

PRELIMINARY SITE ASSESSMENT

**PARCEL 002
ROY R. BERG ET. AL. PROPERTY
ROY'S CARBURETOR & TUNE-UP SERVICE
1740 BURNETT BLVD.
WILMINGTON, NEW HANOVER COUNTY, NORTH CAROLINA**

**INTERSECTION OF SR 1436 / US 421 TRUCK (FRONT STREET) AND SR 1140
(BURNETT BLVD.) SOUTH OF WILLARD STREET
WBS ELEMENT: 17BP.3.R.28**

CATLIN PROJECT NO. 214037

PREPARED FOR:



**NCDOT GEOTECHNICAL ENGINEERING UNIT-GEOENVIRONMENTAL SECTION
1589 MSC
RALEIGH, NORTH CAROLINA 27699-1589**

JUNE 25, 2014

PREPARED BY:

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is planning construction activities and acquisition of the right-of-way (ROW) is necessary for intersection improvements at the Greenfield Lake Spillway Culvert (above referenced WBS Element 17BP.3.R.28). NCDOT has indicated site investigations are necessary to determine the presence of contaminated groundwater and/or soil at three (3) sites along the proposed construction area.

2.0 PURPOSE OF INVESTIGATION AND DESCRIPTION

Catlin Engineers & Scientists (CATLIN) was retained by the NCDOT Geotechnical Engineering Unit to provide field investigations concluding with Preliminary Site Assessment (PSA) reports for three (3) sites associated with WBS Element 17BP.3.R.28. In response to a Request for Technical and Cost Proposal (RFP) dated March 17, 2014, CATLIN submitted a proposal for conducting PSAs at the three (3) sites. This report documents the investigation at Parcel 002, Roy R. Berg Property, 1740 Burnett Blvd. in Wilmington, North Carolina 28401. Roy's Carburetor & Tune-Up Service operates at this location. The general location is illustrated on Sheet 1. CATLIN personnel conducted a field investigation at the property on May 16, 2014. This PSA report documents activities and findings.

According to the RFP, this facility was built in the 1950's and has operated as a repair garage since the 1950's. Any history of UST use on this property is unknown. The proposed right of way will be expanded into the driveway resulting in a cut section. This parcel does not appear on the North Carolina Department of Environment and Natural Resources (NCDENR) Underground Storage Tank (UST) Section registry or Ground Water Incident database.

The requested area of investigation is within the proposed right of way (ROW)

and easement along Burnett Blvd. Borings were proposed within the proposed ROW and along planned drainage features including catch basins and drainage piping. The NCDOT conventional plan sheet symbols are provided on Sheet 2 and the site layout including proposed features are illustrated on Sheet 3.

The NCDOT has requested an investigation to determine if contamination is present at the site. The purpose of this investigation was to:

- Locate all USTs and determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- If contamination is evident, estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map.
- Provide a MicroStation file with the location of USTs, soil contamination and monitoring wells.
- Prepare a report including field activities, findings, and recommendations for this site and submit to this office in triplicate.

3.0 METHODS

Proposed boring/sample locations were illustrated on a Plan Sheet provided by NCDOT and agreed upon before beginning investigations. Borings/samples were approved by NCDOT at proposed drainage catch basin locations, along the proposed drainage features, and near the edge of the proposed ROW.

CATLIN coordinated geophysical activities Pyramid Environmental and Engineering (Pyramid). The geophysical investigation methods are detailed in the Pyramid geophysical report provided in Appendix A.

CATLIN proposed utilizing QROS On-Site Rapid measurement Techniques and Tools (QED™ Analyzer) to evaluate potential for petroleum impacts to soil in a cost effective manner. Soil samples collected from above the approximate water table depth with concentrations greater than 10 milligrams per kilogram (mg/kg) diesel range organics (DRO) or gasoline range organics (GRO) will be considered contaminated for estimated contaminated vadose soil volume calculations. Contaminated soil volume is estimated from the surface to the water table and/or the midpoint distance between a clean sample location and dirty sample location or the property line and ROW/easement. Moist/damp soils were encountered two (2) to three (3) feet below land surface (BLS) and saturated soils were observed at four (4) feet BLS.

Borings advanced during this investigation are identified with the parcel number prefix ("2") and numbered sequentially "##". Soil samples for analysis per QROS QED™ Analyzer were identified by parcel number, boring number,

and depth [example: 2-01 (2')].

3.1 FIELD METHODS

All field work was conducted in general accordance with state and federal guidelines and industry standards.

Underground utility locating was coordinated by CATLIN personnel. The North Carolina One Call Center (NC-1-Call) was contacted for underground utility location. The areas around the proposed boring locations were checked and underground utilities were indicated by NC-1-Call personnel.

CATLIN personnel gathered subsurface soil data by Direct Push Technology boring advancement using an AMS PowerProbe™ 9600D (PowerProbe). When using the PowerProbe, the borings are advanced to depth by static force and a 90-pound hydraulic percussion hammer. Two and one-quarter inch diameter by four-foot length steel is used as casing. Soil samples are continuously collected in one and one-half inch clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS). Boring information was recorded on field logs and transferred to Boring Logs (see Appendix B). Soil samples were collected and packed in appropriate glassware for analysis.

New disposable nitrile gloves were worn during sampling activities. Soils selected for QROS QED™ analysis were placed into new glassware provided by QROS. All samples were placed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper Chain of Custody procedures. A copy of the Chain of Custody is provided following the analytical report in Appendix C.

Boreholes were abandoned to the surface in grassy areas and just below existing asphalt in asphalt areas using three-eighth inch bentonite chips. Bentonite and water were poured into the borehole simultaneously to facilitate hydration. Boreholes in asphalt were finished with asphalt patch to the surface.

3.2 ANALYTICAL TESTING

The QROS QED™ Analyzer methods have been approved by the NCDENR for petroleum contamination determination. Complete QROS QED™ procedures are on file with the NCDENR and are available upon request. The QROS QED™ analysis was conducted by QROS personnel at their laboratory in Wilmington, North Carolina.

QROS QED™ analysis provides total Benzene, Toluene, Ethylbenzene, and Toluene (BTEX), DRO, GRO, total petroleum hydrocarbon (TPH), total aromatics (C-10-C35) and (total) 16 Environmental Protection Agency (EPA) Poly Aromatic Hydrocarbons (PAHs) concentrations. Soil sample DRO and GRO results greater than 10 mg/kg are considered contaminated for this investigation.

4.0 FIELD ACTIVITIES

4.1 CURRENT SITE CONDITIONS AND FIELD OBSERVATIONS

As previously mentioned, Roy's Carburetor & Tune-Up Service currently operates at the site. No signs of USTs were observed. Photographs taken during the geophysical investigation are included in the geophysical report provided in Appendix A.

The site vicinity is illustrated on Sheet 1 and Sheet 3 illustrates the current site map with soil boring and sample locations.

4.2 SOIL SAMPLING

A total of six (6) borings were installed as part of the investigation. At least one (1) soil sample interval was collected from each boring and submitted for analysis. Boring/sample locations are illustrated on Sheet 3. Boring logs are included in Appendix B.

