GEL Engineering of NC INC

an affiliate of **The GEL Group** INC

PRELIMINARY SITE ASSESSMENT REPORT

9320 NC Hwy. 107
James Richard Russell Living Trust U/A Property, Parcel 053
Cullowhee, North Carolina
State Project R-4753
WBS Element #39999.1.1
Jackson County

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

June 16, 2014

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Signature Page

This document, entitled *Preliminary Site Assessment Report*, has been prepared for the James Richard Russell Living Trust U/A Property (Parcel 053), located at 9320 NC Hwy. 107 in Cullowhee, North Carolina (State Project R-4753, WBS Element #39999.1.1, Jackson County). It has been prepared by GEL Engineering of NC, Inc. in accordance with the Notice to Proceed provided by the North Carolina Department of Transportation-GeoEnvironmental Section, Geotechnical Engineering Unit for the exclusive use of the North Carolina Department of Transportation. It has been prepared in accordance with accepted quality control practices and has been reviewed by the undersigned.

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

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

06-16-14

Date

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9320 NC Hwy. 107
James Richard Russell Living Trust U/A Property, Parcel 053
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State Project R-4753, WBS Element #39999.1.1
Jackson County

Executive Summary

The subject site is the James Richard Russell Living Trust U/A property (Parcel 053) located at 9320 NC Hwy. 107 in Jackson County, North Carolina. The primary purpose of this investigation was to evaluate the presence or absence of underground storage tanks (USTs) and constituents of concern in soil within the proposed and existing North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) and easements adjacent to Parcel 053 on the west side of NC Hwy. 107, as a result of previous and/or current operations at the subject site.

The property comprising Parcel 053 on the west side of NC Hwy. 107 contains a convenience store that operates on a part-time basis. Neighbors in the vicinity of the site indicated the convenience store may have previously sold gasoline. An aboveground storage tank (AST) is located adjacent to the convenience store, but no evidence of USTs, vents, or UST removals was noted.

The files reviewed at the Asheville Regional Office of the North Carolina Department of Environment and Natural Resources (NCDENR) did not contain any information about Parcel 053. NCDENR representatives of the UST Section confirmed that the site has no assigned UST Facility ID number and that no UST Incident number has ever been assigned to the site. No groundwater monitoring wells were observed at the site.

GEL Engineering of NC, Inc. (GEL) performed a preliminary site assessment within the proposed and existing NCDOT westerly ROW and easements adjacent to Parcel 053 that included a geophysical investigation, and the collection and analysis of soil samples. No subsurface anomalies indicative of “Known USTs,” “Probable USTs,” or “Possible USTs” were identified within the investigation area.

Executive Summary (continued)

Soil samples were collected for analysis from three borings constructed within the investigation area and analyzed for petroleum hydrocarbon constituents. DRO was not detected in any of the samples, but GRO was detected in samples S53-3 and S53-2 at levels of 1.1 mg/kg and 69.7 mg/kg, respectively. The GRO concentration detected in sample S53-2 exceeds the NCDENR action level for GRO (10 mg/kg).

Based on the detection of elevated GRO concentration in the S53-2 soil sample, it is estimated that there is an approximate total volume of 475 cubic yards of impacted soil (GRO >10 mg/kg) in the vicinity of boring S53-2.

No additional environmental investigation of the soil at the site by NCDOT is recommended at this time. However, it is recommended that soils excavated in the vicinity of boring S53-2 as part of planned construction activities by NCDOT be handled appropriately and further characterized for petroleum constituents, as needed.

PRELIMINARY SITE ASSESSMENT REPORT

9320 NC Hwy. 107
James Richard Russell Living Trust U/A Property, Parcel 053
Cullowhee, North Carolina
State Project R-4753, WBS Element #39999.1.1
Jackson County

1.0 Introduction

This document presents the details of a geophysical survey and preliminary site assessment performed within the accessible portions of the existing and proposed North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) and easements on the west side of NC Hwy. 107 at the James Richard Russell Trust U/A property (Parcel 053) located at 9320 NC Hwy. 107 in Jackson County, North Carolina.

Parcel 053 is divided by NC Hwy. 107. A residence is located within the parcel on the east side of NC Hwy. 107, and a convenience store is located on the west side of the highway. Neighbors in the vicinity of the site indicated the convenience store may have previously sold gasoline. The site location is shown in Figure 1, an excerpt from the United States Geological Survey (USGS) 7.5-minute quadrangle map of Sylva South and Tuckasegee, North Carolina. The preliminary site assessment (PSA) was conducted by GEL Engineering of NC, Inc. (GEL) in accordance with the Notice to Proceed issued by NCDOT on February 5, 2014.

The primary purpose of this investigation was to evaluate the presence or absence of underground storage tanks (USTs) and/or constituents of concern in soil within accessible portions of the existing and proposed easements and NCDOT ROW fronting Parcel 053 on the west side of NC Hwy. 107 as a result of current and/or former operations.

2.0 Background

NCDOT is planning road improvements to the area in the vicinity of NC Hwy. 107 in Jackson County, North Carolina. NCDOT wanted to assess the area in the existing and proposed ROW and easements on the west side of NC Hwy 107 fronting Parcel 053 to evaluate the presence or absence of USTs and soil contamination related to the current and former on-site operations, and the impact (if any) of these operations on the

proposed road improvements. Figures 2 through 4 show the general site layout for Parcel 053**.**

The property comprising Parcel 053 is divided by NC Hwy. 107. A residence is located within the parcel on the east side of NC Hwy. 107, and a convenience store (with a basement) is located on the west side of the highway. Neighbors in the vicinity of the site indicated the convenience store may have previously sold gasoline. An aboveground storage tank (AST) is located adjacent to the convenience store, but no evidence of USTs, vents, or UST removals was note. The basement beneath the convenience store appeared to be an occupied residence. Photograph 1 in Appendix I shows the convenience store and the area in front of the store that was included as part of the investigation.

The files reviewed at the Asheville Regional Office of the North Carolina Department of Environment and Natural Resources (NCDENR) did not contain any information about Parcel 053. NCDENR representatives of the UST Section confirmed that the site has no assigned UST Facility ID number and that no UST Incident number has ever been assigned to the site. No groundwater monitoring wells were observed at the site.

3.0 Local Geology and Surroundings

Parcel 053 is located in a sparsely developed area of Jackson County, North Carolina. Surrounding land uses include residential and commercial activities. It is located in an unincorporated area between Cullowhee and Tuckasegee, North Carolina.

This area is located in the Blue Ridge Belt within the Blue Ridge Physiographic of North Carolina. The land surface of the area is characterized by mountainous terrain. The Blue Ridge Belt is typified by a complex of sedimentary, metamorphic, and igneous rocks, including felsic gneiss and granite that are Late Proterozoic in age. Parcel 053 is located adjacent to and within the Tuckasegee River floodplain.

