December 14, 2018

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 13-Speedy Auto & Alignment
691 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175

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. 43-1800583 REV-02 dated August 16, 2018, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its August 20, 2018 Notice to Proceed Letter.

♦ Background/Project Information

Based on NCDOT's July 30, 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
13	Barbara Bass	(Speedy Auto & Alignment) 691 Long Branch Road, Dunn, NC

The PSA included a geophysical survey, subsequent limited soil sampling (ten soil borings up to 10 feet below ground surface (ft.-bgs.) and limited groundwater sampling (one groundwater sample), 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

On September 11, 2018, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 13. 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 the proposed 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, ditches, dense agricultural crops, 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 eleven GPR profiles (Lines 1 through 11) 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 petroleum UST were not identified in the geophysical data sets collected at the site. However, two anomalous features were identified in the geophysical data sets (Anomalies A and B; **Figures 5 through 7)**. Anomaly A is an approximate seven feet by seven feet feature characterized by TDEM response value greater than about 500 mV and high amplitude GPR responses at about one to two ft-bgs. Anomaly A is consistent with a possible buried septic tank. Anomaly B is characterized by relatively high TDEM values (greater than about 200 mV) and high amplitude GPR responses located within the upper two feet. Anomaly B is approximately three feet by three feet in size and likely related to a buried isolated metallic target or 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 October 2, 2018, S&ME's drill crew utilized a track mounted Geoprobe® rig to advance ten soil borings (B-1 through B-10) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 13. The approximate location of the soil borings are shown in **Figure 2**. A photographic log is included in **Appendix I.** S&ME's drill crew advanced the Geoprobe® borings to a depth of approximately 10 ft.-bgs. During the advancement of the soil borings, groundwater was encountered at depths ranging from approximately four to 7.2 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 within the collected soil samples. The highest concentration of elevated PID readings and petroleum odors were noted within soil borings B-2, near the former pump island in front of the building. 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 20 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

Based upon analytical results of soil samples analyzed by RED Lab using UVP spectroscopy, TPH were reported at concentrations exceeding the North Carolina TPH Action Levels at soil boring B-2 (near the former pump island) at the zero to four foot depth intervals and eight to ten foot depth interval and soil borings B-7 (southeast side of

the building) and B-8 through B-10 (west side of the building) at the four to six foot depth intervals. Groundwater at B-2 was encountered at a depth of 7.2 ft.-bgs. The highest concentration of TPH GRO was reported at soil boring B-2 (near the former pump island) at the two to four foot depth interval at a concentration of 342 milligrams per kilograms (mg/kg), which exceeds its North Carolina TPH Action Level of 50 mg/kg. The highest concentration of TPH-DRO was reported at soil boring B-8 (west side of building) at the four to six foot depth interval at a concentration of 1,010 mg/kg, which exceeds it North Carolina TPH Action Level of 100 mg/kg. Groundwater was encountered at B-8 at a depth of six ft.-bgs.

TPH-GRO and TPH-DRO were reported at the remaining soil borings at concentrations below the North Carolina TPH Action Levels. 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 at depths ranging from approximately four to 7.2 ft.-bgs. Therefore, the Geoprobe® was used to advance one of the soil borings into the groundwater table for the collection of a groundwater sample. Based on the analytical results of soil samples (elevated GRO and DRO detections), soil boring B-2 located near the former pump island was selected for collection of a groundwater sample. A temporary monitor well (TW-1) was installed at soil boring B-2 to a depth of approximately ten ft.-bgs using a five foot section of one-inch diameter, Schedule 40 PVC well riser attached to a 10 foot section of 0.01-inch slotted screen that intersected the groundwater table. Groundwater within the temporary monitor well at soil boring B-2 was measured at 7.2 ft.-bgs. Groundwater from the temporary well was purged until relatively clear using disposable tubing attached to a peristaltic pump. A slight petroleum sheen was noted on the surface of the water. The flow rate was reduced and laboratory supplied containers were filled directly from the tubing, labeled as TW-1 Parcel 13, 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 well materials were removed and the soil borings backfilled with bentonite pellets and soil cuttings. Investigative derived wastes (IDW), such as 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 and tubing were bagged and disposed off-site.

Groundwater Analytical Results

Based upon analytical results of groundwater samples analyzed by Con-Test Laboratories, numerous petroleum related target constituents were reported at concentrations exceeding their 15A NCAC 2L Groundwater Quality Standard (2L Standard). Benzene was reported at a concentration of 4,000 micrograms per liter (µg/L), which is near its Gross Contamination Level of 5,000 µg/L. 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

The geophysical survey identified two anomalous features (Anomaly A and B). Anomaly A is a possible buried septic tank located at the northwest corner of the building. Anomaly B is likely related to a buried isolated metallic target or debris located west of the building. Responses indicative of a potential petroleum UST were not identified in the geophysical data sets collected at the site.

S&ME advanced ten soil borings (B-1 through B-10) to a depth of approximately 10 ft.-bgs at the site. Petroleum odors and elevated PID readings were noted within the collected soil samples, particularly near the former pump island in front of the building. Selected soil samples from the soil borings were analyzed onsite for TPH-GRO and TPH-DRO using UVF spectroscopy. TPH-GRO and TPH-DRO were reported in the soil samples at concentrations exceeding the North Carolina TPH Action Levels. During the soil boring advancement, groundwater was encountered at depths ranging from approximately four to 7.2 ft.-bgs. One temporary well (TW-1) was installed at soil boring B-2 located near the former pump island in front of the building. Groundwater at TW-1 was measured at 7.2 ft.-bgs and analyzed by Con-Test Laboratories for VOCs by EPA Method 8260 and PAHs by EPA Method 8270. A slight petroleum sheen was noted on the surface of the water. Several petroleum related target constituents were reported at concentrations exceeding their 2L Standards. Benzene was reported at a concentration near its GCL.

Based on the findings of the geophysical survey and 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. Petroleum impacted soil may be encountered within the vicinity of soil borings B-2, B-7 and B-8 through B-10. Assuming that a section of petroleum impacted soil approximately four feet thick, 40 feet wide and 40 feet long at a depth of zero to four ft.-bgs may be impacted; up to 240 cubic yards of soil near boring B-2 may be impacted. Assuming that a section of petroleum impacted soil approximately two feet thick, twenty feet in diameter at a depth of four to six ft.-bgs, which is near the groundwater table, may be impacted within the vicinity of soil boring B-7; up to 30 cubic yards of soil near boring B-7 may be impacted. Assuming that a section of petroleum impacted soil approximately two feet thick, 50 feet wide and 60 feet long at a depth of four to six ft.-bgs, which is near the groundwater table, may be impacted within the vicinity of soil borings B-8 through B-10; up to 225 cubic yards of soil near borings b-8 through B-10 may be impacted. Therefore, a total of approximately 500 cubic yards of petroleum impacted soil may be encountered during construction to depths of approximately four to six ft.-bgs below ground surface; it should also be assumed that saturated petroleum impacted soil will be encountered if construction excavations extend deeper than four to six ft.-bgs. 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 feet below ground surface.

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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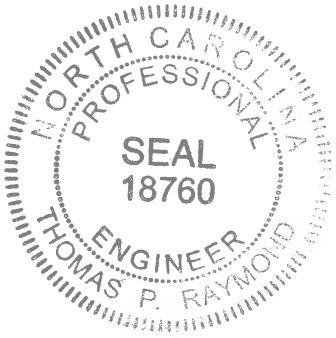


1/22/2019

Attachments:

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

Figure 1: Vicinity Map
Figure 2: Site Map
Figure 3: Soil and Groundwater 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 1, 2 and 3
Figure 9: Example GPR Data – Lines 4 and 5

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 13 - (Speedy Auto & Alignment)
691 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

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**
Parcel 13 B-1	10/2/2018	0 to 2	<0.22	**0.82**
		2 to 4	**4**	**0.6**
Parcel 13 B-2	10/2/2018	0 to 2	**61.1**	**3.2**
		2 to 4	**342**	**515.6**
		4 to 6	**17.7**	**37.8**
		8 to10	**99.7**	**162.6**
Parcel 13 B-3	10/2/2018	2 to 4	**1.7**	**0.72**
Parcel 13 B-4	10/2/2018	0 to 2	<0.54	**0.91**
		2 to 4	<0.46	<0.46
		4 to 6	**39.6**	**5.5**
Parcel 13 B-5	10/2/2018	0 to 2	**5.6**	**11.3**
		2 to 4	<0.5	**1.2**
		4 to 6	<0.46	**6**
Parcel 13 B-6	10/2/2018	0 to 2	<0.59	**2.1**
		2 to 4	<0.44	**0.54**
Parcel 13 B-7	10/2/2018	4 to 6	**120.1**	**27.4**
Parcel 13 B-8	10/2/2018	2 to 4	<0.56	**13.6**
		4 to 6	**331.8**	**1,010**
Parcel 13 B-9	10/2/2018	4 to 6	**29.8**	**330.5**
Parcel 13 B-10	10/2/2018	4 to 6	**29.3**	**211.6**
North Carolina TPH Action Levels			**50**	**100**

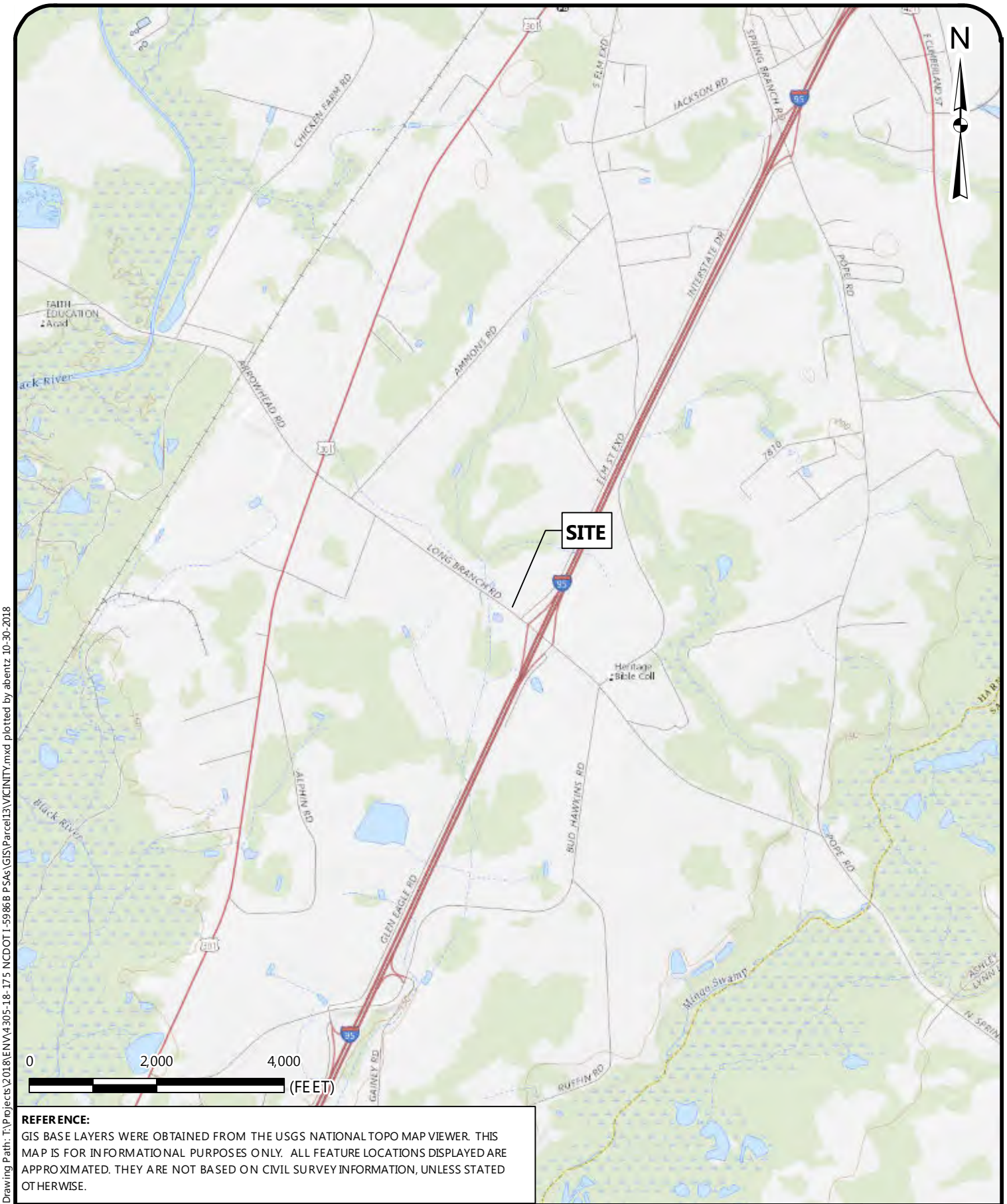
Notes:
1. UVF analysis performed by RED Lab, LLC
2. Concentrations are reported in milligrams per kilogram (mg/Kg).
3. ft.-bgs:- feet below ground surface.
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the North Carolina TPH Action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

TABLE 2
SUMMARY OF GROUNDWATER SAMPLING RESULTS
NCDOT Project I-5986B
Parcel 13 - (Speedy Auto & Alignment)
691 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

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	Naphthalene	n-Butylbenzene	sec-Butylbenzene	n-Propylbenzene	p-Isopropyltoluene	Toluene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Total Xylenes	Acenaphthene	Naphthalene	Phenanthrene	2-Methylnaphthalene
TW-1 Parcel 13	10/2/2018	**4,000**	**11,000**	**1,000**	**3,800**	**2,000**	**390**	**3,600**	**240**	**36,000**	**21,000**	**6,100**	**44,000**	**0.46**	**530**	**0.59**	**240**
2L Standard (µg/L)		**1**	**600**	**70**	**6**	**70**	**70**	**70**	**25**	**600**	**400**	**400**	**500**	**80**	**6**	**200**	**30**
GCL (µg/L)		**5,000**	**84,500**	**25,000**	**6,000**	**6,900**	**8,500**	**30,000**	**11,700**	**260,000**	**28,500**	**25,000**	**85,500**	**2,120**	**6,000**	**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.

Figures



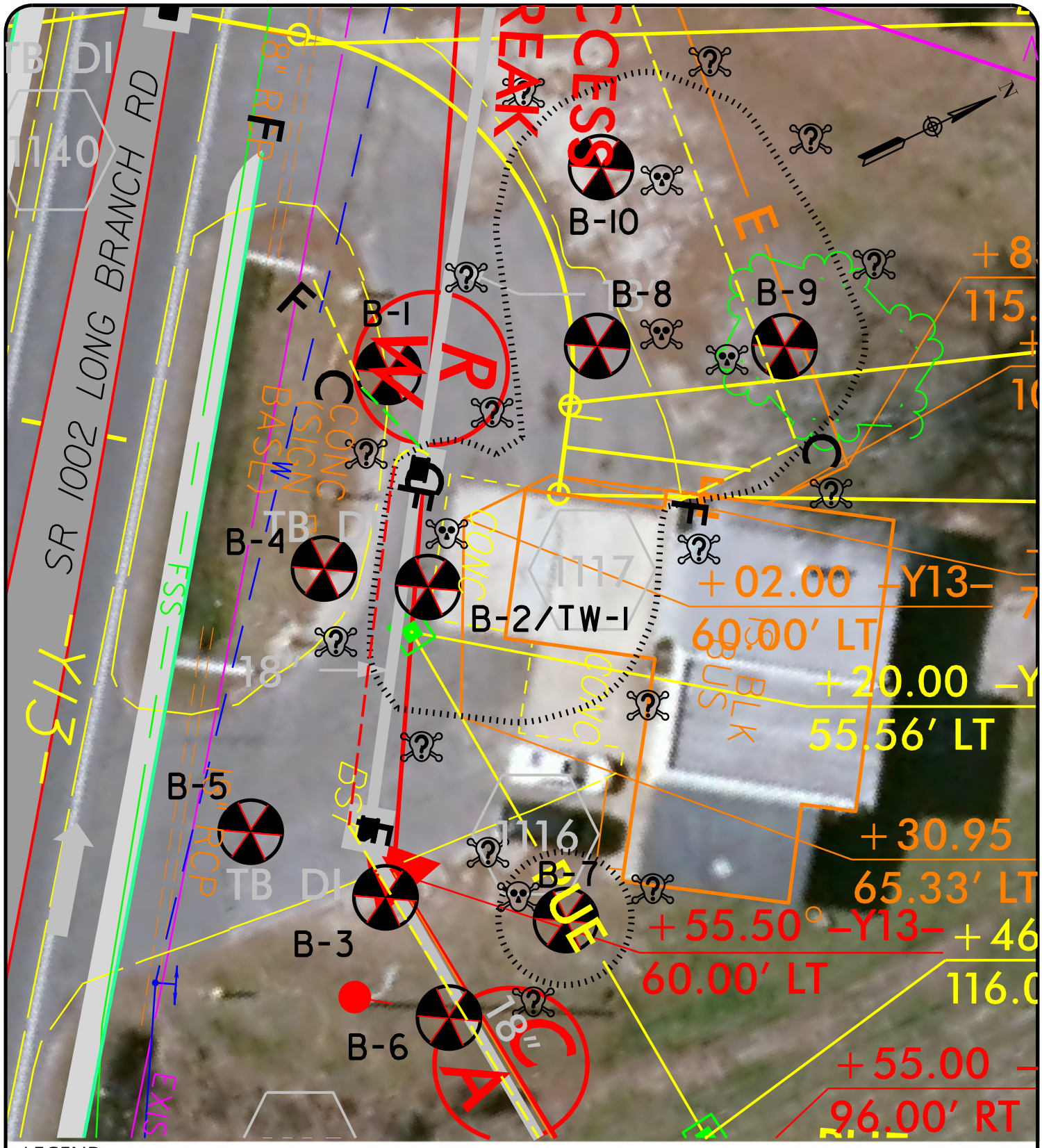
REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: T:\Projects\2018\ENV\4305-18-175 NCDOT I-5986B PSAs\GIS\Parcel13\VICINITY.mxd plotted by abentz 10-30-2018

VICINITY MAP

NCDOT I-5986B
PARCEL 13 (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	FIGURE NO.
1 " = 2,000 '	1
DATE: 10-30-18	
PROJECT NUMBER 4305-18-175	



LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

TW-1: Temporary Monitor Well Location

Map Source: NCDOT Project I-5986B

Image Source: NC ONEMAP, Dated 2016

Known Soil Contamination:

Possible Soil Contamination:

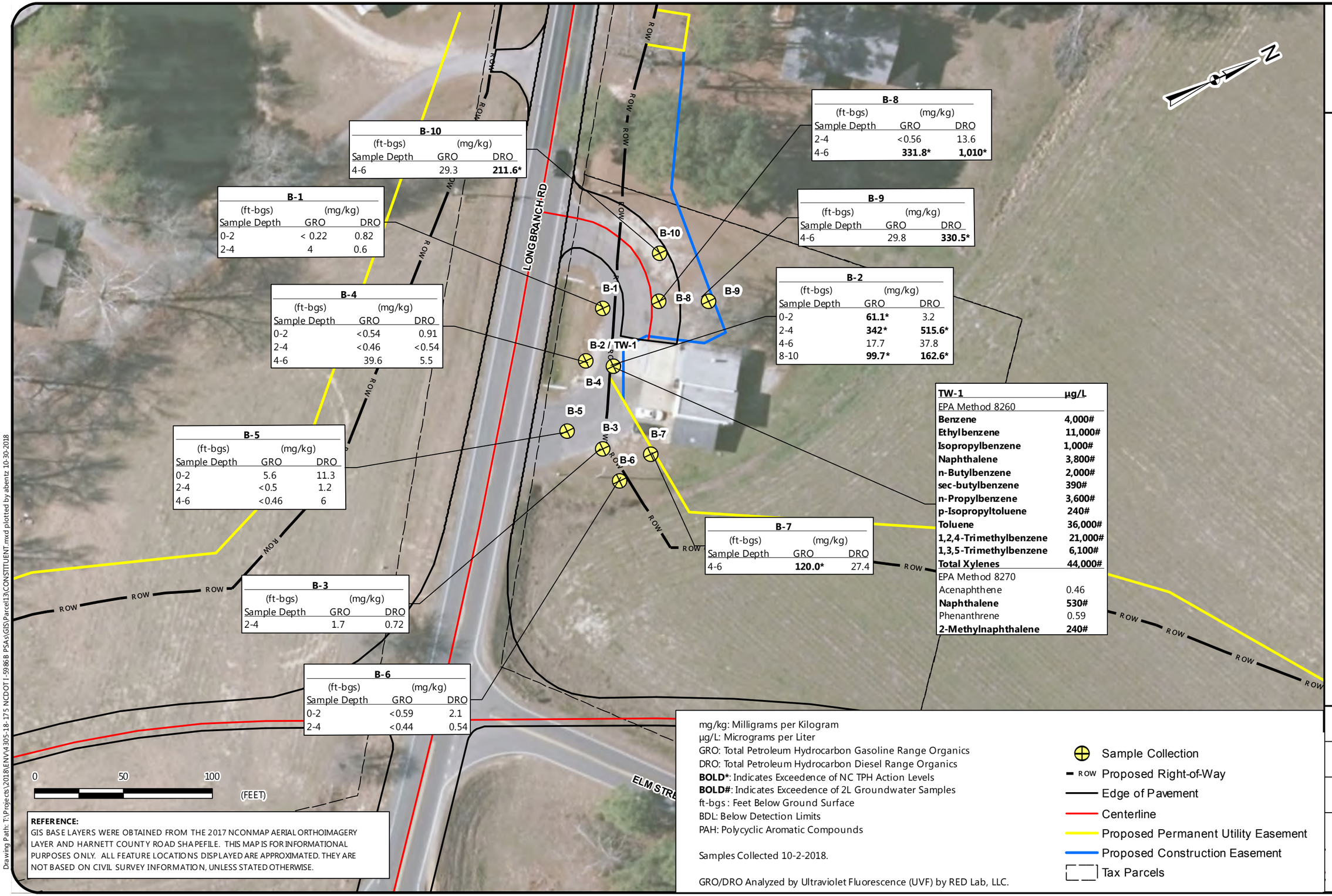
0 20 40

GRAPHIC SCALE (IN FEET)

SITE MAP

NCDOT PROJECT: I-5986B
PARCEL 13 - (SPEEDWAY AUTO & ALIGNMENT)
691 Long Branch Rd., Dunn, Harnett County, NC

SCALE:	FIGURE NO.
1" = 20'	2
DATE:	
DEC. 2018	
PROJECT NUMBER	
4305-18-175	



B-10

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
4-6	29.3	**211.6***

B-1

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
0-2	< 0.22	0.82
2-4	4	0.6

B-4

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
0-2	<0.54	0.91
2-4	<0.46	<0.54
4-6	39.6	5.5

B-5

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
0-2	5.6	11.3
2-4	<0.5	1.2
4-6	<0.46	6

B-3

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
2-4	1.7	0.72

B-6

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
0-2	<0.59	2.1
2-4	<0.44	0.54

B-8

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
2-4	<0.56	13.6
4-6	**331.8***	**1,010***

B-9

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
4-6	29.8	**330.5***

B-2

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
0-2	**61.1***	3.2
2-4	**342***	**515.6***
4-6	17.7	37.8
8-10	**99.7***	**162.6***

B-7

(ft-bgs) Sample Depth	(mg/kg) GRO	DRO
4-6	**120.0***	27.4

TW-1	**µg/L**
EPA Method 8260	
Benzene	**4,000#**
Ethylbenzene	**11,000#**
Isopropylbenzene	**1,000#**
Naphthalene	**3,800#**
n-Butylbenzene	**2,000#**
sec-butylbenzene	**390#**
n-Propylbenzene	**3,600#**
p-Isopropyltoluene	**240#**
Toluene	**36,000#**
1,2,4-Trimethylbenzene	**21,000#**
1,3,5-Trimethylbenzene	**6,100#**
Total Xylenes	**44,000#**
EPA Method 8270	
Acenaphthene	0.46
Naphthalene	**530#**
Phenanthrene	0.59
2-Methylnaphthalene	**240#**

REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONMAP AERIAL ORTHOIMAGERY LAYER AND HARNETT COUNTY ROAD SHAPEFILE. 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 Exceedence of NC TPH Action Levels
BOLD#: Indicates Exceedence of 2L Groundwater Samples
ft-bgs : Feet Below Ground Surface
BDL: Below Detection Limits
PAH: Polycyclic Aromatic Compounds

Samples Collected 10-2-2018.

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

Sample Collection
ROW Proposed Right-of-Way
Edge of Pavement
Centerline
Proposed Permanent Utility Easement
Proposed Construction Easement
Tax Parcels

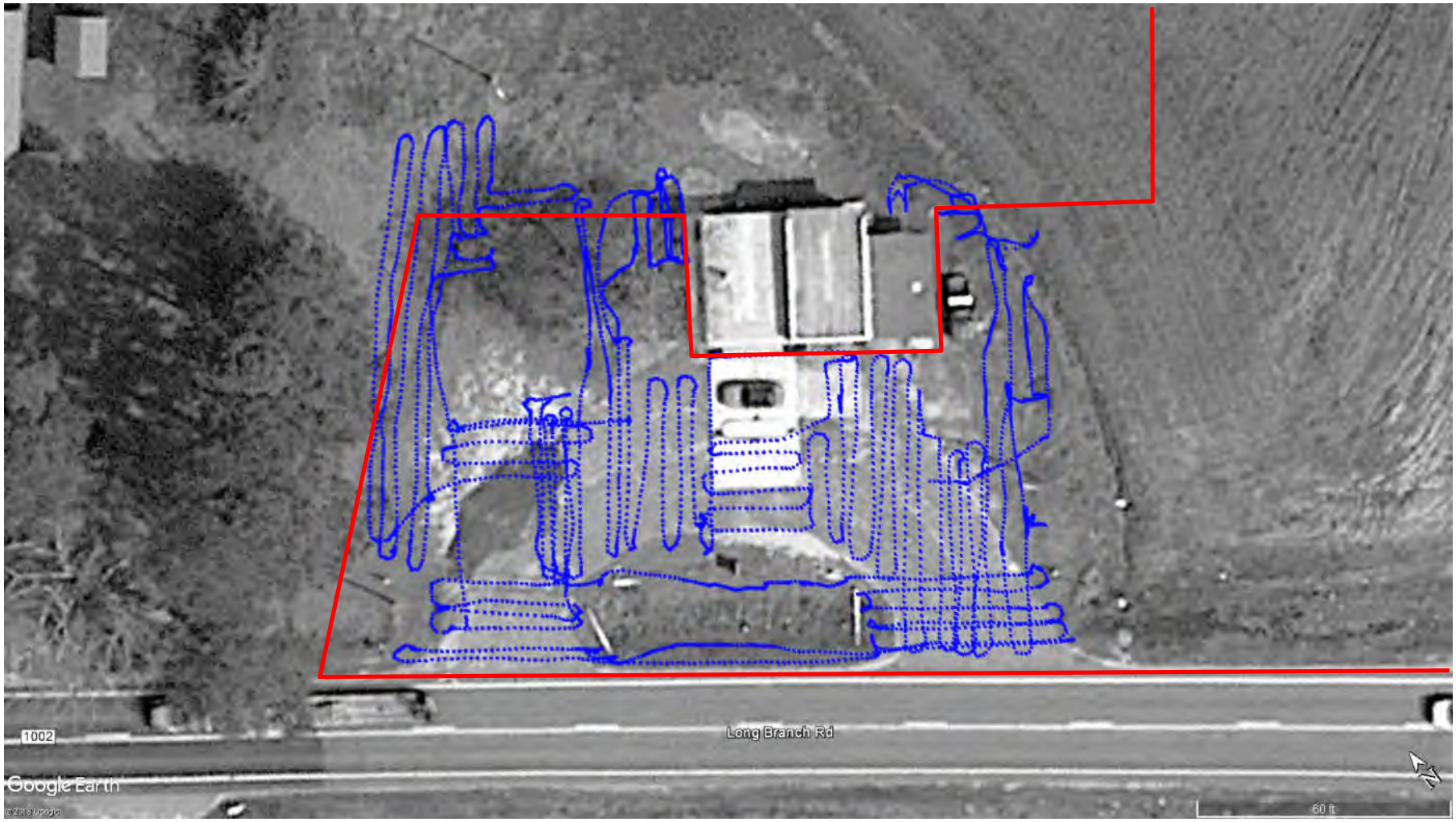
SOIL AND GROUNDWATER CONSTITUENT MAP

NCDOT I-5986B
PARCEL 13 (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: 1 " = 50 '
DATE: 10-30-18
PROJECT NUMBER 4305-18-175
FIGURE NO. 3

Drawing Path: T:\Projects\2018\ENV\4305-18-175 NCDOT I-5986B PSAs\GIS\Parcel13\CONSTITUENT.mxd plotted by abentz 10-30-2018

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 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
10/31/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
4

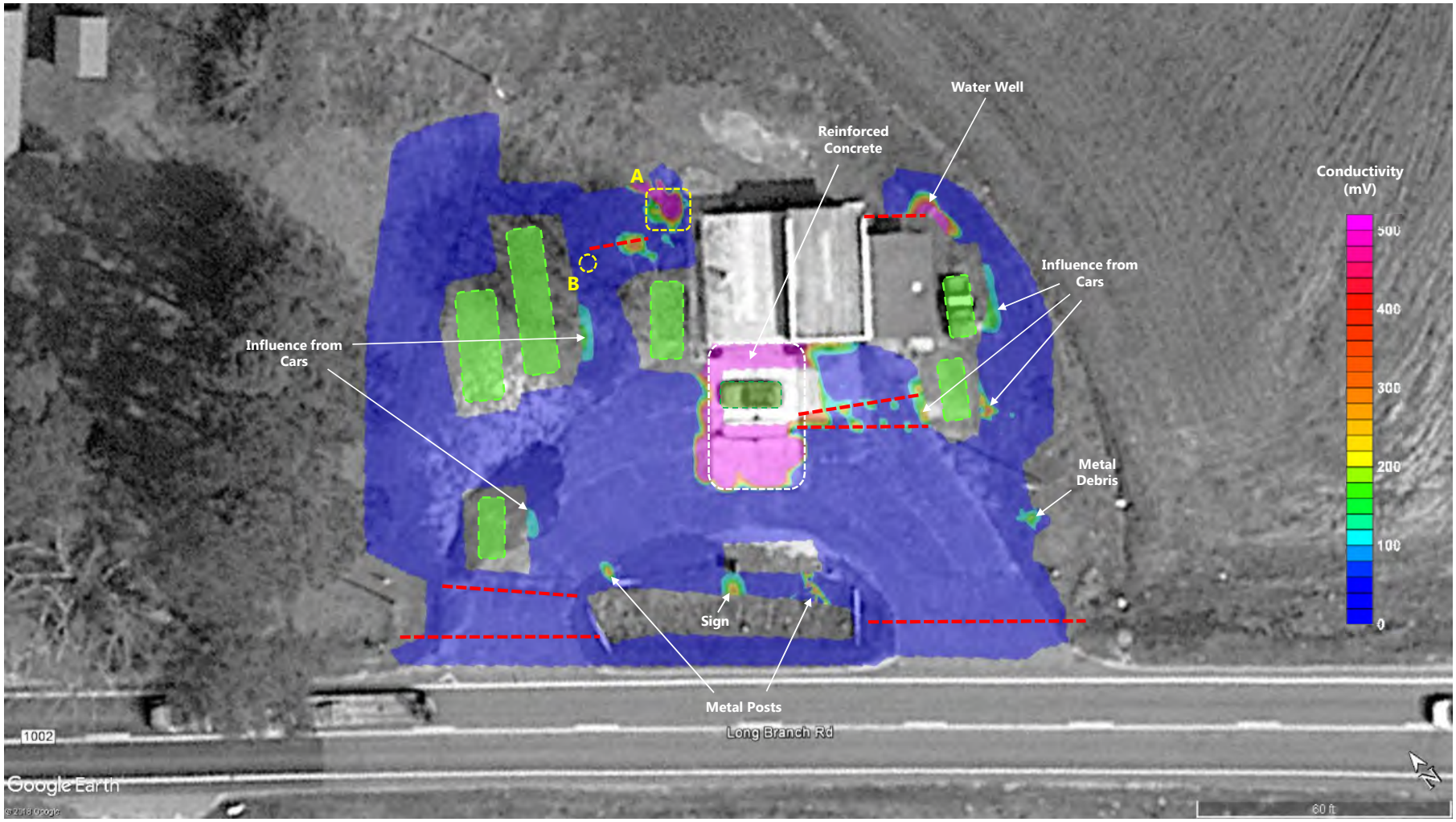
REFERENCE:
(*GOOGLE EARTH PRO)* AERIAL PHOTOGRAPH
(DATED, MARCH, 04 2018)

TDEM DATA PLOT A

NCDOT PROJECT: I-5986B
PARCEL 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	AS SHOWN
DATE:	10/31/2018
PROJECT NUMBER	4305-18-175
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 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

