GEL Engineering of NC INC

an affiliate of **The GEL Group** INC

GEOENVIRONMENTAL PHASE II INVESTIGATION REPORT
PARCEL #6
20915 & 20917 N. MAIN SREET, CORNELIUS, NC

December 5, 2019

WBS Number:	46425.1.1
TIP Number:	U-5873
County:	Mecklenburg
Description:	Intersection of NC 115 and Potts Street; Construct Improvements, Cornelius, Mecklenburg County, NC
Parcel No (PIN):	Parcel #6; Howell and Sons Canvas PIN # 00320412
Address:	20915 & 20917 N. Main Street, Cornelius, NC 28031

Submitted to:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

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This document, entitled *GeoEnvironmental Phase II Investigation Report, Parcel #6, 20915 & 20917 N. Main Street, Cornelius, NC*, has been prepared by GEL Engineering of NC, Inc., for the parcel identified above in accordance with the Notice to Proceed issued by the North Carolina Department of Transportation – Geotechnical Engineering Unit on September 17, 2019. It has been prepared in accordance with accepted quality control practices for the exclusive use of the North Carolina Department of Transportation and has been reviewed by the undersigned.

GEL ENGINEERING OF NC, INC.
an Affiliate of The GEL Group, Inc.

E. Jorgen Bergstrom
Senior Geophysicist

Andrew D. Stahl, L.G.
Senior Project Manager

December 5, 2019
Date

DocuSigned by:
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NORTH CAROLINA LICENSED SEAL 1650 GEOLOGIST ANDREW D. STAHL

GEOENVIRONMENTAL PHASE II INVESTIGATION REPORT
PARCEL #6, 20915 & 20917 N. MAIN SREET, CORNELIUS, NC

December 5, 2019

Intersection of NC 115 and Potts Street; Construct Improvements,
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Mecklenburg County

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APPENDICES

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) authorized GEL Engineering of NC, Inc. (GEL), to perform a Phase II GeoEnvironmental Investigation at the subject parcel in Mecklenburg County. The objective of the investigation was to evaluate the presence of potential environmental hazards within the existing and proposed rights-of-way (ROWs) and/or easements, including objects such as underground storage tanks (USTs) and petroleum contaminated soil. The subject parcel location is shown on Figure 1 and listed below.

Parcel #	Owner	Business Name	Address	Mecklenburg County PIN #
6	Nickolaos P. Drossopoulos and Wife, Stella M. Rhodes	Howell and Sons Canvas	20915 & 20917 N. Main St. Cornelius, NC 28031	00320412

A portion of the parcel was designated as the investigation area from information included in NCDOT's U-5873 CAD files and input the NCDOT GeoEnvironmental Project Manager provided to GEL. This area is shown on Figure 2 and extends from the edge-of-pavement to the innermost existing or proposed ROW or easement. Geophysical surveys were conducted across the investigation area using ground penetrating radar (GPR) and time-domain electromagnetic (TDEM) technologies. Twelve geoenvironmental soil borings were installed within the investigation area at the locations shown on Figure 3. The methodologies and results of these investigations are discussed in the following sections.

In addition to the electronic DocuSign copy of this report, GEL is submitting to NCDOT (a) an electronic MicroStation U-5873_Geo_env.dgn file that provides the geoenvironmental soil boring locations, and (b) a Microsoft Excel file of the soil sample ultra-violet fluorescence (UVF) spectrometry analytical results prepared by RED Lab, LLC, of Wilmington, North Carolina (RED Lab).

2.0 HISTORY

Pre-scoping comments prepared by the NCDOT GeoEnvironmental Section for the subject parcel are as follows:

> *Parcel 006: Site is likely the site of a former gas station. USTs may be on site. Currently the site has two bay garage doors that may have hydraulic lifts.*

GEL searched North Carolina Department of Environmental Quality (NCDEQ) electronic records and contacted the NCDEQ Mooresville Regional Office and NCDEQ Headquarters in Raleigh to obtain pertinent environmental records and regulatory history. NCDEQ responded they have no record of the facility in their various databases. This is consistent with the results of GEL's online search of the NCDEQ registered USTs, UST incidences, and other data systems.

As further discussed in Section 3.0, GEL was informed by the current Property owner that, prior to his ownership, a fueling station did in fact operate at the Property.

3.0 SITE OBSERVATIONS

In advance of the field investigation, the GEL Project Manager contacted Mr. Nick Drossopoulos, the owner of the Property and the onsite business, Howell and Sons Canvas, of the planned investigation activities. The GEL Project Manager also discussed the operations with Mr. Drossopoulos and interviewed him while conducting a site reconnaissance on October 16, 2019, during the beginning of the investigation. Representative photographs taken during the site reconnaissance are provided in Appendix A.

GEL was informed during the site reconnaissance that a fueling station did in fact historically operate at the Property. Mr. Drossopoulos stated that this was mentioned to him from the now deceased prior Property owner. Mr. Drossopoulos understood that the fuel tanks were situated somewhere on the north side of the commercial building toward Davidson Street, but he did not know exactly where or whether they were USTs or aboveground tanks. Remnants of the fuel dispenser pedestal were observed, as shown in Photograph 11 in Appendix A.

Other than the fuel dispenser pedestal remnants, no features of potential environmental concern were observed within or adjacent to the investigation area. The interior of the canvas/upholstery operation facility is depicted in Photographs 15 and 16 (Appendix A). Mr. Drossopoulos stated his facility has no hydraulic lifts or other interior equipment utilizing fuels or other substances of environmental concern. The only obstructions to the geophysical survey across the investigation area were minor surface utility structures, signposts, and landscaping.

4.0 METHODS

This section describes the field methods followed to complete the geophysical surveys and the geoenvironmental soil boring and sampling program.

4.1 Geophysical Survey Methods

The geophysical evaluation included the deployment of GPR and TDEM technologies to the site. These technologies were used in concert with one another in order to identify the presence of potential USTs or other subsurface features of concern such as buried drums. A brief description of these technologies is presented in the following paragraphs.

The GPR and TDEM surveys were conducted by towing the geophysical equipment along a system of transect lines on an approximately 2.5-foot spaced grid established within the investigation area. In spatially restricted and surface obstructed areas, a modified pattern of transect lines was implemented to maximize data acquisition. Positioning for the investigation was provided using a Trimble real-time kinematic (RTK) global positioning system (GPS).

4.1.1 Ground Penetrating Radar Methodology

An ImpulseRadar Crossover dual-channel digital radar control system configured with a 400- and 800-Megahertz (MHz) antenna array was used in this investigation. GPR is an electromagnetic geophysical method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of an antenna which houses the transmitter and receiver, a digital control unit which both generates and digitally records the GPR data, and a color video monitor to view data as it is collected in the field.

The transmitter radiates repetitive short duration electromagnetic waves (at radar frequencies) into the earth from an antenna moving across the ground surface. These radar waves are reflected back to the receiver from the interface of materials with different dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant between the materials, the conductivity of the material through which the wave is traveling, and the frequency of the signal.

Subsurface features that commonly cause such reflections are: 1) natural geologic conditions, such as changes in sediment composition, bedding, and cementation horizons and voids; or 2) unnatural changes to the subsurface such as disturbed soils, soil backfill, buried debris, tanks,

pipelines, and utilities. The digital control unit processes the signal from the receiver and produces a continuous cross-section of the subsurface interface reflection events.

GPR data profiles were collected along transects covering the entire investigation area. Depth of investigation of the GPR signal is highly site specific and is limited by signal attenuation (absorption) in 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 clays, brackish groundwater, or groundwater with a high dissolved solid content from natural or manmade sources. Signal attenuation is lowest in relatively low conductivity materials such as dry sand or rock. Depth of investigation is also dependent on the antenna's transmitting frequency. Depth of investigation generally increases as transmitting frequency decreases; however, the ability to resolve smaller subsurface features is diminished as frequency is decreased. The average depth of penetration at this site was approximately 3 to 5 feet below the surface.

The GPR antenna used at this site is internally shielded from aboveground interference sources. Accordingly, the GPR response is not affected by overhead power lines, metallic buildings, or nearby objects.

4.1.2 Time Domain Electromagnetic Methodology

TDEM methods measure the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time or frequency-varying magnetic field and measuring (with a receiver) the amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary magnetic field is passed through them.

The Geonics EM-61 system used in this investigation operates within these principles. However, the EM-61 TDEM system can discriminate between moderately conductive earth materials and very conductive metallic targets. The EM-61 consists of a portable coincident loop time domain transmitter and receiver with a 1.0-meter by 0.5-meter coil system. The EM-61 generates 150 pulses per second and measures the response from the ground after transmission or between pulses. The secondary EM responses from metallic targets are of longer duration than those created by conductive earth materials. By recording the later time EM arrivals, only the response from metallic targets is measured, rather than the field generated by the earth material.