The United States Department of Agriculture's *Web Soil Survey* (2014) (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx) maps the native soil in the investigation area as "Evard-Cowee Complex" (EvE), which is characterized as hill slopes consisting of "residuum weathered from hornblende gneiss and/or amphibolite that is affected by soil creep in the upper solum," and Cullasaja-Tuckasegee Complex (CuD), which is characterized as footslopes or toeslopes consisting of "cobbly and stony

colluviums derived from igneous and metamorphic rock." The soils encountered at the site during the preliminary site assessment for Parcel 053 consisted predominantly of brown/orange, silty clay overlying and/or incorporating saprolite and gravels.

Groundwater was not encountered in borings constructed as part of the preliminary site assessment. Previous depth to groundwater measurements made in monitoring wells located at sites in the vicinity of Parcel 053 indicate the water table is located at depths of approximately 20 feet below ground surface (bgs). Based on the USGS topographic map presented as Figure 1, the site is located approximately 2150 feet above mean sea level. The topography in Figure 1 indicates that groundwater in the vicinity of Parcel 053 most likely flows in a westerly direction towards the Tuckasegee River. Storm water from the site, as well as from adjacent sites surrounding Parcel 053, generally flows in a westerly direction to the river.

4.0 Subsurface Investigation

To evaluate the presence or absence of USTs and/or impact to subsurface soil within the accessible portions of the existing and proposed easements and NCDOT ROWs at Parcel 053, GEL performed a limited site assessment within the accessible portions of the highlighted area shown in Figure 2 that consisted of the following tasks:

- Performance of a geophysical investigation to identify the presence or absence of USTs and associated appurtenances within the accessible portions of the existing and proposed easements and ROW.
- Soil vapor screening of soil samples collected from subsurface soil borings located within the accessible portions of the existing and proposed easements and ROW to evaluate the potential presence or absence of soil impact from petroleum constituents of concern.
- Collection and laboratory analysis of soil samples from the subsurface borings.

The details of these tasks are discussed in the following sections.

4.1 Geophysical Survey

The geophysical survey included the deployment of ground penetrating radar (GPR) technology and time domain electromagnetic technology (TDEM) to the site. These technologies were used in concert with one another in order to identify subsurface

metallic anomalies and, more specifically, to identify the potential presence of USTs within the investigation area. A brief description of each technology is presented in the following paragraphs followed by a discussion of the results of the geophysical investigation.

4.1.1 Ground Penetrating Radar Methodology

A RAMAC digital radar control system configured with a 250 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 that houses the transmitter and receiver, a digital control unit that both generates and digitally records the GPR data, and a color video monitor to view data as they are 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 are collected along transects, which are measured paths along which the GPR antenna is moved. During a survey, marks are placed in the data by the operator at designated points along the GPR transects or with a survey wheel odometer. These marks allow for a correlation between the GPR data and the position of the GPR antenna on the ground.

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

on 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 man-made 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 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

The 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 0.5-meter by 1.0-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.

4.1.3 Field Procedures

The GPR and TDEM field investigation was performed on March 4, 2014, within the accessible portions of the existing and proposed easements and ROW at Parcel 053, as shown in Figure 3. A GPR system time range setting of 90 nanoseconds (ns) was used

during the entire investigation. This range was determined after a series of test lines were conducted to evaluate the GPR response in the local geologic section. Interpretation of the GPR data was conducted in the field and any potential anomalies were marked in the field. GPR data processing typically included band pass filtering, background removal, horizontal smoothing, and gain adjustments. TDEM was also used to scan the project site. Any electromagnetic anomalies indicative of buried metallic objects were marked in the field.

It should be noted that NC 811 underground utility locations had been performed within the investigation area at Parcel 053 prior to the initiation of the preliminary site assessment field activities at the site and were marked with paint.

The TDEM and GPR data did not indicate the presence of "Known USTs," "Probable USTs," or "Possible USTs" in the subsurface of the investigation area. Additionally, there was no visual evidence of USTs in the investigation area. However, an EM-61 signature is shown within the investigation area in Figure 3 that resulted from a parked car.

As shown in Figure 3 and Photograph 3 in Appendix I, two GPR anomalies were identified within the investigation area near the western edge of NC Hwy 107. The EM-61 data did not indicate the presence of any metallic objects in the subsurface within either anomaly. Both anomaly areas were penetrated to a depth of 5 feet below ground surface (bgs) using direct push technology (DPT), but no USTs were encountered. The two identified anomalies may represent differences in lithology compared to surrounding soils resulting from fill material that may have been emplaced following the possible previous removal of USTs.

4.2 Subsurface Soil Investigation

To evaluate the presence or absence of impact to subsurface soil by constituents of concern, GEL collected soil samples from three subsurface soil borings at Parcel 053, S53-1 through S53-3, on March 4, 2014 for analysis of total petroleum hydrocarbon indicator parameters. The soil borings were constructed within accessible portions of the existing and proposed easements and NCDOT ROW at Parcel 053, as shown in Figures 2 and 4, and in Photograph 3 in Appendix I. The northing and easting coordinates for the boring locations are listed in the table below.

Summary of Location Data and PID Measurements for Soil Samples Collected for Analysis at Parcel 053

Soil Boring	Depth Interval of Soil Sample Collected for Analysis (feet bgs)	PID Reading (ppm)	Northing	Easting
S53-1	7-8	0.0	582800.795	769203.135
S53-2	7-8	0.0	582788.324	769222.067
S53-3	7-8	0.0	582843.235	769196.350

Notes:
1) Northings and Eastings are based on the NC State Plane Coordinate System
2) bgs = below ground surface
3) PID = photoionization detector
4) ppm = parts per million

All borings were advanced to a total depth of 8 feet below ground surface (bgs). Soil samples were collected at depths of 3-4 feet bgs and 7-8 feet bgs from each borehole. All soil samples were inspected for indications of impact by constituents of concern, including petroleum hydrocarbons, such as odors, discoloration, or visible sheen. This sampling was accomplished using DPT provided by Probe Technology, Inc. Soil boring lithologic logs are attached as Appendix II of this document. Groundwater was not encountered in any borings.

The soil samples were screened for the presence of organic vapors using a portable photoionization detector (PID). 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, and the sample was allowed to equilibrate for approximately 5 minutes, after which time a small opening was made in the bag. The probe of the PID was then inserted into the bag, and the airspace above the soil was screened for organic vapors.

No organic vapor concentrations were measured in any of the soil screening samples collected from the five borings. Therefore, to assess the subsurface soil quality, soil samples collected from the 7 to 8-foot depth interval were designated for analysis.