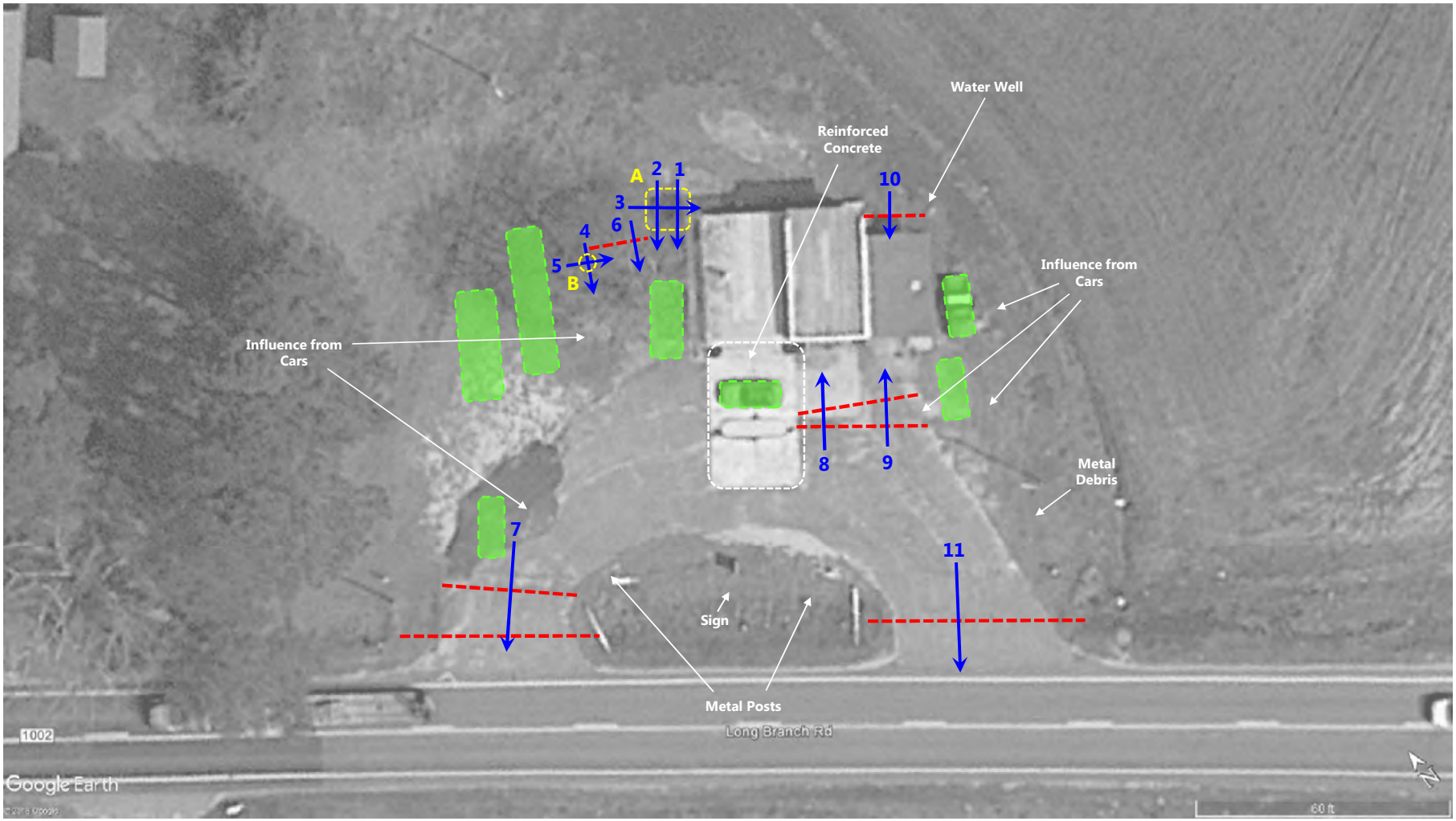
SCALE:
AS SHOWN

DATE:
10/31/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
6

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

Approximate Location of GPR Profile

GEOPHYSICAL ANOMALY LOCATION PLAN

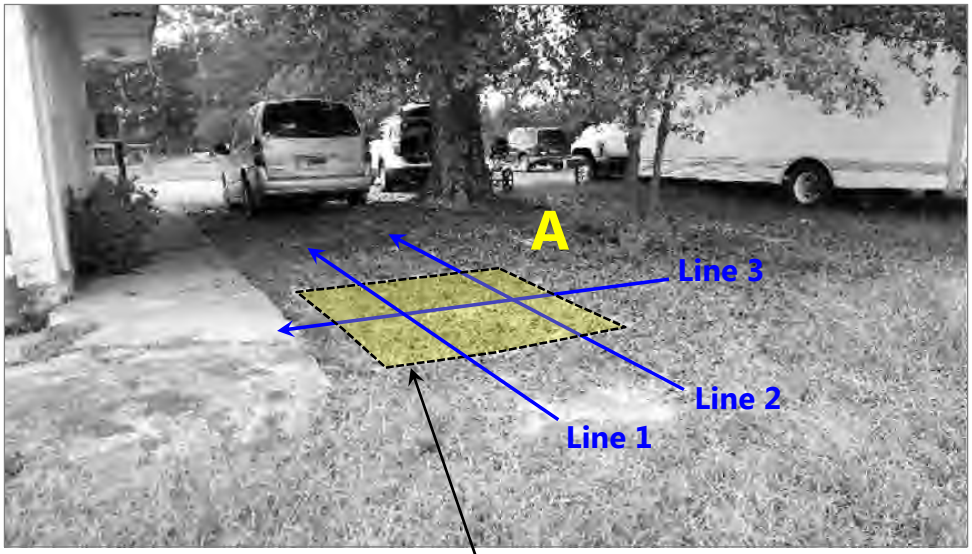
NCDOT PROJECT: I-5986B
PARCEL 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/31/2018

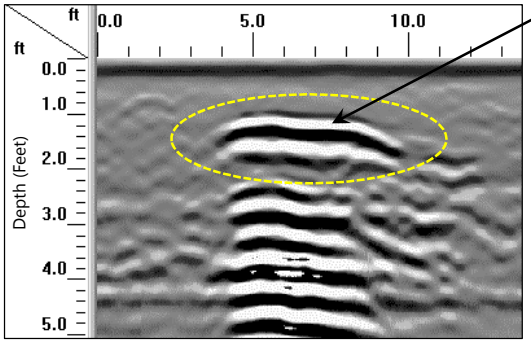
PROJECT NUMBER 4305-18-175

FIGURE NO. **7**

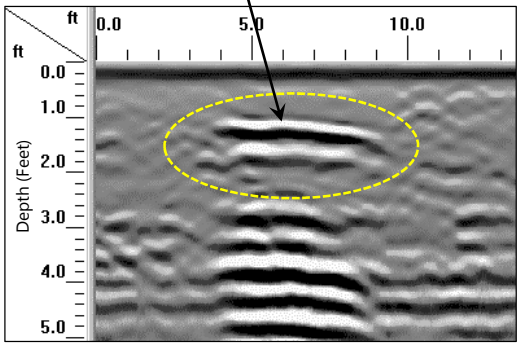


Anomaly A

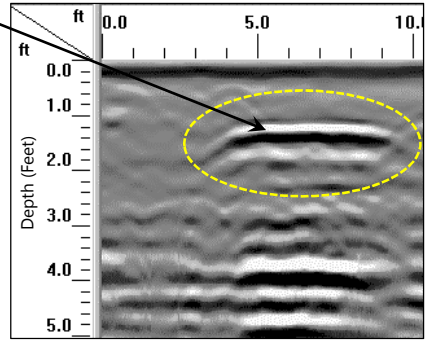
Line 1



Line 2



Line 3



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

EXAMPLE GPR DATA – LINES 1, 2, AND 3

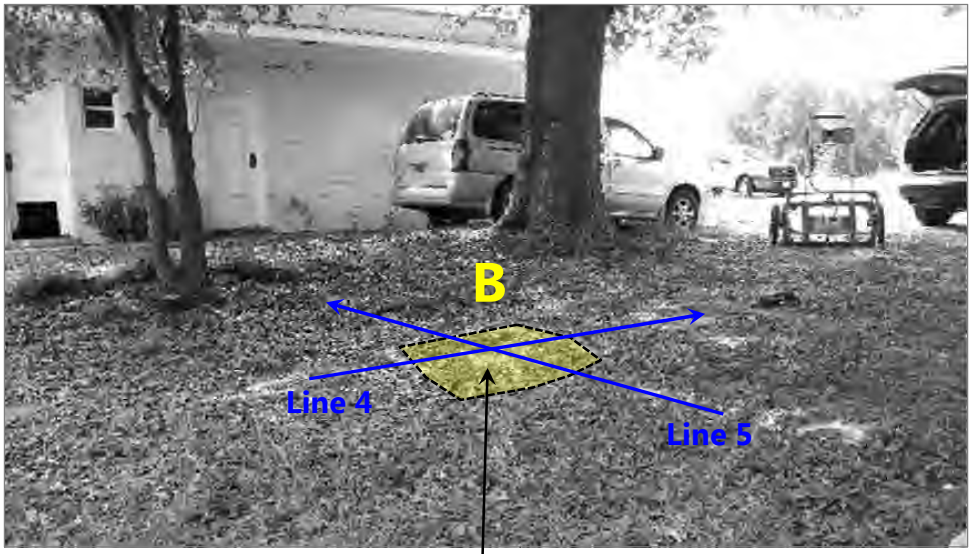
NCDOT PROJECT: I-5986B
PARCEL 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

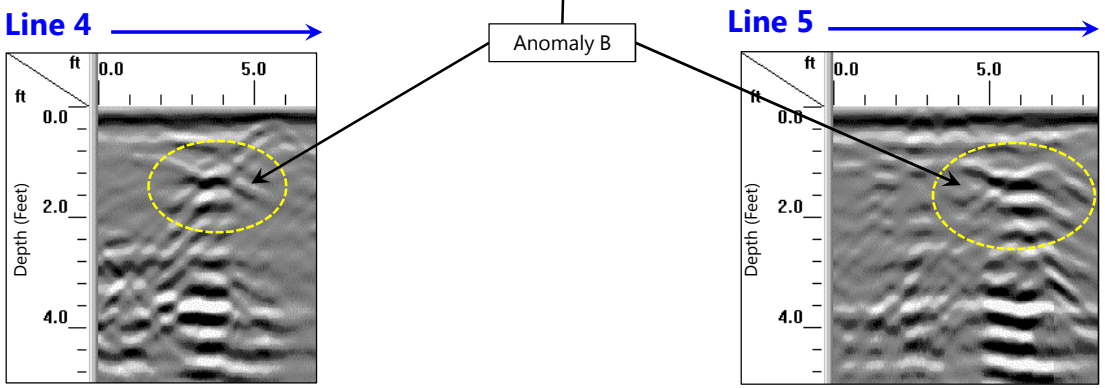
SCALE: AS SHOWN

DATE: 10/31/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **8**





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

EXAMPLE GPR DATA – LINES 4 AND 5

NCDOT PROJECT: I-5986B
PARCEL 13 – (SPEEDY AUTO & ALIGNMENT)
691 LONG BRANCH ROAD,DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/31/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **9**

Appendix I – Photographs

Date: 10/2/2018

Photographer: JTH

1	**Location / Orientation**	Front view of site looking northeast
	Remarks	None

Date: 10/2/2018

Photographer: JTH

2	**Location / Orientation**	Front view of site looking northwest.
	Remarks	None

Date: 10/2/2018

Photographer: JTH

3	**Location / Orientation**	View looking west across front of site.
	Remarks	Note TW-1 at soil boring B-2 near former pump island

Appendix II – Boring Logs

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-1**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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, Black,								
		Sand, Brown, Black, Fine,			39.0	Yes				
					601.0	Yes				
5		Sandy Clay, Tan, Orange,	▼							
		Clayey Sand, Tan, Orange,								
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-2/TW-1**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	7.2
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,								
		Sand, Black, Fine, Petroleum Odors			483.0	Yes				
		Sandy Clay, Tan, Orange, Petroleum Odors			2282	Yes				
5					1796	Yes				
			▼		1103	No				
		Clayey Sand, Tan, Orange, Petroleum Odors			999.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-3**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Tan, Brown, Fine, Slight Petroleum Odors			1.1	No				
5			▼		10.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-4**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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,								
		Sand, Brown, Tan, Fine,			1.3	Yes				
		Sandy Clay, Tan, Orange,			2.0	Yes				
5		Clayey Sand, Red, Orange, Slight Petroleum Odors	▼		400.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-5**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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,								
		Sand, Black, Brown, Fine,			62.0	Yes				
					24.0	Yes				
5		Clayey Sand, Tan, Orange,								
					6.0	Yes				
		Sandy Clay, Red, Orange,	▼							
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-6**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Orange, Brown, Fine,			1.9	Yes				
5			▼		1.0	Yes				
		Clayey Sand, Orange, Brown, Medium,								
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-7**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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,								
		Sandy Clay, Orange, Brown,			1.2	No				
					2.4	No				
5					280.0	Yes				
		Sandy Clay, Orange, Red,	▼							
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-8**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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, Orange,			8.3	No				
		Clayey Sand, Brown,			20.0	Yes				
5		Clayey Sand, Orange,	▼		860.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-9**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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,								
		Sand, Brown, Tan,			1.7	No				
		Clayey Sand, Tan, Orange,			1.0	No				
5		Sandy Clay, Orange, Red,	▼		80.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 13-691 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-10**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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
		Sand, Brown,			5.9	No				
					1.5	No				
5		Sandy Clay, Tan,								
		Sandy Clay, Red, Orange,	▼		394.0	Yes				
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Tuesday, October 02, 2018
Samples extracted Tuesday, October 02, 2018
Samples analysed Tuesday, October 02, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 13 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 13 B-3 (2'-4')	19.7	<0.49	1.7	0.72	2.42	0.54	<0.16	<0.02	78.8	14.2	7	V.Deg.PHC 84.8%,(FCM)
s	PARCEL 13 B-2 (2'-4')	63.6	<1.6	342	515.6	857.6	43	1.7	<0.064	99.8	0.2	0	Deg.Kerosene 88.7%,(FCM)
s	PARCEL 13 B-2 (8'-10')	49.1	<1.2	99.7	162.6	262.3	11.5	<0.39	<0.049	99.7	0.3	0	Deg.Kerosene 90.6%,(FCM)
s	PARCEL 13 B-2 (0'-2')	17.2	<0.43	61.1	3.2	64.3	1.8	<0.14	<0.017	97.4	2	0.6	Deg.PHC 82.6%,(FCM)
s	PARCEL 13 B-1 (0'-2')	8.6	<0.22	<0.22	0.82	0.82	0.43	<0.07	<0.009	0	74.4	25.6	V.Deg.PHC 90.7%,(FCM),(BO)
s	PARCEL 13 B-1 (2'-4')	6.3	<0.16	4	0.6	4.6	0.58	<0.05	<0.006	98	1.6	0.4	No Match found
s	PARCEL 13 B-4 (0'-2')	21.7	<0.54	<0.54	0.91	0.91	0.65	<0.17	<0.022	0	66.6	33.4	V.Deg.PHC 75.8%,(FCM)
s	PARCEL 13 B-4 (2'-4')	18.3	<0.46	<0.46	<0.46	<0.46	<0.09	<0.15	<0.018	0	0	100	Residual HC,(BO)
s	PARCEL 13 B-4 (4'-6')	25.0	6.8	39.6	5.5	45.1	3.7	<0.2	<0.025	99.3	0.6	0.1	Deg.Gas 80.2%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 93.7 %

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

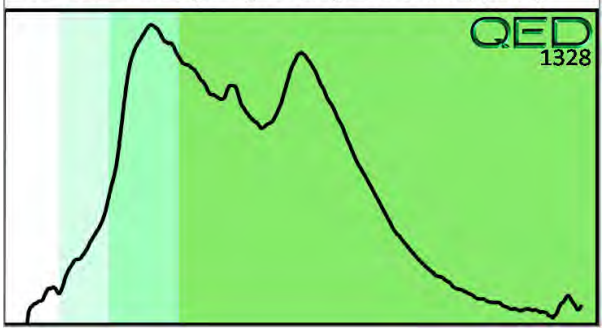
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

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

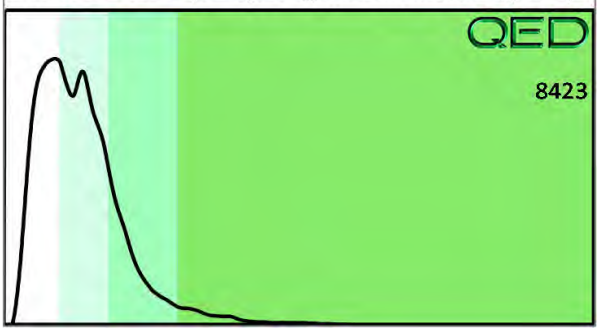
QED Hydrocarbon Fingerprints

Project: PARCEL 13 - PROJ 4305-18-175 ##################

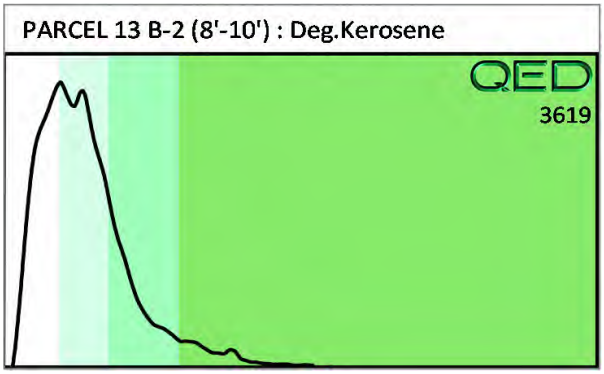
PARCEL 13 B-3 (2'-4') : V.Deg.PHC 84.8%,(FCM)



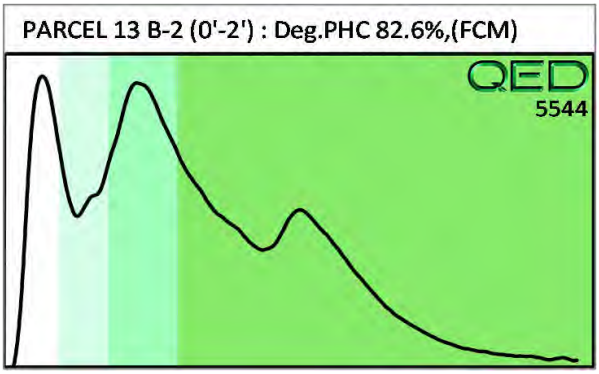
PARCEL 13 B-2 (2'-4') : Deg.Kerosene 88.7%,(FCM)



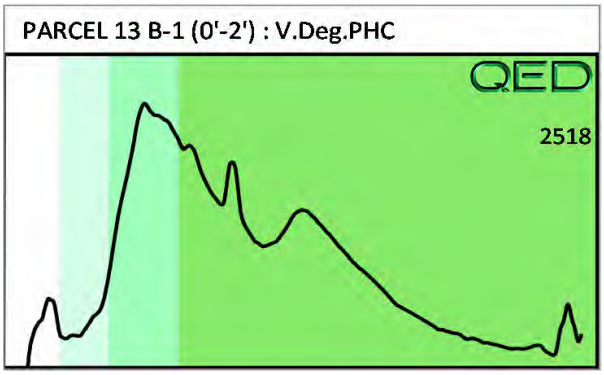
PARCEL 13 B-2 (8'-10') : Deg.Kerosene



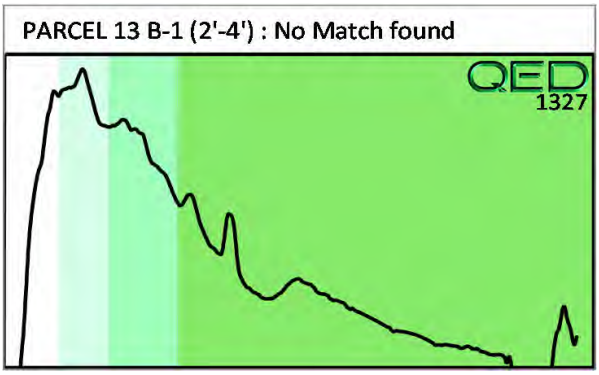
PARCEL 13 B-2 (0'-2') : Deg.PHC 82.6%,(FCM)



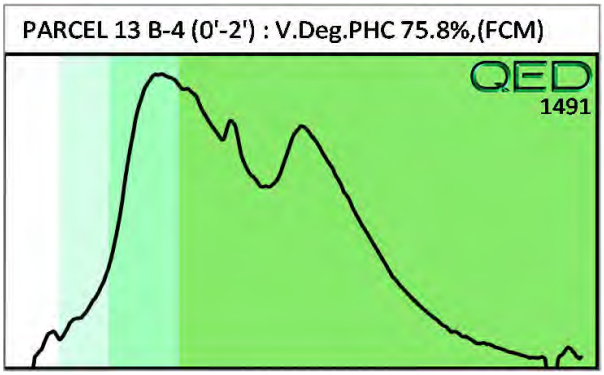
PARCEL 13 B-1 (0'-2') : V.Deg.PHC



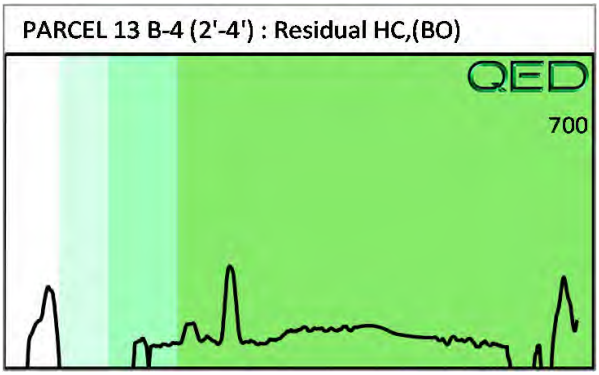
PARCEL 13 B-1 (2'-4') : No Match found



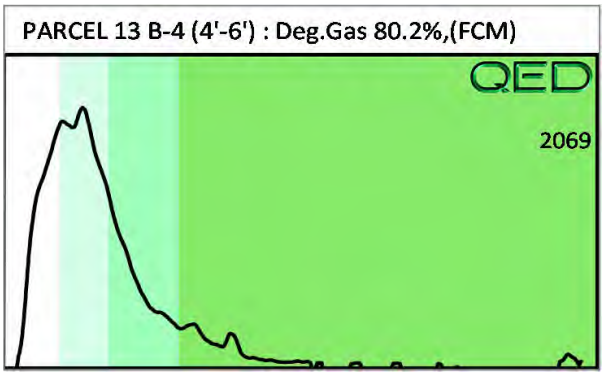
PARCEL 13 B-4 (0'-2') : V.Deg.PHC 75.8%,(FCM)



PARCEL 13 B-4 (2'-4') : Residual HC,(BO)



PARCEL 13 B-4 (4'-6') : Deg.Gas 80.2%,(FCM)



QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Tuesday, October 02, 2018
Samples extracted Tuesday, October 02, 2018
Samples analysed Tuesday, October 02, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 13 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 13 B-2 (4'-6')	20.6	<0.52	17.7	37.8	55.5	2.9	<0.17	<0.021	99.2	0.7	0.1	Deg.Kerosene 87.8%,(FCM)
s	PARCEL 13 B-5 (0'-2')	19.5	<0.49	5.6	11.3	16.9	4.1	0.26	<0.02	70.9	26.4	2.8	Deg.PHC 80.4%,(FCM)
s	PARCEL 13 B-5 (2'-4')	20.2	<0.5	<0.5	1.2	1.2	0.61	<0.16	<0.02	94.5	4.3	1.2	Deg.PHC 75.3%,(FCM),(P)
s	PARCEL 13 B-5 (4'-6')	18.4	<0.46	<0.46	6	6	3.6	0.2	<0.018	0	88.4	11.6	Deg.Fuel 74.3%,(FCM)
s	PARCEL 13 B-6 (0'-2')	23.6	<0.59	<0.59	2.1	2.1	2	<0.19	<0.024	0	64.3	35.7	V.Deg.PHC 73.6%,(FCM),(P)
s	PARCEL 13 B-6 (2'-4')	17.6	<0.44	<0.44	0.54	0.54	0.37	<0.14	<0.018	0	68.2	31.8	V.Deg.PHC 75.3%,(FCM)
s	PARCEL 13 B-7 (4'-6')	15.3	42.6	120.1	27.4	147.5	20.1	0.79	<0.015	99.3	0.6	0.1	Deg.Gas 82.8%,(FCM)
s	PARCEL 13 B-8 (2'-4')	22.2	<0.56	<0.56	13.6	13.6	4.3	<0.18	<0.022	60.1	39.3	0.7	Deg.Diesel 82.8%,(FCM)
s	PARCEL 13 B-8 (4'-6')	331.0	118.1	331.8	1010	1342	376.7	13.9	<0.33	90	9.7	0.3	Deg.Diesel 81.1%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 106.8 %

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

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

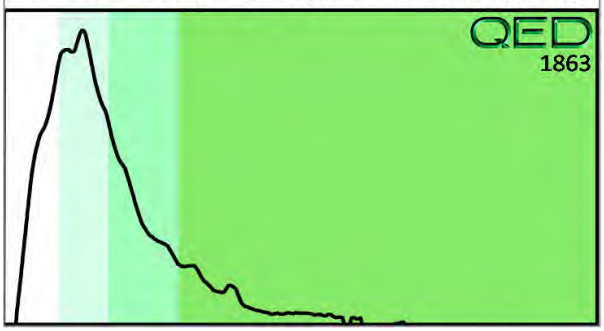
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

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

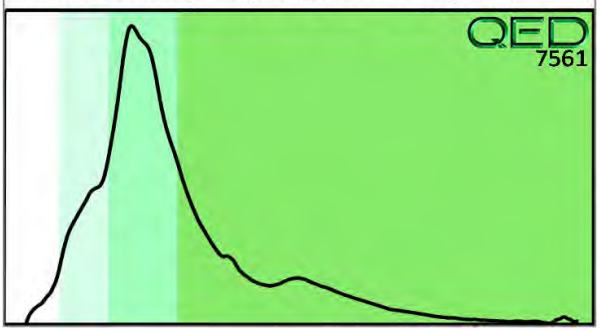
QED Hydrocarbon Fingerprints

Project: PARCEL 13 - PROJ 4305-18-175 ##################

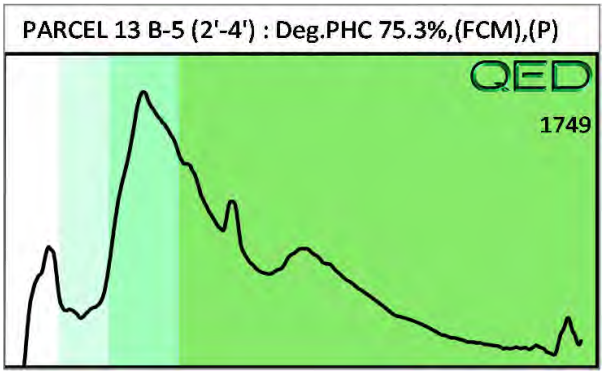
PARCEL 13 B-2 (4'-6') : Deg.Kerosene 87.8%,(FCM)



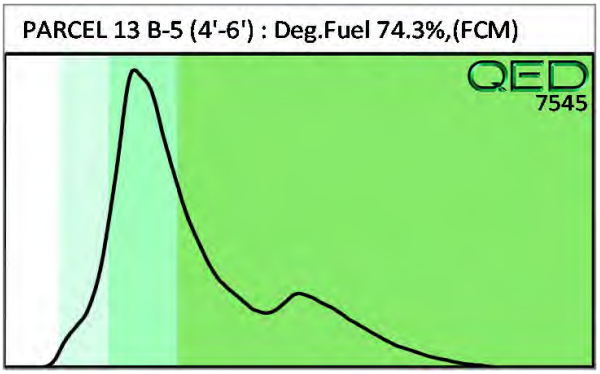
PARCEL 13 B-5 (0'-2') : Deg.PHC 80.4%,(FCM)



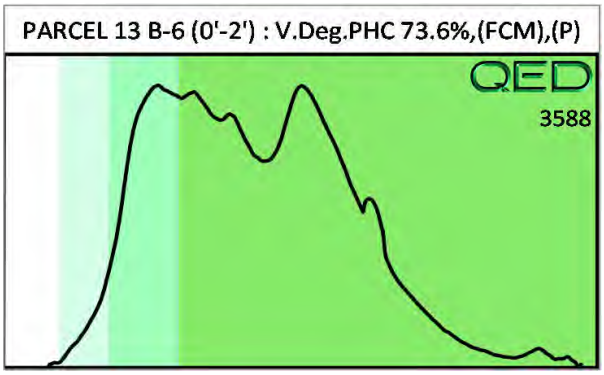
PARCEL 13 B-5 (2'-4') : Deg.PHC 75.3%,(FCM),(P)



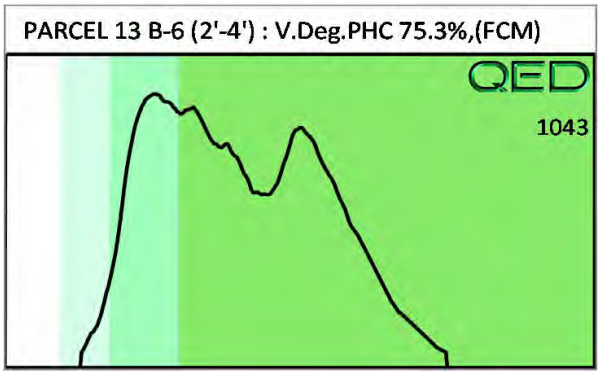
PARCEL 13 B-5 (4'-6') : Deg.Fuel 74.3%,(FCM)



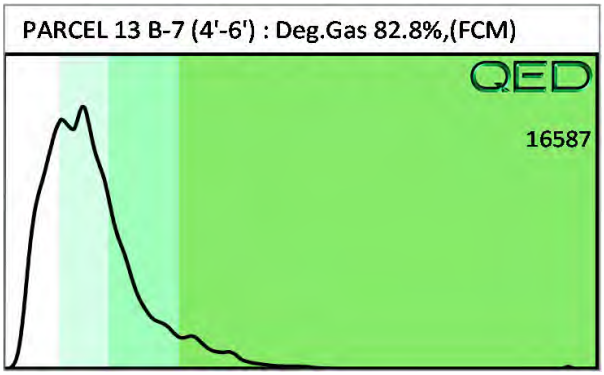
PARCEL 13 B-6 (0'-2') : V.Deg.PHC 73.6%,(FCM),(P)



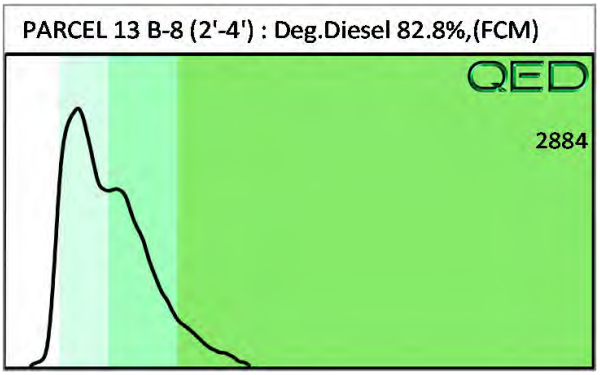
PARCEL 13 B-6 (2'-4') : V.Deg.PHC 75.3%,(FCM)



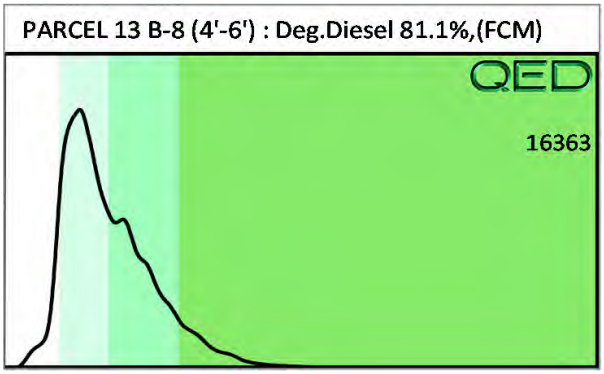
PARCEL 13 B-7 (4'-6') : Deg.Gas 82.8%,(FCM)



PARCEL 13 B-8 (2'-4') : Deg.Diesel 82.8%,(FCM)



PARCEL 13 B-8 (4'-6') : Deg.Diesel 81.1%,(FCM)



QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Tuesday, October 02, 2018
Samples extracted Tuesday, October 02, 2018
Samples analysed Tuesday, October 02, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 13 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 13 B-9 (4'-6')	202.0	<5.1	29.8	330.5	360.3	134.4	5	<0.2	70.6	28.3	1.1	Deg.Diesel 85.8%,(FCM)
s	PARCEL 13 B-10 (4'-6')	66.7	<1.7	29.3	211.6	240.9	76.5	2.8	<0.067	78.4	21	0.6	Deg.Diesel 87.3%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 92.8 %

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

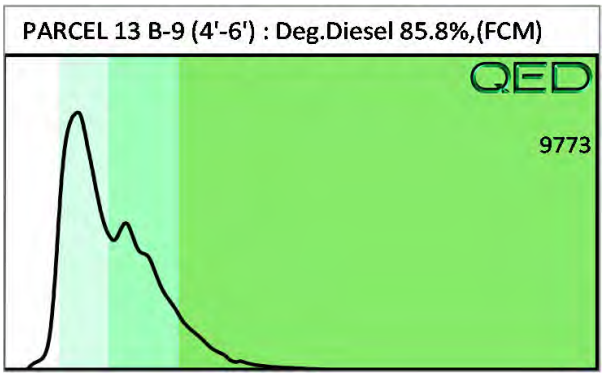
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

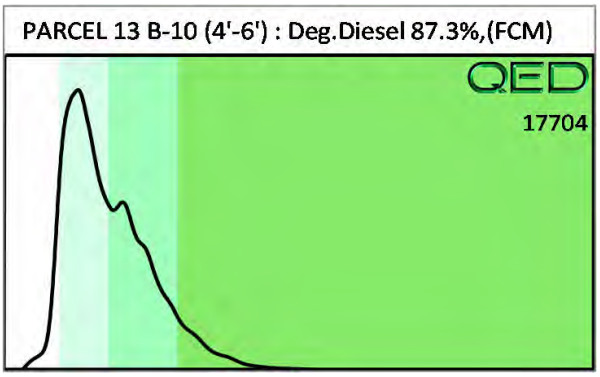
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

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

QED Hydrocarbon Fingerprints

Project: PARCEL 13 - PROJ 4305-18-175 ##################





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

October 15, 2018

Michael Pfeifer
S&ME, Inc - Raleigh, NC
3201 Spring Forest Rd.
Raleigh, NC 27616

Project Location: NC DOT I-5986B Parcel 13
Client Job Number:
Project Number: 4305-18-175
Laboratory Work Order Number: 18J0293

Enclosed are results of analyses for samples received by the laboratory on October 4, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kerry K. McGee
Project Manager

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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: Michael Pfeifer

REPORT DATE: 10/15/2018

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 4305-18-175

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18J0293

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

PROJECT LOCATION: NC DOT I-5986B Parcel 13

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
TW-1- Parcel 13	18J0293-01	Ground Water		SW-846 8260B 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: **TW-1- Parcel 13** Lab ID: **18J0293-01**

Analyte	Results/Qual	DL	RL	Units	Method
1,2,4-Trimethylbenzene	21000	36	200	µg/L	SW-846 8260B
1,3,5-Trimethylbenzene	6100	26	200	µg/L	SW-846 8260B
Benzene	4000	24	200	µg/L	SW-846 8260B
Ethylbenzene	11000	26	200	µg/L	SW-846 8260B
Isopropylbenzene (Cumene)	1000	24	200	µg/L	SW-846 8260B
m+p Xylene	32000	51	400	µg/L	SW-846 8260B
Naphthalene	3800	24	400	µg/L	SW-846 8260B
n-Butylbenzene	2000	30	200	µg/L	SW-846 8260B
n-Propylbenzene	3600	26	200	µg/L	SW-846 8260B
o-Xylene	12000	26	200	µg/L	SW-846 8260B
p-Isopropyltoluene (p-Cymene)	240	30	200	µg/L	SW-846 8260B
sec-Butylbenzene	390	26	200	µg/L	SW-846 8260B
Toluene	36000	34	200	µg/L	SW-846 8260B
2-Methylnaphthalene (SIM)	240	11	140	µg/L	SW-846 8270D
Acenaphthene (SIM)	0.46	0.086	0.43	µg/L	SW-846 8270D
Naphthalene (SIM)	530	10	140	µg/L	SW-846 8270D
Phenanthrene (SIM)	0.59	0.057	0.071	µg/L	SW-846 8270D

con-test® ANALYTICAL LABORATORY

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

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 8270 PAH(SIM), sample 18J0293-01 was run at a dilution due to high concentration target compounds

For method 8260B elevated reporting limit for sample 18J0293-01 due to high concentrations of target compounds.

