | 50.0 | | 74.2 | 40-140 | 1.27 | 20 | |
| Benzo(a)anthracene (SIM) | 31.4 | 1.2 | µg/L | 50.0 | | 62.7 | 40-140 | 2.13 | 20 | |
| Benzo(a)pyrene (SIM) | 36.6 | 2.5 | µg/L | 50.0 | | 73.2 | 40-140 | 1.22 | 20 | |
| Benzo(b)fluoranthene (SIM) | 37.0 | 1.2 | µg/L | 50.0 | | 74.0 | 40-140 | 0.740 | 20 | |
| Benzo(g,h,i)perylene (SIM) | 38.7 | 12 | µg/L | 50.0 | | 77.4 | 40-140 | 0.454 | 20 | |
| Benzo(k)fluoranthene (SIM) | 37.4 | 5.0 | µg/L | 50.0 | | 74.8 | 40-140 | 1.21 | 20 | |
| Chrysene (SIM) | 33.5 | 5.0 | µg/L | 50.0 | | 67.0 | 40-140 | 1.92 | 20 | |
| Dibenz(a,h)anthracene (SIM) | 41.4 | 2.5 | µg/L | 50.0 | | 82.7 | 40-140 | 0.302 | 20 | |
| Fluoranthene (SIM) | 35.0 | 12 | µg/L | 50.0 | | 70.0 | 40-140 | 2.09 | 20 | |
| Fluorene (SIM) | 35.6 | 25 | µg/L | 50.0 | | 71.3 | 40-140 | 3.64 | 20 | |
| Indeno(1,2,3-cd)pyrene (SIM) | 40.7 | 2.5 | µg/L | 50.0 | | 81.4 | 40-140 | 0.00 | 20 | ‡ |
| 2-Methylnaphthalene (SIM) | 34.5 | 25 | µg/L | 50.0 | | 69.0 | 40-140 | 2.94 | 20 | |
| Naphthalene (SIM) | 31.6 | 25 | µg/L | 50.0 | | 63.2 | 40-140 | 0.556 | 20 | |
| Phenanthrene (SIM) | 35.4 | 1.2 | µg/L | 50.0 | | 70.8 | 40-140 | 0.423 | 20 | |
| Pyrene (SIM) | 31.0 | 25 | µg/L | 50.0 | | 62.1 | 40-140 | 2.54 | 20 | |
| Surrogate: Nitrobenzene-d5 (SIM) | *62.2* | | µg/L | 100 | | 62.2 | 30-130 | | | |
| Surrogate: 2-Fluorobiphenyl | *46.1* | | µg/L | 100 | | 46.1 | 30-130 | | | |
| Surrogate: p-Terphenyl-d14 | *44.5* | | µg/L | 100 | | 44.5 | 30-130 | | | |

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**FLAG/QUALIFIER SUMMARY**

| | |
|---|---|
| * | QC result is outside of established limits. |
| † | Wide recovery limits established for difficult compound. |
| ‡ | Wide RPD limits established for difficult compound. |
| # | Data exceeded client recommended or regulatory level |
| | Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded. |
| | No results have been blank subtracted unless specified in the case narrative section. |
| I-02 | Result not attainable due to sample matrix interferences (a chemical or physical interference which could not be eliminated). |
| J | Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag). |
| L-07A | Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD outside of control limits. Reduced precision anticipated for any reported result for this compound. |
| R-05 | Laboratory fortified blank duplicate RPD is outside of control limits. Reduced precision is anticipated for any reported value for this compound. |
| RL-11 | Elevated reporting limit due to high concentration of target compounds. |
| RL-13 | Elevated reporting limit due to high concentration of non-target compounds. |
| S-02 | The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample extract. |
| V-16 | Response factor is less than method specified minimum acceptable value. Reduced precision and accuracy may be associated with reported result. |
| V-20 | Continuing calibration verification (CCV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound. |
| V-36 | Initial calibration verification (ICV) did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound. |

con-test® ANALYTICAL LABORATORY
39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