Following completion of the soil sampling activities, all borings were abandoned by filling the boreholes with soil cuttings and hydrated bentonite. The backfilled material in each boring was topped off with asphalt patch material. Soil samples collected from

the borings were submitted to QROS' analytical laboratory in Wilmington, North Carolina for analysis of petroleum hydrocarbon constituents using Ultra-violet Fluorescence Spectrometry. The analytical results are included on the Certificates of Analysis provided in Appendix III, and a summary of the analytical results is presented in Table 1.

The analytical results indicate that DRO was not detected in any of the samples. GRO was detected in samples S53-3 and S53-2 at levels of 1.1 milligrams per kilogram (mg/kg) and 69.7 mg/kg, respectively. The GRO concentration detected in sample S53-2 exceeds the NCDENR action level for GRO (10 mg/kg).

It is estimated that there is an approximate total volume of 475 cubic yards of impacted soil (GRO >10 mg/kg) in the vicinity of boring S53-2 based on the following assumed area within the investigation area (as shown on Figure 4) and assumed depth of impacted soil:

Boring S53-2 Area

- 1600 square feet x 8 feet = 475 cubic yards

5.0 Conclusions and Recommendations

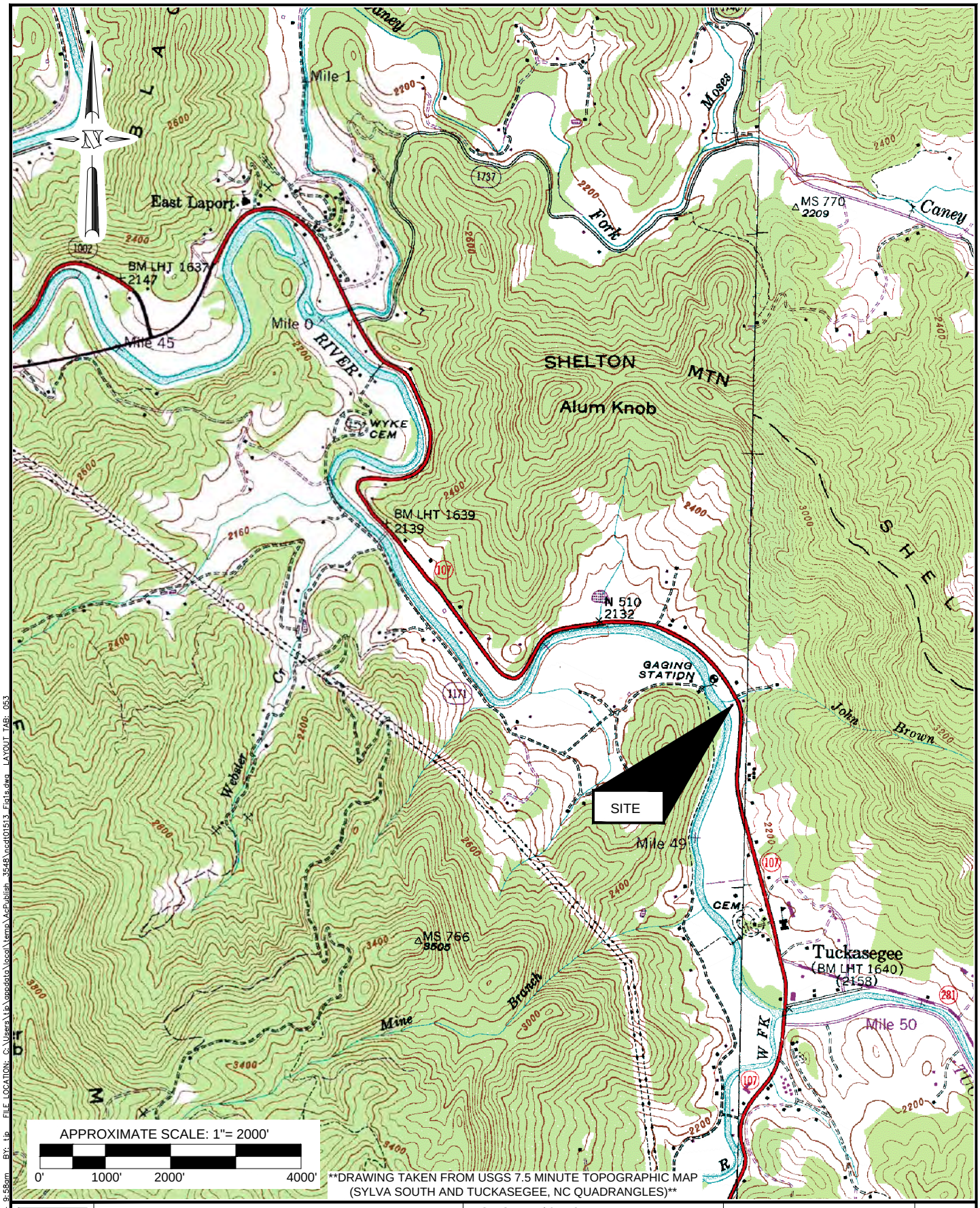
GEL performed a preliminary site assessment within the accessible portions of the existing and proposed easements and NCDOT ROW at Parcel 053 that included a geophysical investigation and the collection and analysis of soil samples. No subsurface anomalies indicative of suspected or known USTs were identified within the investigation area.

Soil samples were collected for analysis from three borings constructed within the investigation area and analyzed for petroleum hydrocarbon constituents. DRO was not detected in any of the samples, but GRO was detected in samples S53-3 and S53-2 at levels of 1.1 mg/kg and 69.7 mg/kg, respectively. The GRO concentration detected in sample S53-2 exceeds the NCDENR action level for GRO (10 mg/kg).

Based on the detection of elevated GRO concentration in the S53-2 soil sample, it is estimated that there is an approximate total volume of 475 cubic yards of impacted soil (GRO >10 mg/kg) in the vicinity of boring S53-2.

No additional environmental investigation of the soil at the site by NCDOT is recommended at this time. However, it is recommended that soils excavated in the vicinity of boring S53-2 as part of planned construction activities by NCDOT be handled appropriately and further characterized for petroleum constituents, as needed.