SW-846 8260B

Qualifications:

RL-11

Elevated reporting limit due to high concentration of target compounds.

Analyte & Samples(s) Qualified:

18J0293-01[TW-1- Parcel 13]

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:

Naphthalene-d8
18J0293-01[TW-1- Parcel 13]

Naphthalene-d8 (SIM)
18J0293-01[TW-1- Parcel 13]

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:

Nitrobenzene-d5
18J0293-01[TW-1- Parcel 13]

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.

Tod E. Kopyscinski
Laboratory Director

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

Project Location: NC DOT I-5986B Parcel 13 Sample Description: Work Order: 18J0293

Date Received: 10/4/2018

Field Sample #: TW-1- Parcel 13 Sampled: 10/2/2018 12:45

Sample ID: 18J0293-01

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	10000	1900	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Acrylonitrile	ND	1000	120	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
tert-Amyl Methyl Ether (TAME)	ND	100	21	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Benzene	4000	200	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Bromobenzene	ND	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Bromochloromethane	ND	200	45	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Bromodichloromethane	ND	100	59	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Bromoform	ND	400	42	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Bromomethane	ND	400	190	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
2-Butanone (MEK)	ND	4000	470	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
tert-Butyl Alcohol (TBA)	ND	4000	430	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
n-Butylbenzene	2000	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
sec-Butylbenzene	390	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
tert-Butylbenzene	ND	200	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	100	19	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Carbon Disulfide	ND	800	200	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Carbon Tetrachloride	ND	1000	49	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Chlorobenzene	ND	200	32	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Chlorodibromomethane	ND	100	21	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Chloroethane	ND	400	56	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Chloroform	ND	400	44	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Chloromethane	ND	400	110	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
2-Chlorotoluene	ND	200	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
4-Chlorotoluene	ND	200	28	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	1000	74	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2-Dibromoethane (EDB)	ND	100	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Dibromomethane	ND	200	32	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2-Dichlorobenzene	ND	200	34	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,3-Dichlorobenzene	ND	200	34	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,4-Dichlorobenzene	ND	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
trans-1,4-Dichloro-2-butene	ND	400	62	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Dichlorodifluoromethane (Freon 12)	ND	400	57	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1-Dichloroethane	ND	200	32	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2-Dichloroethane	ND	200	39	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1-Dichloroethylene	ND	200	42	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
cis-1,2-Dichloroethylene	ND	200	29	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
trans-1,2-Dichloroethylene	ND	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2-Dichloropropane	ND	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,3-Dichloropropane	ND	100	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
2,2-Dichloropropane	ND	200	43	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1-Dichloropropene	ND	400	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
cis-1,3-Dichloropropene	ND	100	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
trans-1,3-Dichloropropene	ND	100	22	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Diethyl Ether	ND	400	44	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH

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

Project Location: NC DOT I-5986B Parcel 13 Sample Description: Work Order: 18J0293

Date Received: 10/4/2018

Field Sample #: TW-1- Parcel 13 Sampled: 10/2/2018 12:45

Sample ID: 18J0293-01

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	100	36	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,4-Dioxane	ND	10000	5300	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Ethylbenzene	11000	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Hexachlorobutadiene	ND	120	120	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
2-Hexanone (MBK)	ND	2000	300	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Isopropylbenzene (Cumene)	1000	200	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
p-Isopropyltoluene (p-Cymene)	240	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Methyl tert-Butyl Ether (MTBE)	ND	200	18	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Methylene Chloride	ND	1000	640	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
4-Methyl-2-pentanone (MIBK)	ND	2000	290	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Naphthalene	3800	400	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
n-Propylbenzene	3600	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Styrene	ND	200	30	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1,1,2-Tetrachloroethane	ND	200	24	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1,2,2-Tetrachloroethane	ND	100	32	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Tetrachloroethylene	ND	200	54	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Tetrahydrofuran	ND	2000	210	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Toluene	36000	200	34	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2,3-Trichlorobenzene	ND	1000	28	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2,4-Trichlorobenzene	ND	200	38	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,3,5-Trichlorobenzene	ND	200	34	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1,1-Trichloroethane	ND	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1,2-Trichloroethane	ND	200	47	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Trichloroethylene	ND	200	40	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Trichlorofluoromethane (Freon 11)	ND	400	29	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2,3-Trichloropropane	ND	400	43	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	200	39	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,2,4-Trimethylbenzene	21000	200	36	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
1,3,5-Trimethylbenzene	6100	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
Vinyl Chloride	ND	400	27	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
m+p Xylene	32000	400	51	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH
o-Xylene	12000	200	26	µg/L	200		SW-846 8260B	10/10/18	10/11/18 12:23	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	79.2	70-130		10/11/18 12:23
Toluene-d8	101	70-130		10/11/18 12:23
4-Bromofluorobenzene	97.8	70-130		10/11/18 12:23

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Project Location: NC DOT I-5986B Parcel 13 Sample Description: Work Order: 18J0293

Date Received: 10/4/2018

Field Sample #: TW-1- Parcel 13 Sampled: 10/2/2018 12:45

Sample ID: 18J0293-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene (SIM)	0.46	0.43	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Acenaphthylene (SIM)	ND	0.29	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Anthracene (SIM)	ND	0.29	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Benzo(a)anthracene (SIM)	ND	0.071	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Benzo(a)pyrene (SIM)	ND	0.14	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Benzo(b)fluoranthene (SIM)	ND	0.071	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Benzo(g,h,i)perylene (SIM)	ND	0.71	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Benzo(k)fluoranthene (SIM)	ND	0.29	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Chrysene (SIM)	ND	0.29	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Dibenz(a,h)anthracene (SIM)	ND	0.14	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Fluoranthene (SIM)	ND	0.71	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Fluorene (SIM)	ND	1.4	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Indeno(1,2,3-cd)pyrene (SIM)	ND	0.14	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
2-Methylnaphthalene (SIM)	240	140	µg/L	100		SW-846 8270D	10/6/18	10/10/18 8:47	IMR
Naphthalene (SIM)	530	140	µg/L	100		SW-846 8270D	10/6/18	10/10/18 8:47	IMR
Phenanthrene (SIM)	0.59	0.071	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR
Pyrene (SIM)	ND	1.4	µg/L	1		SW-846 8270D	10/6/18	10/9/18 17:18	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	*	30-130	S-02	10/9/18 17:18
Nitrobenzene-d5	50.4	30-130		10/10/18 8:47
2-Fluorobiphenyl	62.0	30-130		10/9/18 17:18
2-Fluorobiphenyl	54.1	30-130		10/10/18 8:47
p-Terphenyl-d14	57.0	30-130		10/9/18 17:18
p-Terphenyl-d14	44.5	30-130		10/10/18 8:47

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Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18J0293-01 [TW-1- Parcel 13]	B214429	0.025	5.00	10/10/18

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18J0293-01 [TW-1- Parcel 13]	B214244	700	1.00	10/06/18
18J0293-01RE1 [TW-1- Parcel 13]	B214244	700	1.00	10/06/18

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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 B214429 - SW-846 5030B										
Blank (B214429-BLK1)				Prepared: 10/10/18 Analyzed: 10/11/18						
Acetone	ND	50	µg/L							
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							
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 B214429 - SW-846 5030B										
Blank (B214429-BLK1)				Prepared: 10/10/18 Analyzed: 10/11/18						
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 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	*20.2*		µg/L	25.0		81.0	70-130			
Surrogate: Toluene-d8	*25.3*		µg/L	25.0		101	70-130			
Surrogate: 4-Bromofluorobenzene	*24.5*		µg/L	25.0		98.1	70-130			
LCS (B214429-BS1)				Prepared: 10/10/18 Analyzed: 10/11/18						
Acetone	110	50	µg/L	100		110	70-160			†
Acrylonitrile	10.0	5.0	µg/L	10.0		100	70-130			
tert-Amyl Methyl Ether (TAME)	9.69	0.50	µg/L	10.0		96.9	70-130			
Benzene	9.91	1.0	µg/L	10.0		99.1	70-130			
Bromobenzene	10.7	1.0	µg/L	10.0		107	70-130			
Bromochloromethane	11.1	1.0	µg/L	10.0		111	70-130			
Bromodichloromethane	9.68	0.50	µg/L	10.0		96.8	70-130			
Bromoform	11.2	1.0	µg/L	10.0		112	70-130			
Bromomethane	8.79	2.0	µg/L	10.0		87.9	40-160			†
2-Butanone (MEK)	101	20	µg/L	100		101	40-160			†
tert-Butyl Alcohol (TBA)	98.5	20	µg/L	100		98.5	40-160			†
n-Butylbenzene	11.3	1.0	µg/L	10.0		113	70-130			
sec-Butylbenzene	11.5	1.0	µg/L	10.0		115	70-130			
tert-Butylbenzene	11.5	1.0	µg/L	10.0		115	70-130			
tert-Butyl Ethyl Ether (TBEE)	9.65	0.50	µg/L	10.0		96.5	70-130			
Carbon Disulfide	10.8	4.0	µg/L	10.0		108	70-130			
Carbon Tetrachloride	8.57	5.0	µg/L	10.0		85.7	70-130			
Chlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
Chlorodibromomethane	10.7	0.50	µg/L	10.0		107	70-130			
Chloroethane	8.75	2.0	µg/L	10.0		87.5	70-130			
Chloroform	9.29	2.0	µg/L	10.0		92.9	70-130			
Chloromethane	9.26	2.0	µg/L	10.0		92.6	40-160			†
2-Chlorotoluene	11.1	1.0	µg/L	10.0		111	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 B214429 - SW-846 5030B										
LCS (B214429-BS1)				Prepared: 10/10/18 Analyzed: 10/11/18						
4-Chlorotoluene	10.6	1.0	µg/L	10.0		106	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	10.4	5.0	µg/L	10.0		104	70-130			
1,2-Dibromoethane (EDB)	10.2	0.50	µg/L	10.0		102	70-130			
Dibromomethane	10.1	1.0	µg/L	10.0		101	70-130			
1,2-Dichlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
1,3-Dichlorobenzene	11.3	1.0	µg/L	10.0		113	70-130			
1,4-Dichlorobenzene	10.5	1.0	µg/L	10.0		105	70-130			
trans-1,4-Dichloro-2-butene	10.8	2.0	µg/L	10.0		108	70-130			
Dichlorodifluoromethane (Freon 12)	7.09	2.0	µg/L	10.0		70.9	40-160			†
1,1-Dichloroethane	10.1	1.0	µg/L	10.0		101	70-130			
1,2-Dichloroethane	8.69	1.0	µg/L	10.0		86.9	70-130			
1,1-Dichloroethylene	9.28	1.0	µg/L	10.0		92.8	70-130			
cis-1,2-Dichloroethylene	9.56	1.0	µg/L	10.0		95.6	70-130			
trans-1,2-Dichloroethylene	10.0	1.0	µg/L	10.0		100	70-130			
1,2-Dichloropropane	11.5	1.0	µg/L	10.0		115	70-130			
1,3-Dichloropropane	9.78	0.50	µg/L	10.0		97.8	70-130			
2,2-Dichloropropane	10.4	1.0	µg/L	10.0		104	40-130			†
1,1-Dichloropropene	9.29	2.0	µg/L	10.0		92.9	70-130			
cis-1,3-Dichloropropene	10.6	0.50	µg/L	10.0		106	70-130			
trans-1,3-Dichloropropene	10.8	0.50	µg/L	10.0		108	70-130			
Diethyl Ether	10.4	2.0	µg/L	10.0		104	70-130			
Diisopropyl Ether (DIPE)	9.93	0.50	µg/L	10.0		99.3	70-130			
1,4-Dioxane	108	50	µg/L	100		108	40-130			†
Ethylbenzene	11.4	1.0	µg/L	10.0		114	70-130			
Hexachlorobutadiene	13.0	0.60	µg/L	10.0		130	70-130			
2-Hexanone (MBK)	102	10	µg/L	100		102	70-160			†
Isopropylbenzene (Cumene)	11.7	1.0	µg/L	10.0		117	70-130			
p-Isopropyltoluene (p-Cymene)	11.4	1.0	µg/L	10.0		114	70-130			
Methyl tert-Butyl Ether (MTBE)	9.84	1.0	µg/L	10.0		98.4	70-130			
Methylene Chloride	9.01	5.0	µg/L	10.0		90.1	70-130			
4-Methyl-2-pentanone (MIBK)	100	10	µg/L	100		100	70-160			†
Naphthalene	10.7	2.0	µg/L	10.0		107	40-130			†
n-Propylbenzene	10.8	1.0	µg/L	10.0		108	70-130			
Styrene	11.4	1.0	µg/L	10.0		114	70-130			
1,1,1,2-Tetrachloroethane	11.4	1.0	µg/L	10.0		114	70-130			
1,1,2,2-Tetrachloroethane	11.1	0.50	µg/L	10.0		111	70-130			
Tetrachloroethylene	11.6	1.0	µg/L	10.0		116	70-130			
Tetrahydrofuran	9.64	10	µg/L	10.0		96.4	70-130			J
Toluene	10.7	1.0	µg/L	10.0		107	70-130			
1,2,3-Trichlorobenzene	10.9	5.0	µg/L	10.0		109	70-130			
1,2,4-Trichlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
1,3,5-Trichlorobenzene	11.4	1.0	µg/L	10.0		114	70-130			
1,1,1-Trichloroethane	9.39	1.0	µg/L	10.0		93.9	70-130			
1,1,2-Trichloroethane	10.9	1.0	µg/L	10.0		109	70-130			
Trichloroethylene	10.7	1.0	µg/L	10.0		107	70-130			
Trichlorofluoromethane (Freon 11)	8.03	2.0	µg/L	10.0		80.3	70-130			
1,2,3-Trichloropropane	10.2	2.0	µg/L	10.0		102	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	10.4	1.0	µg/L	10.0		104	70-130			
1,2,4-Trimethylbenzene	10.6	1.0	µg/L	10.0		106	70-130			
1,3,5-Trimethylbenzene	10.7	1.0	µg/L	10.0		107	70-130			
Vinyl Chloride	9.45	2.0	µg/L	10.0		94.5	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 B214429 - SW-846 5030B										
LCS (B214429-BS1)				Prepared: 10/10/18 Analyzed: 10/11/18						
m+p Xylene	21.9	2.0	µg/L	20.0		109	70-130			
o-Xylene	10.8	1.0	µg/L	10.0		108	70-130			
Surrogate: 1,2-Dichloroethane-d4	*19.8*		µg/L	25.0		79.0	70-130			
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130			
Surrogate: 4-Bromofluorobenzene	*25.2*		µg/L	25.0		101	70-130			
LCS Dup (B214429-BSD1)				Prepared: 10/10/18 Analyzed: 10/11/18						
Acetone	106	50	µg/L	100		106	70-160	3.55	25	†
Acrylonitrile	9.63	5.0	µg/L	10.0		96.3	70-130	4.07	25	
tert-Amyl Methyl Ether (TAME)	9.83	0.50	µg/L	10.0		98.3	70-130	1.43	25	
Benzene	9.76	1.0	µg/L	10.0		97.6	70-130	1.53	25	
Bromobenzene	10.4	1.0	µg/L	10.0		104	70-130	3.04	25	
Bromochloromethane	11.0	1.0	µg/L	10.0		110	70-130	0.816	25	
Bromodichloromethane	9.46	0.50	µg/L	10.0		94.6	70-130	2.30	25	
Bromoform	10.6	1.0	µg/L	10.0		106	70-130	5.40	25	
Bromomethane	9.56	2.0	µg/L	10.0		95.6	40-160	8.39	25	†
2-Butanone (MEK)	98.3	20	µg/L	100		98.3	40-160	3.17	25	†
tert-Butyl Alcohol (TBA)	93.1	20	µg/L	100		93.1	40-160	5.67	25	†
n-Butylbenzene	11.0	1.0	µg/L	10.0		110	70-130	2.77	25	
sec-Butylbenzene	11.3	1.0	µg/L	10.0		113	70-130	1.32	25	
tert-Butylbenzene	11.1	1.0	µg/L	10.0		111	70-130	3.28	25	
tert-Butyl Ethyl Ether (TBEE)	9.70	0.50	µg/L	10.0		97.0	70-130	0.517	25	
Carbon Disulfide	10.3	4.0	µg/L	10.0		103	70-130	4.63	25	
Carbon Tetrachloride	8.13	5.0	µg/L	10.0		81.3	70-130	5.27	25	
Chlorobenzene	10.8	1.0	µg/L	10.0		108	70-130	1.92	25	
Chlorodibromomethane	10.6	0.50	µg/L	10.0		106	70-130	0.842	25	
Chloroethane	8.49	2.0	µg/L	10.0		84.9	70-130	3.02	25	
Chloroform	9.25	2.0	µg/L	10.0		92.5	70-130	0.431	25	
Chloromethane	9.15	2.0	µg/L	10.0		91.5	40-160	1.20	25	†
2-Chlorotoluene	10.3	1.0	µg/L	10.0		103	70-130	7.39	25	
4-Chlorotoluene	10.1	1.0	µg/L	10.0		101	70-130	5.10	25	
1,2-Dibromo-3-chloropropane (DBCP)	9.59	5.0	µg/L	10.0		95.9	70-130	8.49	25	
1,2-Dibromoethane (EDB)	10.2	0.50	µg/L	10.0		102	70-130	0.195	25	
Dibromomethane	10.1	1.0	µg/L	10.0		101	70-130	0.0993	25	
1,2-Dichlorobenzene	10.9	1.0	µg/L	10.0		109	70-130	1.10	25	
1,3-Dichlorobenzene	11.1	1.0	µg/L	10.0		111	70-130	1.61	25	
1,4-Dichlorobenzene	10.4	1.0	µg/L	10.0		104	70-130	1.34	25	
trans-1,4-Dichloro-2-butene	10.3	2.0	µg/L	10.0		103	70-130	5.03	25	
Dichlorodifluoromethane (Freon 12)	6.71	2.0	µg/L	10.0		67.1	40-160	5.51	25	†
1,1-Dichloroethane	10.0	1.0	µg/L	10.0		100	70-130	1.39	25	
1,2-Dichloroethane	8.70	1.0	µg/L	10.0		87.0	70-130	0.115	25	
1,1-Dichloroethylene	8.94	1.0	µg/L	10.0		89.4	70-130	3.73	25	
cis-1,2-Dichloroethylene	9.55	1.0	µg/L	10.0		95.5	70-130	0.105	25	
trans-1,2-Dichloroethylene	9.94	1.0	µg/L	10.0		99.4	70-130	0.802	25	
1,2-Dichloropropane	11.4	1.0	µg/L	10.0		114	70-130	0.523	25	
1,3-Dichloropropane	9.88	0.50	µg/L	10.0		98.8	70-130	1.02	25	
2,2-Dichloropropane	10.0	1.0	µg/L	10.0		100	40-130	3.91	25	†
1,1-Dichloropropene	9.40	2.0	µg/L	10.0		94.0	70-130	1.18	25	
cis-1,3-Dichloropropene	10.5	0.50	µg/L	10.0		105	70-130	1.23	25	
trans-1,3-Dichloropropene	10.7	0.50	µg/L	10.0		107	70-130	0.927	25	
Diethyl Ether	9.97	2.0	µg/L	10.0		99.7	70-130	3.74	25	
Diisopropyl Ether (DIPE)	9.84	0.50	µg/L	10.0		98.4	70-130	0.910	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 B214429 - SW-846 5030B											
LCS Dup (B214429-BSD1)				Prepared: 10/10/18 Analyzed: 10/11/18							
1,4-Dioxane	101	50	µg/L	100		101	40-130	6.81	50		† ‡
Ethylbenzene	10.8	1.0	µg/L	10.0		108	70-130	5.23	25		
Hexachlorobutadiene	12.8	0.60	µg/L	10.0		128	70-130	2.17	25		
2-Hexanone (MBK)	98.3	10	µg/L	100		98.3	70-160	3.51	25		†
Isopropylbenzene (Cumene)	11.5	1.0	µg/L	10.0		115	70-130	2.41	25		
p-Isopropyltoluene (p-Cymene)	11.3	1.0	µg/L	10.0		113	70-130	0.791	25		
Methyl tert-Butyl Ether (MTBE)	9.80	1.0	µg/L	10.0		98.0	70-130	0.407	25		
Methylene Chloride	8.97	5.0	µg/L	10.0		89.7	70-130	0.445	25		
4-Methyl-2-pentanone (MIBK)	97.6	10	µg/L	100		97.6	70-160	2.93	25		†
Naphthalene	10.2	2.0	µg/L	10.0		102	40-130	4.11	25		†
n-Propylbenzene	10.3	1.0	µg/L	10.0		103	70-130	4.73	25		
Styrene	10.8	1.0	µg/L	10.0		108	70-130	5.39	25		
1,1,1,2-Tetrachloroethane	11.2	1.0	µg/L	10.0		112	70-130	2.21	25		
1,1,2,2-Tetrachloroethane	10.7	0.50	µg/L	10.0		107	70-130	3.03	25		
Tetrachloroethylene	11.3	1.0	µg/L	10.0		113	70-130	3.14	25		
Tetrahydrofuran	9.82	10	µg/L	10.0		98.2	70-130	1.85	25	J	
Toluene	10.6	1.0	µg/L	10.0		106	70-130	0.470	25		
1,2,3-Trichlorobenzene	10.8	5.0	µg/L	10.0		108	70-130	0.368	25		
1,2,4-Trichlorobenzene	10.6	1.0	µg/L	10.0		106	70-130	3.42	25		
1,3,5-Trichlorobenzene	11.4	1.0	µg/L	10.0		114	70-130	0.00	25		
1,1,1-Trichloroethane	9.16	1.0	µg/L	10.0		91.6	70-130	2.48	25		
1,1,2-Trichloroethane	10.6	1.0	µg/L	10.0		106	70-130	3.45	25		
Trichloroethylene	10.3	1.0	µg/L	10.0		103	70-130	3.81	25		
Trichlorofluoromethane (Freon 11)	7.89	2.0	µg/L	10.0		78.9	70-130	1.76	25		
1,2,3-Trichloropropane	8.56	2.0	µg/L	10.0		85.6	70-130	17.8	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.85	1.0	µg/L	10.0		98.5	70-130	5.91	25		
1,2,4-Trimethylbenzene	10.5	1.0	µg/L	10.0		105	70-130	0.951	25		
1,3,5-Trimethylbenzene	10.4	1.0	µg/L	10.0		104	70-130	3.04	25		
Vinyl Chloride	8.87	2.0	µg/L	10.0		88.7	40-160	6.33	25		†
m+p Xylene	21.2	2.0	µg/L	20.0		106	70-130	3.25	25		
o-Xylene	10.6	1.0	µg/L	10.0		106	70-130	2.52	25		
Surrogate: 1,2-Dichloroethane-d4	*20.2*		µg/L	25.0		80.9	70-130				
Surrogate: Toluene-d8	*25.2*		µg/L	25.0		101	70-130				
Surrogate: 4-Bromofluorobenzene	*24.2*		µg/L	25.0		96.9	70-130				

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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 B214244 - SW-846 3510C										
Blank (B214244-BLK1)				Prepared: 10/06/18 Analyzed: 10/08/18						
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	*74.2*		µg/L	100		74.2	30-130			
Surrogate: 2-Fluorobiphenyl	*78.7*		µg/L	100		78.7	30-130			
Surrogate: p-Terphenyl-d14	*80.5*		µg/L	100		80.5	30-130			
LCS (B214244-BS1)				Prepared: 10/06/18 Analyzed: 10/08/18						
Acenaphthene (SIM)	39.6	7.5	µg/L	50.0		79.1	40-140			
Acenaphthylene (SIM)	41.0	5.0	µg/L	50.0		82.0	40-140			
Anthracene (SIM)	42.4	5.0	µg/L	50.0		84.9	40-140			
Benzo(a)anthracene (SIM)	40.9	1.2	µg/L	50.0		81.8	40-140			
Benzo(a)pyrene (SIM)	43.4	2.5	µg/L	50.0		86.9	40-140			
Benzo(b)fluoranthene (SIM)	44.4	1.2	µg/L	50.0		88.7	40-140			
Benzo(g,h,i)perylene (SIM)	41.4	12	µg/L	50.0		82.8	40-140			
Benzo(k)fluoranthene (SIM)	42.2	5.0	µg/L	50.0		84.3	40-140			
Chrysene (SIM)	40.3	5.0	µg/L	50.0		80.6	40-140			
Dibenz(a,h)anthracene (SIM)	42.4	2.5	µg/L	50.0		84.9	40-140			
Fluoranthene (SIM)	41.9	12	µg/L	50.0		83.8	40-140			
Fluorene (SIM)	41.0	25	µg/L	50.0		82.1	40-140			
Indeno(1,2,3-cd)pyrene (SIM)	43.0	2.5	µg/L	50.0		86.0	40-140			
2-Methylnaphthalene (SIM)	39.7	25	µg/L	50.0		79.4	40-140			
Naphthalene (SIM)	36.6	25	µg/L	50.0		73.3	40-140			
Phenanthrene (SIM)	40.2	1.2	µg/L	50.0		80.5	40-140			
Pyrene (SIM)	38.7	25	µg/L	50.0		77.4	40-140			
Surrogate: Nitrobenzene-d5	*54.6*		µg/L	100		54.6	30-130			
Surrogate: 2-Fluorobiphenyl	*71.5*		µg/L	100		71.5	30-130			
Surrogate: p-Terphenyl-d14	*57.2*		µg/L	100		57.2	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 B214244 - SW-846 3510C										
LCS Dup (B214244-BSD1)				Prepared: 10/06/18 Analyzed: 10/08/18						
Acenaphthene (SIM)	40.4	7.5	µg/L	50.0		80.8	40-140	2.13	20	
Acenaphthylene (SIM)	41.8	5.0	µg/L	50.0		83.5	40-140	1.81	20	
Anthracene (SIM)	44.0	5.0	µg/L	50.0		88.1	40-140	3.70	20	
Benzo(a)anthracene (SIM)	44.4	1.2	µg/L	50.0		88.8	40-140	8.09	20	
Benzo(a)pyrene (SIM)	45.6	2.5	µg/L	50.0		91.2	40-140	4.88	20	
Benzo(b)fluoranthene (SIM)	46.8	1.2	µg/L	50.0		93.6	40-140	5.43	20	
Benzo(g,h,i)perylene (SIM)	43.6	12	µg/L	50.0		87.3	40-140	5.29	20	
Benzo(k)fluoranthene (SIM)	44.6	5.0	µg/L	50.0		89.2	40-140	5.59	20	
Chrysene (SIM)	42.6	5.0	µg/L	50.0		85.3	40-140	5.73	20	
Dibenz(a,h)anthracene (SIM)	44.9	2.5	µg/L	50.0		89.8	40-140	5.61	20	
Fluoranthene (SIM)	43.3	12	µg/L	50.0		86.6	40-140	3.34	20	
Fluorene (SIM)	41.8	25	µg/L	50.0		83.6	40-140	1.81	20	
Indeno(1,2,3-cd)pyrene (SIM)	45.4	2.5	µg/L	50.0		90.8	40-140	5.37	20	‡
2-Methylnaphthalene (SIM)	40.2	25	µg/L	50.0		80.4	40-140	1.38	20	
Naphthalene (SIM)	37.1	25	µg/L	50.0		74.2	40-140	1.29	20	
Phenanthrene (SIM)	41.8	1.2	µg/L	50.0		83.6	40-140	3.84	20	
Pyrene (SIM)	40.8	25	µg/L	50.0		81.5	40-140	5.10	20	
Surrogate: Nitrobenzene-d5	*54.9*		µg/L	100		54.9	30-130			
Surrogate: 2-Fluorobiphenyl	*71.1*		µg/L	100		71.1	30-130			
Surrogate: p-Terphenyl-d14	*57.9*		µg/L	100		57.9	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).
RL-11	Elevated reporting limit due to high concentration of 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.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260B 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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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260B 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

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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	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
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	12/14/2018
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

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CHAIN OF CUSTODY RECORD (North Carolina)

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 1

Company Name: SMI NC

Address: 3201 Spring Forest Rd Raleigh, NC

Phone: 919 872-2660

Project Name:

Project Location: NCDOT I-5986B Parcel 13

Project Number: 4305-18-175

Project Manager: Mike Pfeifer

Con-Test Quote Name/Number:

Invoice Recipient: Mike Pfeifer

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: mpfeifer@smiinc.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	# of Containers	[2] Preservation Code	[3] Container Code	8260	PAH 8270
1	TW-1 - Parcel 13	10.2.18	1245		✓	GW	H				✓	✓

Comments: Upp 3/4 of 1 liter collected for 8270 PAH. Well allow to recharge

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

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)

	Date/Time:
Relinquished by: (signature)	10/4/18 3:00pm
Received by: (signature)	Date/Time: 10/5/18 8:58
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
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

Sign In

TRACK ANOTHER SHIPMENT

783089843299

Delivered
Friday 10/05/2018 at 8:58 am

DELIVERED

Signed for by: P.BLAKE

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

RALEIGH, NC US

TO

EAST LONGMEADOW, MA US

Travel History | Shipment Facts

10/05/2018 - Friday	8:58 am	Delivered EAST LONGMEADOW, MA

Expand History

10/04/2018 - Thursday	1:52 pm	Shipment information sent to FedEx

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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 ST ME

Received By RAP Date 10/5/15 Time 858

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

Direct from Sampling _____ Ambient _____ Melted Ice _____

By Gun # 557 Actual Temp - 3.9

Were samples within Temperature? 2-6°C T By Blank # _____ Actual Temp - _____

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

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

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? N/A Acid _____ Base _____

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.	1	1 Liter Plastic		16 oz Amb.	
HCL-	3	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			

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:

December 14, 2018

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 21-Paul Williams Trucking
2981 Bud Hawkins Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175

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. 43-1800583 REV-02 dated August 16, 2018, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its August 20, 2018 Notice to Proceed Letter.