4.2 GeoEnvironmental Soil Borings and Soil Sampling

A direct push technology (DPT) drilling rig provided by our subcontracted driller, Regional Probing Services, Inc., was used to advance soil borings across the investigation area at the locations shown on Figure 3. A utility clearance was performed by North Carolina One-Call across the investigation area prior to the soil boring program. In addition to the GPR and TDEM geophysical investigations described in Section 4.1, GEL specifically cleared each planned drilling location for underground utilities utilizing radio frequency electromagnetics instrumentation.

GEL installed each of the 12 soil borings to 10 feet below ground surface (bgs). DPT soil sampling consists of pushing/hammering a stainless-steel, 4-foot long, Macro-Core soil sampler and PVC liner to the desired sampling depth. The liner is removed from the soil sampler and cut to expose a continuous soil core for characterization and sampling. Lithologic descriptions of soil samples were recorded on soil boring logs along with other field observations. The soil boring logs are provided as Appendix B. Downhole DPT equipment was decontaminated before and after each boring was constructed. Following sample collection, the borings were backfilled with bentonite chips, and the location of each boring (Figure 3) was measured using the Trimble RTK/GPS.

Subsurface soil was screened for organic vapors using a field photoionization detector (PID), and these measurements were recorded on the soil boring logs (Appendix B). The PID measures the concentration of organic compounds in the vapor space above a soil sample resulting from volatilization of organic compounds contained in the soil. To screen the soils, each sample was placed in a clean, resealable polyethylene bag. The bag was sealed, the sample was allowed to equilibrate, the probe of the PID was then inserted into the bag, and the airspace above the soil was screened for organic vapors.

After the soil core extracted from each boring was logged, the horizon with the highest field PID reading was selected for laboratory analysis. In the absence of discernable PID reading differences, the sample collected from 1 to 2 feet bgs was selected for laboratory analysis, because the NCDOT U-5873 plans and cross sections indicated this to be the most representative soil horizon to be cut or otherwise handled by NCDOT at this parcel during the planned construction project.

To collect the sample, approximately 10 grams of soil from the selected horizon were extracted using a laboratory-provided Terra-Core sampler and transferred into a laboratory-provided VOA

vial containing 20 milliliters of methanol preservative and handled according to RED Lab field sampling protocol. Laboratory-quality nitrile gloves were worn by sampling personnel throughout the sampling process and changed between each sample. Upon collection, sample bottles were placed on ice in a cooler and transported to the analytical laboratory under proper chain-of-custody procedures. The samples were submitted to RED Lab and analyzed by UVF Spectrometry for the following indicator parameters to evaluate the investigation area for the presence petroleum of contaminated soil:

- Total benzene, toluene, ethylbenzene, and xylenes (BTEX) (C6-C9 fraction)
- Diesel Range Organics (DRO) (C10-C35 fraction)
- Gasoline Range Organics (GRO) (C5-C10 fraction)
- Total Petroleum Hydrocarbons (TPH) (C5-C35 fraction)
- Total Aromatics (C10-C35 fraction)
- 16 EPA Polyaromatic Hydrocarbons (PAHs) (total PAH value)
- Benzo(a)Pyrene.

5.0 RESULTS

The results of the geophysical surveys and geoenvironmental soil boring and soil sampling program are presented below.

5.1 Geophysical Survey Results

The geophysical field investigation was successfully performed at the subject parcel. Interpretation of the GPR data was conducted in the field, with subsequent data processing including band pass filtering, background removal, horizontal smoothing, and gain adjustments. TDEM was also used to scan the project site. The TDEM survey results are displayed on Figure 4. No electromagnetic or GPR anomalies were detected that were indicative of buried metallic objects that warranted marking in the field. All high TDEM responses shown on Figure 4 are correlated to underground utilities, surface metallic debris, and/or above-ground metal structures as labeled on the figure and are not considered to be representative of "Potential USTs." Although not discerned in the field using GPR or radio frequency electromagnetics instrumentation, office review of the TDEM data revealed a feature possibly indicative of a fuel line that had connected the fuel dispensers to the supply tanks, which reportedly were positioned on the north side of the commercial building toward Davidson Street (see Section 3.0).

5.2 Soil Sample Analytical Results

The field PID screening measurements are listed in Table 1. These measurements did not indicate the presence of significant organic vapors, with a highest PID measurement of 1.1 parts per million (ppm). Where discernable PID-reading differences across soil horizons within a soil boring were discernable, a sample of the soil collected from the horizon with the highest measurement was submitted for laboratory analysis. Otherwise, the horizon selected for laboratory analysis was 1 to 2 feet bgs as discussed in Section 4.2. The selected soil samples were submitted to RED Lab for indicator-parameter UVF Spectrometry analysis to evaluate for the presence petroleum contaminated soil. A summary of the soil sampling details is tabulated in Table 1, along with a listing of the northing and easting coordinates for the boring locations.

The UVF Spectrometry analytical results for GRO, DRO, and TPH are presented in Table 1. These results are also presented in Appendix B along with hydrocarbon fingerprint graphs prepared by RED Lab and the chain-of-custody form completed for the project. Consistent with the field PID measurement results, none of the samples contained notable concentrations of petroleum

hydrocarbons. The highest reported TPH concentration (carbon range C5 through C35) was 1.46 mg/Kg in the sample from boring SB-5, and this concentration is below the NCDEQ screening levels for GRO (50 mg/Kg) and DRO (100 mg/Kg). The distribution of the reported TPH concentrations are illustrated on Figure 5. The soil borings placed adjacent to the prior fuel dispenser pedestal (SB-9) and within the TDEM anomaly that may represent the fuel line that had connected the fuel pumps to the supply tanks (SB-7) had TPH results of 0.79 and 0.18 mg/Kg, respectively.

6.0 CONCLUSIONS

Field and office review of the geophysical field investigation data correlated all identified geophysical anomalies to underground utilities, surface or shallow-buried metallic debris, and/or above ground metal structures. No potential anomalies were marked in the field, and the geophysical survey results suggest there are no buried metallic objects indicative of "Potential USTs" within the investigation area.

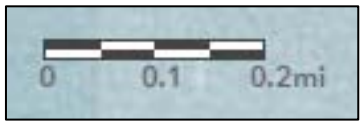
Only minor concentrations of petroleum hydrocarbons were identified in soil samples. The highest concentration of 1.46 mg/Kg is well below NCDEQ screening levels.

7.0 RECOMMENDATIONS

No additional environmental investigation of the soil at the site is recommended at this time. Should project plans change to include additional area of disturbance on the north side of the commercial building where, reportedly, either USTs or aboveground tanks serviced the historical fueling station, additional assessment may be required considering the limited area included on that side of the parcel in this Phase II Investigation (see Figure 2).

Although geophysical methods provide a high level of assurance for the location of subsurface objects, the possibility exists that not all features can or will be identified. Therefore, due caution should be used when performing subsurface excavation across the entire investigation area.

FIGURES



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PROJECT: ncdt06619

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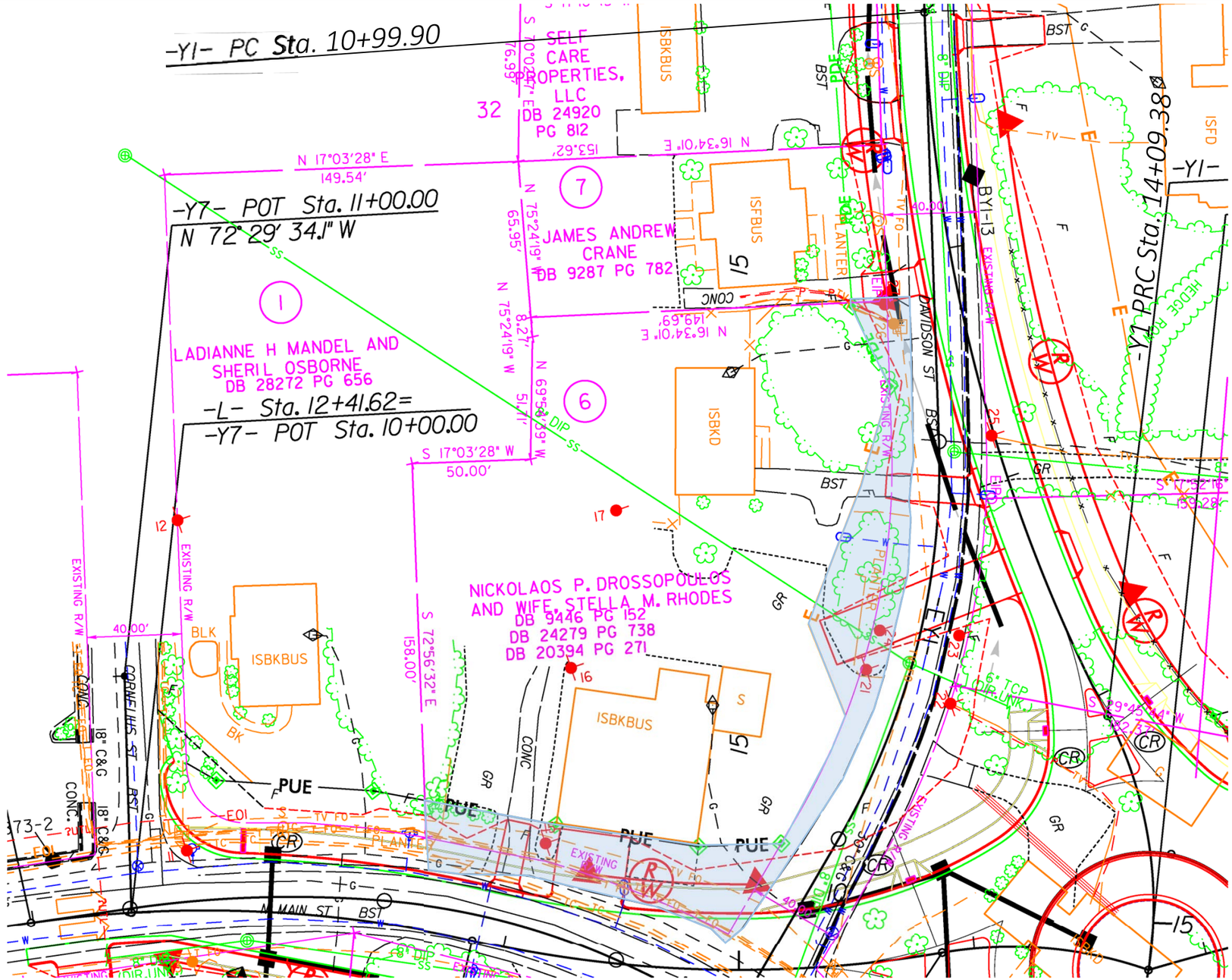
DATE: December 5, 2019