FIGURES



DRAWING TAKEN FROM USGS 7.5 MINUTE TOPOGRAPHIC MAP (SYLVA SOUTH AND TUCKASEGEE, NC QUADRANGLES)

PLOTTED: May 29, 2014 – 9:58am BY: tjp FILE LOCATION: C:\Users\tjp\appdata\local\Temp\AcPublish_3548\ncdt01513_Fig1s.dwg LAYOUT TAB: 053

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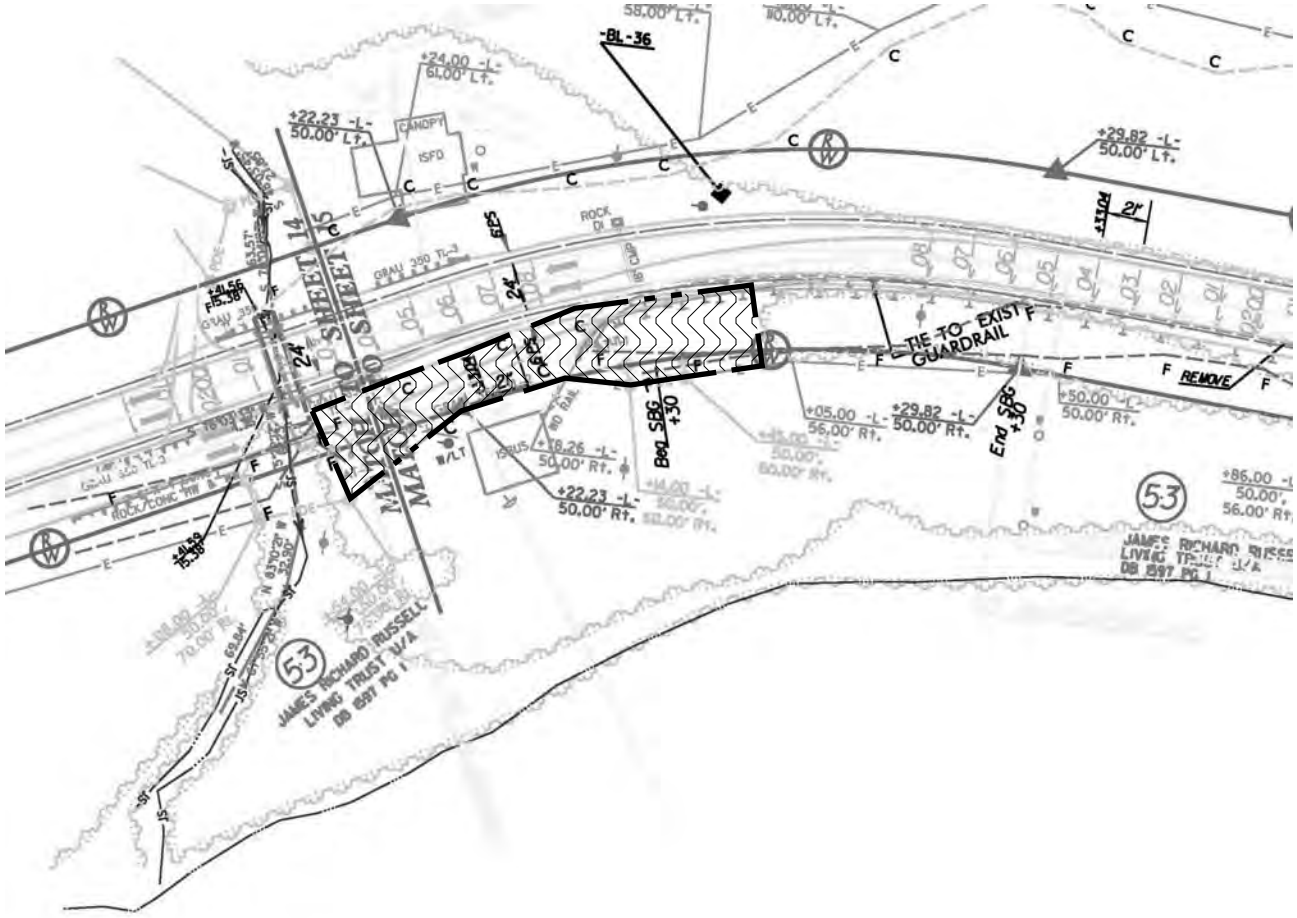
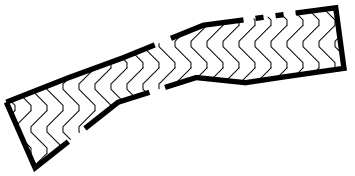
PROJECT: ncdt01513		
PRELIMINARY SITE ASSESSMENT PARCEL 053 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1	SITE LOCATION MAP	FIGURE 1
DATE: May 27, 2014	DRAWN BY: TJP / APPRV. BY: ADE	