♦ Background/Project Information

Based on NCDOT's July 30, 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
21	Paul and Tammy Williams	(Paul Williams Trucking) 2981 Bud Hawkins Road, Dunn, NC

The PSA included a geophysical survey, subsequent limited soil sampling (four soil borings up to 10 feet below ground surface (ft.-bgs.) and limited groundwater sampling (one groundwater sample), 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

On September 11, 2018, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 21. 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 the proposed 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, 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 three (3) GPR profiles (Lines 1 through 3) 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, one anomalous feature (Anomaly A) was identified in both the TDEM and GPR data sets (**Figures 5 through 7**). Anomaly A is characterized by relatively higher TDEM values (greater than about 100 mV) and a high amplitude GPR response at about three feet below ground surface (bgs). Anomaly A is likely related to a buried isolated metallic target. The identified anomaly was also marked in the field using white spray paint. Example GPR profiles are presented in **Figure 8.**

♦ Soil Sampling

On October 2, 2018, S&ME's drill crew utilized a track mounted Geoprobe® rig to advance four soil borings (B-1 through B-4) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 21. The approximate location of the soil borings are shown in **Figure 2**. A photographic log is included in **Appendix I.** S&ME's drill crew advanced the Geoprobe® borings to a depth of approximately 10 ft.-bgs. During the advancement of the soil borings, groundwater was encountered at a depth of approximately six 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.**

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 four to six foot depth interval) were selected from each boring and provided to RED Lab, LLC (Red Lab) for on-site analysis. A total of eight 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.

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 laboratory method reporting limits. 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 one of the soil borings into the groundwater table for the collection of a groundwater sample. Due to the lack of evidence of a release, soil boring B-2 was selected at random for the collection of a groundwater sample. A temporary monitor well (TW-1) was installed at soil boring B-2 to a depth of approximately eight ft.-bgs using a five foot section of one-inch diameter, Schedule 40 PVC well riser attached to a five foot section of 0.01-inch slotted screen that intersected the groundwater table. Groundwater within the temporary monitor well at soil boring B-2 was measured at 4.9 ft.-bgs. Groundwater from the temporary well was purged until relatively clear using disposable tubing attached to a peristaltic pump. The flow rate was reduced and laboratory supplied containers were filled directly from the tubing, labeled as TW-1 Parcel 21, 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 well materials were removed and the soil borings backfilled with bentonite pellets and soil cuttings. Investigative derived wastes (IDW), such as 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 and tubing were bagged and disposed off-site.

Groundwater Analytical Results

Based upon analytical results of groundwater samples analyzed by Con-Test Laboratories, no target constituents were reported at concentrations exceeding the laboratory method reporting limits. 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

The geophysical survey identified one anomaly (Anomaly A) which is likely related to a buried isolated metallic target. Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site.

S&ME advanced four soil borings (B-1 through B-4) 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-GRO and TPH-DRO were not reported in the soil samples at concentrations exceeding the laboratory method reporting limits. During the soil boring advancement, groundwater was encountered at a depth of approximately six ft.-bgs. One temporary well (TW-1) was installed at soil boring B-2. Groundwater at TW-1 was measured at 4.9 ft.-bgs and analyzed by Con-Test Laboratories for VOCs by EPA Method 8260 and PAHs by EPA Method 8270. No target constituents were reported in the groundwater sample at concentrations exceeding the laboratory method reporting limits.

Based on the findings of the geophysical survey and analytical results of soil and groundwater samples, no recommendations are provided.

♦ 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 feet below ground surface.

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.

Jamie T Honeycutt
Environmental Professional
jhoneycutt@smeinc.com

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Thomas P. Raymond, P.E., P.M.P.
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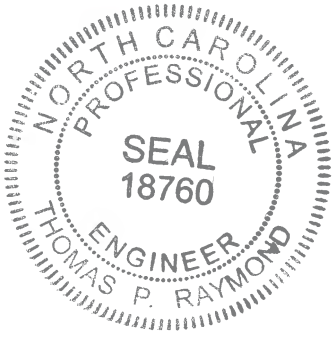
1/22/2019



Attachments:

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

Figure 1: Vicinity Map
Figure 2: Site Map
Figure 3: Soil and Groundwater 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 2 and 3

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 21 - (Paul Williams Trucking)
2981 Bud Hawkins Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

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**
Parcel 21 B-1	10/2/2018	2 to 4	<0.58	<0.58
		4 to 6	<0.63	<0.63
Parcel 21 B-2	10/2/2018	2 to 4	<0.47	<0.47
		4 to 6	<0.56	<0.56
Parcel 21 B-3	10/2/2018	2 to 4	<0.43	<0.43
		4 to 6	<0.24	<0.24
Parcel 21 B-4	10/2/2018	2 to 4	<0.31	<0.31
		4 to 6	<0.19	<0.19
North Carolina TPH Action Levels			**50**	**100**

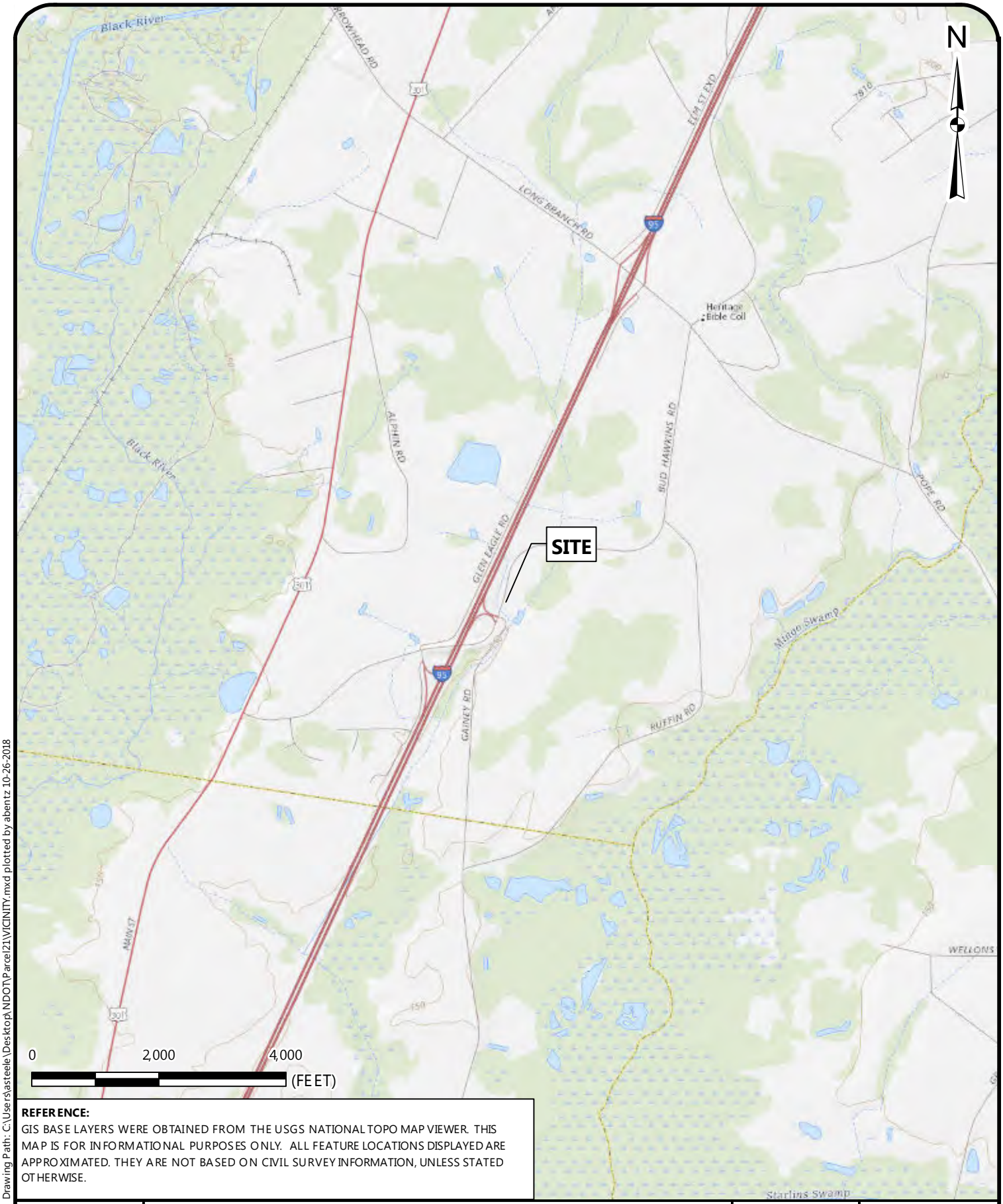
Notes:
1. UVF analysis performed by RED Lab, LLC
2. Concentrations are reported in milligrams per kilogram (mg/Kg).
3. ft.-bgs:- feet below ground surface.
4. Concentrations exceeding the laboratory's reporting limits are shown in **BOLD** fields.
5. Concentrations exceeding the North Carolina TPH Action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

TABLE 2
SUMMARY OF GROUNDWATER SAMPLING RESULTS
NCDOT Project I-5986B
Parcel 21 - (Paul Williams Trucking)
2981 Bud Hawkins Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

Analytical Method→		Volatile Organic Compounds by EPA Method 8260	Polycyclic Aromatic Compounds (PAHs) by EPA Method 8270
Sample ID	Contaminant of Concern→	Constituent Specific	Constituent Specific
	Date		
TW-1 Parcel 21	10/2/2018	Below laboratory method reporting limits	Below laboratory method reporting limits
2L Standard (µg/L)		Not Applicable	Not Applicable

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.

Figures



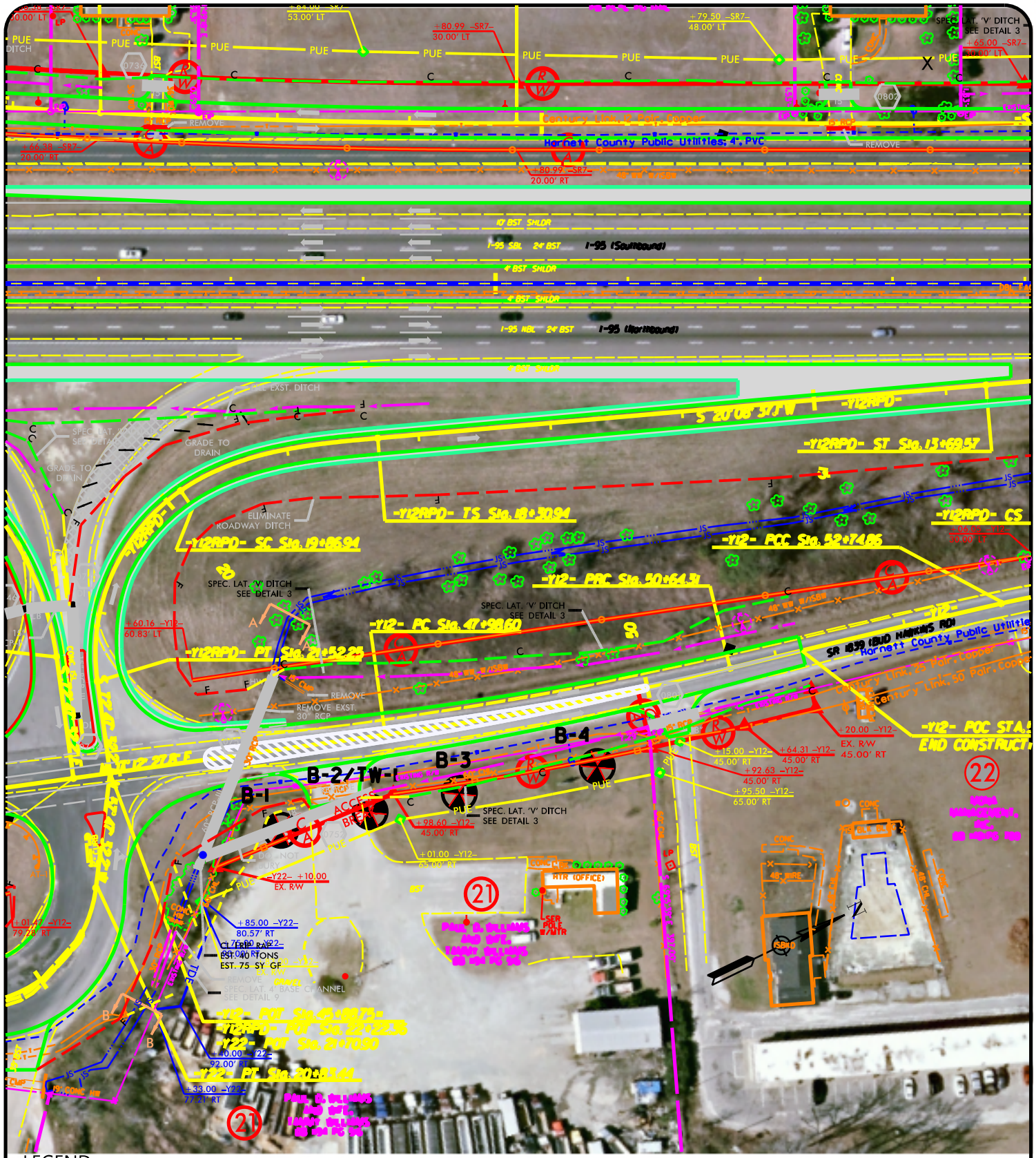
REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: C:\Users\asteele\Desktop\NDOT\Parcel21\VICINITY.mxd plotted by abentz 10-26-2018

VICINITY MAP

NCDOT I-5986B
PARCEL 21 (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	FIGURE NO.
1 " = 2,000 '	1
DATE: 10-26-18	
PROJECT NUMBER 4305-18-175	



LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

TW-1: Temporary Monitor Well Location

Map Source: NCDOT Project I-5986B

Image Source: NC ONEMAP, Dated 2016

Known Soil Contamination:

Possible Soil Contamination:

0 100 200

GRAPHIC SCALE (IN FEET)

SITE MAP

NCDOT PROJECT: I-5986B
PARCEL 21 - (PAUL WILLIAMS TRUCKING)
2981 Bud Hawkins Rd., Dunn, Harnett County, NC

SCALE:	FIGURE NO.
1" = 100'	2
DATE:	
DEC. 2018	
PROJECT NUMBER	
4305-18-175	

INTERSTATE 95

INTERSTATE 95

EXT RAMP 70 N

ENT RAMP 70 N

BUD HAWKINS RD

GAINEY RD

ROW

B-3

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.43	< 0.43
4-6	< 0.24	< 0.24

B-1

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.58	< 0.58
4-6	< 0.63	< 0.63

B-4

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.31	< 0.31
4-6	< 0.19	< 0.19

B-2

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.47	< 0.47
4-6	< 0.56	< 0.56

TW-1	µg/L
Method 8260	BDL
Method 8270 (PAH)	BDL

0 100 200 (FEET)

REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONMAP AERIAL ORTHOIMAGERY LAYER AND HARNETT COUNTY ROAD SHAPEFILE. 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
*Indicates Exceedence of NC TPH Action Levels
#Indicated Exceedence of 2L Groundwater Samples
ft-bgs : Feet Below Ground Surface
BDL: Below Detection Limits
PAH: Polycyclic Aromatic Compounds

Samples Collected 10-2-2018.

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

- Sample Location
- ROW Proposed Right-of-Way
- Edge of Pavement
- Centerline
- Proposed Permanent Utility Easement
- Proposed Construction Easement
- Tax Parcels

SOIL AND GROUNDWATER CONSTITUENT MAP

NCDOT I-5986B
PARCEL 21 (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: 1 " = 100 '

DATE: 10-26-18

PROJECT NUMBER 4305-18-175

FIGURE NO. 3

Drawing Path: C:\Users\asteele\Desktop\NDOT\Parcel21\CONSTITUENT.mxd plotted by abentz 10-26-2018

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 21 – (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

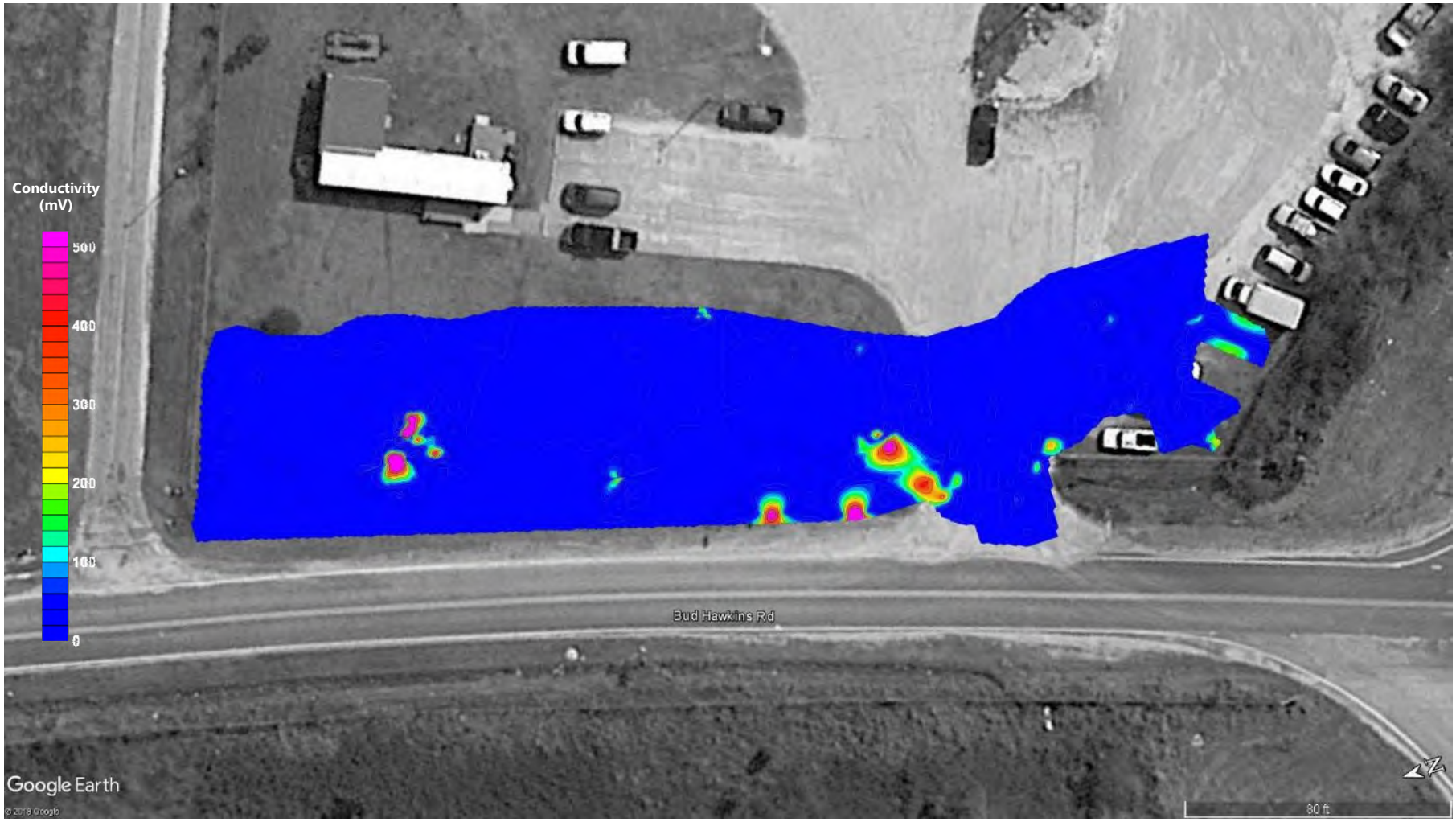
SCALE:
AS SHOWN

DATE:
10/29/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
4

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

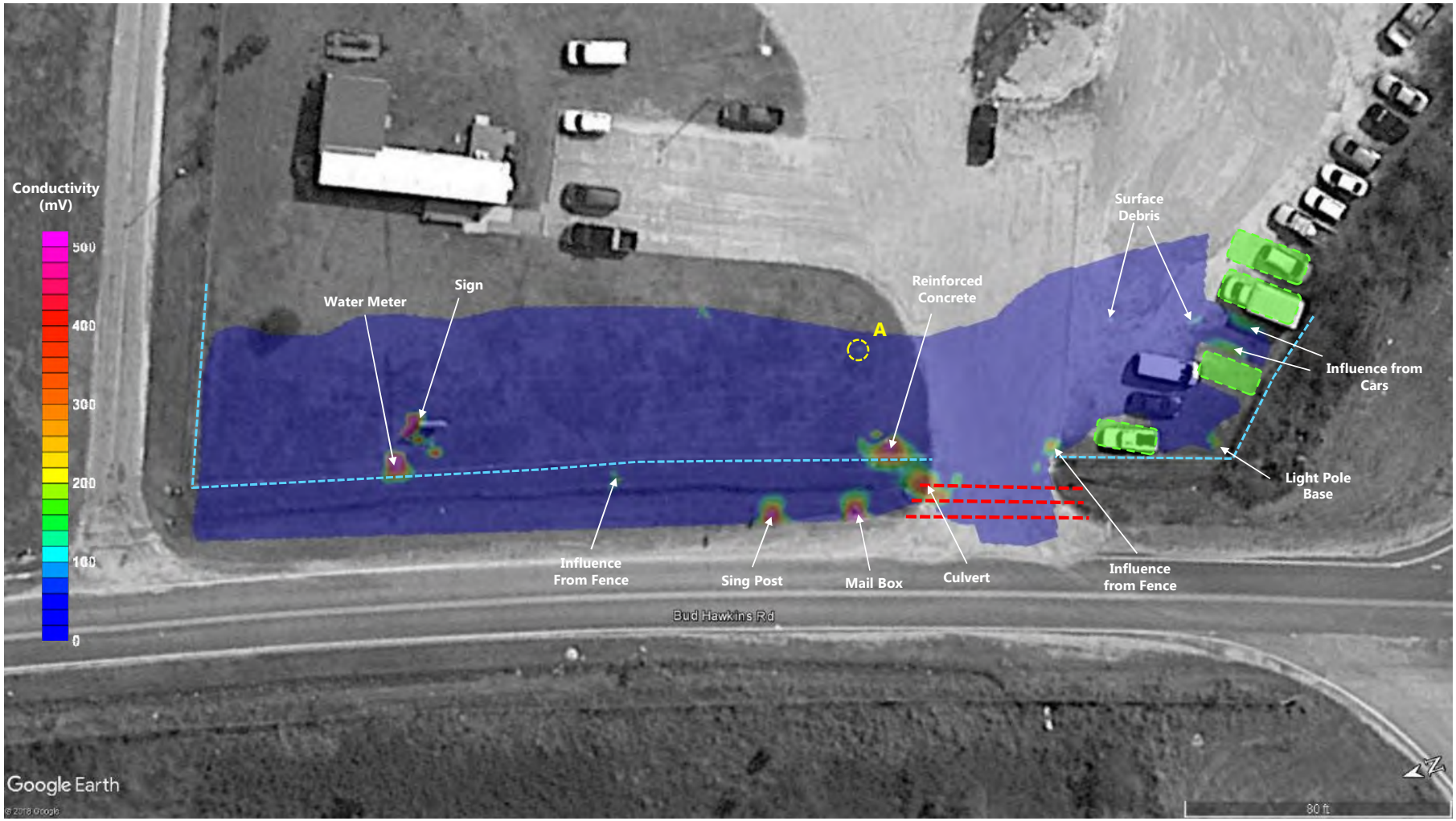


TDEM DATA PLOT A

NCDOT PROJECT: I-5986B
PARCEL 21 – (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	AS SHOWN
DATE:	10/29/2018
PROJECT NUMBER	4305-18-175
FIGURE NO.	5

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



LEGEND

Approximate Location of TDEM Anomaly

Approximate Location of Possible Utilities

Approximate Location of Vehicle

Approximate Location of Fence

TDEM DATA PLOT B

NCDOT PROJECT: I-5986B
PARCEL 21 – (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

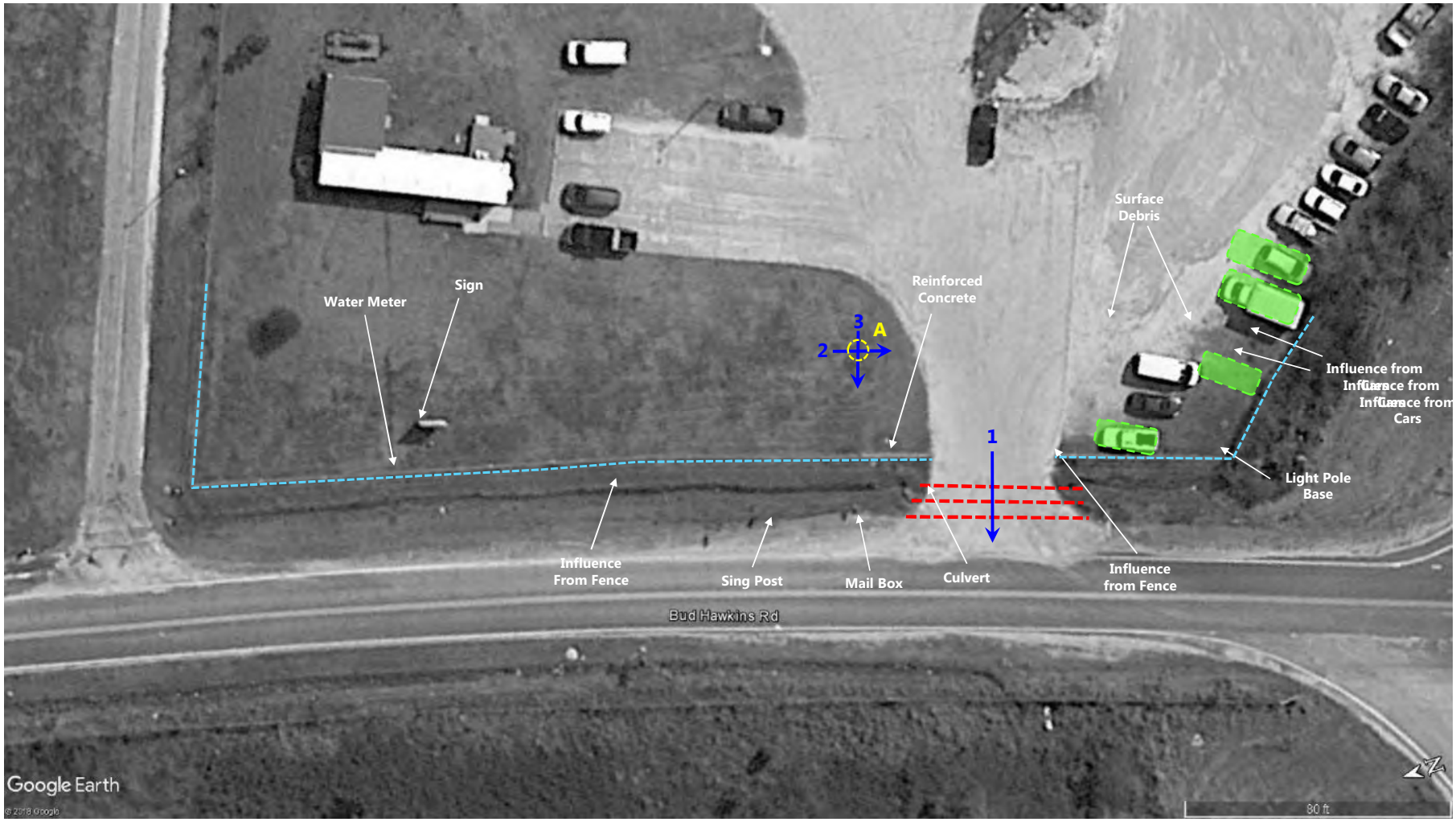
SCALE: AS SHOWN

DATE: 10/29/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **6**

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



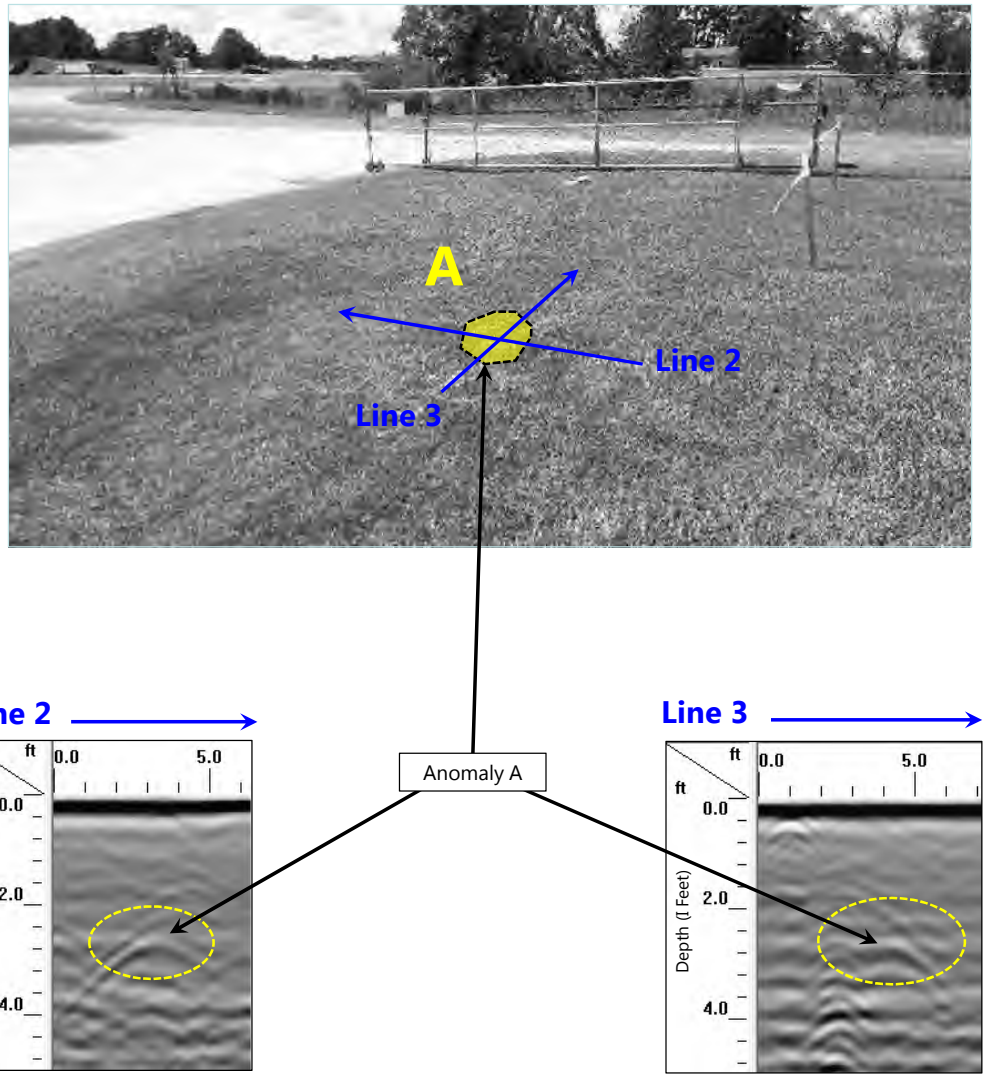
LEGEND

- Approximate Location of TDEM Anomaly
- Approximate Location of Fence
- Approximate Location of Possible Utilities
- Approximate Location of GPR Profile
- Approximate Location of Vehicle

GEOPHYSICAL ANOMALY LOCATION PLAN

NCDOT PROJECT: I-5986B
PARCEL 21 – (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	AS SHOWN
DATE:	10/29/2018
PROJECT NUMBER	4305-18-175
FIGURE NO.	7



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

EXAMPLE GPR DATA – LINES 2 AND 3

NCDOT PROJECT: I-5986B
PARCEL 21 – (PAUL WILLIAMS TRUCKING)
2981 BUD HAWKINS ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/29/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **8**

Appendix I – Photographs

Date: 10/2/2018

Photographer: JTH

1	**Location / Orientation**	View of site looking east
	Remarks	None

Date: 10/2/2018

Photographer: JTH

2	**Location / Orientation**	View of site looking north.
	Remarks	None

Date: 10/2/2018

Photographer: JTH

3	**Location / Orientation**	View of TW-1 at soil boring B-2.
	Remarks	None

Appendix II – Boring Logs

PROJECT:	**NCDOT I-5986B** Parcel 21-2981 Bud Hawkins Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-1**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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, Fine,			0.7	No				
					1.2	Yes				
5										
					1.5	Yes				
		Sand, Tan, Orange, Medium, Wet,	▼							
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 21-2981 Bud Hawkins Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-2/TW-1**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	4.9
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, Brown, Fine,			1.6	No				
					1.9	Yes				
5			▼							
					2.1	Yes				
		Sand, Tan, Orange, Medium, Wet,								
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 21-2981 Bud Hawkins Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-3**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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, Fine,			1.3	No				
					2.2	Yes				
5			▼		7.7	Yes				
		Sand, Orange, Medium, Wet,								
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 21-2981 Bud Hawkins Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-4**
DATE DRILLED:	Tuesday, October 02, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	WATER LEVEL:	6
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, Fine,			0.3	No				
					1.2	Yes				
5			▼		0.8	Yes				
		Sand, Tan, Medium, Wet,								
10		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Tuesday, October 02, 2018
Samples extracted Tuesday, October 02, 2018
Samples analysed Tuesday, October 02, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 21 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 21 B-1 (2'-4')	23.2	<0.58	<0.58	<0.58	<0.58	<0.12	<0.19	<0.023	0	0	0	PHC not detected
s	PARCEL 21 B-1 (4'-6')	25.2	<0.63	<0.63	<0.63	<0.63	<0.13	<0.2	<0.025	0	0	0	PHC not detected
s	PARCEL 21 B-2 (2'-4')	19.0	<0.47	<0.47	<0.47	<0.47	<0.09	<0.15	<0.019	0	0	0	PHC not detected
s	PARCEL 21 B-2 (4'-6')	22.2	<0.56	<0.56	<0.56	<0.56	<0.11	<0.18	<0.022	0	0	0	PHC not detected
s	PARCEL 21 B-3 (2'-4')	17.3	<0.43	<0.43	<0.43	<0.43	<0.09	<0.14	<0.017	0	0	0	PHC not detected
s	PARCEL 21 B-3 (4'-6')	9.8	<0.24	<0.24	<0.24	<0.24	<0.05	<0.08	<0.01	0	0	0	,(FCM)
s	PARCEL 21 B-4 (2'-4')	12.3	<0.31	<0.31	<0.31	<0.31	<0.06	<0.1	<0.012	0	0	0	,(FCM)
s	PARCEL 21 B-4 (4'-6')	7.5	<0.19	<0.19	<0.19	<0.19	<0.04	<0.06	<0.007	0	0	0	,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 104 %

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.