**CERTIFICATIONS**

**Certified Analyses included in this Report**

| Analyte | Certifications |
|---|---|
| ***SW-846 8260D in Water*** | |
| Acetone | NC |
| Acrylonitrile | NC |
| tert-Amyl Methyl Ether (TAME) | NC |
| Benzene | NC |
| Bromobenzene | NC |
| Bromochloromethane | NC |
| Bromodichloromethane | NC |
| Bromoform | NC |
| Bromomethane | NC |
| 2-Butanone (MEK) | NC |
| tert-Butyl Alcohol (TBA) | NC |
| n-Butylbenzene | NC |
| sec-Butylbenzene | NC |
| tert-Butylbenzene | NC |
| tert-Butyl Ethyl Ether (TBEE) | NC |
| Carbon Disulfide | NC |
| Carbon Tetrachloride | NC |
| Chlorobenzene | NC |
| Chlorodibromomethane | NC |
| Chloroethane | NC |
| Chloroform | NC |
| Chloromethane | NC |
| 2-Chlorotoluene | NC |
| 4-Chlorotoluene | NC |
| 1,2-Dibromo-3-chloropropane (DBCP) | NC |
| 1,2-Dibromoethane (EDB) | NC |
| Dibromomethane | NC |
| 1,2-Dichlorobenzene | NC |
| 1,3-Dichlorobenzene | NC |
| 1,4-Dichlorobenzene | NC |
| trans-1,4-Dichloro-2-butene | NC |
| Dichlorodifluoromethane (Freon 12) | NC |
| 1,1-Dichloroethane | NC |
| 1,2-Dichloroethane | NC |
| 1,1-Dichloroethylene | NC |
| cis-1,2-Dichloroethylene | NC |
| trans-1,2-Dichloroethylene | NC |
| 1,2-Dichloropropane | NC |
| 1,3-Dichloropropane | NC |
| 2,2-Dichloropropane | NC |
| 1,1-Dichloropropene | NC |
| cis-1,3-Dichloropropene | NC |
| trans-1,3-Dichloropropene | NC |
| Diethyl Ether | NC |
| Diisopropyl Ether (DIPE) | NC |
| 1,4-Dioxane | NC |
| Ethylbenzene | NC |

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

**CERTIFICATIONS**

**Certified Analyses included in this Report**

| Analyte | Certifications |
|---|---|
| ***SW-846 8260D in Water*** | |
| Hexachlorobutadiene | NC |
| 2-Hexanone (MBK) | NC |
| Isopropylbenzene (Cumene) | NC |
| p-Isopropyltoluene (p-Cymene) | NC |
| Methyl tert-Butyl Ether (MTBE) | NC |
| Methylene Chloride | NC |
| 4-Methyl-2-pentanone (MIBK) | NC |
| Naphthalene | NC |
| n-Propylbenzene | NC |
| Styrene | NC |
| 1,1,1,2-Tetrachloroethane | NC |
| 1,1,2,2-Tetrachloroethane | NC |
| Tetrachloroethylene | NC |
| Tetrahydrofuran | NC |
| Toluene | NC |
| 1,2,3-Trichlorobenzene | NC |
| 1,2,4-Trichlorobenzene | NC |
| 1,3,5-Trichlorobenzene | NC |
| 1,1,1-Trichloroethane | NC |
| 1,1,2-Trichloroethane | NC |
| Trichloroethylene | NC |
| Trichlorofluoromethane (Freon 11) | NC |
| 1,2,3-Trichloropropane | NC |
| 1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113) | NC |
| 1,2,4-Trimethylbenzene | NC |
| 1,3,5-Trimethylbenzene | NC |
| Vinyl Chloride | NC |
| m+p Xylene | NC |
| o-Xylene | NC |