SITE LOCATION MAP

FIGURE 1

DRAWN BY: ADS



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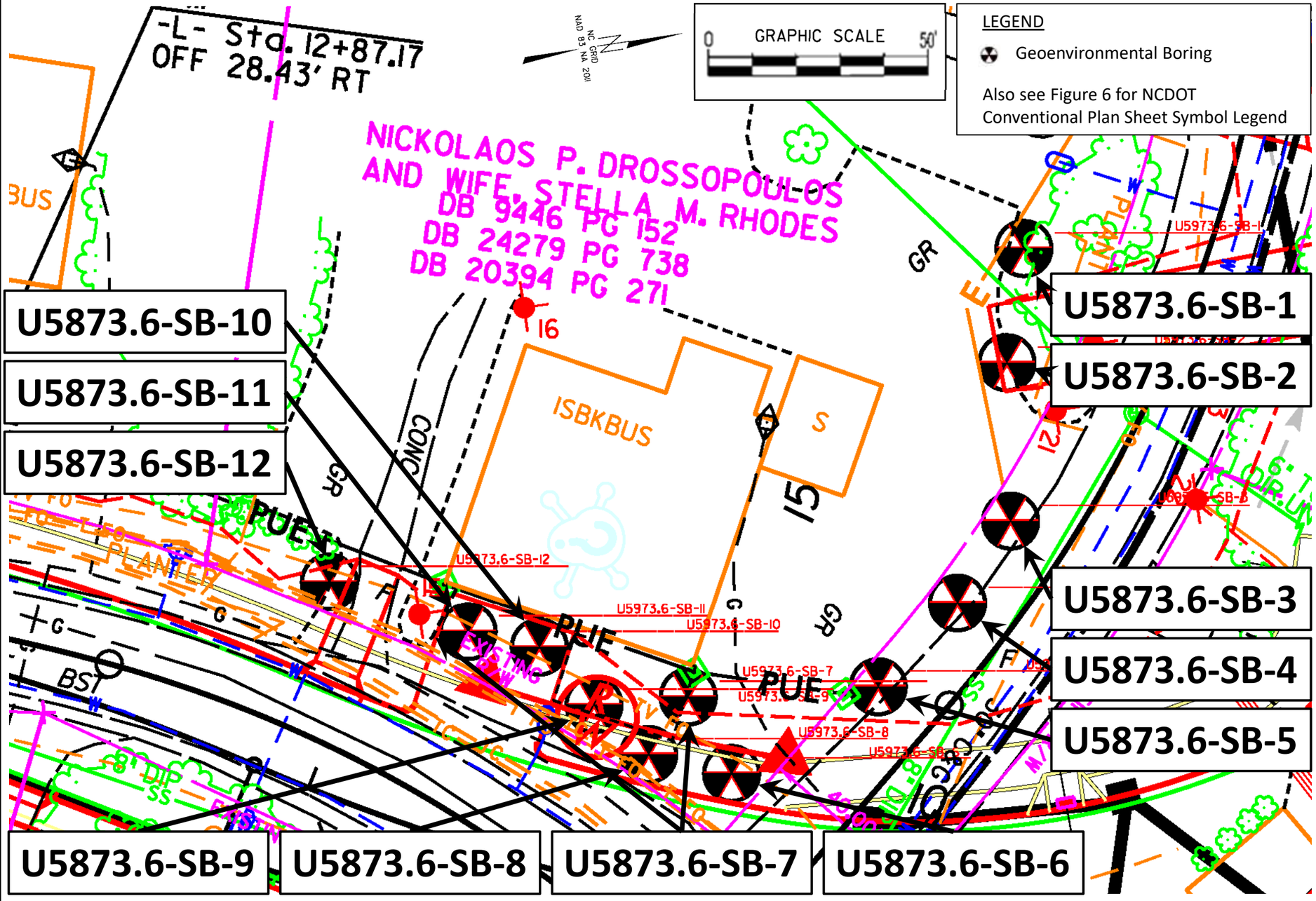
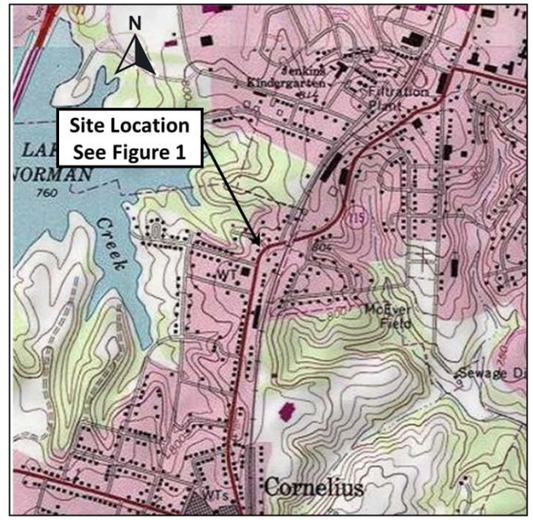
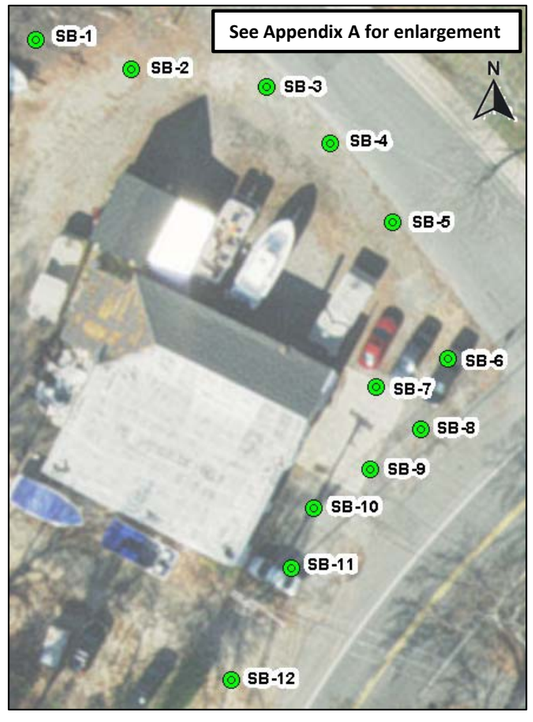
TIP NO. U-5873, WBS NO. 46425.1.1