Borings were advanced to four (4) feet deep and terminated in saturated soils. Soils were collected continuously to boring termination. After retrieving the drive, soil was visually/manually classified for USCS classification. Soil samples collected from each boring for analysis were packed in the appropriate glassware, labeled, and placed in a cooler on ice. Borings 2-01 and 2-04 were located at proposed catch basins and two (2) soil samples were collected for analysis at these locations. A total of eight (8) soil samples were submitted to QROS for QED™ analysis. Chain of Custody documentation is included in Appendix C.

4.3 SURVEYING

Boring/sample locations were recorded utilizing a Trimble® global positioning survey instrument and data collector. Boring coordinates are shown on the Boring Logs provided in Appendix B. Boring locations are indicated on plan sheets provided by NCDOT and are included as Sheet 3.

5.0 RESULTS

Geophysical Investigation

The complete geophysical investigation report is included in Appendix A. As indicated in the Pyramid Report, the investigation did not reveal any evidence of metallic USTs in the survey area.

Soil

Soil sample results from the recent assessment activities utilizing QROS QED™ analysis are provided on Table 1. Soil sample locations, summarized results and estimated extent of DRO impacted soils are illustrated on Sheet 3. The complete QROS QED™ report is provided in Appendix C.

Soils encountered across the site were predominately sandy with gravelly soils near the surface and a clayey soil was encountered at the bottom of boring 2-01. Damp/moist soils were encountered approximately two (2) to three (3) feet BLS and saturated soil were observed at the bottom (4 feet BLS). Soils from the surface to two (2) feet BLS are considered vadose zone.

No GRO soil concentrations were reported above the detection limits. Soils collected from proposed catch basin 0408 (boring 2-01) revealed DRO concentrations greater than 10 mg/kg in the sample collected from four (4) feet BLS and less than 10 mg/kg DRO and GRO in the sample collected from two (2) feet BLS. The boring 2-04 advanced at proposed catch basin 0409 revealed DRO concentrations above 10 mg/kg in the soil samples collected from two (2) feet and four (4) feet BLS.

The soil samples collected from two (2) feet BLS along the proposed drainage pipe at borings 2-02 and 2-03 did not reveal contamination. The samples collected from two (2) feet BLS at borings 2-05 and 2-06 located near the proposed ROW did reveal contamination above 10 mg/kg DRO.

The estimated volume of petroleum impacted soils as illustrated on Sheet 3 includes the area around all borings except borings 2-02 and 2-03 (along the proposed drainage line). The approximate water table at both these locations is three (3) feet BLS. The approximate area is 2,808 feet² and a total volume of impacted soils is approximately 210 yds³. However, any saturated

soils encountered during construction activities may be considered contaminated.

6.0 SUMMARY AND CONCLUSIONS

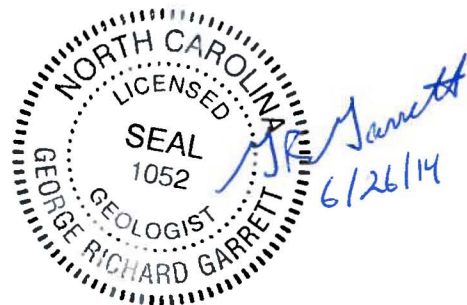
The site is currently a vehicle repair facility. No USTs are suspected at the area of investigation. Six (6) borings were advanced for soil sample collection at proposed drainage features and within the proposed ROW. Contaminated soils were revealed by QROS QED™ in borings 2-01 and 2-04 at proposed catch basins 0408 and 0409, respectively, in samples collected from four (4) feet BLS. The soil sample collected at two (2) feet BLS from boring 2-04 (at proposed catch basin 0409) also revealed contamination. The borings 2-05 and 2-06 were advanced along the proposed ROW and samples collected at two (2) feet BLS from these locations revealed contamination.

A total estimated contaminated soil volume of 210 yds³ may be encountered in vadose zone soils across the site and around borings 2-01 and 2-04 through 2-06. Any saturated soils encountered during construction/excavation at the site may also be contaminated. Any detectable concentrations in excavated soils may require handling and disposal as an impacted waste.

7.0 SIGNATURES



Benjamin J. Ashba, P.G.
Project Manager



G. Richard Garrett, P.G.
Contract Manager

TABLES

**TABLE 1
SUMMARY OF SOIL RESULTS**



Hydrocarbon Analysis Results

Client: 220 Old Dairy Rd.
Address Wilmington, NC 28405

Contact: Ben Ashba

Project: Parcel 2 NCDOT Front St. and Burnett Blvd - WBS: 17BP.3.R.28
CATLIN Project No. 214037

Samples taken Friday, May 16, 2014
Samples extracted Friday, May 16, 2014
Samples analysed Monday, May 19, 2014
Operator Rachel Menoher

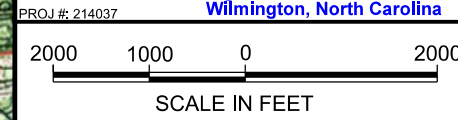
Matrix	Sample ID	Location	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match	
											% light	% mid	% heavy		
s	2-01 (2')	Proposed Catch Basin (CB) 0408	19.0	<0.9	<0.9	6.69	6.69	6.28	0.3	<0.019	59.4	32.5	8.1	V.Deg.PHC 96.9%	
s	2-01 (4')		26.0	<1.3	<1.3	19.89	19.89	6.18	0.26	<0.026	64.3	29.5	6.2	Deg.Fuel (FCM) 93.1%	
s	2-02 (2')	Proposed drainage line south of CB 0408	18.0	<0.9	<0.9	3.99	3.99	1.26	0.05	<0.018	74.3	17.9	7.7	Deg.Fuel (FCM) 75.1%	
s	2-03 (2')	Proposed drainage line north of CB 0409	22.0	<1.1	<1.1	5.73	5.73	4.16	0.28	<0.022	67.2	25.5	7.3	V.Deg.PHC 91.9%	
s	2-04 (2')	CB 0409	21.0	<1.1	<1.1	33.6	33.6	30.68	1.98	<0.021	34	52.6	13.4	V.Deg.PHC 81.5%	
s	2-04 (4')		22.0	<1.1	<1.1	52.91	52.91	19.45	0.8	<0.022	54.3	40.7	5	Deg.Fuel (FCM) 94.2%	
s	2-05 (2')	Southwestern portion of parcel along Right-of-Way	260.0	<13	<13	22.91	22.91	20.63	4.18	<0.26	45.4	37.7	16.9	Coal Tar 81.1%	
s	2-06 (2')	Western portion of parcel along Right-of-Way	322.0	<16.1	<16.1	86.28	86.28	77.54	15.57	0.78	37.7	48.2	14.1	Coal Tar 81.4%	
			Initial Calibrator QC check			OK			Final FCM QC Check			OK			102.2%