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

| Code | Description | Number | Expires |
|---|---|---|---|
| AIHA | AIHA-LAP, LLC - ISO17025:2005 | 100033 | 03/1/2020 |
| MA | Massachusetts DEP | M-MA100 | 06/30/2019 |
| CT | Connecticut Department of Publilc Health | PH-0567 | 09/30/2019 |
| NY | New York State Department of Health | 10899 NELAP | 04/1/2019 |
| NH-S | New Hampshire Environmental Lab | 2516 NELAP | 02/5/2020 |
| RI | Rhode Island Department of Health | LAO00112 | 12/30/2019 |
| NC | North Carolina Div. of Water Quality | 652 | 12/31/2019 |
| NJ | New Jersey DEP | MA007 NELAP | 06/30/2019 |
| FL | Florida Department of Health | E871027 NELAP | 06/30/2019 |
| VT | Vermont Department of Health Lead Laboratory | LL015036 | 07/30/2019 |
| ME | State of Maine | 2011028 | 06/9/2019 |
| VA | Commonwealth of Virginia | 460217 | 12/14/2019 |
| NH-P | New Hampshire Environmental Lab | 2557 NELAP | 09/6/2019 |
| VT-DW | Vermont Department of Health Drinking Water | VT-255716 | 06/12/2019 |
| NC-DW | North Carolina Department of Health | 25703 | 07/31/2019 |

1903931

con-test ANALYTICAL LABORATORY

Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

http://www.contestlabs.com

Doc # 379 Rev 1_03242017

CHAIN OF CUSTODY RECORD (North Carolina)

39 Spruce Street
East Longmeadow, MA 01028



Company Name: SEMC

Address: 3201 Spring Forest RD Raleigh NC

Phone: 919 977-7614

Project Name: Parcel 140 DOT-Dunn

Project Location: @ 60 Robin Hood Rd. Dunn, NC

Project Number: 4305-18-175A

Project Manager: Jamie Honeycutt

Con-Test Quote Name/Number:

Invoice Recipient:

Sampled By: Jamie Honeycutt

**Requested Turnaround Time**
7-Day ☐ 10-Day ☐
Due Date:

**Rush Approval Required**
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐

**Data Delivery**
Format: PDF ☑ EXCEL ☑
Other:
CLP Like Data Pkg Required: ☐
Email To: jhoneycutt@semcinc.com
Fax To #:

**ANALYSIS REQUESTED**

| Con-Test Work Order# | Client Sample ID / Description | Beginning Date/Time | Ending Date/Time | Composite | Grab | [1] Matrix Code | Conc Code | 8260 | 8270 (PAHs) | # of Containers | [2] Preservation Code | [3] Container Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | B-7/TW-1 | 2-18-19 | 2:15 pm | | / | GW | H | / | / | | | |
| 2 | B-8/TW-2 | | 3:15 pm | | / | GW | H | / | / | | | |

**Dissolved Metals Samples**
☐ Field Filtered
☐ Lab to Filter

**Orthophosphate Samples**
☐ Field Filtered
☐ Lab to Filter

[1] **Matrix Codes:**
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

[2] **Preservation Codes:**
I = Iced
H = HCL
M = Methanol
N = Nitric Acid
S = Sulfuric Acid
B = Sodium Bisulfate
X = Sodium Hydroxide
T = Sodium Thiosulfate
O = Other (please define)

[3] **Container Codes:**
A = Amber Glass
G = Glass
P = Plastic
ST = Sterile
V = Vial
S = Summa Canister
T = Tedlar Bag
O = Other (please define)

Comments:

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
H - High; M - Medium; L - Low; C - Clean; U - Unknown

| | | |
|---|---|---|
| Relinquished by: (signature) | Date/Time: 2/20/19 1400 | |
| Received by: (signature) | Date/Time: 2/20/19 1400 | |
| Relinquished by: (signature) | Date/Time: 2/20/19 1700 | |
| Received by: (signature) 4.9 | Date/Time: 2/21/19 1025 | |
| Relinquished by: (signature) | Date/Time: | |
| Received by: (signature) | Date/Time: | |

**North Carolina Detection Limit Requirements**
☐ 2L
☐ GWPC
☐ SWSL
☐ IHSB
☐ MSCC
Other:

**Program Information**
☐ DSCA ☐ UST/Trust Fund
☐ SWS Landfill ☐ REC
☐ IHSB Orphaned Landfill
☐ State Lead
☐ Other:

NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality
☐ Federal ☐ Brownfield
☐ City ☐ School