INVESTIGATION AREA

PROJECT: ncdt06619 | DATE: December 5, 2019 | **FIGURE 2**







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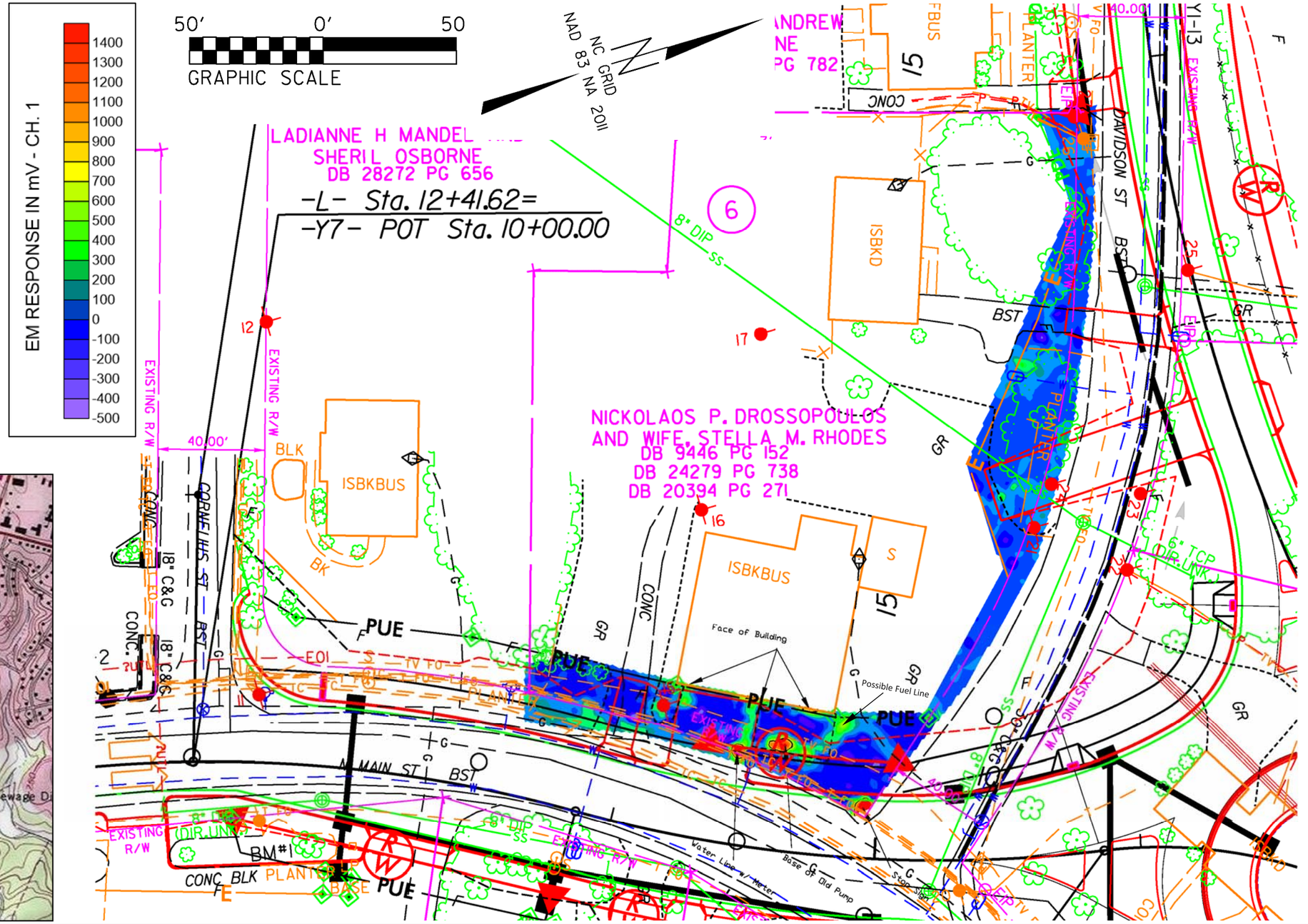
GEOENVIRONMENTAL BORING LOCATIONS

PROJECT: ncdt06619 | DATE: December 5, 2019 | **FIGURE 3**

NOTES

1) The field survey was conducted October 16, 2019. Underground features were located using visual evidence, ground penetrating radar (GPR), and time domain electromagnetic (TDEM) methods.
2) Although geophysical methods provide a high level of assurance for the location of subsurface objects, the possibility exists that not all features can or will be identified due to limitations of the geophysical methods, site access, authorized scope-of-work, and/or high target congestion. Therefore, due caution should be used when performing any subsurface excavation, and GEL Engineering of NC, Inc., is not liable for any damages that may occur. Identifying the location of some structures may only be possible with vacuum or other excavation methods.
3) See Figure 6 for NCDOT Conventional Plan Sheet Symbol Legend. GEL Engineering of NC, Inc., is not liable for the accuracy of the base map provided by NCDOT.



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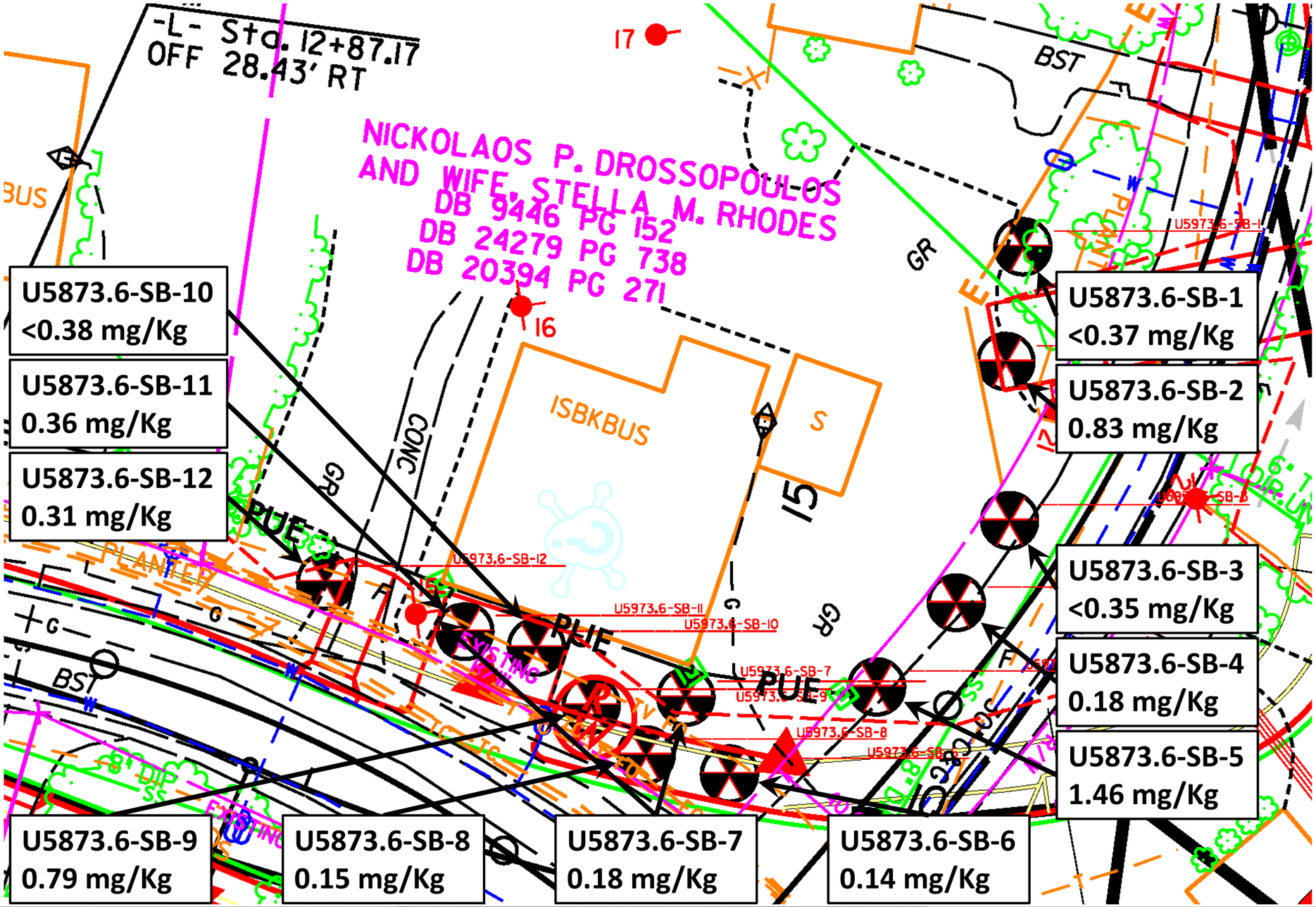

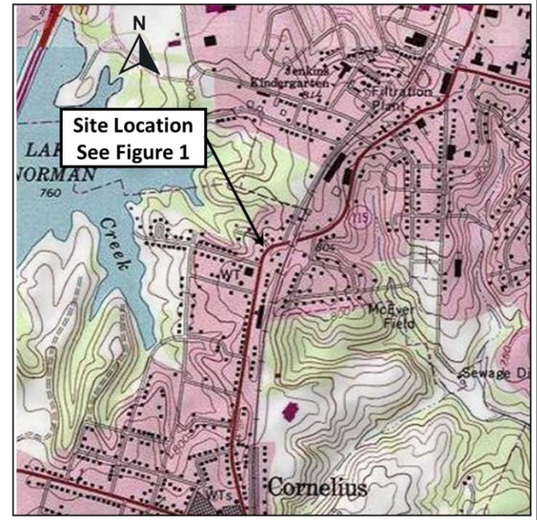

LEGEND

SB-# #.# mg/Kg — Geoenvironmental Boring with Total Petroleum Hydrocarbon (TPH; C5-C35) Analytical Result, in milligrams per kilogram (mg/Kg)

Also see Figure 6 for NCDOT Conventional Plan Sheet Symbol Legend

0 GRAPHIC SCALE 50'

NAD 83 NC GRID

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SOIL SAMPLE TPH ANALYTICAL RESULTS