N

PARCEL 053
INVESTIGATION AREA

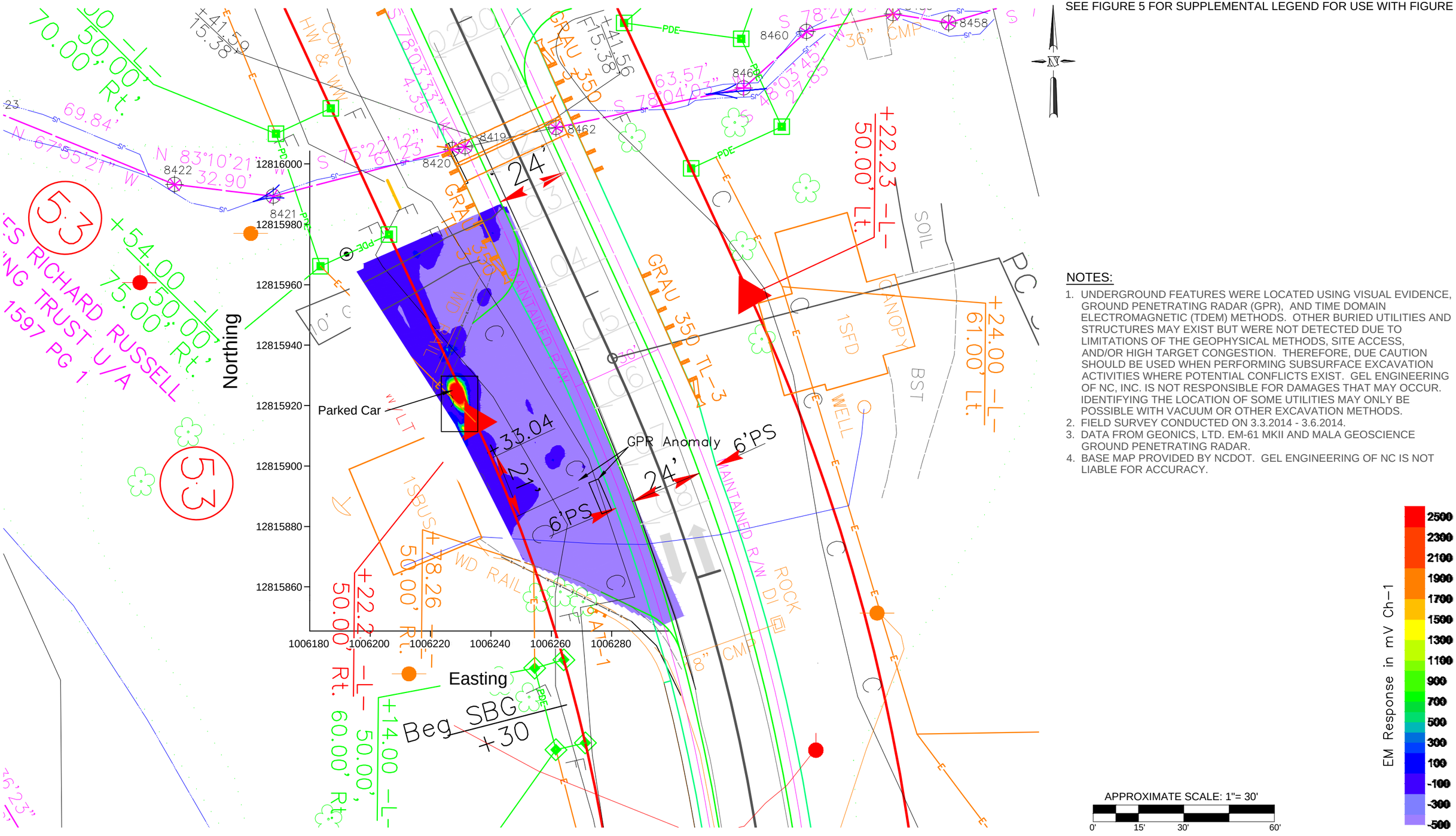


NO SCALE

SEE FIGURE 5 FOR
SUPPLEMENTAL LEGEND
FOR USE WITH FIGURE 2

GEL ENGINEERING of NC, Inc. *an Affiliate of THE GEL GROUP, Inc.* GEL Post Office Box 14262 Research Triangle Park, NC 27709 (919) 544-1100	PROJECT: ncdt01513		
	PRELIMINARY SITE ASSESSMENTS PARCEL 053 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1	DESIGNATED INVESTIGATION AREA FOR PARCEL 053	FIGURE 5
	DATE: May 5, 2014	DRAWN BY: ADE	

SEE FIGURE 5 FOR SUPPLEMENTAL LEGEND FOR USE WITH FIGURE 3



NOTES:

1. UNDERGROUND FEATURES WERE LOCATED USING VISUAL EVIDENCE, GROUND PENETRATING RADAR (GPR), AND TIME DOMAIN ELECTROMAGNETIC (TDEM) METHODS. OTHER BURIED UTILITIES AND STRUCTURES MAY EXIST BUT WERE NOT DETECTED DUE TO LIMITATIONS OF THE GEOPHYSICAL METHODS, SITE ACCESS, AND/OR HIGH TARGET CONGESTION. THEREFORE, DUE CAUTION SHOULD BE USED WHEN PERFORMING SUBSURFACE EXCAVATION ACTIVITIES WHERE POTENTIAL CONFLICTS EXIST. GEL ENGINEERING OF NC, INC. IS NOT RESPONSIBLE FOR DAMAGES THAT MAY OCCUR. IDENTIFYING THE LOCATION OF SOME UTILITIES MAY ONLY BE POSSIBLE WITH VACUUM OR OTHER EXCAVATION METHODS.
2. FIELD SURVEY CONDUCTED ON 3.3.2014 - 3.6.2014.
3. DATA FROM GEONICS, LTD. EM-61 MKII AND MALA GEOSCIENCE GROUND PENETRATING RADAR.
4. BASE MAP PROVIDED BY NCDOT. GEL ENGINEERING OF NC IS NOT LIABLE FOR ACCURACY.

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PRELIMINARY SITE ASSESSMENT
PARCEL 053
JACKSON COUNTY, NORTH CAROLINA
TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1

SITE MAP SHOWING RESULTS OF GEOPHYSICAL INVESTIGATION

FIGURE 3

DATE: Jun 16, 2014

DRAWN BY: TJP APPRV. BY: ADE

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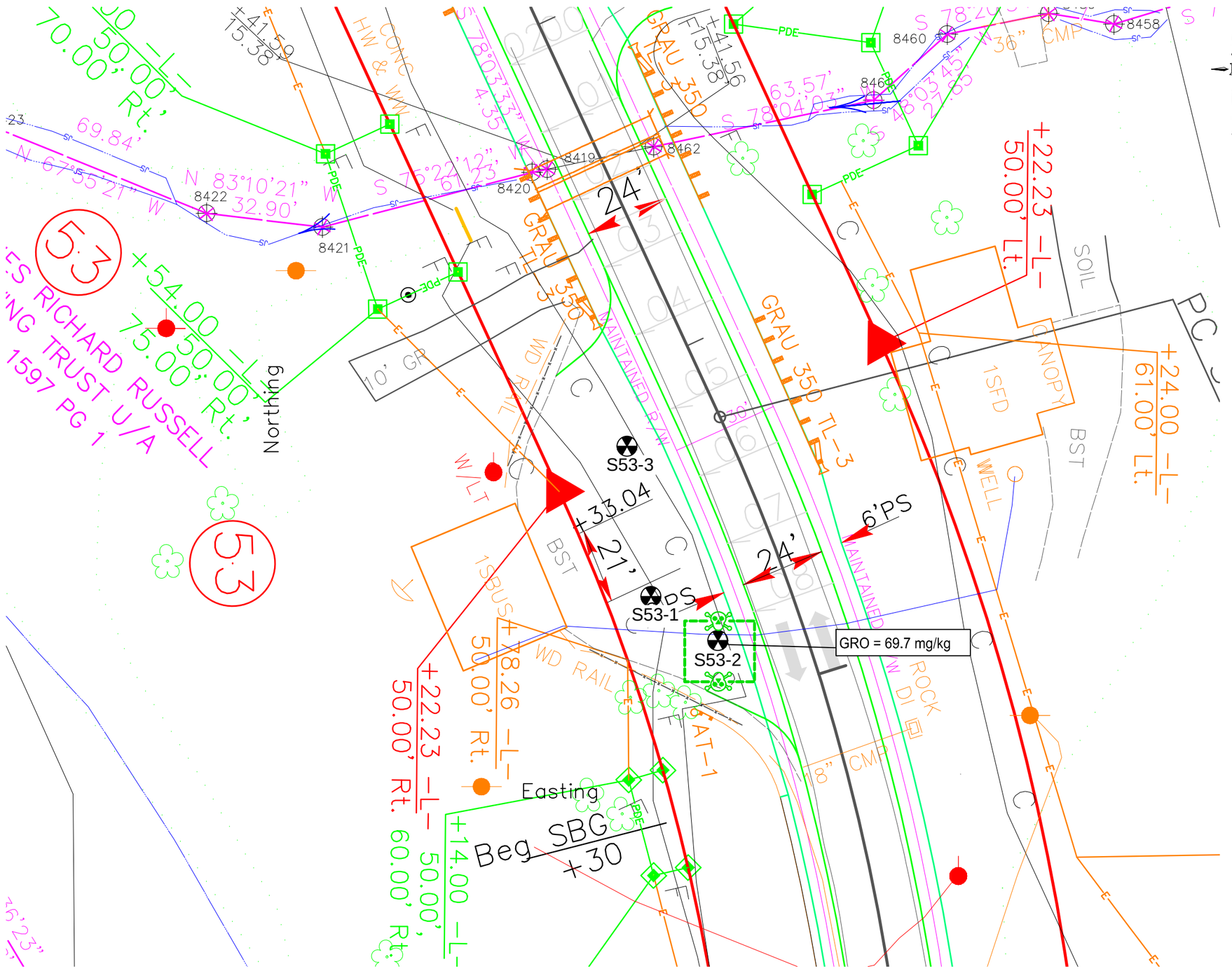
SEE FIGURE 5 FOR SUPPLEMENTAL LEGEND FOR USE WITH FIGURE 4