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

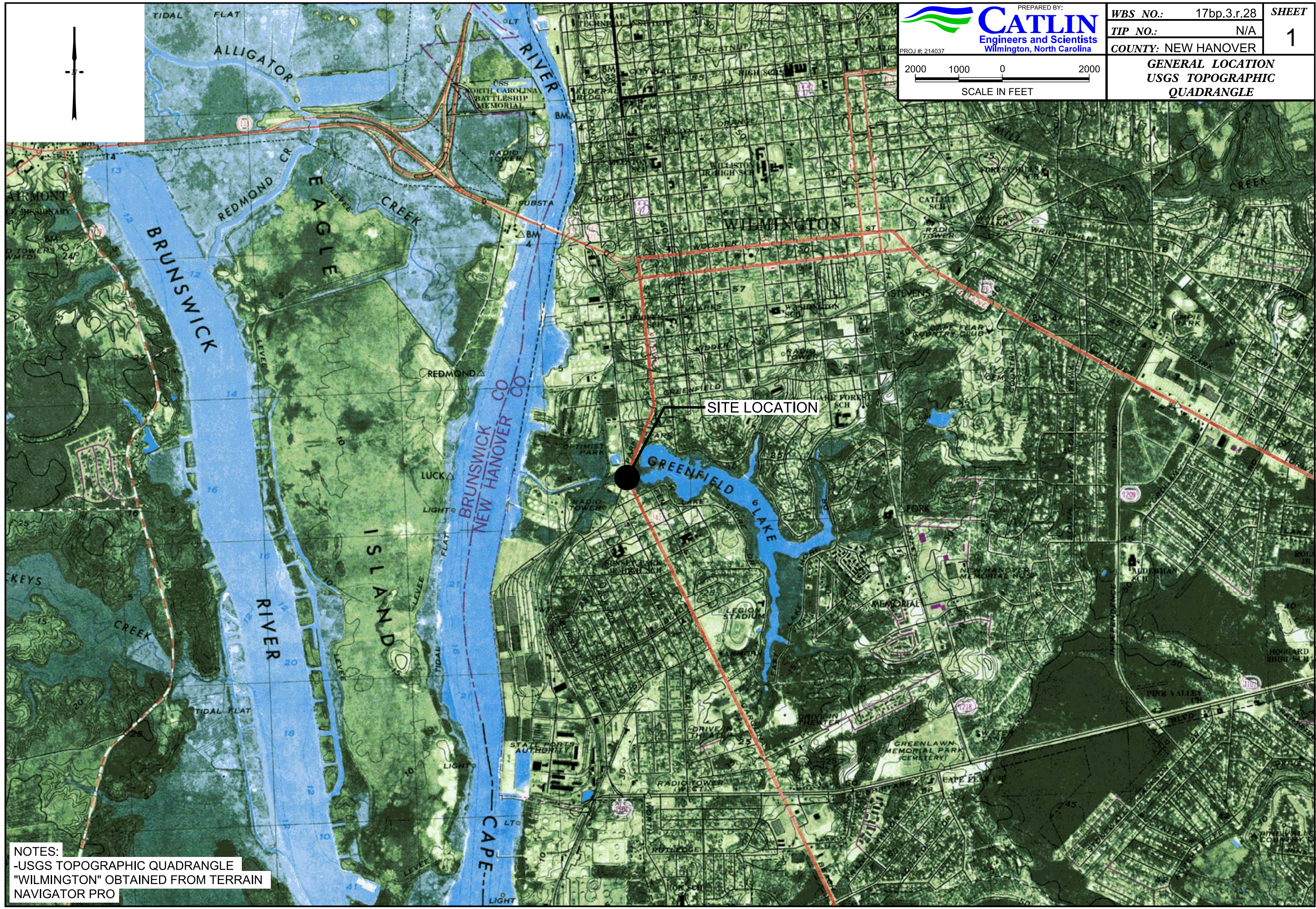
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

SHEETS



GENERAL LOCATION
 USGS TOPOGRAPHIC
 QUADRANGLE



NOTES:
 -USGS TOPOGRAPHIC QUADRANGLE
 "WILMINGTON" OBTAINED FROM TERRAIN
 NAVIGATOR PRO

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONVENTIONAL PLAN SHEET SYMBOLS

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 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	
Curb Cut Future 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:

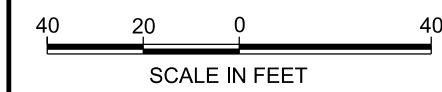
Gas Valve	
Gas Meter	
Recorded U/G Gas Line	
Designated U/G Gas Line (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

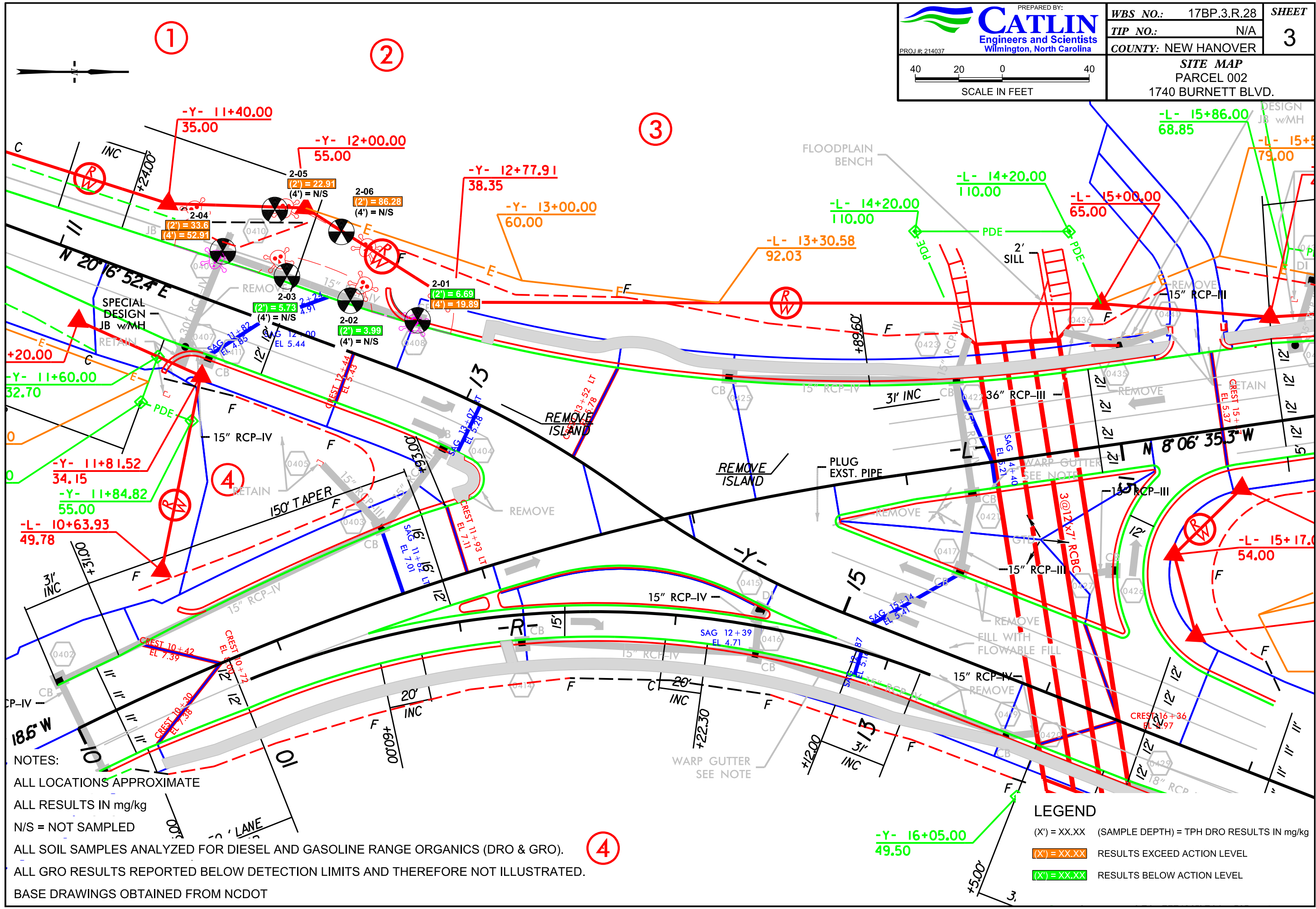
Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
Recorded SS Forced Main Line	
Designated SS Forced Main Line (S.U.E.*)	

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	
End of Information	



SITE MAP
 PARCEL 002
 1740 BURNETT BLVD.