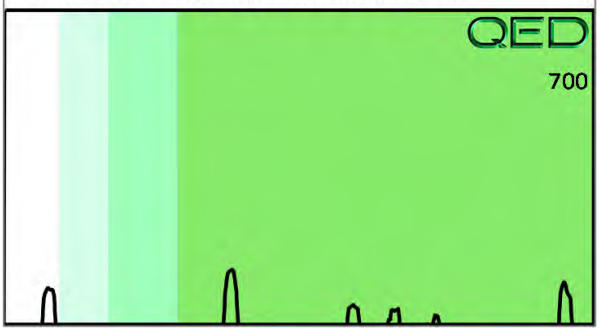
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

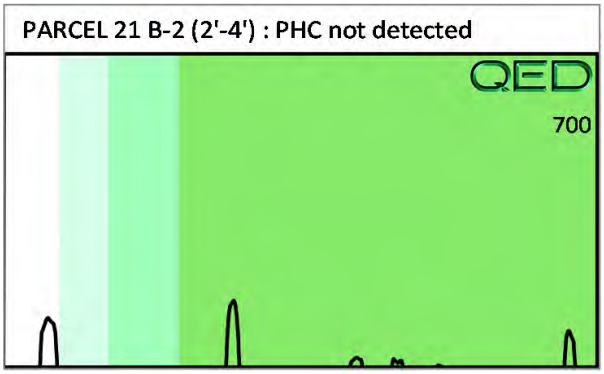
Project: PARCEL 21 - PROJ 4305-18-175 ##################

PARCEL 21 B-1 (2'-4') : PHC not detected

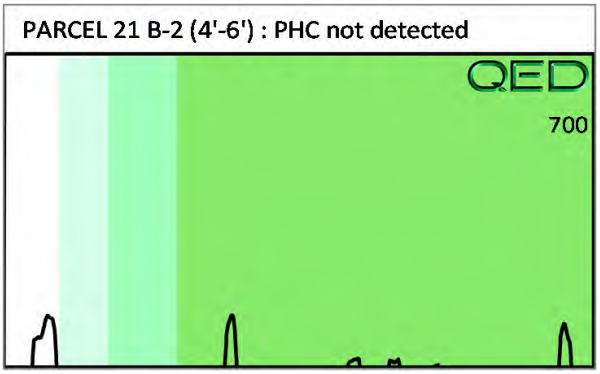
PARCEL 21 B-1 (4'-6') : PHC not detected



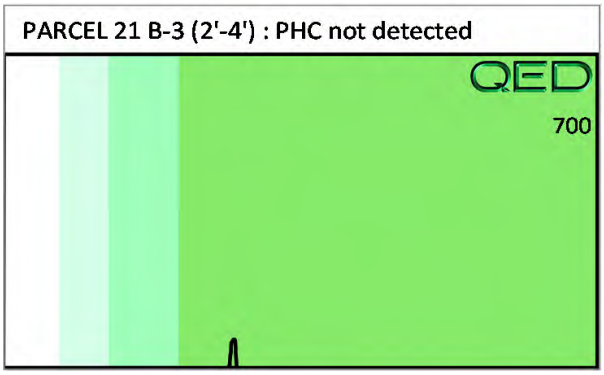
PARCEL 21 B-2 (2'-4') : PHC not detected



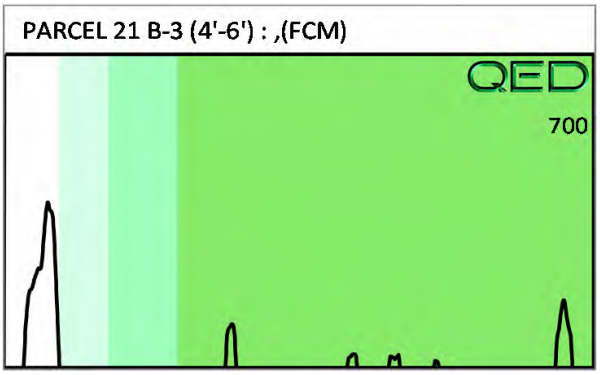
PARCEL 21 B-2 (4'-6') : PHC not detected



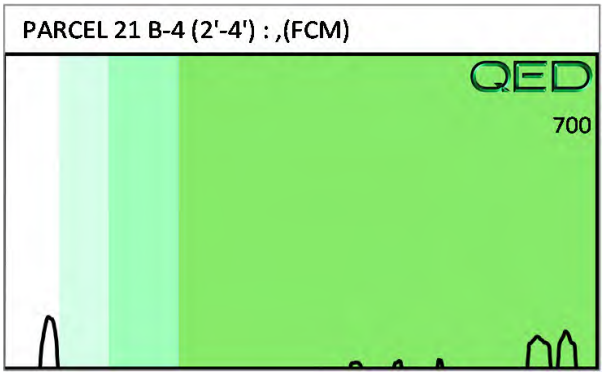
PARCEL 21 B-3 (2'-4') : PHC not detected



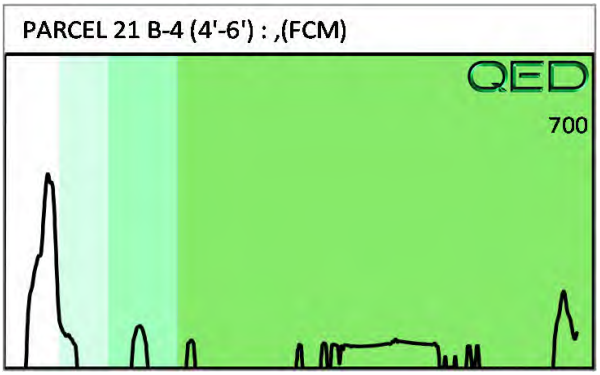
PARCEL 21 B-3 (4'-6') : ,(FCM)



PARCEL 21 B-4 (2'-4') : ,(FCM)



PARCEL 21 B-4 (4'-6') : ,(FCM)



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

October 12, 2018

Michael Pfeifer
S&ME, Inc - Raleigh, NC
3201 Spring Forest Rd.
Raleigh, NC 27616

Project Location: NCDOT I5986B- Parcel 21
Client Job Number:
Project Number: 4305-18-175
Laboratory Work Order Number: 18J0298

Enclosed are results of analyses for samples received by the laboratory on October 4, 2018. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kerry K. McGee
Project Manager

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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: Michael Pfeifer

REPORT DATE: 10/12/2018

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 4305-18-175

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 18J0298

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

PROJECT LOCATION: NCDOT I5986B- Parcel 21

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
TW-1 Parcel 21	18J0298-01	Ground Water		SW-846 8260B SW-846 8270D	

con-test® ANALYTICAL LABORATORY
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EXECUTIVE SUMMARY

Client ID: **TW-1 Parcel 21**

Lab ID: **18J0298-01**

No Results Detected

con-test® ANALYTICAL LABORATORY

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

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.

SW-846 8260B

Qualifications:

L-04

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:

Vinyl Acetate

B214298-BLK1, B214298-BS1, B214298-BSD1

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: NCDOT I5986B- Parcel 21 Sample Description: Work Order: 18J0298

Date Received: 10/4/2018

Field Sample #: TW-1 Parcel 21 Sampled: 10/2/2018 17:00

Sample ID: 18J0298-01

Sample Matrix: Ground Water

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	50	9.7	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Acrylonitrile	ND	5.0	0.58	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
tert-Amyl Methyl Ether (TAME)	ND	0.50	0.11	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Benzene	ND	1.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Bromobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Bromochloromethane	ND	1.0	0.22	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Bromodichloromethane	ND	0.50	0.30	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Bromoform	ND	2.0	0.21	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Bromomethane	ND	2.0	0.94	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
2-Butanone (MEK)	ND	20	2.4	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
tert-Butyl Alcohol (TBA)	ND	20	2.2	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
n-Butylbenzene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
sec-Butylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
tert-Butylbenzene	ND	1.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
tert-Butyl Ethyl Ether (TBEE)	ND	0.50	0.095	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Carbon Disulfide	ND	4.0	1.0	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Carbon Tetrachloride	ND	5.0	0.25	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Chlorobenzene	ND	1.0	0.16	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Chlorodibromomethane	ND	0.50	0.10	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Chloroethane	ND	2.0	0.28	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Chloroform	ND	2.0	0.22	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Chloromethane	ND	2.0	0.55	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
2-Chlorotoluene	ND	1.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
4-Chlorotoluene	ND	1.0	0.14	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2-Dibromo-3-chloropropane (DBCP)	ND	5.0	0.37	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2-Dibromoethane (EDB)	ND	0.50	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Dibromomethane	ND	1.0	0.16	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2-Dichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,3-Dichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,4-Dichlorobenzene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
trans-1,4-Dichloro-2-butene	ND	2.0	0.31	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Dichlorodifluoromethane (Freon 12)	ND	2.0	0.28	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1-Dichloroethane	ND	1.0	0.16	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2-Dichloroethane	ND	1.0	0.19	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1-Dichloroethylene	ND	1.0	0.21	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
cis-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
trans-1,2-Dichloroethylene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2-Dichloropropane	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,3-Dichloropropane	ND	0.50	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
2,2-Dichloropropane	ND	1.0	0.21	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1-Dichloropropene	ND	2.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
cis-1,3-Dichloropropene	ND	0.50	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
trans-1,3-Dichloropropene	ND	0.50	0.11	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Diethyl Ether	ND	2.0	0.22	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH

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

Project Location: NCDOT I5986B- Parcel 21 Sample Description: Work Order: 18J0298

Date Received: 10/4/2018

Field Sample #: TW-1 Parcel 21 Sampled: 10/2/2018 17:00

Sample ID: 18J0298-01

Sample Matrix: Ground Water

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	0.50	0.18	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,4-Dioxane	ND	50	26	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Ethylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Hexachlorobutadiene	ND	0.60	0.59	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
2-Hexanone (MBK)	ND	10	1.5	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Isopropylbenzene (Cumene)	ND	1.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
p-Isopropyltoluene (p-Cymene)	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Methyl tert-Butyl Ether (MTBE)	ND	1.0	0.090	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Methylene Chloride	ND	5.0	3.2	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
4-Methyl-2-pentanone (MIBK)	ND	10	1.5	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Naphthalene	ND	2.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
n-Propylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Styrene	ND	1.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1,1,2-Tetrachloroethane	ND	1.0	0.12	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1,2,2-Tetrachloroethane	ND	0.50	0.16	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Tetrachloroethylene	ND	1.0	0.27	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Tetrahydrofuran	ND	10	1.1	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Toluene	ND	1.0	0.17	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2,3-Trichlorobenzene	ND	5.0	0.14	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2,4-Trichlorobenzene	ND	1.0	0.19	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,3,5-Trichlorobenzene	ND	1.0	0.17	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1,1-Trichloroethane	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1,2-Trichloroethane	ND	1.0	0.24	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Trichloroethylene	ND	1.0	0.20	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Trichlorofluoromethane (Freon 11)	ND	2.0	0.15	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2,3-Trichloropropane	ND	2.0	0.22	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	1.0	0.20	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,2,4-Trimethylbenzene	ND	1.0	0.18	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
1,3,5-Trimethylbenzene	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
Vinyl Chloride	ND	2.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
m+p Xylene	ND	2.0	0.26	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH
o-Xylene	ND	1.0	0.13	µg/L	1		SW-846 8260B	10/9/18	10/10/18 3:59	EEH

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
1,2-Dichloroethane-d4	80.4	70-130		10/10/18 3:59
Toluene-d8	100	70-130		10/10/18 3:59
4-Bromofluorobenzene	98.0	70-130		10/10/18 3:59

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Project Location: NCDOT I5986B- Parcel 21 Sample Description: Work Order: 18J0298

Date Received: 10/4/2018

Field Sample #: TW-1 Parcel 21 Sampled: 10/2/2018 17:00

Sample ID: 18J0298-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acenaphthene (SIM)	ND	0.30	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Acenaphthylene (SIM)	ND	0.20	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Anthracene (SIM)	ND	0.20	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Benzo(a)anthracene (SIM)	ND	0.050	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Benzo(a)pyrene (SIM)	ND	0.10	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Benzo(b)fluoranthene (SIM)	ND	0.050	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Benzo(g,h,i)perylene (SIM)	ND	0.50	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Benzo(k)fluoranthene (SIM)	ND	0.20	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Chrysene (SIM)	ND	0.20	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Dibenz(a,h)anthracene (SIM)	ND	0.10	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Fluoranthene (SIM)	ND	0.50	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Fluorene (SIM)	ND	1.0	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Indeno(1,2,3-cd)pyrene (SIM)	ND	0.10	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
2-Methylnaphthalene (SIM)	ND	1.0	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Naphthalene (SIM)	ND	1.0	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Phenanthrene (SIM)	ND	0.050	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR
Pyrene (SIM)	ND	1.0	µg/L	1		SW-846 8270D	10/6/18	10/9/18 18:44	IMR

Surrogates	% Recovery	Recovery Limits	Flag/Qual	
Nitrobenzene-d5	65.2	30-130		10/9/18 18:44
2-Fluorobiphenyl	68.0	30-130		10/9/18 18:44
p-Terphenyl-d14	61.6	30-130		10/9/18 18:44

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Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18J0298-01 [TW-1 Parcel 21]	B214298	5	5.00	10/09/18

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
18J0298-01 [TW-1 Parcel 21]	B214244	1000	1.00	10/06/18

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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 B214298 - SW-846 5030B										
Blank (B214298-BLK1)				Prepared: 10/09/18 Analyzed: 10/10/18						
Acetone	ND	50	µg/L							
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							
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 B214298 - SW-846 5030B										
Blank (B214298-BLK1)				Prepared: 10/09/18 Analyzed: 10/10/18						
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	0.50	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							L-04
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	*19.7*		µg/L	25.0		78.9	70-130			
Surrogate: Toluene-d8	*24.6*		µg/L	25.0		98.6	70-130			
Surrogate: 4-Bromofluorobenzene	*24.4*		µg/L	25.0		97.8	70-130			
LCS (B214298-BS1)				Prepared: 10/09/18 Analyzed: 10/10/18						
Acetone	80.9	50	µg/L	100		80.9	70-160			†
Acrylonitrile	9.78	5.0	µg/L	10.0		97.8	70-130			
tert-Amyl Methyl Ether (TAME)	9.61	0.50	µg/L	10.0		96.1	70-130			
Benzene	9.41	1.0	µg/L	10.0		94.1	70-130			
Bromobenzene	10.3	1.0	µg/L	10.0		103	70-130			
Bromochloromethane	10.7	1.0	µg/L	10.0		107	70-130			
Bromodichloromethane	9.52	0.50	µg/L	10.0		95.2	70-130			
Bromoform	10.7	1.0	µg/L	10.0		107	70-130			
Bromomethane	8.50	2.0	µg/L	10.0		85.0	40-160			†
2-Butanone (MEK)	85.4	20	µg/L	100		85.4	40-160			†
tert-Butyl Alcohol (TBA)	87.4	20	µg/L	100		87.4	40-160			†
n-Butylbenzene	10.8	1.0	µg/L	10.0		108	70-130			
sec-Butylbenzene	11.3	1.0	µg/L	10.0		113	70-130			
tert-Butylbenzene	11.2	1.0	µg/L	10.0		112	70-130			
tert-Butyl Ethyl Ether (TBEE)	9.61	0.50	µg/L	10.0		96.1	70-130			
Carbon Disulfide	10.4	4.0	µg/L	10.0		104	70-130			
Carbon Tetrachloride	8.26	5.0	µg/L	10.0		82.6	70-130			
Chlorobenzene	10.5	1.0	µg/L	10.0		105	70-130			
Chlorodibromomethane	10.1	0.50	µg/L	10.0		101	70-130			
Chloroethane	8.88	2.0	µg/L	10.0		88.8	70-130			
Chloroform	8.89	2.0	µg/L	10.0		88.9	70-130			
Chloromethane	9.04	2.0	µg/L	10.0		90.4	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 B214298 - SW-846 5030B										
LCS (B214298-BS1)				Prepared: 10/09/18 Analyzed: 10/10/18						
2-Chlorotoluene	10.6	1.0	µg/L	10.0		106	70-130			
4-Chlorotoluene	10.3	1.0	µg/L	10.0		103	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	9.39	5.0	µg/L	10.0		93.9	70-130			
1,2-Dibromoethane (EDB)	9.90	0.50	µg/L	10.0		99.0	70-130			
Dibromomethane	9.76	1.0	µg/L	10.0		97.6	70-130			
1,2-Dichlorobenzene	10.7	1.0	µg/L	10.0		107	70-130			
1,3-Dichlorobenzene	11.0	1.0	µg/L	10.0		110	70-130			
1,4-Dichlorobenzene	10.5	1.0	µg/L	10.0		105	70-130			
trans-1,4-Dichloro-2-butene	9.07	2.0	µg/L	10.0		90.7	70-130			
Dichlorodifluoromethane (Freon 12)	7.05	2.0	µg/L	10.0		70.5	40-160			†
1,1-Dichloroethane	10.1	1.0	µg/L	10.0		101	70-130			
1,2-Dichloroethane	8.59	1.0	µg/L	10.0		85.9	70-130			
1,1-Dichloroethylene	8.84	1.0	µg/L	10.0		88.4	70-130			
cis-1,2-Dichloroethylene	9.21	1.0	µg/L	10.0		92.1	70-130			
trans-1,2-Dichloroethylene	9.92	1.0	µg/L	10.0		99.2	70-130			
1,2-Dichloropropane	11.1	1.0	µg/L	10.0		111	70-130			
1,3-Dichloropropane	9.53	0.50	µg/L	10.0		95.3	70-130			
2,2-Dichloropropane	8.50	1.0	µg/L	10.0		85.0	40-130			†
1,1-Dichloropropene	9.18	2.0	µg/L	10.0		91.8	70-130			
cis-1,3-Dichloropropene	10.2	0.50	µg/L	10.0		102	70-130			
trans-1,3-Dichloropropene	10.2	0.50	µg/L	10.0		102	70-130			
Diethyl Ether	9.82	2.0	µg/L	10.0		98.2	70-130			
Diisopropyl Ether (DIPE)	9.57	0.50	µg/L	10.0		95.7	70-130			
1,4-Dioxane	93.6	50	µg/L	100		93.6	40-130			†
Ethylbenzene	10.8	1.0	µg/L	10.0		108	70-130			
Hexachlorobutadiene	12.4	0.60	µg/L	10.0		124	70-130			
2-Hexanone (MBK)	92.2	10	µg/L	100		92.2	70-160			†
Isopropylbenzene (Cumene)	11.4	1.0	µg/L	10.0		114	70-130			
p-Isopropyltoluene (p-Cymene)	11.2	1.0	µg/L	10.0		112	70-130			
Methyl tert-Butyl Ether (MTBE)	9.43	1.0	µg/L	10.0		94.3	70-130			
Methylene Chloride	8.74	5.0	µg/L	10.0		87.4	70-130			
4-Methyl-2-pentanone (MIBK)	94.2	10	µg/L	100		94.2	70-160			†
Naphthalene	10.4	2.0	µg/L	10.0		104	40-130			†
n-Propylbenzene	10.3	1.0	µg/L	10.0		103	70-130			
Styrene	10.8	1.0	µg/L	10.0		108	70-130			
1,1,1,2-Tetrachloroethane	11.2	1.0	µg/L	10.0		112	70-130			
1,1,2,2-Tetrachloroethane	10.6	0.50	µg/L	10.0		106	70-130			
Tetrachloroethylene	10.6	0.50	µg/L	10.0		106	70-130			
Tetrahydrofuran	9.11	10	µg/L	10.0		91.1	70-130			J
Toluene	10.4	1.0	µg/L	10.0		104	70-130			
1,2,3-Trichlorobenzene	10.6	5.0	µg/L	10.0		106	70-130			
1,2,4-Trichlorobenzene	10.8	1.0	µg/L	10.0		108	70-130			
1,3,5-Trichlorobenzene	11.1	1.0	µg/L	10.0		111	70-130			
1,1,1-Trichloroethane	8.88	1.0	µg/L	10.0		88.8	70-130			
1,1,2-Trichloroethane	10.5	1.0	µg/L	10.0		105	70-130			
Trichloroethylene	10.3	1.0	µg/L	10.0		103	70-130			
Trichlorofluoromethane (Freon 11)	7.72	2.0	µg/L	10.0		77.2	70-130			
1,2,3-Trichloropropane	9.81	2.0	µg/L	10.0		98.1	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.58	1.0	µg/L	10.0		95.8	70-130			
1,2,4-Trimethylbenzene	10.5	1.0	µg/L	10.0		105	70-130			
1,3,5-Trimethylbenzene	10.5	1.0	µg/L	10.0		105	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 B214298 - SW-846 5030B												
LCS (B214298-BS1)				Prepared: 10/09/18 Analyzed: 10/10/18								
Vinyl Acetate	60.7	20	µg/L	100		**60.7**	*	70-130			L-04	
Vinyl Chloride	8.89	2.0	µg/L	10.0		88.9		40-160				†
m+p Xylene	21.0	2.0	µg/L	20.0		105		70-130				
o-Xylene	10.6	1.0	µg/L	10.0		106		70-130				
Surrogate: 1,2-Dichloroethane-d4	*19.7*		µg/L	25.0		78.6		70-130				
Surrogate: Toluene-d8	*24.9*		µg/L	25.0		99.5		70-130				
Surrogate: 4-Bromofluorobenzene	*24.4*		µg/L	25.0		97.6		70-130				
LCS Dup (B214298-BSD1)				Prepared: 10/09/18 Analyzed: 10/10/18								
Acetone	103	50	µg/L	100		103		70-160	23.8	25		†
Acrylonitrile	9.74	5.0	µg/L	10.0		97.4		70-130	0.410	25		
tert-Amyl Methyl Ether (TAME)	9.63	0.50	µg/L	10.0		96.3		70-130	0.208	25		
Benzene	9.53	1.0	µg/L	10.0		95.3		70-130	1.27	25		
Bromobenzene	10.2	1.0	µg/L	10.0		102		70-130	0.973	25		
Bromochloromethane	10.7	1.0	µg/L	10.0		107		70-130	0.373	25		
Bromodichloromethane	9.34	0.50	µg/L	10.0		93.4		70-130	1.91	25		
Bromoform	10.8	1.0	µg/L	10.0		108		70-130	0.747	25		
Bromomethane	9.41	2.0	µg/L	10.0		94.1		40-160	10.2	25		†
2-Butanone (MEK)	94.8	20	µg/L	100		94.8		40-160	10.4	25		†
tert-Butyl Alcohol (TBA)	89.8	20	µg/L	100		89.8		40-160	2.72	25		†
n-Butylbenzene	10.9	1.0	µg/L	10.0		109		70-130	0.277	25		
sec-Butylbenzene	11.0	1.0	µg/L	10.0		110		70-130	2.15	25		
tert-Butylbenzene	11.1	1.0	µg/L	10.0		111		70-130	1.26	25		
tert-Butyl Ethyl Ether (TBEE)	9.46	0.50	µg/L	10.0		94.6		70-130	1.57	25		
Carbon Disulfide	9.77	4.0	µg/L	10.0		97.7		70-130	6.53	25		
Carbon Tetrachloride	8.35	5.0	µg/L	10.0		83.5		70-130	1.08	25		
Chlorobenzene	10.4	1.0	µg/L	10.0		104		70-130	0.575	25		
Chlorodibromomethane	10.1	0.50	µg/L	10.0		101		70-130	0.00	25		
Chloroethane	8.46	2.0	µg/L	10.0		84.6		70-130	4.84	25		
Chloroform	8.98	2.0	µg/L	10.0		89.8		70-130	1.01	25		
Chloromethane	9.05	2.0	µg/L	10.0		90.5		40-160	0.111	25		†
2-Chlorotoluene	9.97	1.0	µg/L	10.0		99.7		70-130	5.65	25		
4-Chlorotoluene	9.89	1.0	µg/L	10.0		98.9		70-130	3.96	25		
1,2-Dibromo-3-chloropropane (DBCP)	9.73	5.0	µg/L	10.0		97.3		70-130	3.56	25		
1,2-Dibromoethane (EDB)	10.2	0.50	µg/L	10.0		102		70-130	2.49	25		
Dibromomethane	10.0	1.0	µg/L	10.0		100		70-130	2.53	25		
1,2-Dichlorobenzene	10.6	1.0	µg/L	10.0		106		70-130	1.41	25		
1,3-Dichlorobenzene	10.9	1.0	µg/L	10.0		109		70-130	0.914	25		
1,4-Dichlorobenzene	10.1	1.0	µg/L	10.0		101		70-130	4.07	25		
trans-1,4-Dichloro-2-butene	9.25	2.0	µg/L	10.0		92.5		70-130	1.97	25		
Dichlorodifluoromethane (Freon 12)	6.84	2.0	µg/L	10.0		68.4		40-160	3.02	25		†
1,1-Dichloroethane	9.65	1.0	µg/L	10.0		96.5		70-130	4.26	25		
1,2-Dichloroethane	8.46	1.0	µg/L	10.0		84.6		70-130	1.52	25		
1,1-Dichloroethylene	8.82	1.0	µg/L	10.0		88.2		70-130	0.227	25		
cis-1,2-Dichloroethylene	8.90	1.0	µg/L	10.0		89.0		70-130	3.42	25		
trans-1,2-Dichloroethylene	9.80	1.0	µg/L	10.0		98.0		70-130	1.22	25		
1,2-Dichloropropane	11.2	1.0	µg/L	10.0		112		70-130	0.809	25		
1,3-Dichloropropane	9.64	0.50	µg/L	10.0		96.4		70-130	1.15	25		
2,2-Dichloropropane	8.04	1.0	µg/L	10.0		80.4		40-130	5.56	25		†
1,1-Dichloropropene	8.96	2.0	µg/L	10.0		89.6		70-130	2.43	25		
cis-1,3-Dichloropropene	10.2	0.50	µg/L	10.0		102		70-130	0.589	25		
trans-1,3-Dichloropropene	9.82	0.50	µg/L	10.0		98.2		70-130	3.70	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 B214298 - SW-846 5030B												
LCS Dup (B214298-BSD1)				Prepared: 10/09/18 Analyzed: 10/10/18								
Diethyl Ether	9.94	2.0	µg/L	10.0		99.4		70-130	1.21	25		
Diisopropyl Ether (DIPE)	9.44	0.50	µg/L	10.0		94.4		70-130	1.37	25		
1,4-Dioxane	99.5	50	µg/L	100		99.5		40-130	6.08	50		† ‡
Ethylbenzene	10.6	1.0	µg/L	10.0		106		70-130	2.24	25		
Hexachlorobutadiene	12.2	0.60	µg/L	10.0		122		70-130	2.19	25		
2-Hexanone (MBK)	95.5	10	µg/L	100		95.5		70-160	3.57	25		†
Isopropylbenzene (Cumene)	11.2	1.0	µg/L	10.0		112		70-130	1.94	25		
p-Isopropyltoluene (p-Cymene)	11.1	1.0	µg/L	10.0		111		70-130	0.810	25		
Methyl tert-Butyl Ether (MTBE)	9.61	1.0	µg/L	10.0		96.1		70-130	1.89	25		
Methylene Chloride	9.05	5.0	µg/L	10.0		90.5		70-130	3.49	25		
4-Methyl-2-pentanone (MIBK)	96.0	10	µg/L	100		96.0		70-160	1.93	25		†
Naphthalene	10.4	2.0	µg/L	10.0		104		40-130	0.193	25		†
n-Propylbenzene	10.1	1.0	µg/L	10.0		101		70-130	1.86	25		
Styrene	11.0	1.0	µg/L	10.0		110		70-130	2.02	25		
1,1,1,2-Tetrachloroethane	10.9	1.0	µg/L	10.0		109		70-130	3.08	25		
1,1,2,2-Tetrachloroethane	10.6	0.50	µg/L	10.0		106		70-130	0.472	25		
Tetrachloroethylene	11.1	0.50	µg/L	10.0		111		70-130	4.25	25		
Tetrahydrofuran	9.51	10	µg/L	10.0		95.1		70-130	4.30	25	J	
Toluene	10.2	1.0	µg/L	10.0		102		70-130	1.46	25		
1,2,3-Trichlorobenzene	10.7	5.0	µg/L	10.0		107		70-130	0.564	25		
1,2,4-Trichlorobenzene	10.7	1.0	µg/L	10.0		107		70-130	1.03	25		
1,3,5-Trichlorobenzene	10.9	1.0	µg/L	10.0		109		70-130	1.36	25		
1,1,1-Trichloroethane	8.69	1.0	µg/L	10.0		86.9		70-130	2.16	25		
1,1,2-Trichloroethane	10.3	1.0	µg/L	10.0		103		70-130	2.12	25		
Trichloroethylene	10.1	1.0	µg/L	10.0		101		70-130	1.87	25		
Trichlorofluoromethane (Freon 11)	7.53	2.0	µg/L	10.0		75.3		70-130	2.49	25		
1,2,3-Trichloropropane	9.66	2.0	µg/L	10.0		96.6		70-130	1.54	25		
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	9.42	1.0	µg/L	10.0		94.2		70-130	1.68	25		
1,2,4-Trimethylbenzene	10.4	1.0	µg/L	10.0		104		70-130	1.82	25		
1,3,5-Trimethylbenzene	10.2	1.0	µg/L	10.0		102		70-130	2.70	25		
Vinyl Acetate	58.2	20	µg/L	100		**58.2**	*	70-130	4.14	25	L-04	
Vinyl Chloride	8.65	2.0	µg/L	10.0		86.5		40-160	2.74	25		†
m+p Xylene	20.6	2.0	µg/L	20.0		103		70-130	1.68	25		
o-Xylene	10.4	1.0	µg/L	10.0		104		70-130	1.61	25		
Surrogate: 1,2-Dichloroethane-d4	*19.7*		µg/L	25.0		78.8		70-130				
Surrogate: Toluene-d8	*25.1*		µg/L	25.0		100		70-130				
Surrogate: 4-Bromofluorobenzene	*24.5*		µg/L	25.0		98.0		70-130				