LEGEND

S53-1 — SOIL BORING LOCATION

KNOWN SOIL CONTAMINATION

GRO = 69.7 mg/kg — DRO CONCENTRATION DETECTED BY QROS

APPROXIMATE SCALE: 1"= 30'

0' 15' 30' 60'

PLOTTED: Jul 16, 2014 – 1:07pm BY: tjp FILE LOCATION: G:\V-P\W\ncdt\NCDT01513\ncdt01513.dwg LAYOUT TAB: 53-4

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PRELIMINARY SITE ASSESSMENT PARCEL 053 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1	SITE MAP SHOWING LOCATIONS OF SOIL BORINGS	FIGURE 4
DATE: Jun 16, 2014	DRAWN BY: TJP APPRV. BY: ADE	

Note: Not to Scale

**S.U.E. = Subsurface Utility Engineering*

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT REFERENCE NO. R-4753C | SHEET NO. 4B

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
- Known Soil Contamination: Area or Site
- Potential Soil Contamination: Area or Site

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
- Recorded U/G Power Line
- Designated U/G Power Line (S.U.E.*)

TELEPHONE:
- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole
- Telephone Booth
- Telephone Pedestal
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole
- Recorded U/G Telephone Cable
- Designated U/G Telephone Cable (S.U.E.*)
- Recorded U/G Telephone Conduit
- Designated U/G Telephone Conduit (S.U.E.*)
- Recorded U/G Fiber Optics Cable
- Designated U/G Fiber Optics Cable (S.U.E.*)

WATER:
- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line
- Designated U/G Water Line (S.U.E.*)
- Above Ground Water Line

TV:
- TV Satellite Dish
- TV Pedestal
- TV Tower
- U/G TV Cable Hand Hole
- Recorded U/G TV Cable
- Designated U/G TV Cable (S.U.E.*)
- Recorded U/G Fiber Optic Cable
- Designated U/G Fiber Optic Cable (S.U.E.*)

GAS:
- Gas Valve
- Gas Meter
- Recorded U/G Gas Line
- Designated U/G Gas Line (S.U.E.*)
- Above Ground Gas Line

SANITARY SEWER:
- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer
- Recorded SS Forced Main Line
- Designated SS Forced Main Line (S.U.E.*)

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

NOTE: LEGEND WAS PROVIDED BY NCDOT

GEL ENGINEERING of NC, Inc.
an Affiliate of THE GEL GROUP, Inc.

Post Office Box 14262
Research Triangle Park, NC 27709
(919) 544-1100

PROJECT: ncdt01513		
PRELIMINARY SITE ASSESSMENT PARCEL 053 JACKSON COUNTY, NORTH CAROLINA TIP NO. R-4753, WBS ELEMENT NO. 39999.1.1	SUPPLEMENTAL LEGEND FOR USE WITH FIGURES 2, 3, AND 4	FIGURE 5
DATE: May 6, 2014	DRAWN BY: ADE	

TABLES

TABLE 1

SUMMARY OF ANALYTICAL RESULTS FOR COLLECTED SOIL SAMPLES

Preliminary Site Assessment
Parcel 053, 9320 NC Hwy. 107
Jackson County, North Carolina
State Project No. R-4753, WBS Element #39999.1.1

Sample ID	Diesel Range Organics (DRO)	Gasoline Range Organics (GRO)	BTEX (C6-C9)	TPH (C5-C35)	Total Aromatics (C10-C35)	16 EPA PAHs	Benzo(a)pyrene
S53-1	<0.2	<0.4	<0.2	<0.8	<0.1	<0.1	<0.01
S53-2	<0.1	69.7	<0.1	69.7	66.3	<0.1	<0.01
S53-3	<0.2	1.1	<0.2	1.1	0.23	0.02	<0.01
NCDENR Action Level	***10***	***10***					
NCDENR MSCC							***0.088***

Notes:

1) All reported values are shown in milligrams per kilogram (mg/kg).

2) MSCC = NCDENR's Maximum Soil Contaminant Concentration Levels (April 2012); MSCC shown is the lowest of established Residential Soil Cleanup Levels and Soil-to Groundwater Maximum Contaminant Concentration shown in the NCDENR MSCC Table for any given constituent.

3) Reported values exceeding corresponding NCDENR Action Levels or MSCCs are highlighted in yellow.