PROJECT: ncdt06619 | DATE: December 5, 2019 | **FIGURE 5**

04/05/15

NOTE:
Legend provided by NCDOT

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin
- Property Corner
- Property Monument
- Parcel/Sequence Number
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream
- Buffer Zone 1
- Buffer Zone 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch
- False Sump

RAILROADS:

- Standard Gauge
- RR Signal Milepost
- Switch
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line
- Proposed Right of Way Line with Iron Pin and Cap Marker
- Proposed Right of Way Line with Concrete or Granite R/W Marker
- Proposed Control of Access Line with Concrete C/A Marker
- Existing Control of Access
- Proposed Control of Access
- Existing Easement Line
- Proposed Temporary Construction Easement
- Proposed Temporary Drainage Easement
- Proposed Permanent Drainage Easement
- Proposed Permanent Drainage / Utility Easement
- Proposed Permanent Utility Easement
- Proposed Temporary Utility Easement
- Proposed Aerial Utility Easement
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut
- Proposed Slope Stakes Fill
- Proposed Curb Ramp
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard

EXISTING STRUCTURES:

MAJOR:
- Bridge, Tunnel or Box Culvert
- Bridge Wing Wall, Head Wall and End Wall

MINOR:
- Head and End Wall
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB
- Paved Ditch Gutter
- Storm Sewer Manhole
- Storm Sewer

UTILITIES:

POWER:
- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*)
- U/G Power Line LOS C (S.U.E.*)
- U/G Power Line LOS D (S.U.E.*)

TELEPHONE:
- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- U/G Telephone Cable LOS B (S.U.E.*)
- U/G Telephone Cable LOS C (S.U.E.*)
- U/G Telephone Cable LOS D (S.U.E.*)
- U/G Telephone Conduit LOS B (S.U.E.*)
- U/G Telephone Conduit LOS C (S.U.E.*)
- U/G Telephone Conduit LOS D (S.U.E.*)
- U/G Fiber Optics Cable LOS B (S.U.E.*)
- U/G Fiber Optics Cable LOS C (S.U.E.*)
- U/G Fiber Optics Cable LOS D (S.U.E.*)

WATER:
- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*)
- U/G Water Line LOS C (S.U.E*)
- U/G Water Line LOS D (S.U.E*)
- Above Ground Water Line

TV:
- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Cable LOS B (S.U.E.*)
- U/G TV Cable LOS C (S.U.E.*)
- U/G TV Cable LOS D (S.U.E.*)
- U/G Fiber Optic Cable LOS B (S.U.E.*)
- U/G Fiber Optic Cable LOS C (S.U.E.*)
- U/G Fiber Optic Cable LOS D (S.U.E.*)

GAS:
- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*)
- U/G Gas Line LOS C (S.U.E.*)
- U/G Gas Line LOS D (S.U.E.*)
- Above Ground Gas Line

SANITARY SEWER:
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*)
- SS Forced Main Line LOS C (S.U.E.*)
- SS Forced Main Line LOS D (S.U.E.*)

MISCELLANEOUS:
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line LOS B (S.U.E.*)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc.
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

GEL problem solved Engineering of NC INC
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Raleigh, NC 27616 F 919.237.9177

GEOENVIRONMENTAL PHASE II INVESTIGATION REPORT, **PARCEL 6**
INTERSECTION OF NC 115 AND POTTS STREET; CONSTRUCT IMPROVEMENTS; CORNELIUS, MECKLENBURG COUNTY, NC
TIP NO. U-5873, WBS NO. 46425.1.1

NCDOT CONVENTIONAL PLAN SHEET SYMBOL LEGEND

PROJECT: ncdt06619 | DATE: December 5, 2019 | **FIGURE 6**

TABLE

TABLE 1. SOIL SAMPLE FIELD SCREENING AND LABORATORY ANALYTICAL RESULTS SUMMARY (Page 1 of 3)

Soil Boring ID (Northing/ Easting)	Date	Depth (feet bgs)	PID Reading (ppm)	QED UVF Results (mg/Kg)		
				GRO (C5-C10) *(action level=50)*	DRO (C10-C35) *(action level=100)*	TPH (C5-C35)
U5873.6-SB-1 (639422.031 / 1447101.191)	10/17/2019	0-1	0.2			
		1-2	0.1	<0.37	<0.37	<0.37
		2-3	0.3			
		3-4	0.1			
		4-5	0.5			
		5-6	0.2			
		6-7	0.3			
		7-8	0.2			
		8-10	0.3			
U5873.6-SB-2 (639414.225 / 1447126.543)	10/17/2019	0-1	0.6			
		1-2	0.5	<0.37	0.83	0.83
		2-3	0.2			
		3-4	0.3			
		4-5	0.4			
		5-6	0.3			
		6-7	0.3			
		7-8	0.3			
		8-10	0.3			
U5873.6-SB-3 (639409.606 / 1447162.658)	10/17/2019	0-1	0.6			
		1-2	0.4			
		2-3	0.5	<0.35	<0.35	<0.35
		3-4	0.4			
		4-5	0.4			
		5-6	0.4			
		6-7	0.3			
		7-8	0.2			
		8-10	0.4			
U5873.6-SB-4 (639394.712 / 1447179.506)	10/17/2019	0-1	0.5			
		1-2	0.3			
		2-3	0.6	<0.36	<0.36	0.18
		3-4	0.3			
		4-5	0.4			
		5-6	0.1			
		6-7	0.2			
		7-8	0.2			
		8-10	0.3			
U5873.6-SB-5 (639373.754 / 1447195.877)	10/17/2019	0-1	0.6			
		1-2	0.6	0.72	0.74	1.46
		2-3	0.4			
		3-4	0.5			
		4-5	0.4			
		5-6	0.3			
		6-7	0.6			
		7-8	0.3			
		8-10	0.6			

TABLE 1. SOIL SAMPLE FIELD SCREENING AND LABORATORY ANALYTICAL RESULTS SUMMARY (Page 2 of 3)

Soil Boring ID	Date	Depth (feet bgs)	PID Reading (ppm)	QED UVF Results (mg/Kg)		
				GRO (C5-C10) *(action level=50)*	DRO (C10-C35) *(action level=100)*	TPH (C5-C35)
U5873.6-SB-6 (639337.392 / 1447210.540)	10/17/2019	0-1	0.7			
		1-2	0.7	<0.28	<0.28	0.14
		2-3	0.5			
		3-4	0.3			
		4-5	0.5			
		5-6	0.5			
		6-7	0.5			
		7-8	0.6			
		8-10	0.2			
U5873.6-SB-7 (639330.146 / 1447191.640)	10/17/2019	0-1	0.9			
		1-2	0.7			
		2-3	0.9	<0.37	<0.37	0.18
		3-4	0.8			
		4-5	0.8			
		5-6	0.7			
		6-7	0.6			
		7-8	0.6			
		8-10	0.5			
U5873.6-SB-8 (639319.163 / 1447203.345)	10/17/2019	0-1	0.1			
		1-2	0.4			
		2-3	0.6			
		3-4	0.6			
		4-5	0.4			
		5-6	0.4			
		6-7	0.5			
		7-8	0.6	<0.30	<0.30	0.15
		8-10	0.6			
U5873.6-SB-9 (639308.440 / 1447190.166)	10/17/2019	0-1	0.1			
		1-2	0.7			
		2-3	0.7			
		3-4	1.1	<0.37	0.79	0.79
		4-5	0.8			
		5-6	0.4			
		6-7	0.5			
		7-8	0.6			
		8-10	0.6			
U5873.6-SB-10 (639297.985 / 1447175.152)	10/17/2019	0-1	1.0			
		1-2	1.1	<0.38	<0.38	<0.38
		2-3	1.1			
		3-4	0.8			
		4-5	0.8			
		5-6	0.9			
		6-7	0.6			
		7-8	0.6			
		8-10	0.7			

TABLE 1. SOIL SAMPLE FIELD SCREENING AND LABORATORY ANALYTICAL RESULTS SUMMARY (Page 3 of 3)

Soil Boring ID	Date	Depth (feet bgs)	PID Reading (ppm)	QED UVF Results (mg/Kg)		
				GRO (C5-C10) *(action level=50)*	DRO (C10-C35) *(action level=100)*	TPH (C5-C35)
U5873.6-SB-11 (639282.302 / 1447169.188)	10/17/2019	0-1	0.8			
		1-2	1.0	<0.36	0.36	0.36
		2-3	0.7			
		3-4	0.9			
		4-5	0.7			
		5-6	0.8			
		6-7	0.7			
		7-8	0.7			
		8-10	0.7			
U5873.6-SB-12 (639252.438 / 1447153.056)	10/17/2019	0-1	0.7			
		1-2	0.8			
		2-3	1.0	<0.31	0.31	0.31
		3-4	0.7			
		4-5	0.6			
		5-6	0.7			
		6-7	0.6			
		7-8	0.6			
		8-10	0.7			