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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 B214244 - SW-846 3510C										
Blank (B214244-BLK1)				Prepared: 10/06/18 Analyzed: 10/08/18						
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	*74.2*		µg/L	100		74.2	30-130			
Surrogate: 2-Fluorobiphenyl	*78.7*		µg/L	100		78.7	30-130			
Surrogate: p-Terphenyl-d14	*80.5*		µg/L	100		80.5	30-130			
LCS (B214244-BS1)				Prepared: 10/06/18 Analyzed: 10/08/18						
Acenaphthene (SIM)	39.6	7.5	µg/L	50.0		79.1	40-140			
Acenaphthylene (SIM)	41.0	5.0	µg/L	50.0		82.0	40-140			
Anthracene (SIM)	42.4	5.0	µg/L	50.0		84.9	40-140			
Benzo(a)anthracene (SIM)	40.9	1.2	µg/L	50.0		81.8	40-140			
Benzo(a)pyrene (SIM)	43.4	2.5	µg/L	50.0		86.9	40-140			
Benzo(b)fluoranthene (SIM)	44.4	1.2	µg/L	50.0		88.7	40-140			
Benzo(g,h,i)perylene (SIM)	41.4	12	µg/L	50.0		82.8	40-140			
Benzo(k)fluoranthene (SIM)	42.2	5.0	µg/L	50.0		84.3	40-140			
Chrysene (SIM)	40.3	5.0	µg/L	50.0		80.6	40-140			
Dibenz(a,h)anthracene (SIM)	42.4	2.5	µg/L	50.0		84.9	40-140			
Fluoranthene (SIM)	41.9	12	µg/L	50.0		83.8	40-140			
Fluorene (SIM)	41.0	25	µg/L	50.0		82.1	40-140			
Indeno(1,2,3-cd)pyrene (SIM)	43.0	2.5	µg/L	50.0		86.0	40-140			
2-Methylnaphthalene (SIM)	39.7	25	µg/L	50.0		79.4	40-140			
Naphthalene (SIM)	36.6	25	µg/L	50.0		73.3	40-140			
Phenanthrene (SIM)	40.2	1.2	µg/L	50.0		80.5	40-140			
Pyrene (SIM)	38.7	25	µg/L	50.0		77.4	40-140			
Surrogate: Nitrobenzene-d5	*54.6*		µg/L	100		54.6	30-130			
Surrogate: 2-Fluorobiphenyl	*71.5*		µg/L	100		71.5	30-130			
Surrogate: p-Terphenyl-d14	*57.2*		µg/L	100		57.2	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 B214244 - SW-846 3510C										
LCS Dup (B214244-BSD1)				Prepared: 10/06/18 Analyzed: 10/08/18						
Acenaphthene (SIM)	40.4	7.5	µg/L	50.0		80.8	40-140	2.13	20	
Acenaphthylene (SIM)	41.8	5.0	µg/L	50.0		83.5	40-140	1.81	20	
Anthracene (SIM)	44.0	5.0	µg/L	50.0		88.1	40-140	3.70	20	
Benzo(a)anthracene (SIM)	44.4	1.2	µg/L	50.0		88.8	40-140	8.09	20	
Benzo(a)pyrene (SIM)	45.6	2.5	µg/L	50.0		91.2	40-140	4.88	20	
Benzo(b)fluoranthene (SIM)	46.8	1.2	µg/L	50.0		93.6	40-140	5.43	20	
Benzo(g,h,i)perylene (SIM)	43.6	12	µg/L	50.0		87.3	40-140	5.29	20	
Benzo(k)fluoranthene (SIM)	44.6	5.0	µg/L	50.0		89.2	40-140	5.59	20	
Chrysene (SIM)	42.6	5.0	µg/L	50.0		85.3	40-140	5.73	20	
Dibenz(a,h)anthracene (SIM)	44.9	2.5	µg/L	50.0		89.8	40-140	5.61	20	
Fluoranthene (SIM)	43.3	12	µg/L	50.0		86.6	40-140	3.34	20	
Fluorene (SIM)	41.8	25	µg/L	50.0		83.6	40-140	1.81	20	
Indeno(1,2,3-cd)pyrene (SIM)	45.4	2.5	µg/L	50.0		90.8	40-140	5.37	20	‡
2-Methylnaphthalene (SIM)	40.2	25	µg/L	50.0		80.4	40-140	1.38	20	
Naphthalene (SIM)	37.1	25	µg/L	50.0		74.2	40-140	1.29	20	
Phenanthrene (SIM)	41.8	1.2	µg/L	50.0		83.6	40-140	3.84	20	
Pyrene (SIM)	40.8	25	µg/L	50.0		81.5	40-140	5.10	20	
Surrogate: Nitrobenzene-d5	*54.9*		µg/L	100		54.9	30-130			
Surrogate: 2-Fluorobiphenyl	*71.1*		µg/L	100		71.1	30-130			
Surrogate: p-Terphenyl-d14	*57.9*		µg/L	100		57.9	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.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260B 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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CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
SW-846 8260B 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

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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	02/5/2019
RI	Rhode Island Department of Health	LAO00112	12/30/2018
NC	North Carolina Div. of Water Quality	652	12/31/2018
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	12/14/2018
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

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CHAIN OF CUSTODY RECORD (North Carolina)

39 Spruce Street
East Longmeadow, MA 01028

Page 1 of 1

Company Name:
Address: SAME 3201 Spring Forest Rd Raleigh, NC
Phone: 919 872-2660
Project Name:
Project Location: NCDOT I5986B - Parcel 21
Project Number: 4705-18-175
Project Manager: Mike Pfeifer
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By: Jamie T 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: mpfeifer@smcinc.com
Fax To #:

ANALYSIS REQUESTED

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	Matrix Code	Conc Code	# of Containers	Preservation Code	Container Code	8260	PAHs 8270
1	TW-1 Parcel 21	10-2-18	5:00pm		✓	GW	C				1	1

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:
	10-4-18 / 3:00pm
Received by: (signature)	Date/Time:
	10/5/18 858
Relinquished by: (signature)	Date/Time:
Received by: (signature)	Date/Time:
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

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)

Table of Contents

Sign In

TRACK ANOTHER SHIPMENT

783089843299

Delivered
Friday 10/05/2018 at 8:58 am

DELIVERED

Signed for by: P.BLAKE

GET STATUS UPDATES

OBTAIN PROOF OF DELIVERY

FROM

RALEIGH, NC US

TO

EAST LONGMEADOW, MA US

Travel History | Shipment Facts

10/05/2018 - Friday	8:58 am	Delivered EAST LONGMEADOW, MA

Expand History

10/04/2018 - Thursday	1:52 pm	Shipment information sent to FedEx

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LANGUAGE

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English

FOLLOW FEDEX

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 SME

Received By RAP Date 10/5/18 Time 858

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

Direct from Sampling _____ Ambient _____ Melted Ice _____

By Gun # 557 Actual Temp - 3.9

Were samples within Temperature? 2-6°C T 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? N/A Acid _____ Base _____

Vials	#	Containers:	#		#		#
Unp-		1 Liter Amb.	2	1 Liter Plastic		16 oz Amb.	
HCL-	3	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			

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:

December 14, 2018

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 28-I-95 Tire and Service
918 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175

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. 43-1800583 REV-02 dated August 16, 2018, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its August 20, 2018 Notice to Proceed Letter.

♦ Background/Project Information

Based on NCDOT's July 30, 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
28	Glen and Loyal Colosky	(I-95 Tire and Service) 918 Long Branch Road, Dunn, NC

The PSA included a geophysical survey and subsequent limited soil sampling (five 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 September 12, 2018, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 28. 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 the proposed 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, 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 (Anomaly A and B) were identified in both the TDEM and GPR data sets (**Figures 5 through 7**). Anomaly A is characterized by relatively high TDEM values (greater than about 500 mV) and high amplitude GPR responses located within the upper one foot. Anomaly A is likely related to a buried isolated metallic target. Anomaly B is characterized by relatively high TDEM values (greater than about 500 mV) and high amplitude GPR responses located at about one ft-bgs. Anomaly B is about four feet by four feet in size and likely related to a buried isolated metallic target. Anomalies were also marked in the field using white spray paint. Example GPR profiles are presented in **Figures 8 and 9.**

♦ Soil Sampling

On October 1, 2018, S&ME's drill crew utilized a track mounted Geoprobe® rig to advance five soil borings (B-1 through B-5) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 28. The approximate location of the soil borings are shown in **Figure 2**. A photographic log is included in **Appendix I.** S&ME'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 8 to 10 foot depth interval) were selected from each boring and provided to RED Lab, LLC (Red Lab) for on-site analysis. A total of ten 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.

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-2 and B-5 at the two to four foot depth intervals at concentrations of 0.49 milligrams per kilograms (mg/kg) and 0.96 mg/kg, which are below its North Carolina TPH Action Level of 100 mg/kg. TPH-GRO was reported at boring B-3 at the two to four foot depth interval at a concentration of 0.54 mg/kg, which is 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 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 two buried isolated metallic targets. Anomaly B appears to be approximately four feet by four feet in size. Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site.

S&ME advanced five soil borings (B-1 through B-5) 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-GRO and TPH-DRO were reported in the two to four foot depth interval at three 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 5 feet below ground surface.

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...

Jamie T Honeycutt
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jhoneycutt@smeinc.com

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

NORTH CAROLINA PROFESSIONAL SEAL 18760 ENGINEER THOMAS P. RAYMOND

1/22/2019

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 1 and 2
Figure 9: Example GPR Data-Lines 3 and 4

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

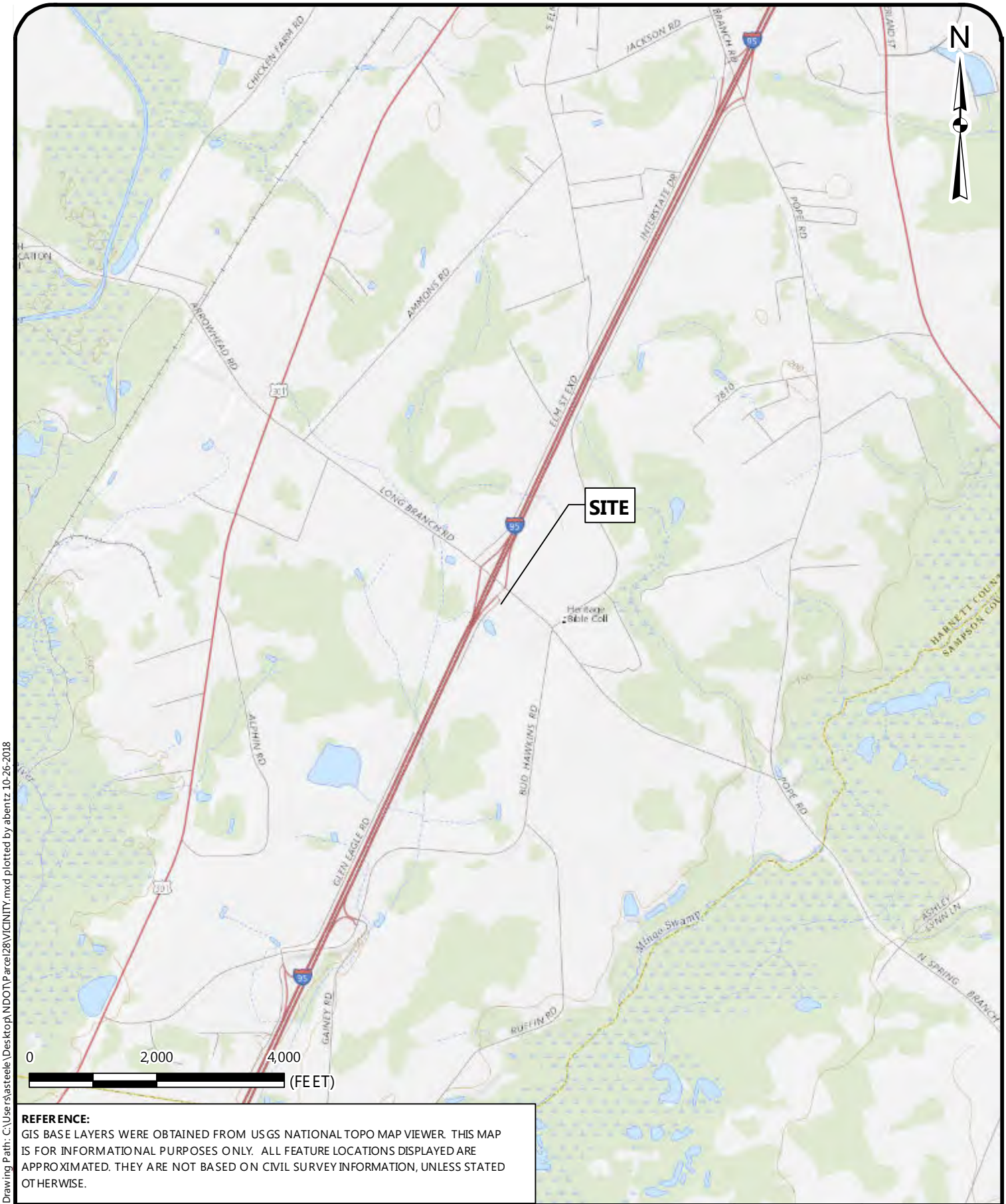
Tables

TABLE 1
SUMMARY OF SOIL SAMPLING RESULTS
NCDOT Project I-5986B
Parcel 28 - (I-95 Tire and Service)
918 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

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
Parcel 28 B-1	10/1/2018	2 to 4	<0.52	<0.52
		8 to10	<0.57	<0.57
Parcel 28 B-2	10/1/2018	2 to 4	<0.49	**0.49**
		8 to10	<0.49	<0.49
Parcel 28 B-3	10/1/2018	2 to 4	**0.54**	<0.22
		8 to10	<0.5	<0.5
Parcel 28 B-4	10/1/2018	2 to 4	<0.31	<0.31
		8 to10	<0.66	<0.66
Parcel 28 B-5	10/1/2018	2 to 4	<0.58	**0.96**
		8 to10	<0.27	<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



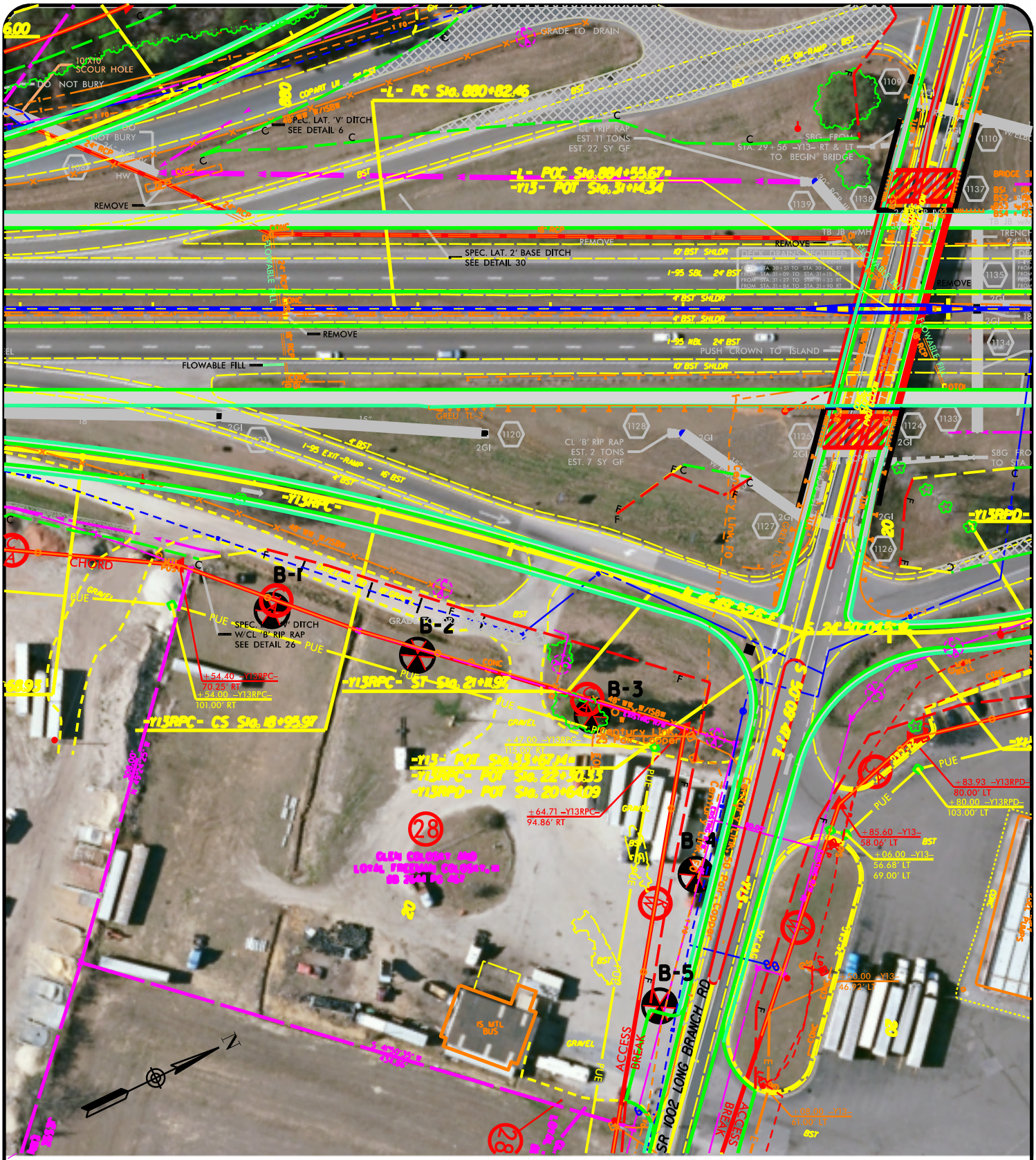
REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: C:\Users\asteele\Desktop\NDOT\Parcel28\VICINITY.mxd plotted by abentz 10-26-2018

VICINITY MAP

NCDOT I-5986B
PARCEL 28 (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	1 " = 2,000 '
DATE:	10-26-18
PROJECT NUMBER	4305-18-175
FIGURE NO.	1



LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

Known Soil Contamination:

Possible Soil Contamination:

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

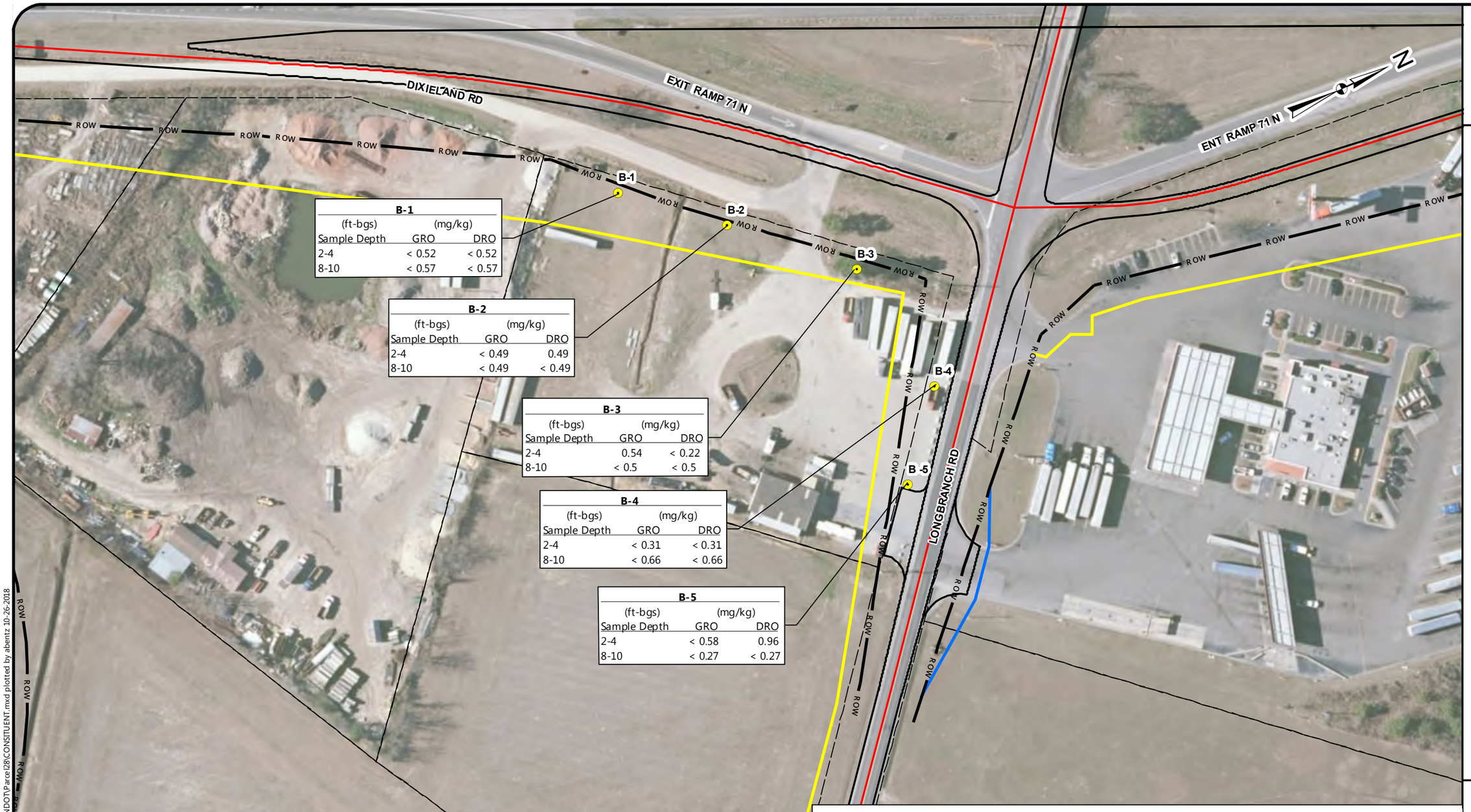
0 100 200

GRAPHIC SCALE (IN FEET)

SITE MAP

NCDOT PROJECT: I-5986B
PARCEL 28 - (I-95 TIRE AND SERVICE)
918 Long Branch Rd., Dunn, Harnett County, NC

SCALE:	FIGURE NO.
1" = 100'	2
DATE:	
DEC. 2018	
PROJECT NUMBER	
4305-18-175	



REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONMAP AERIAL ORTHOIMAGERY LAYER AND HARNETT COUNTY ROAD SHAPEFILE. 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
*Indicates Exceedence of NC TPH Action Levels
ft-bgs : Feet Below Ground Surface

Samples Collected 10-1-2018.

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

- Sample Location
- ROW Proposed Right-of-Way
- Edge of Pavement
- Centerline
- Proposed Permanent Utility Easement
- Proposed Construction Easement
- Tax Parcels

SOIL CONSTITUENT MAP

NCDOT I-5986B
PARCEL 28 (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: 1 " = 100 '

DATE: 10-26-18

PROJECT NUMBER 4305-18-175

FIGURE NO. 3

Drawing Path: C:\Users\asteele\Desktop\NDOT\Parcel28\CONSITUENT.mxd plotted by abentz 10-26-2018

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 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
10/29/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
4

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

TDEM DATA PLOT A

NCDOT PROJECT: I-5986B
PARCEL 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

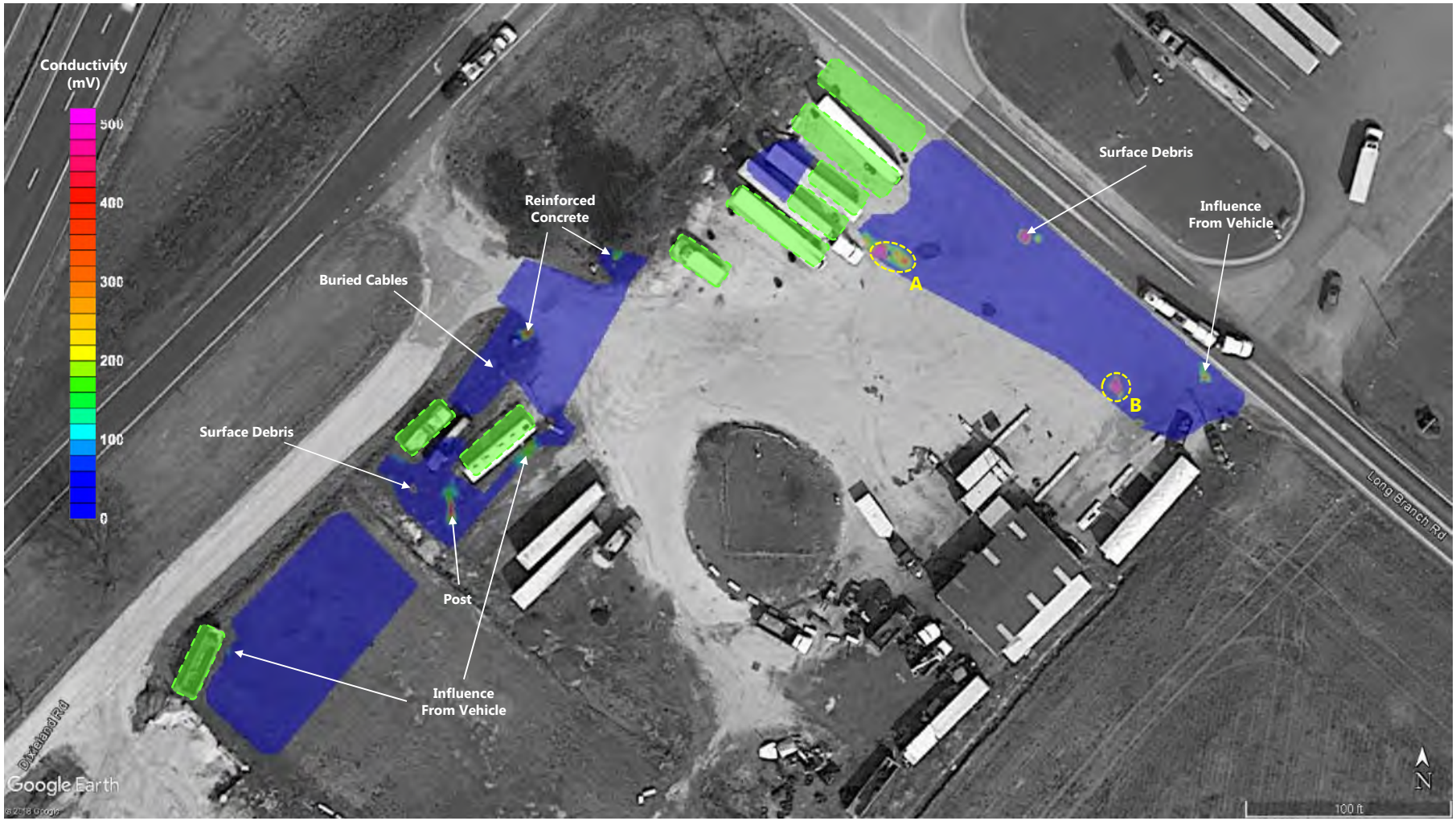
SCALE:
AS SHOWN

DATE:
10/29/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
5

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



LEGEND

Approximate Location of TDEM Anomaly

Approximate Location of Vehicle

TDEM DATA PLOT B

NCDOT PROJECT: I-5986B
PARCEL 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/29/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **6**

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

LEGEND

Approximate Location of TDEM Anomaly

Approximate Location of Vehicle

Approximate Location of GPR Profile

GEOPHYSICAL ANOMALY LOCATION PLAN

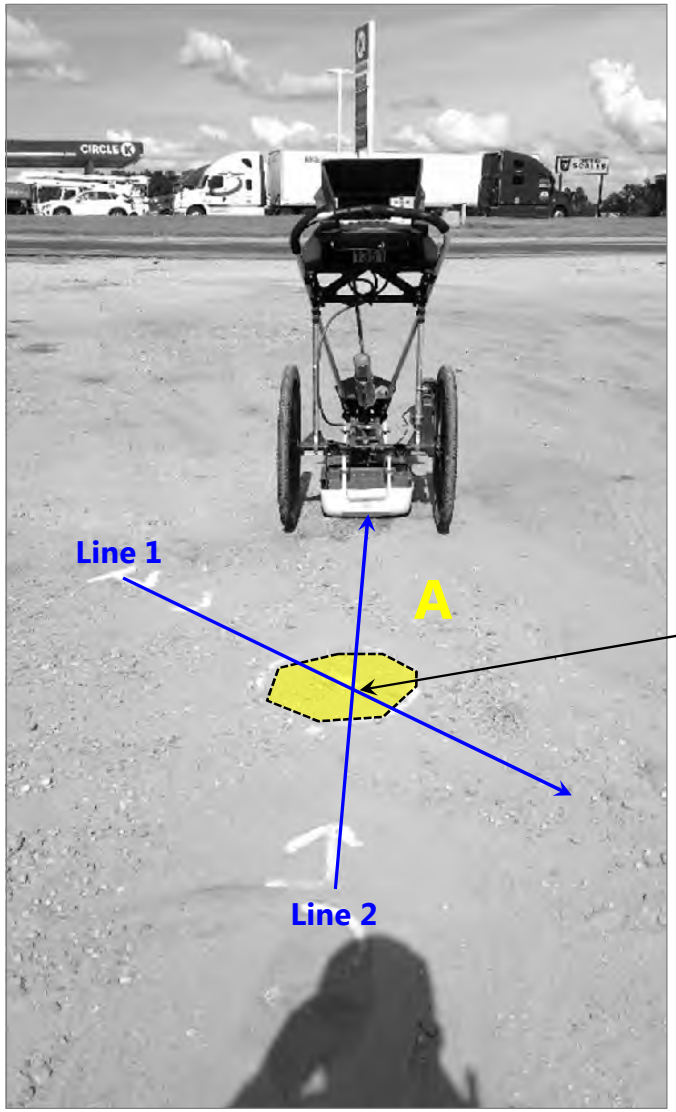
NCDOT PROJECT: I-5986B
PARCEL 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

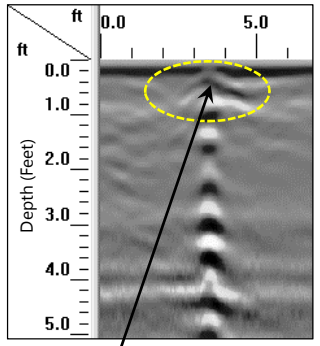
SCALE:
AS SHOWN

DATE:
10/29/2018

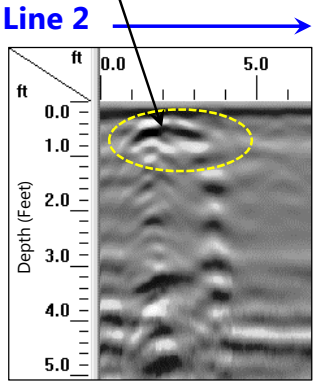
PROJECT NUMBER
4305-18-175

FIGURE NO.
7





Anomaly A



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

EXAMPLE GPR DATA – LINES 1 AND 2

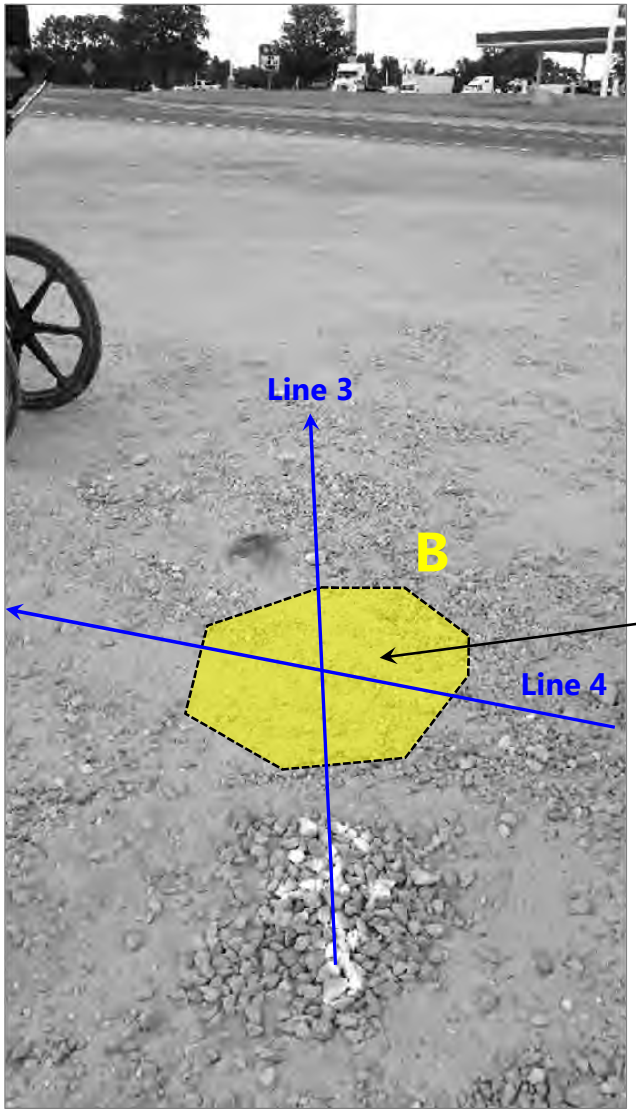
NCDOT PROJECT: I-5986B
PARCEL 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

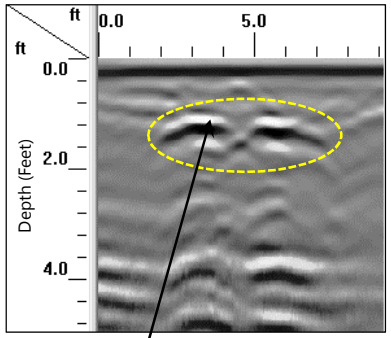
DATE: 10/29/2018

PROJECT NUMBER: 4305-18-175

FIGURE NO.: **8**

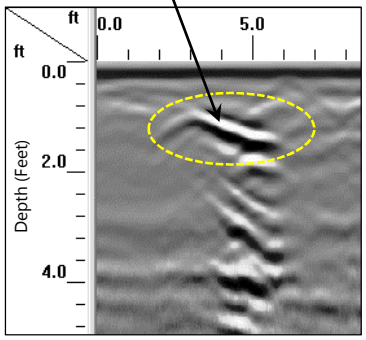


Line 3



Anomaly B

Line 4



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 28 – (I-95 TIRE AND SERVICE)
918 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/29/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **9**

Appendix I – Photographs

Date: 10/1/2018

Photographer: JTH

1	**Location / Orientation**	View of site looking southeast
	Remarks	None

Date: 10/1/2018

Photographer: JTH

2	**Location / Orientation**	View of site looking east.
	Remarks	Note soil boring B-4.