NOTES:
 ALL LOCATIONS APPROXIMATE
 ALL RESULTS IN mg/kg
 N/S = NOT SAMPLED
 ALL SOIL SAMPLES ANALYZED FOR DIESEL AND GASOLINE RANGE ORGANICS (DRO & GRO).
 ALL GRO RESULTS REPORTED BELOW DETECTION LIMITS AND THEREFORE NOT ILLUSTRATED.
 BASE DRAWINGS OBTAINED FROM NCDOT

LEGEND

(X) = XX.XX	(SAMPLE DEPTH) = TPH DRO RESULTS IN mg/kg
(X) = XX.XX	RESULTS EXCEED ACTION LEVEL
(X) = XX.XX	RESULTS BELOW ACTION LEVEL

APPENDIX A
PYRAMID GEOPHYSICAL REPORT



PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2014-103)

GEOPHYSICAL SURVEY

PARCEL 002 – VICINITY OF FRONT
STREET & BURNETT BOULEVARD
NCDOT PROJECT WBS: 17BP.3.R.28

WILMINGTON, NEW HANOVER COUNTY, NC

MAY 12, 2014

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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 2 – Front St. & Burnett Blvd.
Wilmington, New Hanover County, North Carolina

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- Figure 3 – Parcel 002 GPR Transect Locations and Images

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at NCDOT Parcel 2 located along Burnett Blvd. near the Front Street intersection in Wilmington, New Hanover County, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) overhead rail line project (NCDOT Project WBS 17BP.3.R.28). Catlin Engineers & Scientists directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to include the area between the existing edge of pavement and the NCDOT proposed ROW and/or easement. The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys.

Geophysical Results: The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles, or to known underground utilities. One EM anomaly was suspected to be associated with an unknown utility line. GPR scans across this feature verified the presence of an underground conduit/utility. The geophysical investigation did not record any evidence of metallic UST at the property.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Catlin Engineers & Scientists at NCDOT Parcel 2 located along Burnett Blvd. near the Front Street intersection in Wilmington, New Hanover County, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) overhead rail line project (NCDOT Project WBS 17BP.3.R.28). Catlin Engineers & Scientists directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to include the area between the existing edge of pavement and the NCDOT proposed ROW and/or easement. The survey grid spanned approximately 200 feet from north to south and approximately 50 feet from west to east, and included the majority of the accessible portions of Parcel 002 between the existing pavement and the proposed ROW/easement. Conducted on May 9, 2014, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site was relatively open, and consisted primarily of gravel parking space and open grassy areas. Dense tree cover was present on the north and south sides of the parcel that was not accessible by the geophysical equipment. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8 foot intervals along north-south trending or east-west trending, generally parallel survey lines spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 11.0 software programs.

GPR data were acquired across select EM differential anomalies on May 9, 2014, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF radar unit that continuously collects data at both 300 MHz and 800MHz frequencies. This dual frequency antenna allows for higher resolution imaging both near the ground surface and within deeper strata. Data were collected generally from east to west and/or north to south across the property. The GPR data were viewed in real time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 8 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. GPR Transects across specific anomalies were saved to the hard drive of the GSSI DF unit for post-processing and figure generation.

DISCUSSION OF RESULTS

A contour plot of the EM61 differential results obtained across survey area at the property is presented in **Figure 2**. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Discussion of EM Anomalies: The EM response that was observed along the entire east boundary of the survey area adjacent to the road was associated with a large natural gas pipeline located in this area. The pipeline had been marked by utility locators, and was also visible above ground to the north of the property. The EM response at the southwest corner of the main property area was associated with vehicles parked at that location. The EM response directly adjacent to the building on site was the result of two large metal poles. The EM response extending from these two pole east to the street was suspected to be associated with a buried utility line, and was investigated further with the GPR.

Discussion of GPR Survey: **Figure 3** presents the locations of the formal GPR transects performed at the property, and **Figure 4** presents the GPR transect images. The three GPR transects performed across the suspected utility line recorded a distinct reflector that is characteristic of a buried conduit/utility pipe. Transects 1 and 2 clearly imaged the suspected utility, and Transect 3 recorded a disrupted reflector that was also indicative of a utility. No reflections were observed that were characteristic of larger objects such as USTs.

The geophysical investigation did not record any evidence of metallic UST at the property.

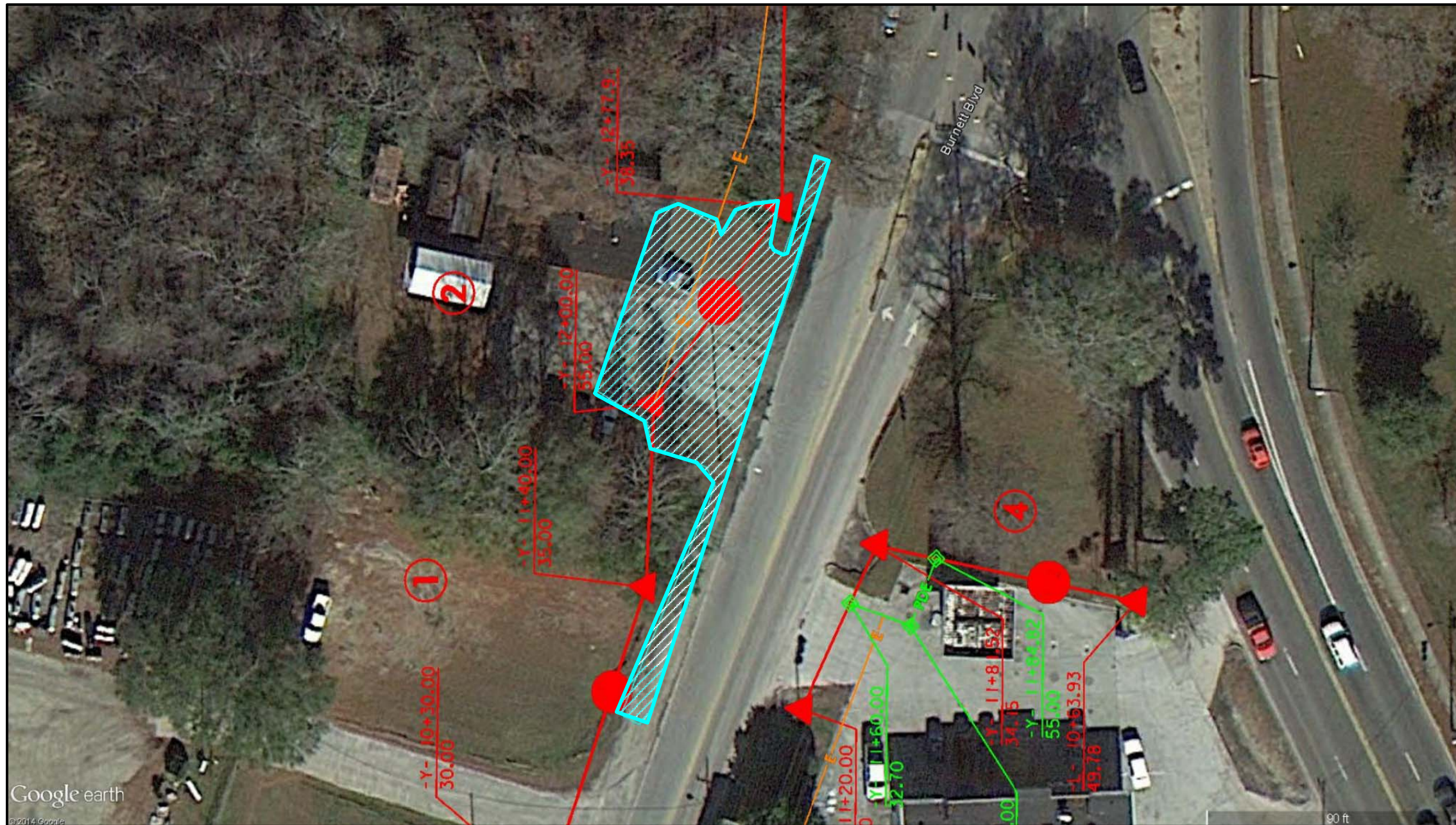
SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected at Parcel 002 along Burnett Blvd. in Wilmington, New Hanover County, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles, or to known underground utilities.
- One EM anomaly was suspected to be associated with an unknown utility line. GPR scans across this feature verified the presence of an underground conduit/utility.
- The geophysical investigation did not record any evidence of metallic UST at the property.