Other
☐ Chromatogram
☐ *AIHA-LAP,LLC*

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet



Table of Contents

FedEx

774519142837

# Delivered
# Thursday 2/21/2019 at 10:25 am

**DELIVERED**

Signed for by: B.BECCA

**GET STATUS UPDATES**

**OBTAIN PROOF OF DELIVERY**

| FROM | TO |
|---|---|
| Raleigh, NC US | EAST LONGMEADOW, MA US |

## Shipment Facts

**TRACKING NUMBER**
774519142837

**SERVICE**
FedEx Priority Overnight

**WEIGHT**
15 lbs / 6.8 kgs

**DIMENSIONS**
25x14x14 in.

**DELIVERED TO**
Shipping/Receiving

**TOTAL PIECES**
1

**TOTAL SHIPMENT WEIGHT**
15 lbs / 6.8 kgs

**TERMS**
Third Party

**SHIPPER REFERENCE**
80

**PACKAGING**
Your Packaging

**SPECIAL HANDLING SECTION**
Deliver Weekday, Additional Handling Surcharge

**STANDARD TRANSIT**
2/21/2019 by 10:30 am

**SHIP DATE**
Wed 2/20/2019

**ACTUAL DELIVERY**
Thu 2/21/2019 10:25 am

## Travel History

Local Scan Time

Thursday , 2/21/2019

| | | |
|---|---|---|
| 10:25 am | EAST LONGMEADOW, MA | Delivered |
| 8:58 am | WINDSOR LOCKS, CT | On FedEx vehicle for delivery |
| 8:47 am | WINDSOR LOCKS, CT | At local FedEx facility |

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples_____

con-test® ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

**Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False**

**Client** S + ME

**Received By** RAQ Date 2/21/19 Time 10:25

How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____

Direct from Sampling _____ Ambient _____ Melted Ice _____

Were samples within Temperature? 2-6°C T By Gun # 1 Actual Temp - 4.9

By Blank # _____ Actual Temp - _____

Was Custody Seal Intact? NA Were Samples Tampered with? NA

Was COC Relinquished ? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? F

Is COC in ink/ Legible? T Were samples received within holding time? T

Did COC include all pertinent Information? Client T Analysis T Sampler Name T

Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified? _____

Are there Rushes? F Who was notified? _____

Are there Short Holds? F Who was notified? _____

Is there enough Volume? T

Is there Headspace where applicable? F MS/MSD? F

Proper Media/Containers Used? T Is splitting samples required? F

Were trip blanks received? F On COC? F

Do all samples have the proper pH? NA Acid _____ Base _____

| Vials | # | Containers: | # | | # | | # |
|---|---|---|---|---|---|---|---|
| Unp- | | 1 Liter Amb. | 4 | 1 Liter Plastic | | 16 oz Amb. | |
| HCL- | 6 | 500 mL Amb. | | 500 mL Plastic | | 8oz Amb/Clear | |
| Meoh- | | 250 mL Amb. | | 250 mL Plastic | | 4oz Amb/Clear | |
| Bisulfate- | | Flashpoint | | Col./Bacteria | | 2oz Amb/Clear | |
| DI- | | Other Glass | | Other Plastic | | Encore | |
| Thiosulfate- | | SOC Kit | | Plastic Bag | | Frozen: | |
| Sulfuric- | | Perchlorate | | Ziplock | | | |

**Unused Media**

| Vials | # | Containers: | # | | # | | # |
|---|---|---|---|---|---|---|---|
| Unp- | | 1 Liter Amb. | | 1 Liter Plastic | | 16 oz Amb. | |
| HCL- | | 500 mL Amb. | | 500 mL Plastic | | 8oz Amb/Clear | |
| Meoh- | | 250 mL Amb. | | 250 mL Plastic | | 4oz Amb/Clear | |
| Bisulfate- | | Col./Bacteria | | Flashpoint | | 2oz Amb/Clear | |
| DI- | | Other Plastic | | Other Glass | | Encore | |
| Thiosulfate- | | SOC Kit | | Plastic Bag | | Frozen: | |
| Sulfuric- | | Perchlorate | | Ziplock | | | |

**Comments:**