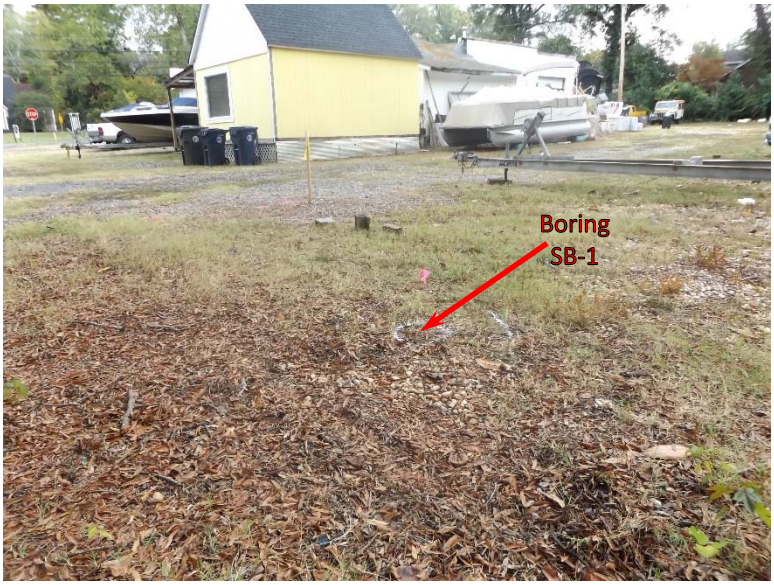
DRO = Diesel range organics
GRO = Gasoline range organics
TPH = Total petroleum hydrocarbons
N/A = not applicable
mg/Kg = milligrams per kilogram
ppm = parts per million
feet bgs = feet below ground surface
GRO and DRO action levels per 7/26/16 NCDEQ UST Corrective Action Branch memornadum

APPENDIX A

SITE PHOTOGRAPHS

Photograph 1. Aerial photograph showing GeoEnvironmental soil boring locations.

Photograph 2. Northwestern portion of investigation area along residential frontage evaluated with geophysical surveys only.



Photograph 3. GeoEnvironmental soil boring location U5873.6-SB-1.

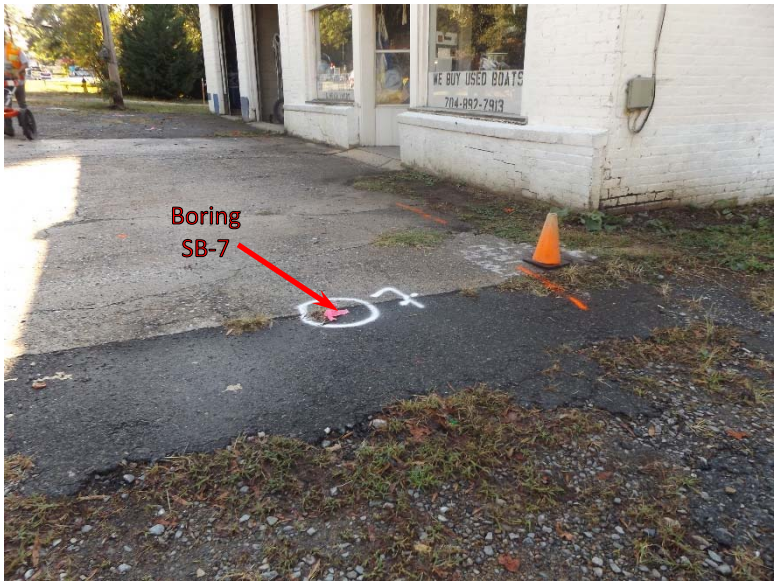
Photograph 4. GeoEnvironmental soil boring location U5873.6-SB-2.

Photograph 5. GeoEnvironmental soil boring location U5873.6-SB-3.

Photograph 6. GeoEnvironmental soil boring location U5873.6-SB-4.

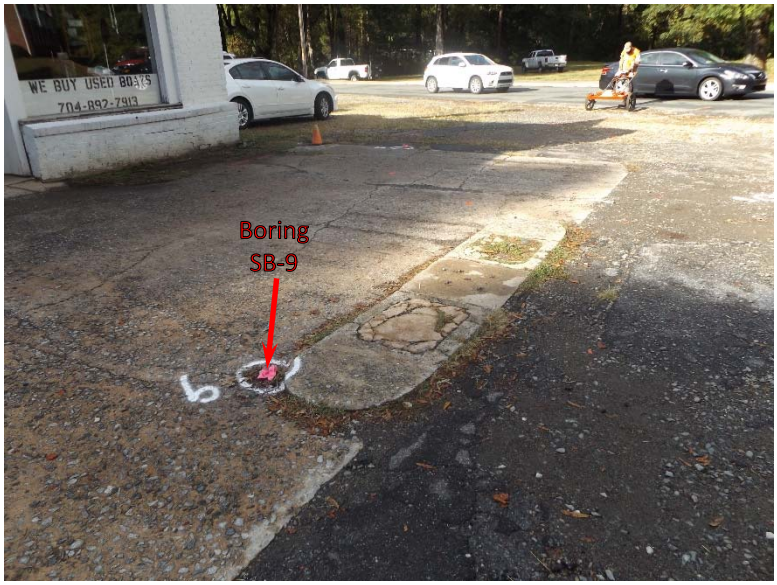
Photograph 7. GeoEnvironmental soil boring location U5873.6-SB-5.

Photograph 8. GeoEnvironmental soil boring location U5873.6-SB-6.



Photograph 9. GeoEnvironmental soil boring location U5873.6-SB-7.

Photograph 10. GeoEnvironmental soil boring location U5873.6-SB-8.



Photograph 11. GeoEnvironmental soil boring location U5873.6-SB-9.

Photograph 12. GeoEnvironmental soil boring location U5873.6-SB-10.

Photograph 13. GeoEnvironmental soil boring location U5873.6-SB-11.

Photograph 14. GeoEnvironmental soil boring location U5873.6-SB-12.

Photograph 15. Interior of the canvas/upholstery operation facility.

Photograph 16. Interior of the canvas/upholstery operation facility.

APPENDIX B

SOIL BORING LOGS

SOIL BORING LOGS

GEL Engineering, of NC, Inc., Raleigh, North Carolina

Project Name: NCDOT Intersection of NC 115 and Potts Street; Construct Improvements, Cornelius, Mecklenburg County, NC; TIP No. U- 5873, WBS No. 46425.1.1 GEL Project Code: NCDT06619

Parcel Address: Parcel 6, 20915 & 20917 N. Main St. Cornelius, NC 28031 (Howell and Sons Canvas)

Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-1			
0-1	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, slight moisture, mica present.	
1-2	0.1	Sandy CLAY (80% clay, 20% fine grained sand), orange, slight moisture, mica present.	●
2-3	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, slight moisture.	
3-4	0.1	Sandy CLAY (80% clay, 20% fine grained sand), orange, slight moisture.	
4-5	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
5-6	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
BORING ID: U5873.6-SB-2			
0-1	0.6	Sandy CLAY (80% clay, 10% medium grained sand, 10% fine grained sand), dark orange, dry.	
1-2	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	●
2-3	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
3-4	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
4-5	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
5-6	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	

SOIL BORING LOGS

GEL Engineering, of NC, Inc., Raleigh, North Carolina

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Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-3			
0-1	0.6	Sandy CLAY (70% clay, 20% fine grained sand, 10% medium grained sand), dark orange, dry, mica present.	
1-2	0.4	Sandy CLAY (70% clay, 20% fine grained sand, 10% medium grained sand), dark orange, dry, mica present.	
2-3	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	●
3-4	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
4-5	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
5-6	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
6-7	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
7-8	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
8-10	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
BORING ID: U5873.6-SB-4			
0-1	0.5	Gravely SAND (50% medium grained sand, 20% coarse grained sand, 20% fine grained sand, 10% gravel), gray, dry.	
1-2	0.3	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	
2-3	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	●
3-4	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
4-5	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
5-6	0.1	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	

SOIL BORING LOGS

GEL Engineering, of NC, Inc., Raleigh, North Carolina

Project Name: NCDOT Intersection of NC 115 and Potts Street; Construct Improvements, Cornelius, Mecklenburg County, NC; TIP No. U- 5873, WBS No. 46425.1.1 GEL Project Code: NCDT06619

Parcel Address: Parcel 6, 20915 & 20917 N. Main St. Cornelius, NC 28031 (Howell and Sons Canvas)

Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-5			
0-1	0.6	Sandy CLAY (60% clay, 20% medium grained sand, 20% fine grained sand), dark orange, dry.	
1-2	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	●
2-3	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
3-4	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
4-5	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
5-6	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
BORING ID: U5873.6-SB-6			
0-1	0.7	Sandy CLAY (60% clay, 20% medium grained sand, 20% fine grained sand), dark orange, dry.	
1-2	0.7	Sandy CLAY (70% clay, 15% medium grained sand, 15% fine grained sand), dark orange, dry.	●
2-3	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
3-4	0.3	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
4-5	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
5-6	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.2	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	

SOIL BORING LOGS

GEL Engineering, of NC, Inc., Raleigh, North Carolina

Project Name: NCDOT Intersection of NC 115 and Potts Street; Construct Improvements, Cornelius, Mecklenburg County, NC; TIP No. U- 5873, WBS No. 46425.1.1 GEL Project Code: NCDT06619