LIMITATIONS

Geophysical surveys have been performed and this report prepared for Catlin Engineers & Scientists in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but that the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.




Approximate Location of the Geophysical Survey Area
With NCDOT Proposed ROW/Easement Overlay



View of Parcel 2
(Facing Approximately West)



View of Geophysical Survey Area
(Facing Approximately North)

TITLE	PARCEL 002: GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	
PROJECT	FRONT ST. & BURNETT BLVD. (NCDOT WBS 17BP.3.R.28) WILMINGTON, NEW HANOVER COUNTY, NC	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE	5/9/2014	CLIENT CATLIN ENGINEERS
PYRAMID PROJECT #:	2014-	FIGURE 1

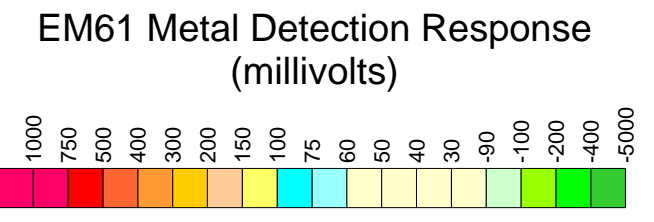



EM61 Differential Results



NO EVIDENCE OF METALLIC USTs OBSERVED


The contour plots show the differential results of the EM61 instrument in millivolts (mV). The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on May 9, 2014, using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on May 9, 2014, using a GSSI Utility Scan DF Dual Frequency Radar unit that utilizes a combined 300 MHz and 800 MHz antennae.



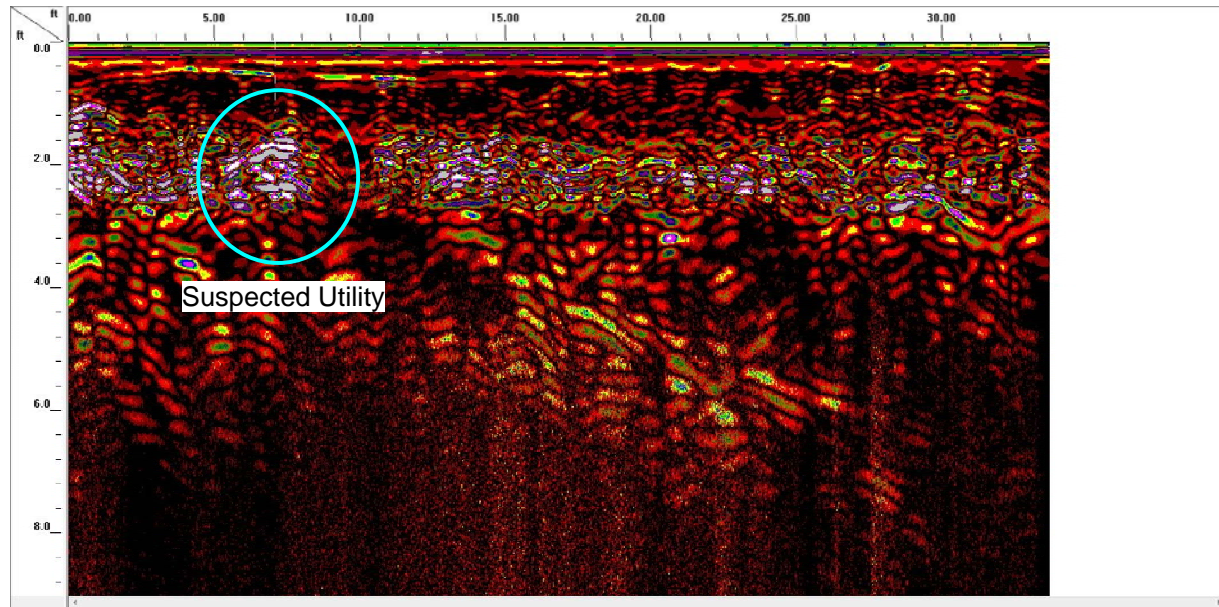
TITLE	PARCEL 002: EM61 DIFFERENTIAL RESULTS CONTOUR MAP	
PROJECT	FRONT ST. & BURNETT BLVD. (NCDOT WBS 17BP.3.R.28) WILMINGTON, NEW HANOVER COUNTY, NC	
	 503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	5/9/2014	CLIENT CATLIN ENGINEERS
PYRAMID PROJECT #:	2014-	FIGURE 2