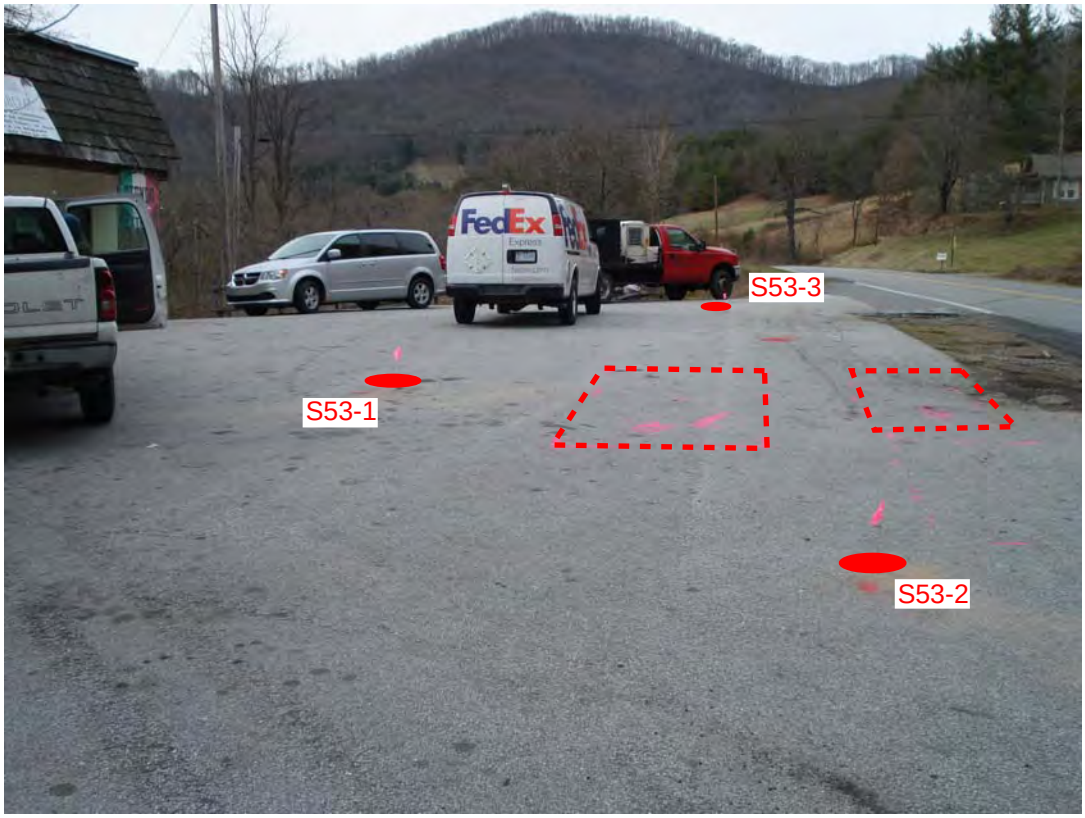
APPENDICES

APPENDIX I

PHOTOGRAPHS

Photograph 1: View looking north at investigation area for Parcel 053.

Photograph 2: View looking south at frontage for Parcel 053 extending beyond pavement that was not included in the subsurface investigation due to inaccessibility and no indication of previous development.



Photograph 3: View looking south at locations of soil borings S53-1, S53-2, and S53-3, and locations of two identified GPR anomalies (dashed rectangles).

APPENDIX II

SOIL BORING LITHOLOGIC LOGS

SOIL BORING LOG

Boring/Well No.: **S53-1**
Date Started: 3/4/14
Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 5.0'	--	0.0	Orange Brown Silt with Weathered Rock, Damp	ML
2	5.0' – 8.0'	--	0.0	Saprolite, Silts and Gravel, Weathered Rock	
3					
4				Total depth = 8 feet below land surface	
5					
6					
7					
8					
9					
10					

Notes:

1) 5-foot continuous cores using DPT.

2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

SOIL BORING LOG

Boring/Well No.: **S53-2**
Date Started: 3/4/14
Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 2.0'	--	--	Red Brown Sandy Silt, Damp	ML
2	2.0' – 7.5'	--	0.0	Orange Brown Silt, Damp	ML
3	7.5' – 8.0'	--	0.0	Red Sandy Clay, Moist	CL
4					
5				Total depth = 8 feet below land surface	
6					
7					
8					
9					
10					

Notes:

1) 5-foot continuous cores using DPT.

2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

SOIL BORING LOG

Boring/Well No.: **S53-3**
Date Started: 3/4/14
Date Completed: 3/4/14

No.	Depth Interval	Blow Counts	PID (ppm)	Soil Description	Soil Type
1	0.0' – 6.0'	--	0.0	Red Brown Saprolite, silts and gravel throughout	
2	6.0' – 8.0'	--	0.0	Orange Brown Silty Clay with Sand, Moist	CL
3					
4				Total depth = 8 feet below land surface	
5					
6					
7					
8					
9					
10					

Notes:

1) 5-foot continuous cores using DPT.

2) PID readings shown are for discrete samples collected at depth intervals of 3'– 4', and 7'– 8'

APPENDIX III

CERTIFICATES OF ANALYSIS AND CHAIN OF CUSTODY RECORD FOR SOIL SAMPLES

QROS, LLC Results

QED

AQROS

Hydrocarbon Analysis Results

Client: GEL Engineering
Address: Durham, NC

Samples taken Wednesday, March 5, 2014
Samples extracted Wednesday, March 5, 2014
Samples analysed Thursday, March 6, 2014

Contact: Andrew Eyer

Operator Rachel Menoher

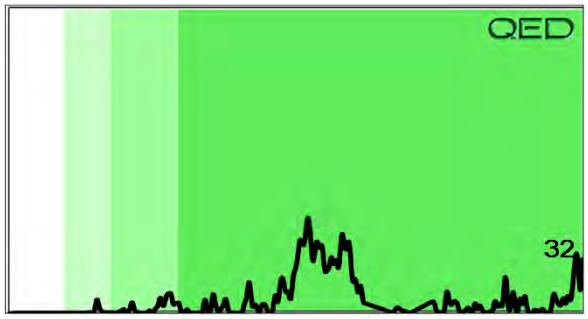
Project: NC DTO 1513

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	S53-1	16.0	<0.2	<0.2	<0.4	<0.8	<0.1	<0.1	<0.01	0	0	100	TPH not detected
s	S53-2	14.0	<0.1	<0.1	69.7	69.7	66.3	<0.1	<0.01	17.4	67.9	14.6	PAH (PFM)
s	S53.3	15.0	<0.2	<0.2	1.1	1.1	0.23	0.02	<0.01	65.7	28.9	5.4	Deg.Fuel (FCM) (P) 83.9%
s	S71-3	14.0	<0.1	<0.1	<0.4	<0.7	<0.1	<0.1	<0.01	0	0	100	TPH not detected
s	S69-1	15.0	<0.2	<0.2	#DIV/0!	#DIV/0!	39	4	0.22	0	0	100	#DIV/0!
s	S69-2	14.0	<0.1	<0.1	37.5	37.5	35.7	1.9	0.1	0	89.9	10.1	Particulate (PFM) (P)
s	S69-3	15.0	<0.1	<0.1	3.3	3.3	2.6	0.11	<0.01	44.8	43.9	11.3	V.Deg.PHC 98.5%
s	S69-4	14.0	<0.1	<0.1	1.7	1.7	1.3	0.09	<0.01	50.9	35.8	13.3	V.Deg.PHC 73.4%
s	S78-1	18.0	<0.2	<0.2	2.2	2.2	2.1	0.14	<0.01	47.2	33.6	19.3	V.Deg.PHC 96.8%
s	S78-2	14.0	<0.1	<0.1	<0.3	<0.7	<0.1	<0.1	<0.01	0	0	100	TPH not detected
		Initial Calibrator QC check			OK								

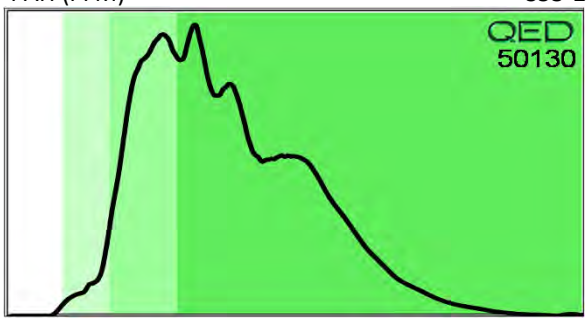
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library (SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