Date: 10/1/2018

Photographer: JTH

3	**Location / Orientation**	View of B-1 looking west.
	Remarks	None

Appendix II – Boring Logs

PROJECT:	**NCDOT I-5986B** Parcel 28-918 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-1**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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 Clay, Orange,			0.9	No				
		Silty Clay, Red,			0.9	Yes				
5					1.4	No				
					1.4	No				
10					0.9	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 28-918 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-2**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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 Clay, Tan, Orange,			0.2	No				
		Silty Clay, Red,			0.2	Yes				
5					0.5	No				
					0.3	No				
10		Boring Terminated at 10 Ft-BGS			0.5	Yes				
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 28-918 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-3**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Tan, Fine,			0.6	No				
		Silty Clay, Orange,			1.3	Yes				
5					1.0	No				
		Silty Clay, Red,			0.8	No				
10					0.8	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 28-918 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-4**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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, Fine,			0.2	No				
					0.5	Yes				
5					0.3	No				
		Silty Clay, Red,			0.6	No				
10					1.0	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 28-918 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-5**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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, Orange, Fine,			0.5	No				
					1.3	Yes				
5					1.2	No				
					1.7	No				
		Silty Clay, Red,								
10					2.0	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Monday, October 01, 2018
Samples extracted Monday, October 01, 2018
Samples analysed Monday, October 01, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 28 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 28 B-1 (2'-4')	20.8	<0.52	<0.52	<0.52	<0.52	<0.1	<0.17	<0.021	0	0	0	PHC not detected
s	PARCEL 28 B-1 (8'-10')	22.6	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	0	0	PHC not detected,(BO)

Initial Calibrator QC check OK

Final FCM QC Check OK 110.4 %

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.

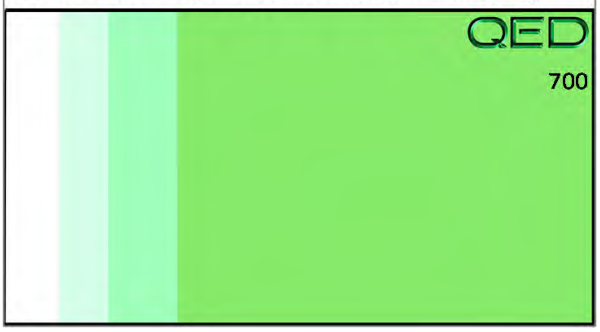
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

Project: PARCEL 28 - PROJ 4305-18-175 ##################

PARCEL 28 B-1 (2'-4') : PHC not detected

PARCEL 28 B-1 (8'-10') : PHC not detected,(BO)



QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Monday, October 01, 2018
Samples extracted Monday, October 01, 2018
Samples analysed Monday, October 01, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 28 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 28 B-4 (2'-4')	12.4	<0.31	<0.31	<0.31	<0.31	<0.06	<0.1	<0.012	0	56.2	43.8	Residual HC
s	PARCEL 28 B-4 (8'-10')	26.3	<0.66	<0.66	<0.66	<0.66	<0.13	<0.21	<0.026	0	34.4	65.6	Residual HC,(BO)
s	PARCEL 28 B-5 (2'-4')	23.0	<0.58	<0.58	0.96	0.96	0.53	<0.18	<0.023	0	78.5	21.5	Deg Fuel 69.9%,(FCM),(P)
s	PARCEL 28 B-5 (8'-10')	10.9	<0.27	<0.27	<0.27	0.24	0.24	<0.09	<0.011	0	71.4	28.6	Residual HC,(BO),(P)
s	PARCEL 28 B-3 (2'-4')	8.7	<0.22	0.54	<0.22	0.54	<0.04	<0.07	<0.009	98.2	0.8	1.1	,(FCM)
s	PARCEL 28 B-3 (8'-10')	20.2	<0.5	<0.5	<0.5	<0.5	<0.1	<0.16	<0.02	0	15.5	84.5	Residual HC,(BO)
s	PARCEL 28 B-2 (2'-4')	19.7	<0.49	<0.49	0.49	0.49	0.37	<0.16	<0.02	0	75.5	24.5	V.Deg.PHC 77%,(FCM)
s	PARCEL 28 B-2 (8'-10')	19.4	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.019	0	0	0	PHC not detected

Initial Calibrator QC check OK

Final FCM QC Check OK 94.3 %

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

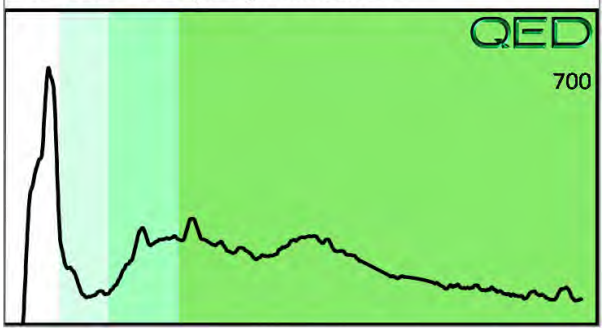
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

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

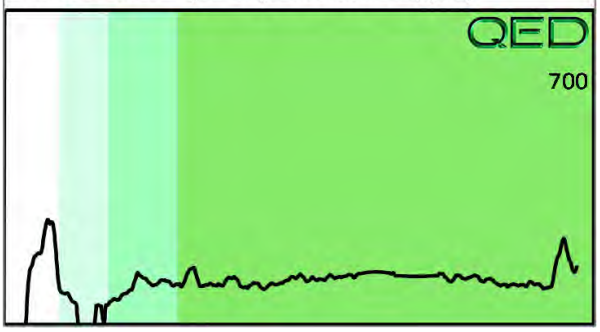
QED Hydrocarbon Fingerprints

Project: PARCEL 28 - PROJ 4305-18-175 ##################

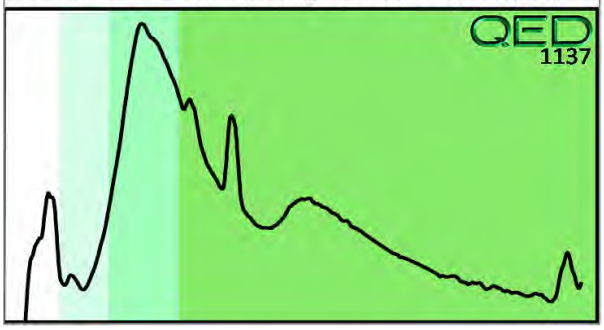
PARCEL 28 B-4 (2'-4') : Residual HC



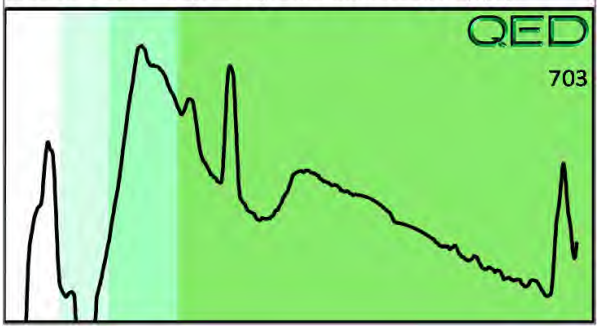
PARCEL 28 B-4 (8'-10') : Residual HC,(BO)



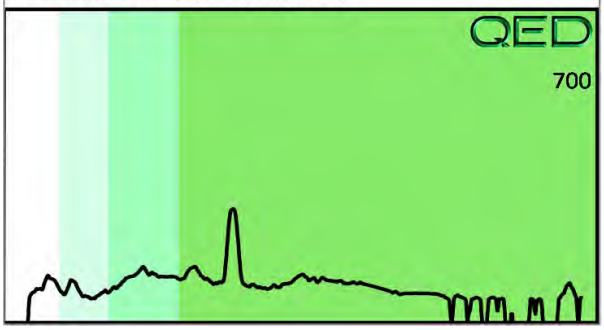
PARCEL 28 B-5 (2'-4') : Deg Fuel 69.9%,(FCM),(P)



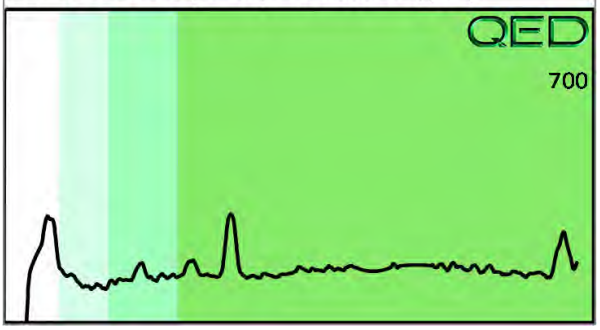
PARCEL 28 B-5 (8'-10') : Residual HC,(BO),(P)



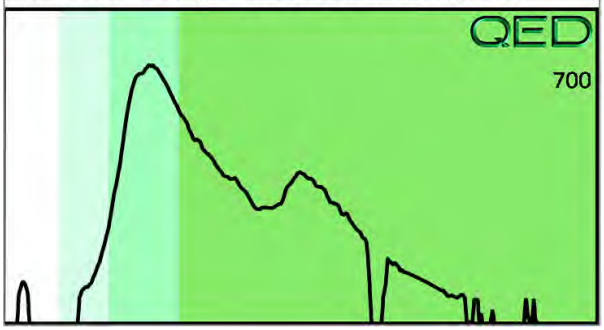
PARCEL 28 B-3 (2'-4') : ,(FCM)



PARCEL 28 B-3 (8'-10') : Residual HC,(BO)



PARCEL 28 B-2 (2'-4') : V.Deg.PHC 77%,(FCM)



PARCEL 28 B-2 (8'-10') : PHC not detected

December 14, 2018

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 29-Circle K/Hardees Truck Stop
873 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project 4305-18-175

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. 43-1800583 REV-02 dated August 16, 2018, and Contract Number 7000018853 dated April 12, 2018 between NCDOT and S&ME, Inc., authorized by NCDOT in its August 20, 2018 Notice to Proceed Letter.

♦ Background/Project Information

Based on NCDOT's July 30, 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
29	Roxy Drive, LLC	(Circle K/Hardees Truck Stop) 873 Long Branch Road, Dunn, NC

The PSA included a geophysical survey and subsequent limited soil sampling (seven 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 September 11 and 12, 2018, S&ME personnel performed a geophysical survey within accessible areas of the proposed ROW/easement at Parcel 29. 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 the proposed 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, heavy 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 19 GPR profiles (Lines 1 through 19) 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, five anomalous features were identified in the geophysical data sets (**Figures 5 through 7**). Anomaly A is an approximate 10 foot linear feature characterized by high amplitude GPR responses at about three ft.-bgs. TDEM responses were not identified over Anomaly A which indicates it may be a buried non-metallic feature possibly related to the nearby water utility. Anomalies B though E are characterized by relatively high TDEM values (greater than about 500 mV) and high amplitude GPR responses located within the upper two feet. The anomalies range from about one to three feet in size and likely related to buried isolated metallic targets/debris. Anomalies were also marked in the field using white spray paint. Example GPR profiles are presented in **Figures 9 through 12**

♦ Soil Sampling

On October 1, 2018, S&ME's drill crew utilized a track mounted Geoprobe® rig to advance seven soil borings (B-1 through B-7) and to collect soil samples within accessible areas of the proposed ROW/easement at Parcel 29. The approximate location of the soil borings are shown in **Figure 2**. A photographic log is included in **Appendix I.** During our field activities, five groundwater monitoring wells, which appear to have been abandoned (filled with grout) were observed within the proposed ROW/easement. The approximate locations of the wells are presented in **Figure 2.** S&ME'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. An additional soil sample (six to eight foot depth interval) was also selected from boring B-7. A total of fifteen 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

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-3 and B-4 at the two to four foot depth intervals at concentrations ranging from 0.23 milligrams per kilograms (mg/kg) to 1.4 mg/kg, which are below its North Carolina TPH Action Level of 100 mg/kg. TPH-GRO was reported at borings B-1 and B-4 at the two to four foot depth interval at a concentration of 1 mg/kg and 0.73 mg/kg, respectively, which is 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 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 five anomalous features (Anomaly A through E). Anomaly A appears to be a non-metallic feature possibly related to the nearby water utility. Anomalies B though E are likely related to buried isolated metallic targets/debris. Responses indicative of a potential UST were not identified in the geophysical data sets collected at the site. Five groundwater monitoring wells were observed within the proposed ROW/easement. However, the monitoring wells appear to have been abandoned by being filled with grout.

S&ME advanced seven soil borings (B-1 through B-7) 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-GRO and TPH-DRO were reported in the two to four foot depth interval at two soil borings and TPH-DRO was reported in the two to four 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 feet below ground surface.

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.

Jamie T Honeycutt
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NORTH CAROLINA PROFESSIONAL SEAL 18760 ENGINEER THOMAS P. RAYMOND

Attachments: 1/22/2019

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 5 and 6
Figure 10: Example GPR Data-Lines 10 and 11
Figure 11: Example GPR Data-Lines 14 and 15
Figure 12: Example GPR Data-Lines 18 and 19

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

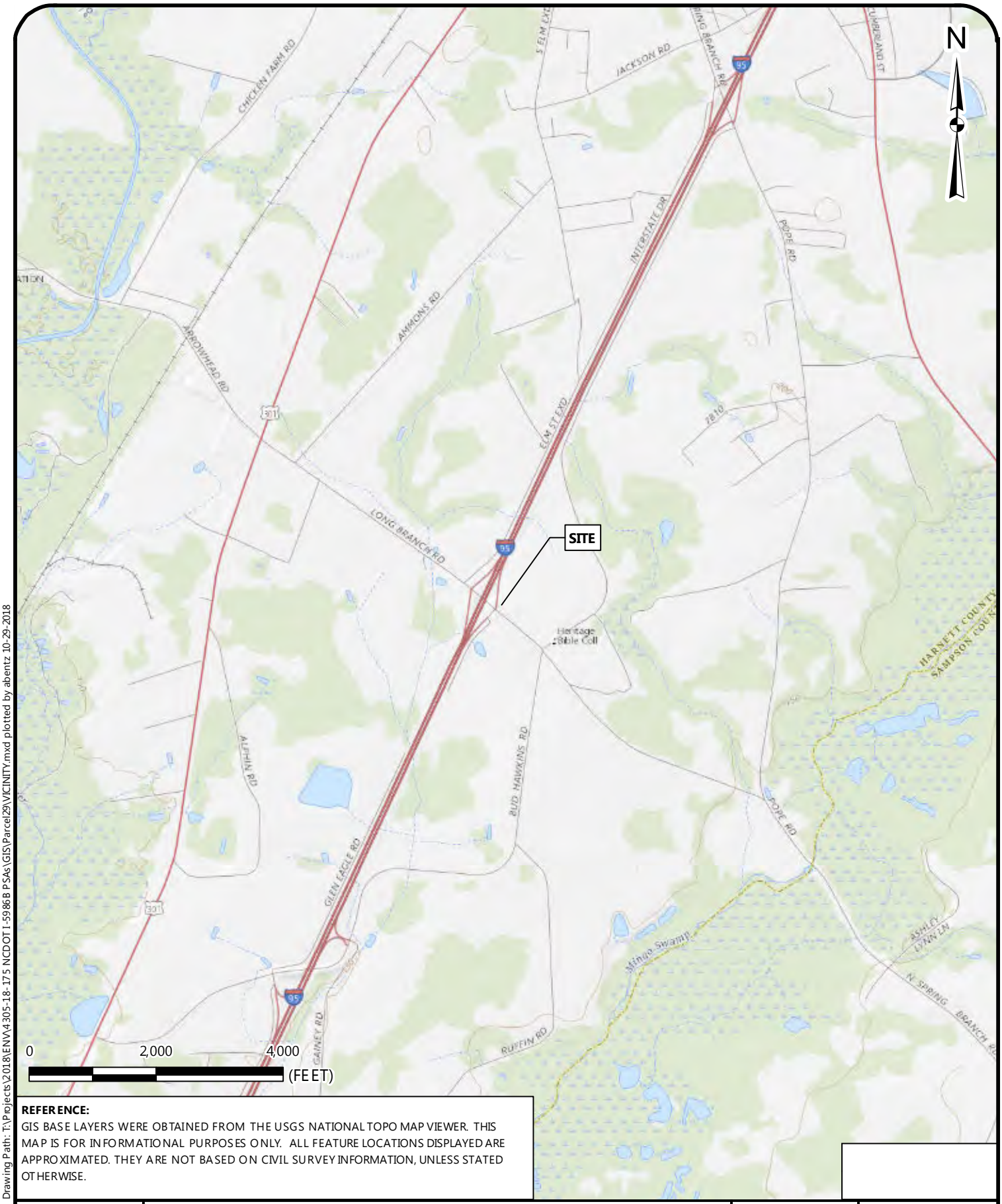
Tables

TABLE 1
SUMMARY OF SOIL SAMPLING RESULTS
NCDOT Project I-5986B
Parcel 29 - (Circle K/Hardees Truck Stop)
873 Long Branch Road
Dunn, Harnett County, North Carolina
S&ME Project No. 4305-18-175

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
Parcel 29 B-1	10/1/2018	2 to 4	**1**	**1.3**
		8 to10	<0.62	<0.62
Parcel 29 B-2	10/1/2018	2 to 4	<0.29	**1.4**
		8 to10	<0.27	<0.27
Parcel 29 B-3	10/1/2018	2 to 4	<0.23	**0.23**
		8 to10	<0.49	<0.49
Parcel 29 B-4	10/1/2018	2 to 4	**0.73**	**0.27**
		8 to10	<0.55	<0.55
Parcel 29 B-5	10/1/2018	2 to 4	<0.28	<0.28
		8 to10	<0.59	<0.59
Parcel 29 B-6	10/1/2018	2 to 4	<0.27	<0.27
		8 to10	<0.62	<0.62
Parcel 29 B-7	10/1/2018	2 to 4	<0.23	<0.23
		6 to 8	<0.28	<0.28
		8 to10	<0.26	<0.26
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



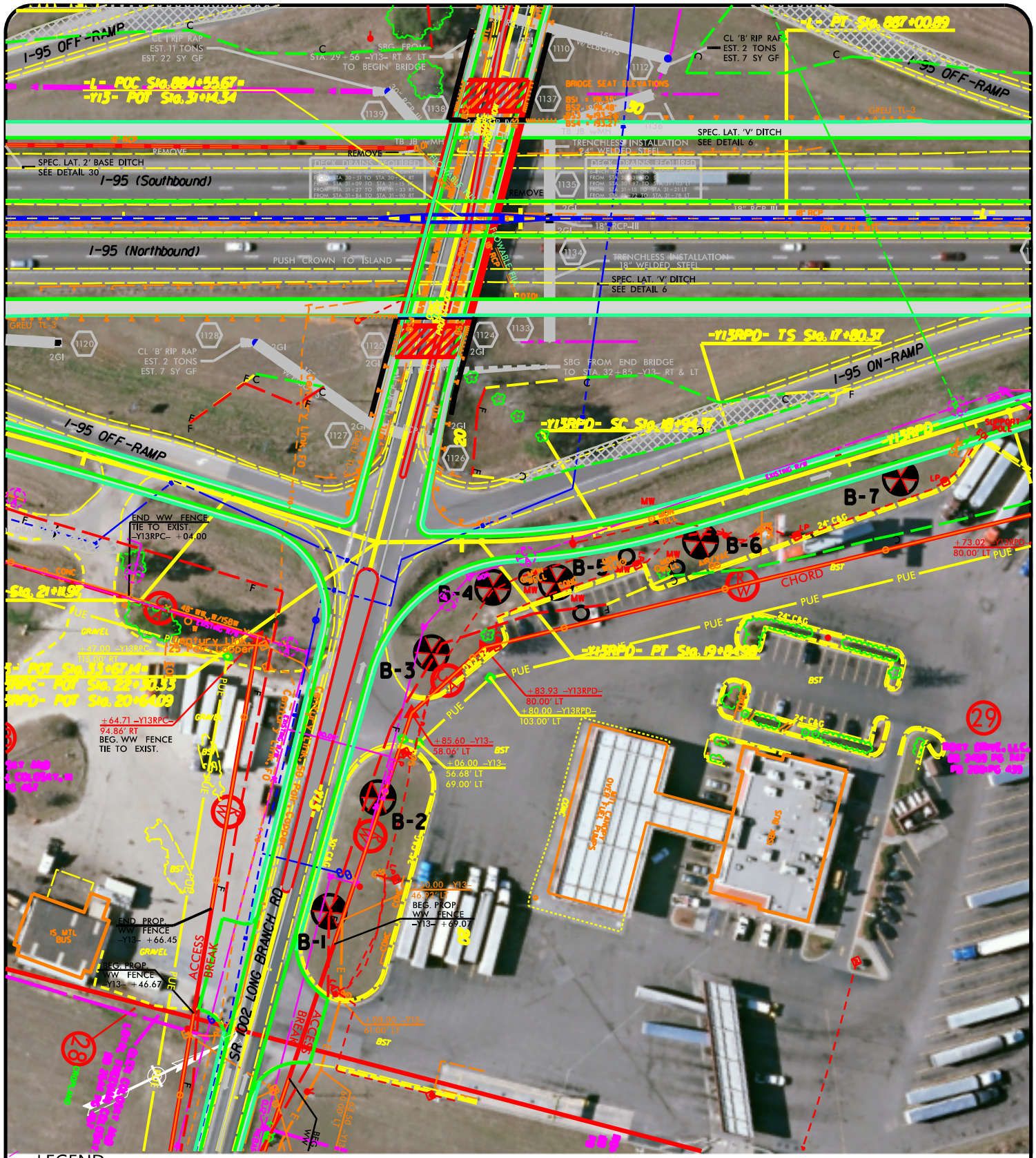
REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE USGS NATIONAL TOPO MAP VIEWER. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: T:\Projects\2018\ENV\4305-18-175 NCDOT I-5986 B PSAs\GIS\Parcel29\VICINITY.mxd plotted by abentz 10-29-2018

VICINITY MAP

NCDOT PROJECT I-5986B
PARCEL 29 (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT CO., NORTH CAROLINA

SCALE:	FIGURE NO.
1 " = 2,000 '	1
DATE: 10-29-18	
PROJECT NUMBER 4305-18-175	



LEGEND

Geoenvironmental Boring:

Underground Storage Tank (UST): UST

TW-1: Temporary Monitor Well Location

Map Source: NCDOT Project I-5986B

Image Source: NC ONEMAP, Dated 2016

Known Soil Contamination:

Possible Soil Contamination:

Abandoned Monitor Well: MW

0 100 200

GRAPHIC SCALE (IN FEET)

SITE MAP

NCDOT PROJECT: I-5986B
PARCEL 29 - (CIRCLE K/HARDEES TRUCK STOP)
873 Long Branch Rd., Dunn, Harnett County, NC

SCALE:	FIGURE NO.
1" = 100'	2
DATE:	
DEC. 2018	
PROJECT NUMBER	
4305-18-175	

SOIL CONSTITUENT MAP

NCDOT PROJECT I-5986B
PARCEL 29 (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

INTERSTATE 95

ENT RAMP 71 N

EXIT RAMP 71 N

DIXIELAND RD

LONGBRANCH RD

ROW

B-5

(ftbgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.28	< 0.28
8-10	< 0.59	< 0.59

B-4

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	0.73	0.27
8-10	< 0.55	< 0.55

B-7

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.23	< 0.23
6-8	< 0.28	< 0.28
8-10	< 0.26	< 0.26

B-6

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.27	< 0.27
8-10	< 0.62	< 0.62

B-3

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.23	0.23
8-10	< 0.49	< 0.49

B-2

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	< 0.29	1.4
8-10	< 0.27	< 0.27

B-1

(ft-bgs)	(mg/kg)	
Sample Depth	GRO	DRO
2-4	1	1.3
8-10	< 0.62	< 0.62

0 100 200 (FEET)

REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM THE 2017 NCONMAP AERIAL ORTHOIMAGERY LAYER AND HARNETT COUNTY ROAD SHAPEFILE. 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
*Indicates Exceedence of NC TPH Action Levels
ft-bgs : Feet Below Ground Surface

Samples Collected 10-1-2018.

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

- Abandoned Monitor Well
- Sample Location
- ROW Proposed Right-of-Way
- Edge of Pavement
- Centerline
- Proposed Permanent Utility Easement
- Proposed Construction Easement
- Tax Parcels

SCALE: 1 " = 100 '

DATE: 10-30-18

PROJECT NUMBER 4305-18-175

FIGURE NO. 3

Drawing Path: T:\Projects\2018\ENV\4305-18-175 NCDOT I-5986B PSAs\GIS\Parcel29\CONSTITUENT.mxd plotted by abentz 10-30-2018

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 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:
AS SHOWN

DATE:
10/30/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
4

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

TDEM DATA PLOT A

NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

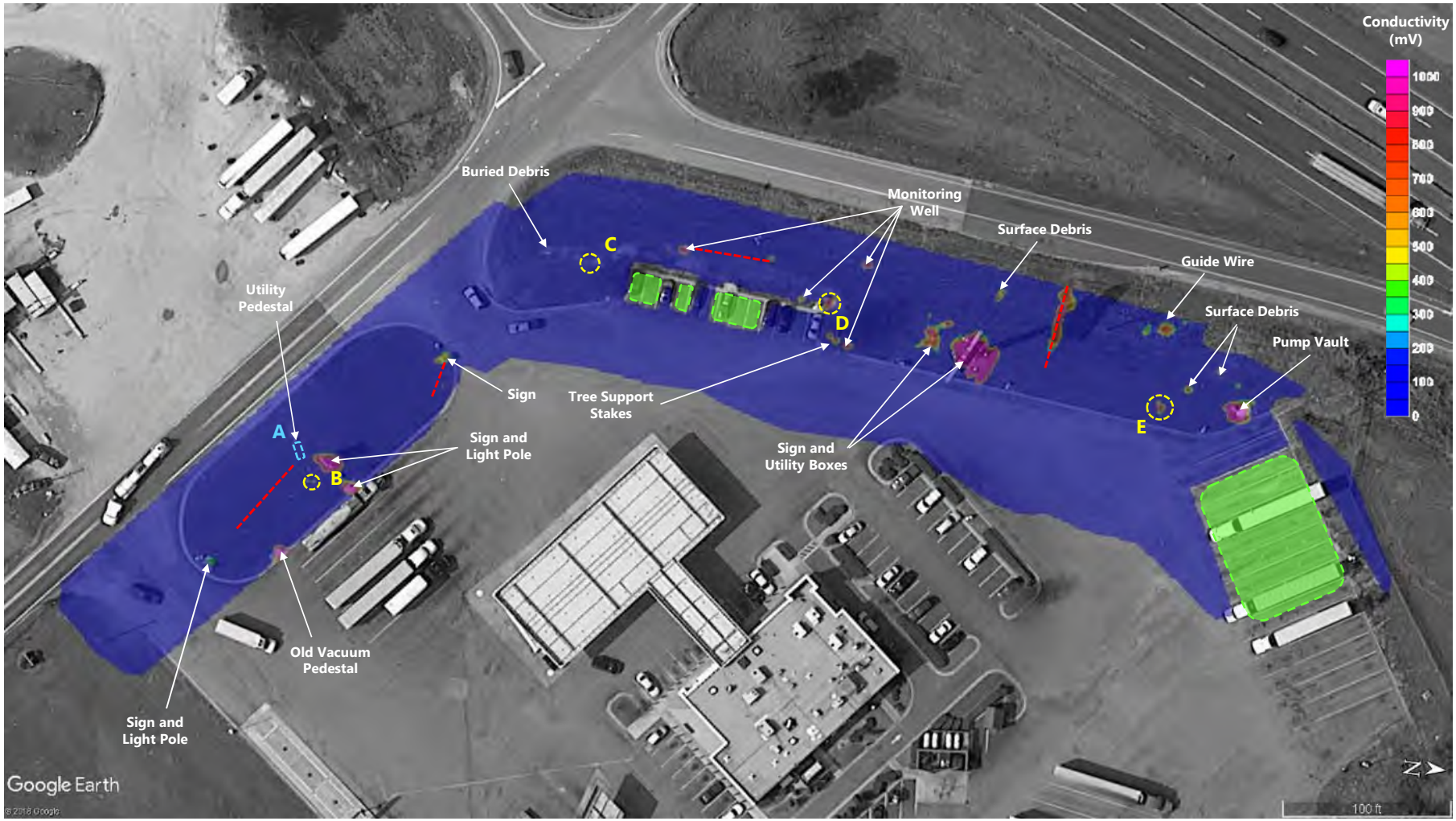
SCALE:
AS SHOWN

DATE:
10/30/2018

PROJECT NUMBER
4305-18-175

FIGURE NO.
5

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 Possible Utility

TDEM DATA PLOT B

NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

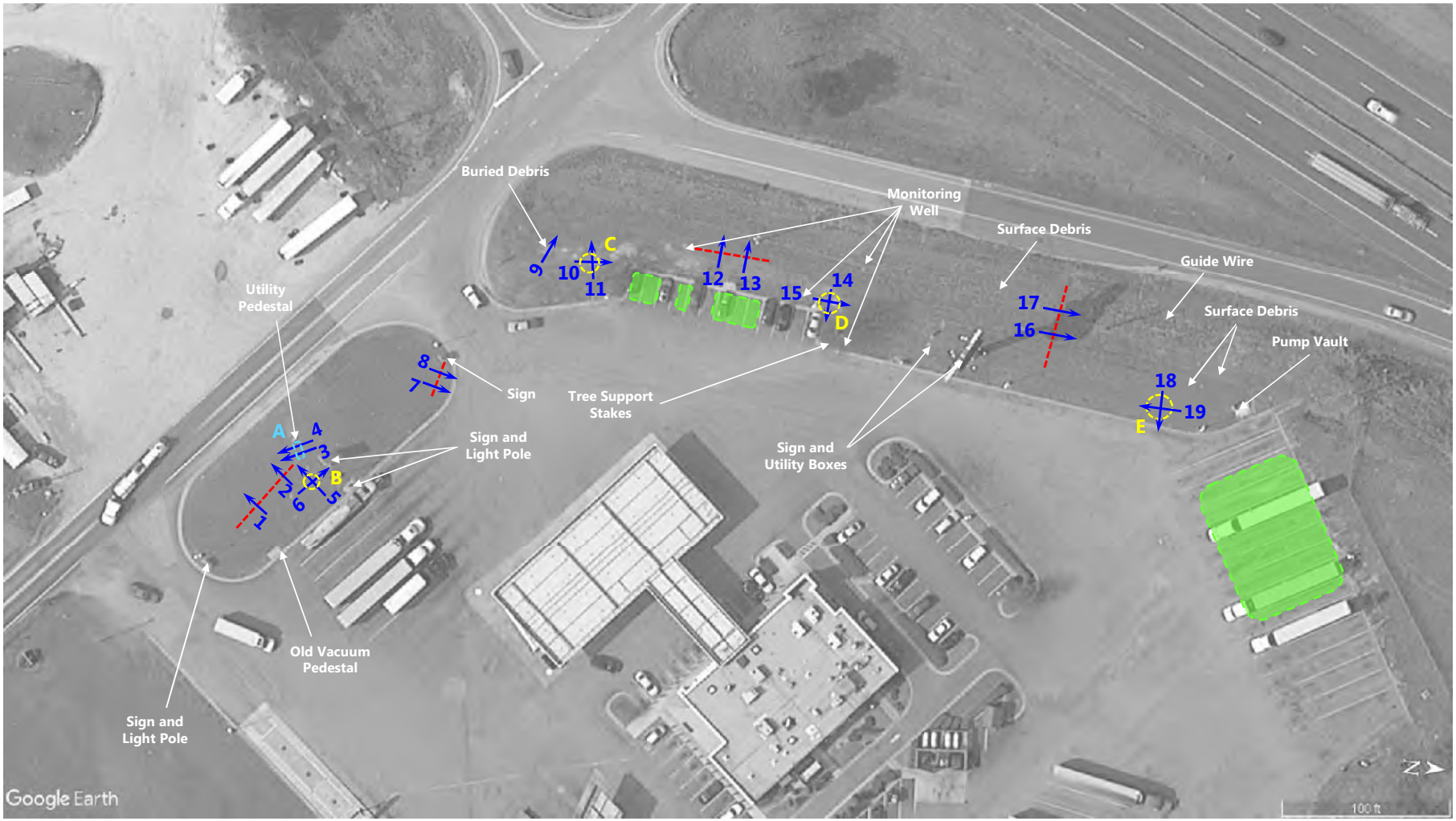
SCALE: AS SHOWN

DATE: 10/30/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **6**

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



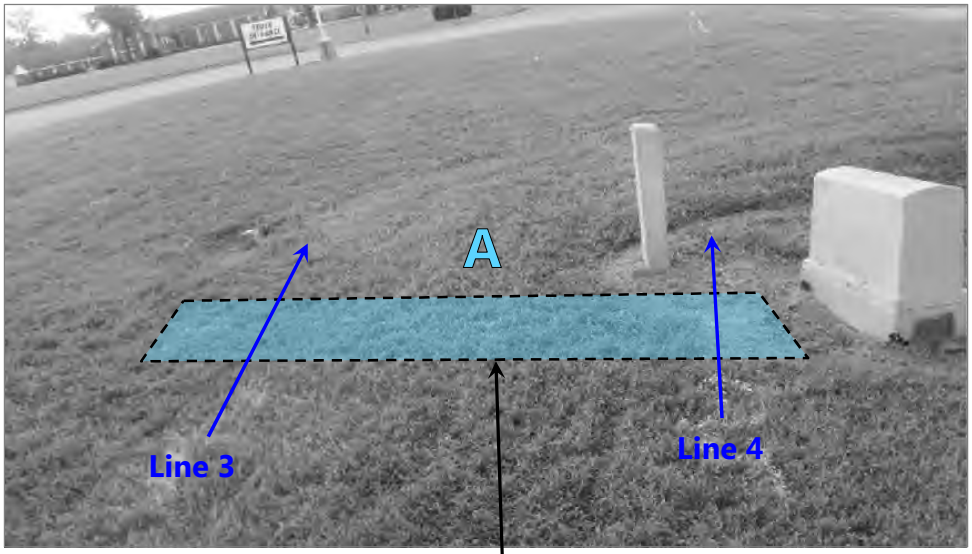
LEGEND

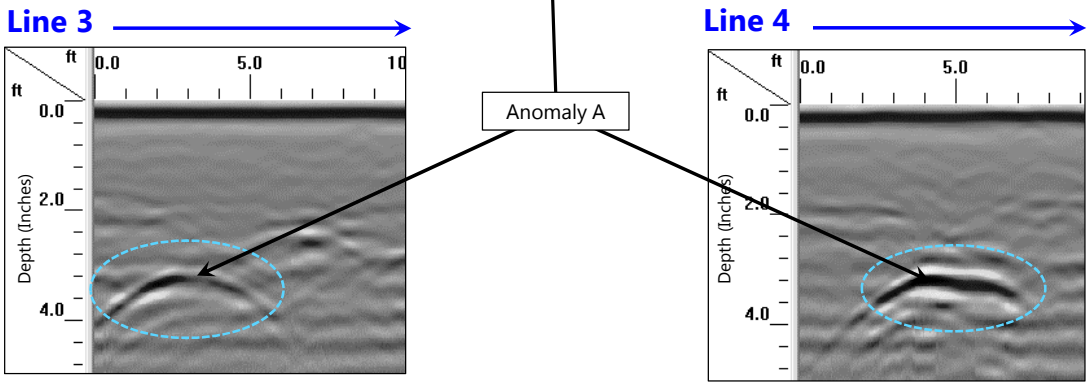
- Approximate Location of TDEM Anomaly
- Approximate Location of Possible Utility
- Approximate Location of GPR Anomaly
- Approximate Location of GPR Profile
- Approximate Location of Vehicle