Locations of GPR Transects

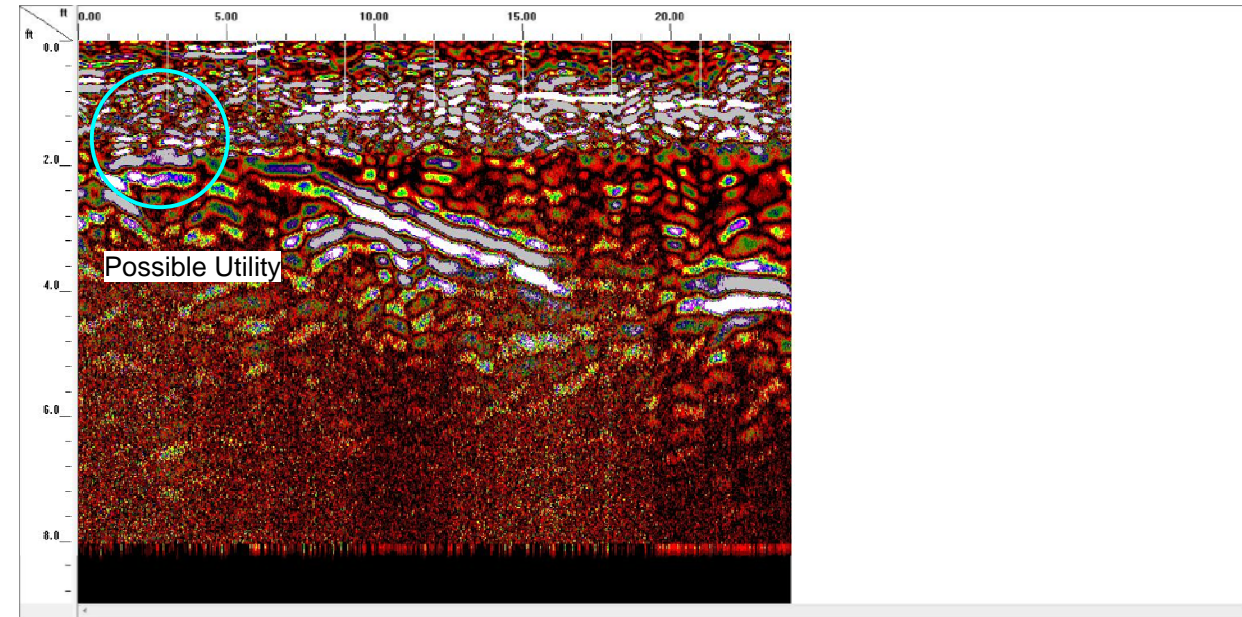


TITLE	PARCEL 002: GPR TRANSECT LOCATIONS	
PROJECT	FRONT ST. & BURNETT BLVD. (NCDOT WBS 17BP.3.R.28) WILMINGTON, NEW HANOVER COUNTY, NC	
	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	5/9/2014	CLIENT CATLIN ENGINEERS
PYRAMID PROJECT #:	2014-	FIGURE 3

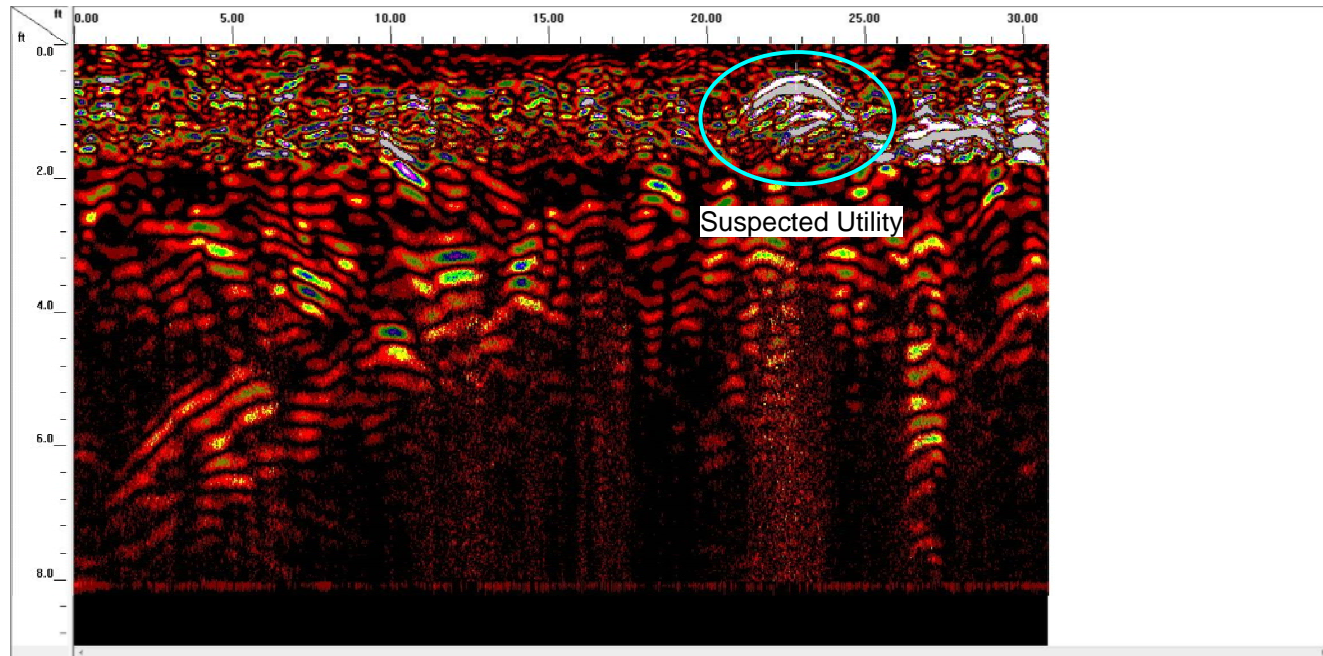
GPR Transect Images



GPR TRANSECT 1




GPR TRANSECT 3



GPR TRANSECT 2



TITLE	PARCEL 002: GPR TRANSECT IMAGES	
PROJECT	FRONT ST. & BURNETT BLVD. (NCDOT WBS 17BP.3.R.28) WILMINGTON, NEW HANOVER COUNTY, NC	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE	5/9/2014	CLIENT CATLIN ENGINEERS
PYRAMID PROJECT #:	2014-	FIGURE 4

APPENDIX B
BORING LOGS

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 214037	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: PARCEL 003 - Naegele Outdoor Advertising, Inc. Property		LOGGED BY: Michael D. Mason	BORING ID: 3-03
NORTHING: 169,784		EASTING: 2,318,653	DRILLER: Larry Wessell
SYSTEM: NCSP NAD 83 (USft)		BORING LOCATION:	CREW: CATLIN
DRILL MACHINE: Hand Auger	METHOD: Hand Auger	0 HOUR DTW: Dry	BORING DEPTH: 3.5
START DATE: 5/16/14	FINISH DATE: 5/16/14	24 HOUR DTW: FIAD	WATER DEPTH: --

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm) 0 250 500 750 1,000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE
	G R A B			3-03 (2')				Black, poorly graded SAND w/Gravel. Moist.
2.0							2.0	S.A.A. w/HCO. Wet.
	G R A B			3-03 (4')				
3.5							3.5	Boring Terminated by Auger Refusal at Depth 3.5 ft due to obstruction.