Parcel Address: Parcel 6, 20915 & 20917 N. Main St. Cornelius, NC 28031 (Howell and Sons Canvas)

Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-7			
0-1	0.9	Sandy CLAY (80% clay, 10% fine grained sand, 5% coarse grained sand, 5% medium grained sand), orange, slight moisture, mica present.	
1-2	0.7	Sandy CLAY (80% clay, 10% medium grained sand, 10% fine grained sand), dark orange, sligh moisture.	
2-3	0.9	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	●
3-4	0.8	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	
4-5	0.8	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
5-6	0.7	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
6-7	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
8-10	0.5	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
BORING ID: U5873.6-SB-8			
0-1	0.1	GRAVEL, gray, dry.	
1-2	0.4	Sandy CLAY (70% clay, 15% medium grained sand, 15% fine grained sand), dark orange, sligh moisture.	
2-3	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	
3-4	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	
4-5	0.4	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, slight moisture.	
5-6	0.4	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
6-7	0.5	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present, slight petroleum odor present.	●
8-10	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	

SOIL BORING LOGS

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Parcel Address: Parcel 6, 20915 & 20917 N. Main St. Cornelius, NC 28031 (Howell and Sons Canvas)

Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-9			
0-1	0.1	GRAVEL, gray, dry, concrete and asphalt present	
1-2	0.7	Sandy CLAY (70% clay, 15% medium grained sand, 15% fine grained sand), dark orange, sligh moisture.	
2-3	0.7	Sandy CLAY (60% clay, 20% medium grained sand, 10% coarse grained sand, 10% fine grained sand), dark orange, slight moisture.	
3-4	1.1	Sandy CLAY (80% clay, 10% medium grained sand, 10% fine grained sand), dark orange, dry.	●
4-5	0.8	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
5-6	0.4	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
6-7	0.5	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
BORING ID: U5873.6-SB-10			
0-1	1.0	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, asphalt present.	
1-2	1.1	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	●
2-3	1.1	Sandy CLAY (60% clay, 20% fine grained sand, 10% coarse grained sand, 10% medium grained sand), dark orange, dry.	
3-4	0.8	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry.	
4-5	0.8	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
5-6	0.9	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.7	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	

SOIL BORING LOGS

GEL Engineering, of NC, Inc., Raleigh, North Carolina

Project Name: NCDOT Intersection of NC 115 and Potts Street; Construct Improvements, Cornelius, Mecklenburg County, NC; TIP No. U- 5873, WBS No. 46425.1.1 GEL Project Code: NCDT06619

Parcel Address: Parcel 6, 20915 & 20917 N. Main St. Cornelius, NC 28031 (Howell and Sons Canvas)

Drilling Date: October 17, 2019 Drilling Contractor: Regional Probing Services, Inc.; NC Cert No. 3322A

Drilling Method: Direct Push Technology (DPT) GEL Geologist: Brian P. Bastian

Depth (ft bgs)	PID (ppm)	Soil Description (depths are in feet below ground surface [ft bgs])	Laboratory Analysis
BORING ID: U5873.6-SB-11			
0-1	0.8	Sandy CLAY (80% clay, 10% medium grained sand, 10% fine grained sand), orange, slight moisture.	
1-2	1.0	Sandy CLAY (70% clay, 20% fine grained sand, 5% coarse grained sand, 5% medium grained sand), dark orange, slight moisture.	●
2-3	0.7	Sandy CLAY (70% clay, 20% fine grained sand, 5% coarse grained sand, 5% medium grained sand), dark orange, slight moisture.	
3-4	0.9	Sandy CLAY (80% clay, 20% fine grained sand), orange, slight moisture.	
4-5	0.7	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
5-6	0.8	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
6-7	0.7	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
7-8	0.7	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
8-10	0.7	Sandy CLAY (80% clay, 20% fine grained sand), orange, dry, mica present.	
BORING ID: U5873.6-SB-12			
0-1	0.7	Sandy CLAY (60% clay, 20% medium grained sand, 20% fine grained sand), dark orange, slight moisture.	
1-2	0.8	Sandy CLAY (60% clay, 20% medium grained sand, 20% fine grained sand), dark orange, dry.	
2-3	1.0	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	●
3-4	0.7	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry.	
4-5	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
5-6	0.7	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
6-7	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
7-8	0.6	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	
8-10	0.7	Sandy CLAY (80% clay, 20% fine grained sand), dark orange, dry, mica present.	

APPENDIX C

LABORATORY ANALYTICAL REPORT AND CHAIN OF CUSTODY RECORD FOR SOIL SAMPLES

QED

AQROS

Hydrocarbon Analysis Results

Client: GEL ENGINEERING
Address:

Samples taken 10/16/19-10/17/19
Samples extracted 10/16/19-10/17/19
Samples analysed Friday, October 18, 2019

Contact: ANDREW STAHL

Operator CAROLINE STEVENS

Project: NCDOT 06619

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	U5873.6-1	14.9	<0.37	<0.37	<0.37	<0.37	<0.07	<0.12	<0.015	0	0	0	Residual HC
s	U5873.6-3	13.8	<0.35	<0.35	<0.35	<0.35	<0.07	<0.11	<0.014	0	100	0	Residual HC
s	U5873.6-4	14.5	<0.36	<0.36	<0.36	0.18	0.18	<0.12	<0.015	0	67	33	Residual HC

Initial Calibrator QC check OK Final FCM QC Check OK 106.3 %

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

AQROS

Hydrocarbon Analysis Results

Client: GEL ENGINEERING
Address:

Samples taken Thursday, October 17, 2019
Samples extracted Thursday, October 17, 2019
Samples analysed Friday, October 18, 2019

Contact: ANDREW STAHL

Operator CAROLINE STEVENS

Project: NCDOT 06619

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	U5873.6-2	14.8	<0.37	<0.37	0.83	0.83	0.67	<0.12	<0.015	0	66.7	33.3	Deg.Fuel 85.1%,(FCM)
s	U5873.6-5	15.6	<0.39	0.72	0.74	1.46	0.5	<0.12	<0.016	76	16.5	7.6	Deg.PHC 77.2%,(FCM)
s	U5873.6-6	11.1	<0.28	<0.28	<0.28	0.14	0.14	<0.09	<0.011	0	52.6	47.4	Residual HC
s	U5873.6-8	12.0	<0.3	<0.3	<0.3	0.15	0.15	<0.1	<0.012	0	56.3	43.7	Residual HC,(BO)
s	U5873.6-9	14.8	<0.37	<0.37	0.79	0.79	0.62	<0.12	<0.015	66.7	20.1	13.2	Deg.Fuel 74.6%,(FCM)
s	U5873.6-10	15.0	<0.38	<0.38	<0.38	<0.38	<0.08	<0.12	<0.015	0	0	0	PHC not detected,(BO)
s	U5873.6-7	14.7	<0.37	<0.37	<0.37	0.18	0.18	<0.12	<0.015	0	51.3	48.7	Residual HC
s	U5873.6-11	14.3	<0.36	<0.36	0.36	0.36	0.23	<0.11	<0.014	0	60.7	39.3	Deg Fuel 75.5%,(FCM)
s	U5873.6-12	12.4	<0.31	<0.31	0.31	0.31	0.25	<0.1	<0.012	0	54.3	45.7	V.Deg.PHC 74.2%,(FCM),(BO)

Initial Calibrator QC check OK

Final FCM QC Check OK 105.9 %

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

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

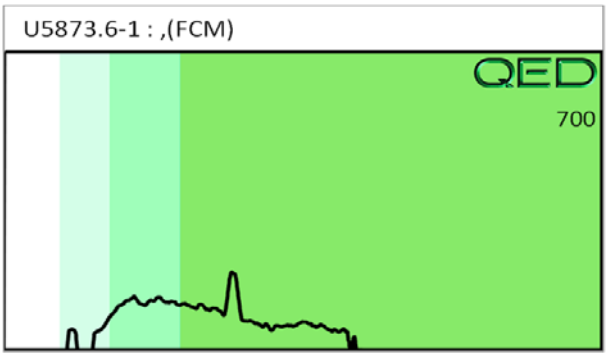
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

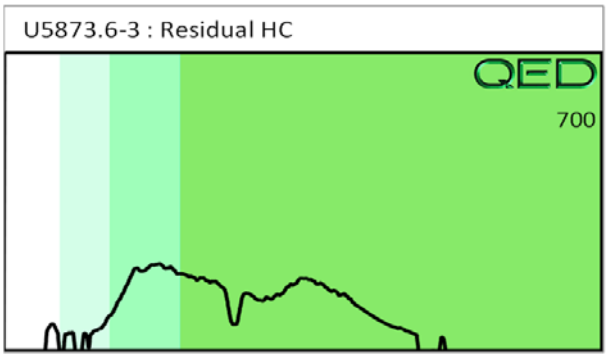
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