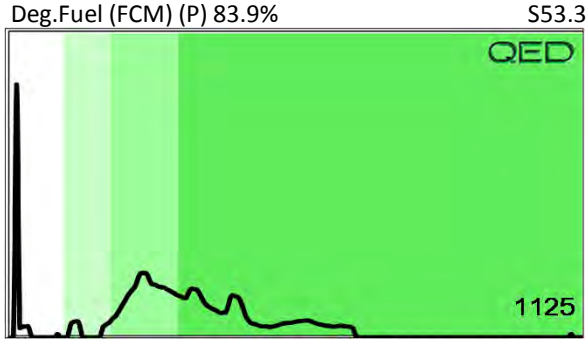
TPH not detected S53-1



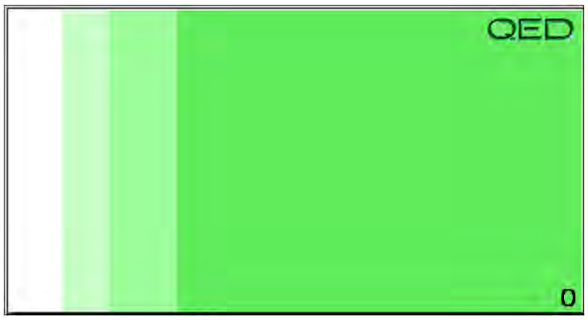
PAH (PFM) S53-2



Deg.Fuel (FCM) (P) 83.9% S53.3

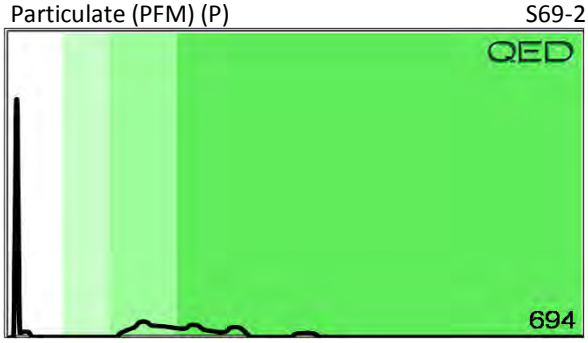


TPH not detected S71-3

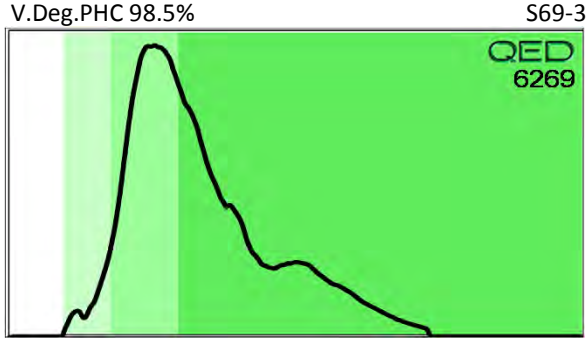


#DIV/0! S69-1

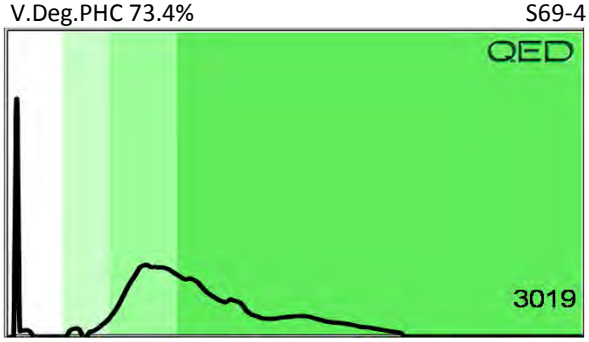
Particulate (PFM) (P) S69-2



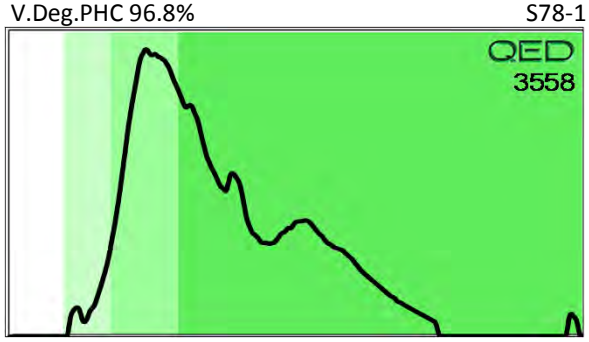
V.Deg.PHC 98.5% S69-3



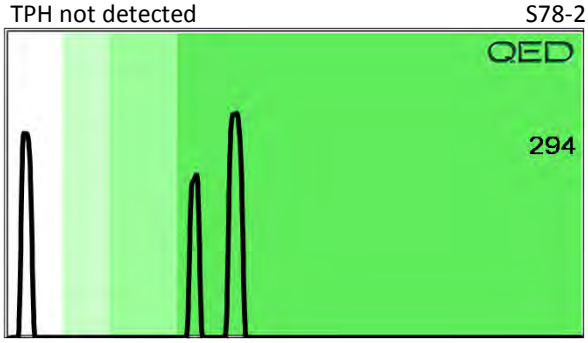
V.Deg.PHC 73.4% S69-4



V.Deg.PHC 96.8% S78-1



TPH not detected S78-2



Chain of Custody Record and Analytical Request Form

Sample ID	Sample Collection			TAT Requested	
QED UVF	Date	Time	Initials	24 Hour	48 Hour
SG-1	3-4-14	09:30	RSG		✓
SG-2		09:45			✓
SG-3		10:10			✓
SG-4		10:30			✓
SB-1		11:10			✓
SB-3		11:34			✓
SB-5		11:57			✓
SB-2		13:05			✓
SB-4		13:25			✓
ST-3		14:55			✓
SS-1		15:25			✓
SS-2		15:40			✓
SS-3	↓	16:00	↓		✓
SG-4	3-5-14	09:15	RSG		✓
SG-3		09:40			✓
SG-2		09:56			✓
SG-1	↓	10:15	↓		✓

Client: GEL

Contact: Andrew Eyer

Phone: (919) 323-8328

Email: ade@gel.com

Project Reference: NCDOT0515 13

Each Sample will be analyzed for total

BTEX, GRO, DRO, TPH, and PAH

Each Sample will generate a fingerprint representative of the petroleum product within the sample. Electronic Data will be submitted to the email above.

Relinquished by	Date/time	Accepted by	Date/time
[signature]	3-5-14 13:50	[signature]	3-6-14 12:30 p.m
Relinquished by	Date/time	Accepted by	Date/time
Relinquished by	Date/time	Accepted by	Date/time

SHIP TO: QROS

420 Raleigh Street Suite E

Wilmington, NC 28412