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/26/14

▽ = 0hr. DTW

▼ = 24hr. DTW

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 214037	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: PARCEL 003 - Naegele Outdoor Advertising, Inc. Property		LOGGED BY: Michael D. Mason	BORING ID: 3-04
NORTHING: 169,823		EASTING: 2,318,658	CREW: CATLIN
SYSTEM: NCSP NAD 83 (USft)	BORING LOCATION:		LAND ELEV.: 3.0
DRILL MACHINE: Hand Auger	METHOD: Hand Auger	0 HOUR DTW: Dry	BORING DEPTH: 4.0
START DATE: 5/16/14	FINISH DATE: 5/16/14	24 HOUR DTW: FIAD	WATER DEPTH: --

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm) 0 250 500 750 1,000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE 3.0
2.0	G R A B			3-04 (2')				Black, poorly graded SAND mixed w/Gravel. Moist.
4.0	G R A B						4.0	-1.0

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/28/14

▽ = 0hr. DTW

▼ = 24hr. DTW

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 214037	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: PARCEL 003 - Naegele Outdoor Advertising, Inc. Property		LOGGED BY: Michael D. Mason	BORING ID: 3-05
NORTHING: 169,857		EASTING: 2,318,659	DRILLER: Larry Wessell
SYSTEM: NCSP NAD 83 (USft)		BORING LOCATION:	CREW: CATLIN
DRILL MACHINE: Power Probe	METHOD: CPT / DPT	0 HOUR DTW: Dry	BORING DEPTH: 4.0
START DATE: 5/16/14	FINISH DATE: 5/16/14	24 HOUR DTW: FIAD	WATER DEPTH: --

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm) 0 250 500 750 1,000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE 3.6
2.0	G R A B			3-05 (2')				Black to brown, poorly graded SAND. Moist. Wet at bottom.
4.0	G R A B						4.0	-0.4 Boring Terminated at Elevation -0.4 ft

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/26/14

▽ = 0hr. DTW

▼ = 24hr. DTW

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 214037	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: PARCEL 003 - Naegele Outdoor Advertising, Inc. Property		LOGGED BY: Michael D. Mason	BORING ID: 3-06
NORTHING: 169,888		EASTING: 2,318,655	DRILLER: Larry Wessell
SYSTEM: NCSP NAD 83 (USft)		BORING LOCATION:	CREW: CATLIN
DRILL MACHINE: Power Probe	METHOD: CPT / DPT	0 HOUR DTW: Dry	BORING DEPTH: 4.0
START DATE: 5/16/14	FINISH DATE: 5/16/14	24 HOUR DTW: FIAD	WATER DEPTH: --

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm) 0 250 500 750 1,000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE 3.7
2.0	G R A B			3-06 (2')				Olive gray, poorly graded SAND. Moist. Wet at bottom.
4.0	G R A B			3-06 (4')			4.0	-0.3
								Boring Terminated at Elevation -0.3 ft

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/26/14

▽ = 0hr. DTW

▼ = 24hr. DTW

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.: 214037	STATE: NC	COUNTY: New Hanover	LOCATION: Wilmington
PROJECT NAME: PARCEL 003 - Naegele Outdoor Advertising, Inc. Property		LOGGED BY: Michael D. Mason	BORING ID: 3-07
NORTHING: 169,895	EASTING: 2,318,638	DRILLER: Larry Wessell	CREW: CATLIN
SYSTEM: NCSP NAD 83 (USft)	BORING LOCATION:		LAND ELEV.: 3.0
DRILL MACHINE: Hand Auger	METHOD: Hand Auger	0 HOUR DTW: Dry	BORING DEPTH: 1.0
START DATE: 5/16/14	FINISH DATE: 5/16/14	24 HOUR DTW: FIAD	WATER DEPTH: --

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm) 0 250 500 750 1,000	LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
							DEPTH	ELEVATION
0.0							0.0	LAND SURFACE 3.0
1.0	G R A B			3-07 (1')			1.0	Black, TOPSOIL and organic (grass). Boring Terminated at Elevation 2.0 ft

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/26/14

▽ = 0hr. DTW

▼ = 24hr. DTW

BORING LOG



214037
Wilmington, NC

SHEET 1 OF 1

PROJECT NO.:	214037	STATE:	NC	COUNTY:	New Hanover	LOCATION:	Wilmington	
PROJECT NAME:	PARCEL 003 - Naegele Outdoor Advertising, Inc. Property			LOGGED BY:	Michael D. Mason	BORING ID:	3-08	
				DRILLER:	Larry Wessell			
NORTHING:	169,966	EASTING:	2,318,645	CREW:	CATLIN			
SYSTEM:	NCSP NAD 83 (USft)	BORING LOCATION:					LAND ELEV.:	3.4
DRILL MACHINE:	Power Probe	METHOD:	CPT / DPT	0 HOUR DTW:	3.0	BORING DEPTH:	8.0	
START DATE:	5/16/14	FINISH DATE:	5/16/14	24 HOUR DTW:	FIAD	WATER DEPTH:	--	

DEPTH	BLOW COUNT 0.5 0.5 0.5 0.5	MOI.	SCREENING RESULTS (ppm)				LAB.	U S C S	L O G	SOIL AND ROCK DESCRIPTION	
			0	250	500	750				1,000	DEPTH
0.0									0.0	LAND SURFACE	3.4
2.0						3-08 (2')					
8.0										Black, poorly graded SAND. Moist. Sat. @ 3'.	
									8.0	Boring Terminated at Elevation -4.6 ft	-4.6

CATLIN\ENVIRO_LOG_214037_NCDOT-BURNETT-BLVD.GPJ CATLIN.GDT 6/26/14

▽ = 0hr. DTW

▼ = 24hr. DTW

APPENDIX C
QROS QED™ REPORT



Hydrocarbon Analysis Results

Client: 220 Old Dairy Rd.
Address: Wilmington, NC 28405

Samples taken Friday, May 16, 2014
Samples extracted Friday, May 16, 2014
Samples analysed Monday, May 19, 2014

Contact: Ben Ashba

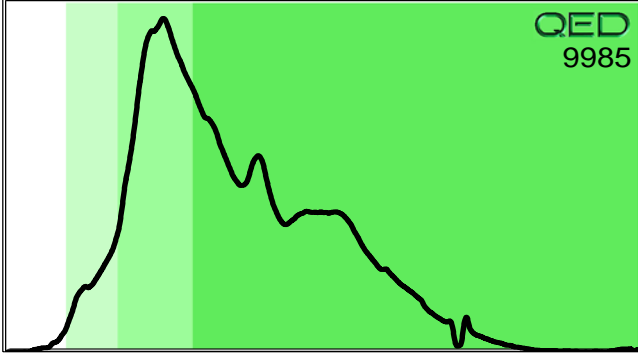
Operator Rachel Menoher

Project: Parcel 2 NCDOT Front St. and Burnett Blvd - WBS: 17BP.3.R.28
CATLIN Project No. 214037

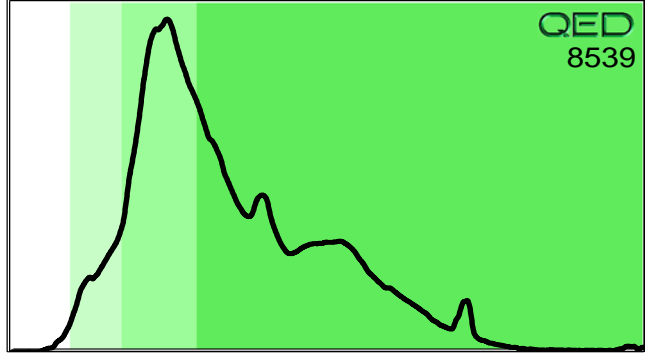
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	2-01 (2')	19.0	<0.9	<0.9	6.69	6.69	6.28	0.3	<0.019	59.4	32.5	8.1	V.Deg.PHC 96.9%
s	2-01 (4')	26.0	<1.3	<1.3	19.89	19.89	6.18	0.26	<0.026	64.3	29.5	6.2	Deg.Fuel (FCM) 93.1%
s	2-02 (2')	18.0	<0.9	<0.9	3.99	3.99	1.26	0.05	<0.018	74.3	17.9	7.7	Deg.Fuel (FCM) 75.1%
s	2-03 (2')	22.0	<1.1	<1.1	5.73	5.73	4.16	0.28	<0.022	67.2	25.5	7.3	V.Deg.PHC 91.9%
s	2-04 (2')	21.0	<1.1	<1.1	33.6	33.6	30.68	1.98	<0.021	34	52.6	13.4	V.Deg.PHC 81.5%
s	2-04 (4')	22.0	<1.1	<1.1	52.91	52.91	19.45	0.8	<0.022	54.3	40.7	5	Deg.Fuel (FCM) 94.2%
s	2-05 (2')	260.0	<13	<13	22.91	22.91	20.63	4.18	<0.26	45.4	37.7	16.9	Coal Tar 81.1%
s	2-06 (2')	322.0	<16.1	<16.1	86.28	86.28	77.54	15.57	0.78	37.7	48.2	14.1	Coal Tar 81.4%
Initial Calibrator QC check			OK			Final FCM QC Check			OK			102.2%	