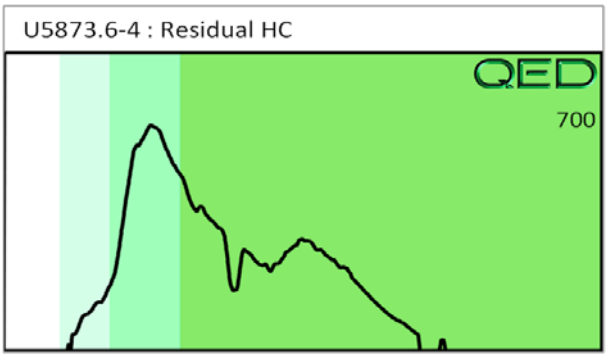
QED Hydrocarbon Fingerprints

Project: NCDOT 06619

Friday, October 18, 2019





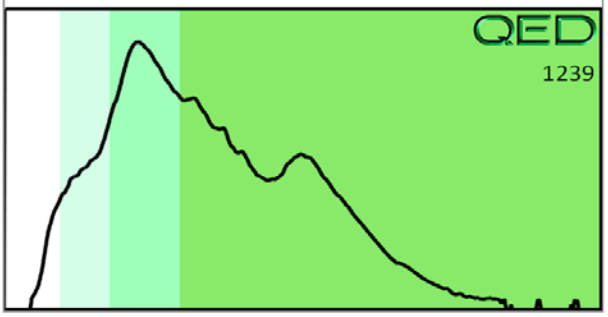


QED Hydrocarbon Fingerprints

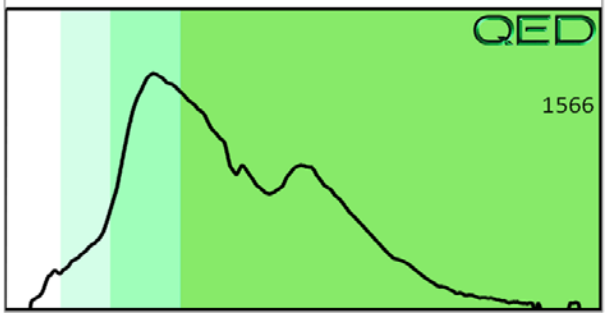
Project: NCDOT 06619

Friday, October 18, 2019

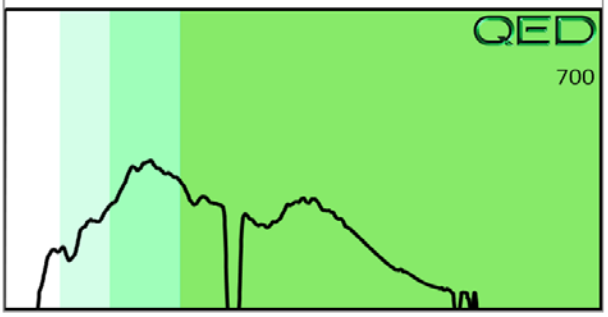
U5873.6-2 : Deg.Fuel 85.1%,(FCM)



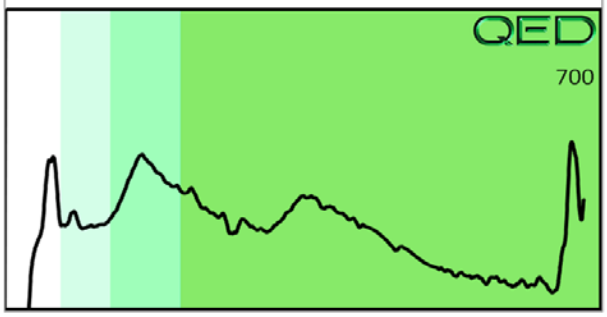
U5873.6-5 : Deg.PHC 77.2%,(FCM)



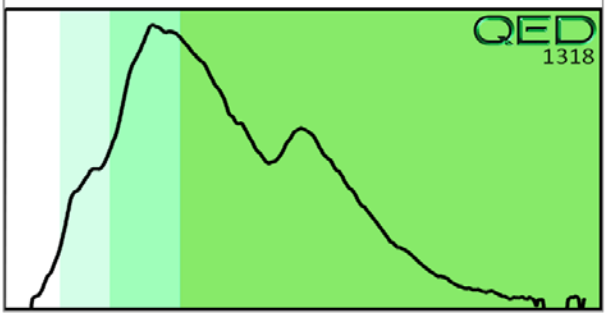
U5873.6-6 : Residual HC



U5873.6-8 : Residual HC,(BO)

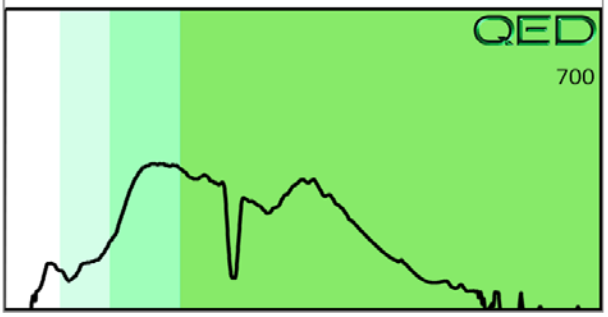


U5873.6-9 : Deg.Fuel 74.6%,(FCM)

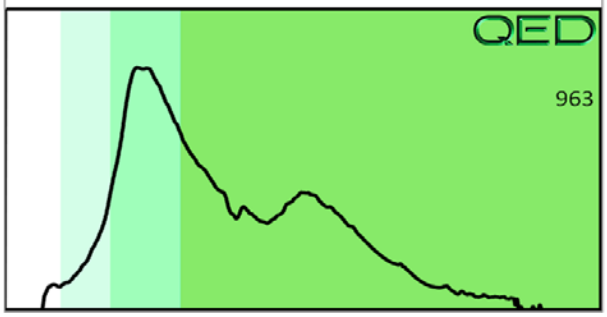


U5873.6-10 : PHC not detected,(BO)

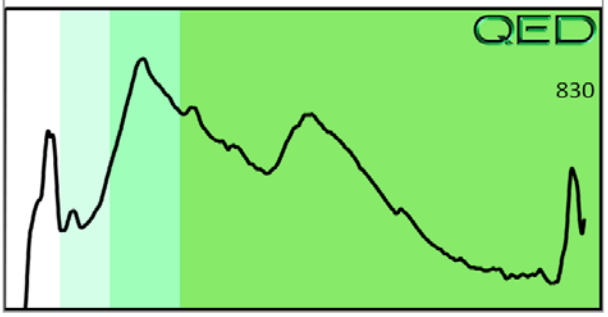
U5873.6-7 : Residual HC



U5873.6-11 : Deg Fuel 75.5%,(FCM)



U5873.6-12 : V.Deg.PHC 74.2%,(FCM),(BO)



Client Name:	GEL Engineering
Address:	
Contact:	Andrew Stahl
Project Ref.:	NCDT06619
Email:	Andrew.Stahl@gel.com
Phone #:	919-819-2510
Collected by:	BPB

REDLAB™
RAPID ENVIRONMENTAL DIAGNOSTICS

CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

RED Lab, LLC
5598 Marvin K Moss Lane
MARBIONC Bldg, Suite 2003
Wilmington, NC 28409

Each sample will be analyzed for BTEX, GRO, DRO, TPH, PAH total aromatics and BaP

Sample Collection Date/Time	TAT Requested 24 Hour	TAT Requested 48 Hour	Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
10-16-19 / 1345		X	BPB	U5873.2-1	55.0	45.0	10
1400		X	BPB	U5873.2-2	54.5	45.1	9.4
1415		X	BPB	U5873.2-3	55.1	45.1	10
1435		X	BPB	U5873.2-4	55.6	44.9	10.7
1500		X	BPB	U5873.2-5	53.0	44.8	7.9
1515		X	BPB	U5873.2-6	53.6	45.1	8.5
1530		X	BPB	U5873.2-7	56.0	44.7	11.3
10-17-19 / 0800		X	BPB	U5873.6-1	56.0	44.8	11.4
0820		X	BPB	U5873.6-3	56.9	44.6	12.3
0840		X	BPB	U5873.6-4	56.5	44.8	11.7
0855		X	BPB	U5873.6-2	56.5	45.0	11.5
0910		X	BPB	U5873.6-5	55.4	44.6	10.9
0940		X	BPB	U5873.6-6	55.5	44.7	10.8
1000		X	BPB	U5873.6-8	54.5	44.5	10
1020		X	BPB	U5873.6-9	56.3	44.8	11.5
1055		X	BPB	U5873.6-10	56.3	45.0	11.3
1115		X	BPB	U5873.6-7	56.6	45.0	11.6
1130		X	BPB	U5873.6-11	56.6	44.7	11.9
1145		X	BPB	U5873.6-12	54.2	44.5	9.7

Comments:

Relinquished by	Date/Time	Accepted by	Date/Time
Brian Bartz	12-17-19 / 1300		
Relinquished by	Date/Time	Accepted by	Date/Time
		CCS	10/18/19 11:00

RED Lab USE ONLY

19

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