GEOPHYSICAL ANOMALY LOCATION PLAN

NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	AS SHOWN
DATE:	10/30/2018
PROJECT NUMBER	4305-18-175
FIGURE NO.	7





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

EXAMPLE GPR DATA – LINES 3 AND 4

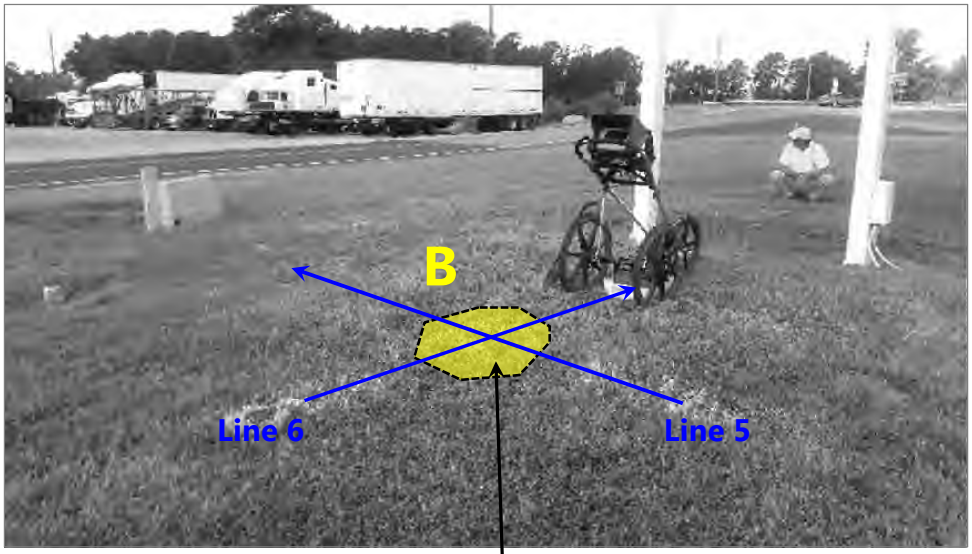
NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

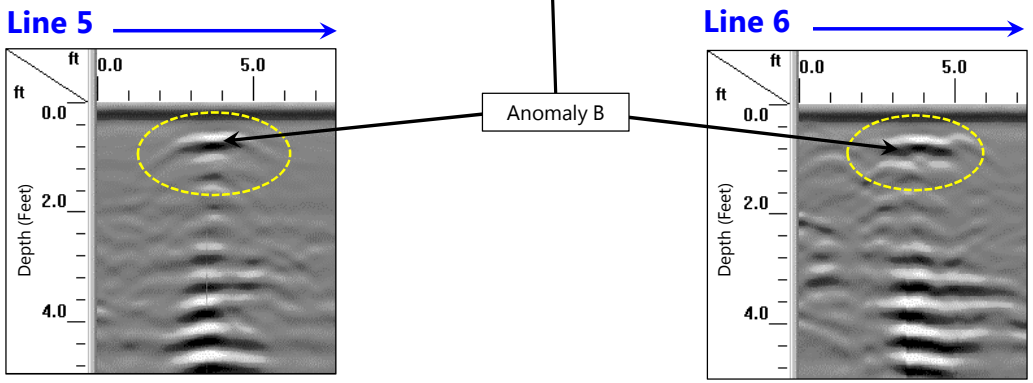
SCALE: AS SHOWN

DATE: 10/30/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **8**





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

EXAMPLE GPR DATA – LINES 5 AND 6

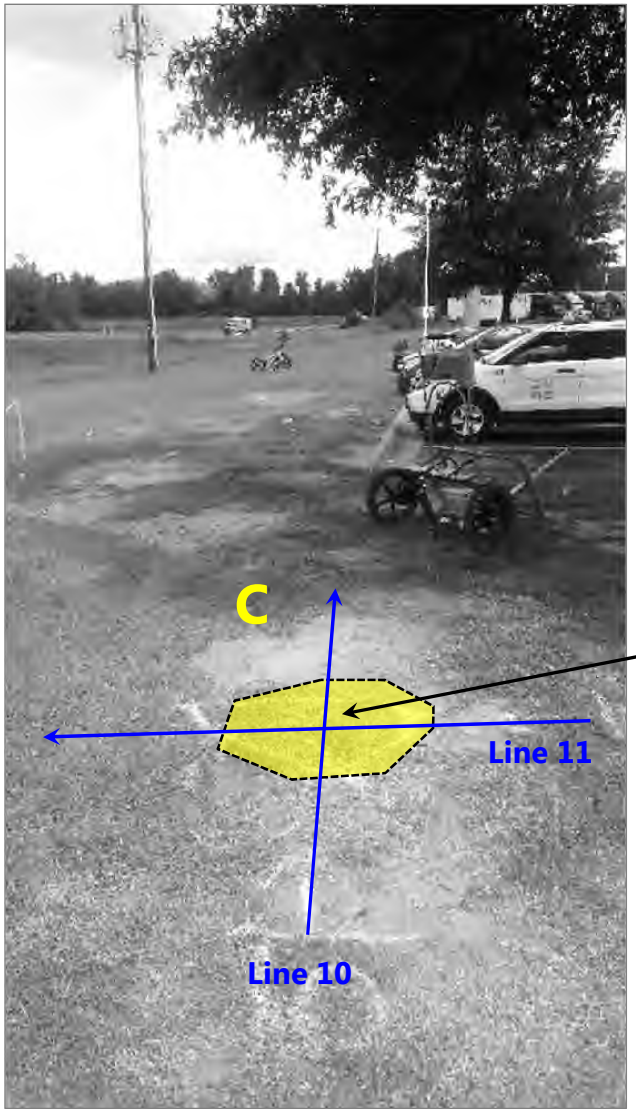
NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

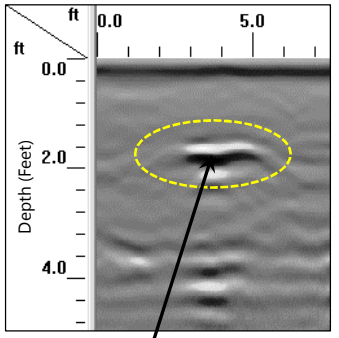
DATE: 10/30/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **9**

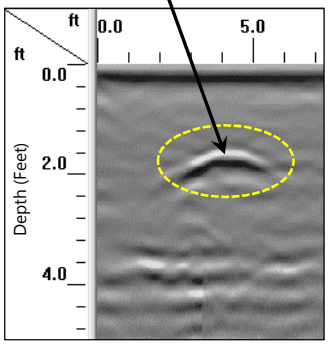


Line 10



Anomaly C

Line 11

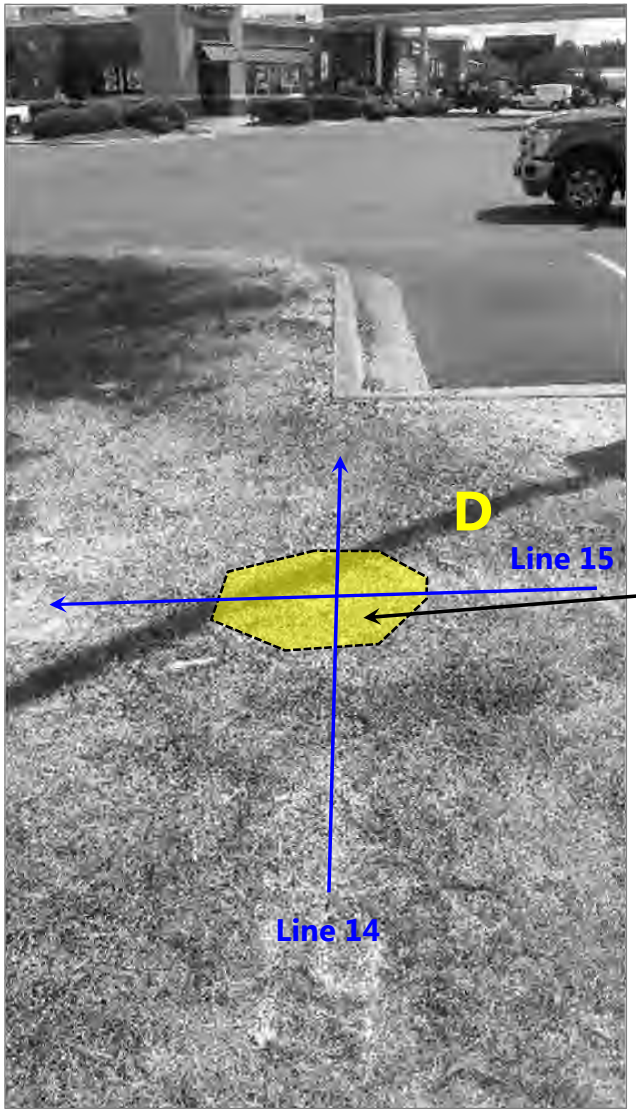


Note: Presented GPR profile depths are based on an assumed average dielectric and should be considered approximate

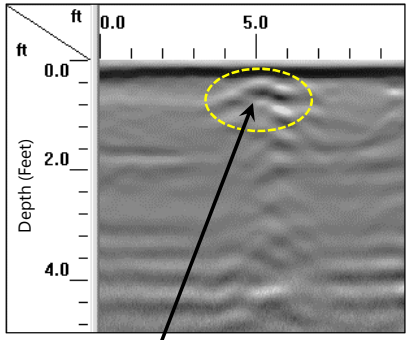
EXAMPLE GPR DATA – LINES 10 AND 11

NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE:	AS SHOWN
DATE:	10/30/2018
PROJECT NUMBER	4305-18-175
FIGURE NO.	10

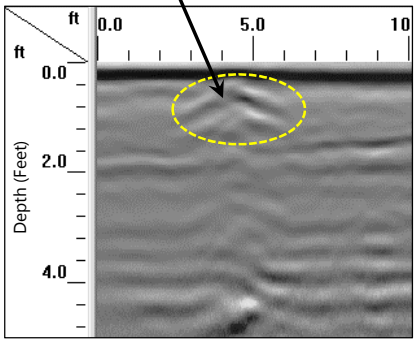


Line 14



Anomaly D

Line 15



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

EXAMPLE GPR DATA – LINES 14 AND 15

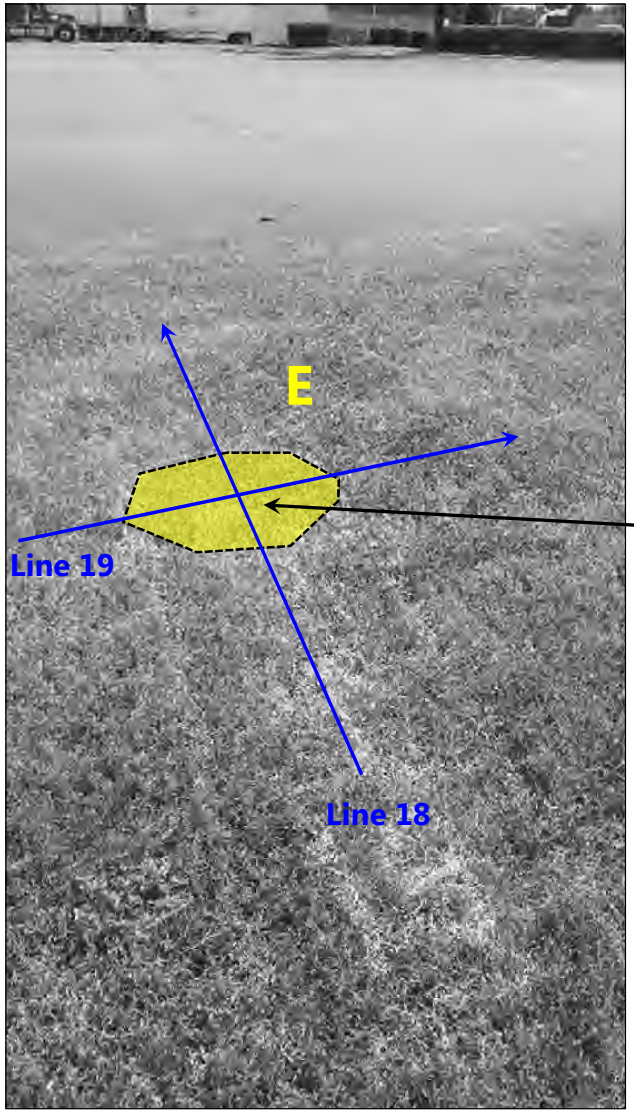
NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

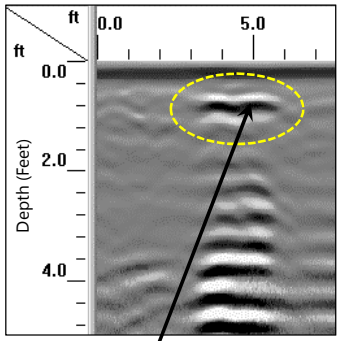
DATE: 10/30/2018

PROJECT NUMBER 4305-18-175

FIGURE NO. **11**

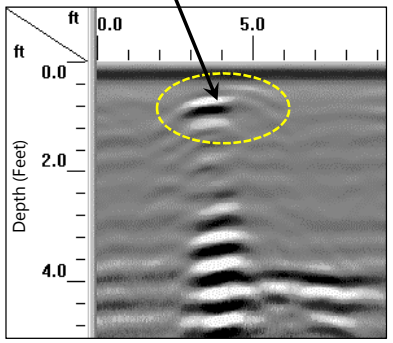


Line 18



Anomaly E

Line 19



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

EXAMPLE GPR DATA – LINES 18 AND 19

NCDOT PROJECT: I-5986B
PARCEL 29 – (CIRCLE K/HARDEES TRUCK STOP)
873 LONG BRANCH ROAD, DUNN, HARNETT COUNTY, NORTH CAROLINA

SCALE: AS SHOWN

DATE: 10/30/2018

PROJECT NUMBER 4305-18-175

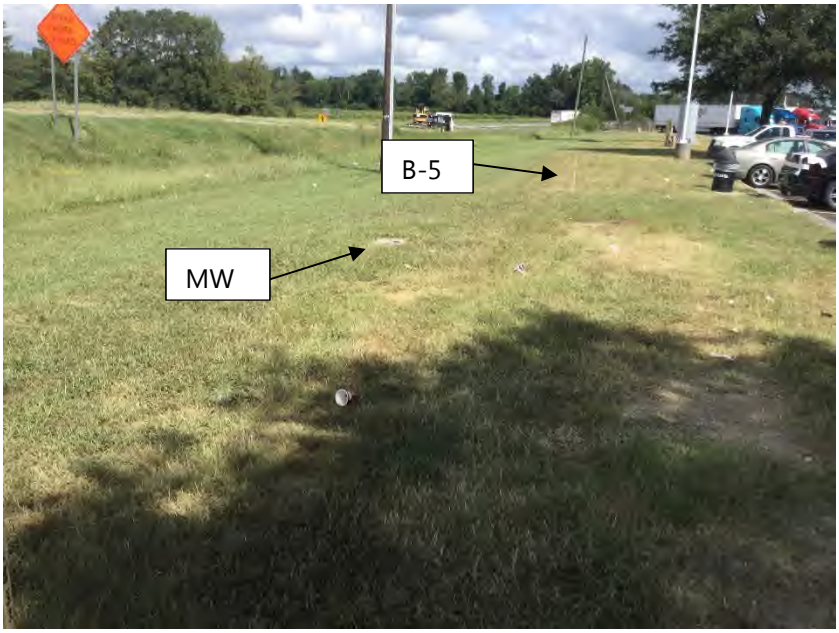
FIGURE NO. **12**

Appendix I – Photographs

Date: 10/1/2018

Photographer: JTH

1	**Location / Orientation**	View of site looking north.
	Remarks	None



Date: 10/1/2018

Photographer: JTH

2	**Location / Orientation**	View looking north.
	Remarks	Soil boring B-5 and abandoned monitor well (MW).

Date: 10/1/2018

Photographer: JTH

3	**Location / Orientation**	View of B-6 looking north.
	Remarks	None

Appendix II – Boring Logs

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-1**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Fine,			0.7	No				
		Silty Clay, Orange,			1.5	Yes				
5					2.0	No				
					2.1	No				
		Silty Clay, Red,								
10					1.2	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-2**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Fine,			0.7	No				
					2.5	Yes				
5		Silty Clay, Orange,			1.5	No				
		Silty Clay, Red,			1.8	No				
10					1.9	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-3**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sandy Clay, Tan, Orange,			0.1	No				
		Sand, Tan, Brown, Fine,			0.5	Yes				
5		Silty Clay, Red, Orange,			0.5	No				
					0.5	No				
10		Boring Terminated at 10 Ft-BGS			0.2	Yes				
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-4**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Fine,			0.5	No				
		Silty Clay, Red, Orange,			0.8	Yes				
5					0.6	No				
		Silty Clay, Red,			1.0	No				
10					1.0	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-5**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Fine,			0.5	No				
		Silty Clay, Orange,			0.5	Yes				
5					0.3	No				
		Silty Clay, Red,			0.2	No				
10		Boring Terminated at 10 Ft-BGS			0.6	Yes				
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-6**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Tan, Fine,			1.0	No				
		Silty Clay, Orange,			1.3	Yes				
5					0.8	No				
		Silty Clay, Red,			0.9	No				
10					1.5	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

PROJECT:	**NCDOT I-5986B** Parcel 29-873 Long Branch Rd, Dunn, NC S&ME Project No. 4305-18-175		**BORING LOG: B-7**
DATE DRILLED:	Monday, October 01, 2018	BORING DEPTH (FT):	10
DRILL RIG:	Geoprobe 54DT	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,								
		Sand, Brown, Fine,			0.7	No				
		Silty Clay, Orange,			0.9	Yes				
5					1.1	No				
		Silty Clay, Red,			1.0	Yes				
10					1.2	Yes				
		Boring Terminated at 10 Ft-BGS								
15										
20										
25										
30										

Appendix III – Laboratory Analytical Reports and Chain of Custody

QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Monday, October 01, 2018
Samples extracted Monday, October 01, 2018
Samples analysed Monday, October 01, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 29 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 29 B-3 (8'-10')	19.4	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.019	0	100	0	PHC not detected,(P)
s	PARCEL 29 B-3 (2'-4')	9.3	<0.23	<0.23	0.23	0.23	0.15	<0.07	<0.009	0	73.1	26.9	V.Deg.PHC 91.3%,(FCM),(P)
s	PARCEL 29 B-4 (2'-4')	10.8	<0.27	0.73	0.27	1	0.17	<0.09	<0.011	84.1	10.4	5.5	V.Deg.PHC 82.2%,(FCM)
s	PARCEL 29 B-4 (8'-10')	21.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	0	60.9	39.1	Residual HC,(BO),(P)
s	PARCEL 29 B-5 (2'-4')	11.0	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	59.5	40.5	Residual HC,(BO)
s	PARCEL 29 B-5 (8'-10')	23.4	<0.59	<0.59	<0.59	<0.59	<0.12	<0.19	<0.023	0	35.5	64.5	Residual HC,(BO)
s	PARCEL 29 B-6 (2'-4')	10.7	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	34.5	65.5	Residual HC,(BO)
s	PARCEL 29 B-6 (8'-10')	24.8	<0.62	<0.62	<0.62	<0.62	<0.12	<0.2	<0.025	0	0	0	PHC not detected,(BO)
s	PARCEL 29 B-7 (2'-4')	9.4	<0.23	<0.23	<0.23	<0.23	<0.05	<0.08	<0.009	0	27.5	72.5	,(FCM),(BO)
s	PARCEL 29 B-7 (6'-8')	11.2	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	0	0	,(FCM),(P)

Initial Calibrator QC check OK Final FCM QC Check OK 89 %

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

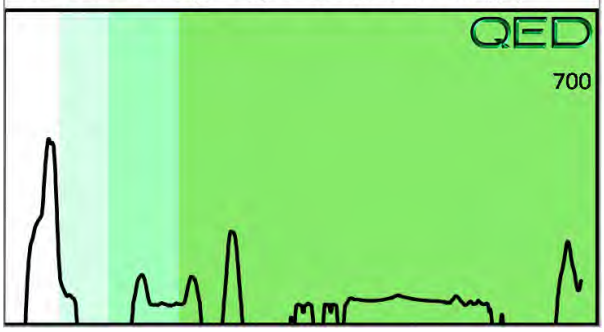
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

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

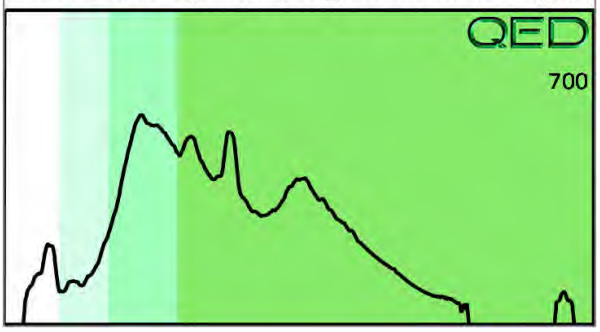
QED Hydrocarbon Fingerprints

Project: PARCEL 29 - PROJ 4305-18-175 ##################

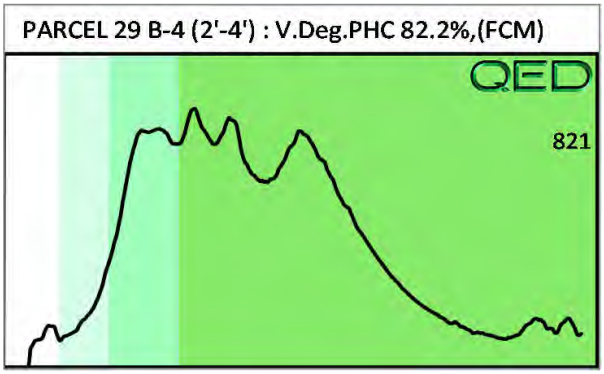
PARCEL 29 B-3 (8'-10') : PHC not detected,(P)



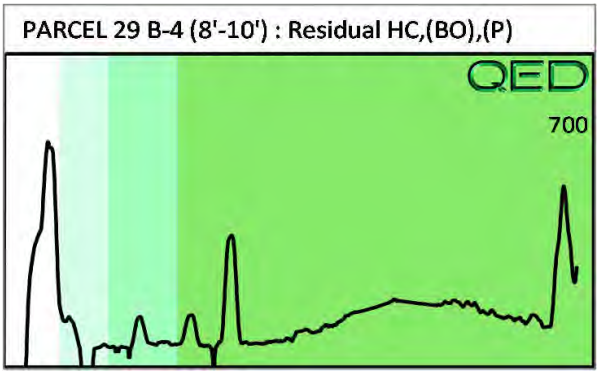
PARCEL 29 B-3 (2'-4') : V.Deg.PHC 91.3%,(FCM),(P)



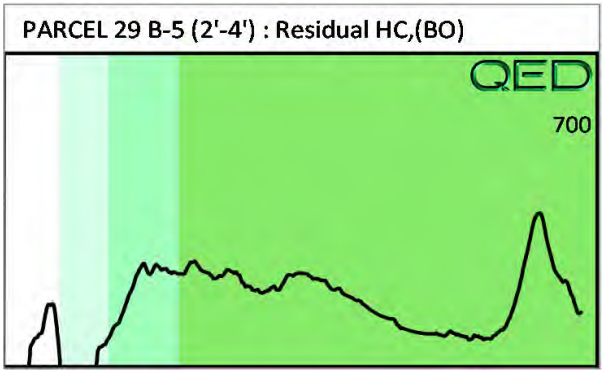
PARCEL 29 B-4 (2'-4') : V.Deg.PHC 82.2%,(FCM)



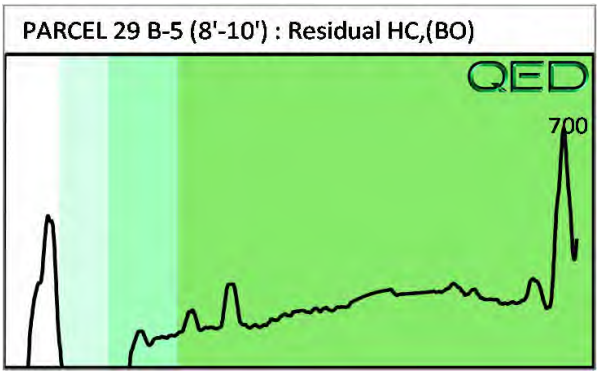
PARCEL 29 B-4 (8'-10') : Residual HC,(BO),(P)



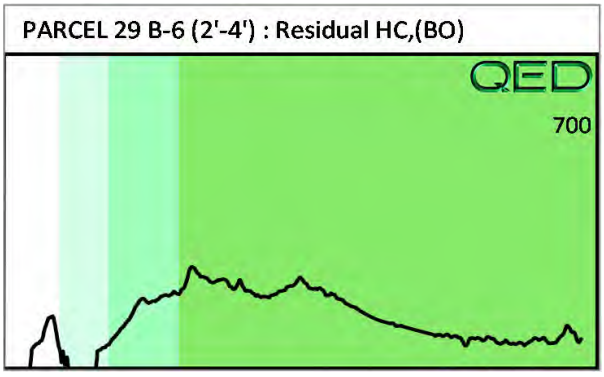
PARCEL 29 B-5 (2'-4') : Residual HC,(BO)



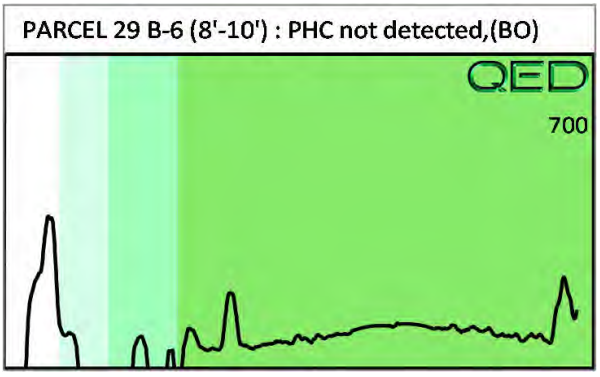
PARCEL 29 B-5 (8'-10') : Residual HC,(BO)



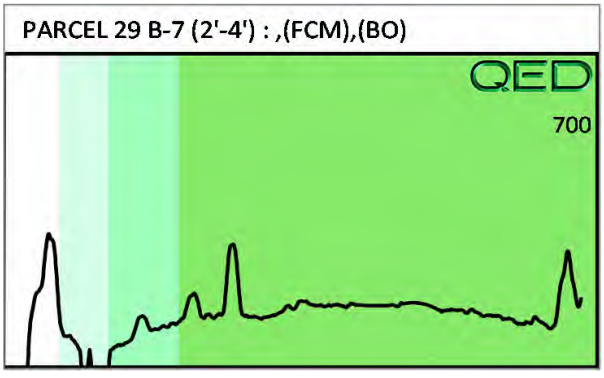
PARCEL 29 B-6 (2'-4') : Residual HC,(BO)



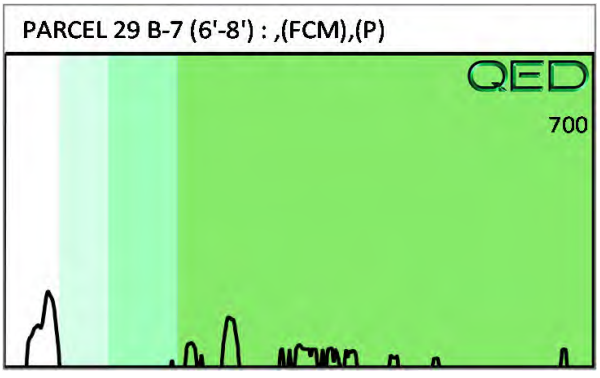
PARCEL 29 B-6 (8'-10') : PHC not detected,(BO)



PARCEL 29 B-7 (2'-4') : ,(FCM),(BO)



PARCEL 29 B-7 (6'-8') : ,(FCM),(P)



QED

AQROS

Hydrocarbon Analysis Results

Client: S&ME
Address:

Samples taken Monday, October 01, 2018
Samples extracted Monday, October 01, 2018
Samples analysed Monday, October 01, 2018

Contact: JAMIE HONEYCUTT

Operator MAX MOYER

Project: PARCEL 29 - PROJ 4305-18-175

U00904

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PARCEL 29 B-7 (8'-10')	10.2	<0.26	<0.26	<0.26	<0.26	<0.05	<0.08	<0.01	0	0	0	,(FCM),(BO)
s	PARCEL 29 B-2 (2'-4')	11.7	<0.29	<0.29	1.4	1.4	1.4	<0.09	<0.012	0	57.5	42.5	V.Deg.PHC 71.4%,(FCM),(BO),(P)
s	PARCEL 29 B-2 (8'-10')	10.9	<0.27	<0.27	<0.27	<0.27	<0.05	<0.09	<0.011	0	0	0	,(FCM),(BO),(P)
s	PARCEL 29 B-1 (2'-4')	9.6	<0.24	1	1.3	2.3	0.88	<0.08	<0.01	57	31.2	11.8	V.Deg.PHC 75.8%,(FCM),(BO)
s	PARCEL 29 B-1 (8'-10')	24.8	<0.62	<0.62	<0.62	<0.62	<0.12	<0.2	<0.025	0	0	100	PHC not detected,(BO),(P)

Initial Calibrator QC check OK

Final FCM QC Check OK 98 %

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.

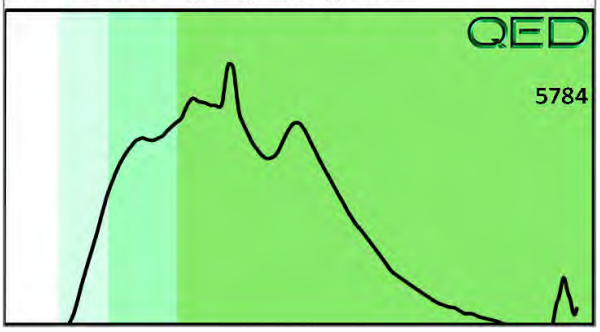
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

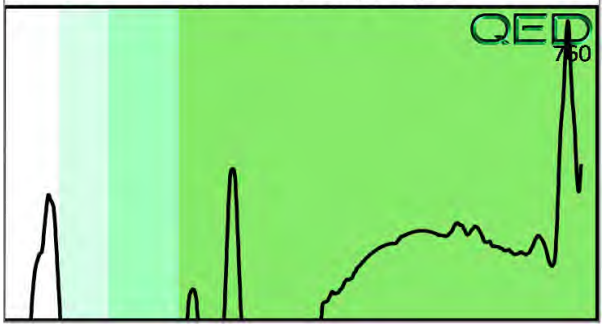
Project: PARCEL 29 - PROJ 4305-18-175 ##################

PARCEL 29 B-7 (8'-10') : ,(FCM),(BO)

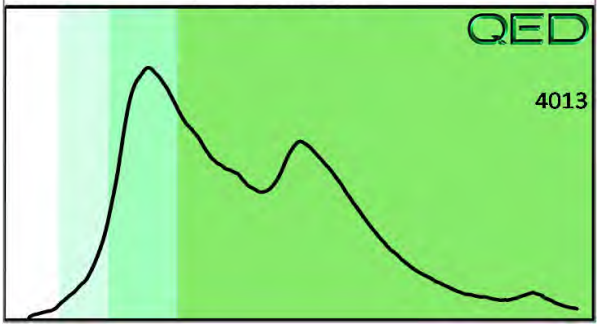
PARCEL 29 B-2 (2'-4') : V.Deg.PHC



PARCEL 29 B-2 (8'-10') : ,(FCM),(BO),(P)



PARCEL 29 B-1 (2'-4') : V.Deg.PHC



PARCEL 29 B-1 (8'-10') : PHC not detected,(BO),(P)