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

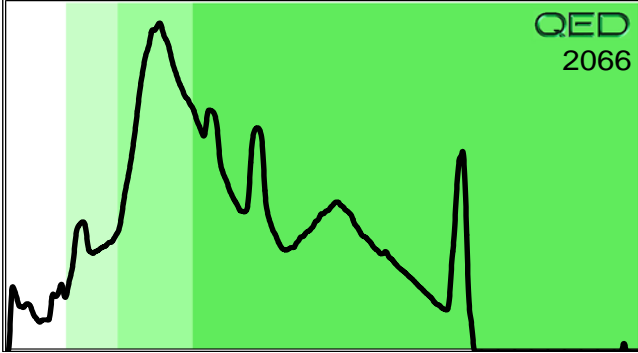
V.Deg.PHC 96.9% 2-01 (2')



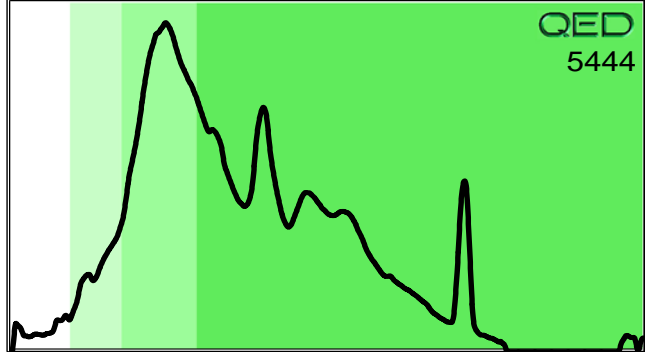
Deg.Fuel (FCM) 93.1% 2-01 (4')



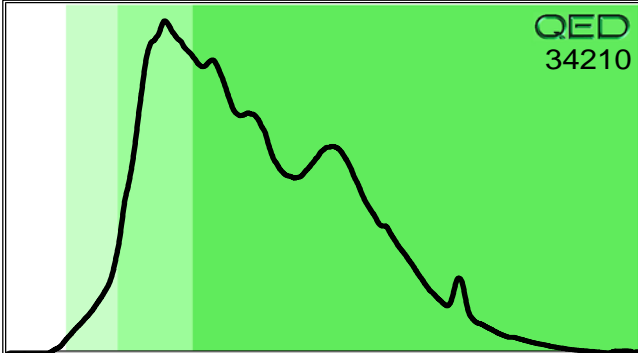
Deg.Fuel (FCM) 75.1% 2-02 (2')



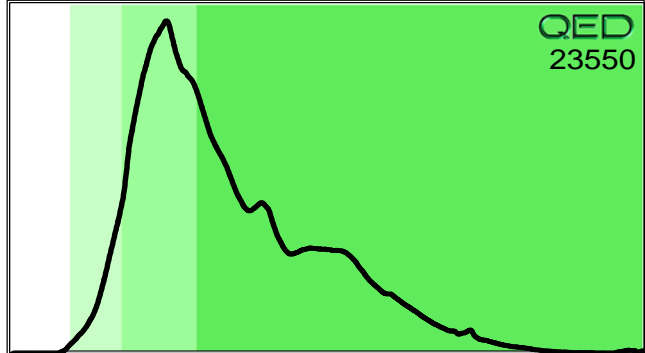
V.Deg.PHC 91.9% 2-03 (2')



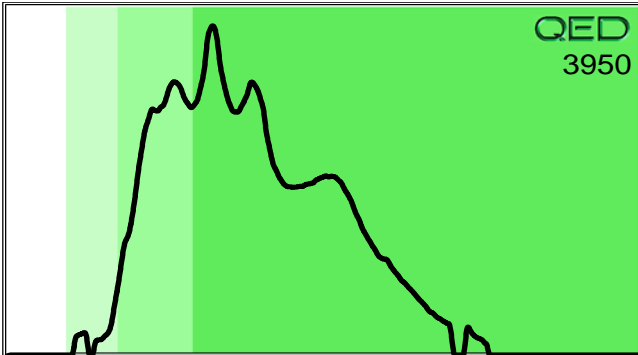
V.Deg.PHC 81.5% 2-04 (2')



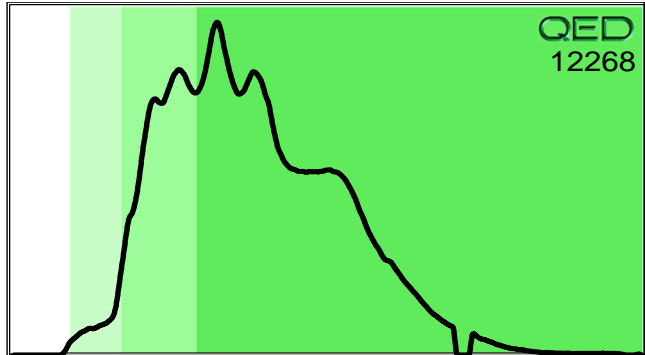
Deg.Fuel (FCM) 94.2% 2-04 (4')



Coal Tar 81.1% 2-05 (2')



Coal Tar 81.4% 2-06 (2')





Chain of Custody Record and Analytical Request Form

Sample ID	Sample Collection			TAT Requested			
	QED UVF	Date	Time	Initials	24 Hour	48 Hour	
2-01(2)		5-16-14	1115	MDM		X	
2-01(4)		↓	1115	MDM		↓	
2-02(2)			1105	MDM			
2-03(2)		↓	1055	MDM		↓	
2-04(2)			1045	MDM			
2-04(4)			1045	MDM			
2-05(2)		↓	1420	MDM		↓	
2-06(2)			1445	MDM			

Client: CATLIN

Contact: Ben Ashby

Phone: 910-452-5861

Email: ben.ashby@catlinusa.com

Project Reference: 214037
PO# 140519-1

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
<i>Michael D. Menoher</i>	5/19/14	<i>Ben Ashby</i>	5-19-14 830
Relinquished by	Date/time	Accepted by	Date/time
<i>Ben Ashby</i>	5-19-14 830	<i>Michael D. Menoher</i>	5/19/14 9:30
Relinquished by	Date/time	Accepted by	Date/time

SHIP TO: QROS

420 Raleigh Street Suite E
Wilmington, NC 28412

Rachel Menoher-
rachelm@qrosllc.com

910-520-2902