

**PRELIMINARY SITE ASSESSMENT
PARCEL 020, STATE PROJECT B-4490
WBS ELEMENT 33727.1.1, CUMBERLAND COUNTY**

**REPLACE BRIDGE NO. 116 OVER CXS RAILROAD,
NORTH SOUTH RAILROAD, AND HILLSBORO STREET
ON NC 24-210, FAYETTEVILLE, NORTH CAROLINA**

Schnabel Project 11821014.33
April 8, 2014





Schnabel
ENGINEERING

April 8, 2014

Mr. Mohammed A. Mulla, P.E., CPM, MCE
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: State Project: B-4490
 WBS Element: 33727.1.1
 County: Cumberland
 Description: Replace Bridge No. 116 over CSX Railroad, North South Railroad, and
 Hillsboro Street on NC 24-210 in Fayetteville

Subject: **Preliminary Site Assessment for Parcel 020, Fayetteville, NC**
 Schnabel Engineering Project 11821014.33

Dear Mr. Mulla:

SCHNABEL ENGINEERING SOUTH, P.C. (Schnabel) is pleased to submit our report for this project. This study was performed in accordance with our proposal dated January 23, 2014 as authorized by the Notice to Proceed on January 24, 2014 and was conducted under our June 2, 2011 Agreement with the NCDOT.

We appreciate the opportunity to be of service for this project. Please call us if you have any questions regarding this report.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC

Benjamin L. Bradley, GIT
Project Scientist

Gregory B. Kuntz, LG
Senior Associate Scientist

BB/GK

schnabel-eng.com

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
PRELIMINARY SITE ASSESSMENT FOR PARCEL 020
STATE PROJECT B-4490, WBS ELEMENT 33727.1.1
REPLACE BRIDGE NO. 116 OVER CSX RAILROAD, NORTH SOUTH RAILROAD,
AND HILLSBORO STREET ON NC 24-210
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA**

TABLE OF CONTENTS

1.0	INTRODUCTION.....	2
2.0	BACKGROUND AND SITE DESCRIPTION	2
3.0	FIELD METHODOLOGY	2
4.0	GROUNDWATER MONITORING WELLS OR REMEDIATION WELLS	3
5.0	DISCUSSION OF RESULTS.....	3
6.0	CONCLUSIONS.....	3
7.0	RECOMMENDATIONS.....	4
8.0	LIMITATIONS	4

LIST OF TABLES

Table 1, Sampling Intervals and Field Volatile Measurements

LIST OF FIGURES

Figure 1, Vicinity Map
Figure 2, Site Map
Figure 3 and 3A, Boring Locations and Legend

APPENDICES

Appendix A, Photographs
Appendix B, Geophysics Report
Appendix C, Soil Boring Logs
Appendix D, Soil Boring GPS Coordinates
Appendix E, UVF Analysis Results

1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is replacing a bridge over CSX Railroad, North South Railroad, and Hillsboro Street on Highway 24/210 (W. Rowan Street) in the town of Fayetteville, located in Cumberland County, North Carolina. Acquisition of properties within the right-of-way (ROW) is necessary prior to road and bridge construction. Schnabel Engineering conducted Preliminary Site Assessments (PSAs) on 10 sites (thirteen parcels) located within the proposed ROW that are of concern to the NCDOT.

This report summarizes the results of field activities conducted during the PSA for the proposed property acquisition area (Study Area) identified by NCDOT on Parcel 020. The property is located on Rowan Street and the eastern side of Raleigh Street, currently owned by unassigned AKA P&S Enterprises (Figure 1). The property line and topography are shown on Figure 2. The approximate NCDOT project limits that delineate the property acquisition area are shown on Figure 3.

The scope of work executed at the site was performed in general accordance with our cost proposal dated January 23, 2014 and was initiated based on a Notice to Proceed issued by the NCDOT Geotechnical Engineering Unit on January 24, 2014 under contract 7000012208, dated June 2, 2011.

2.0 BACKGROUND AND SITE DESCRIPTION

An open air metal canopy is located on Parcel 020. The surface of the proposed ROW is covered with a paved parking lot. Several utilities cross the site including buried water and storm sewer lines, and overhead electric lines are located along the ROW. The information regarding prior site use provided to Schnabel Engineering by NCDOT was that this parcel appears to be a portion of the restaurant on Parcel 021/022. This PSA is for the investigation of the entire parcel. Photographs of the Study Area are presented in Appendix A.

3.0 FIELD METHODOLOGY

Prior to mobilizing to the site to conduct the field investigation, Schnabel Engineering contacted North Carolina One Call to locate underground utilities in the Study Area of the site. Schnabel Engineering mobilized a geophysical crew to the site on January 29, 2014 and performed an electromagnetic survey of the subsurface in the proposed ROW area within the parcel. The electromagnetic survey equipment (EM61-MK2) identified various magnetic anomalies within the Study Area. The Schnabel geophysical crew returned to the Study Area on February 10, 2014 to perform ground penetrating radar (GPR) survey with a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna. Results of the survey suggested the presence of buried utility lines or conduits, and a probable underground storage tank (UST) within the Study Area.

After reviewing the background information and geophysical data, Schnabel returned to Parcel 020 to conduct field screening of soils from within the Study Area. Three soil borings designated B-20-01 through B-20-03 were advanced by SAEDACCO of Fort Mill, SC along Rowan Street on February 20, 2014. Two borings were advanced near the location of the probable UST and one boring was advanced in an area planned to be cut for a proposed drainage easement. The location of the soil borings are shown on Figure 3. The borings were advanced to a total depth of 10 to 12 feet below ground surface (bgs). The borings drilled within the Study Area were advanced utilizing a track-mounted Geoprobe® (Model 7822-DT) with direct push probe technology. At the completion of the sampling activities, the borings were backfilled with soil removed from the boring during sampling and/or bentonite chips.

Soils for field screening were obtained from the borings using a MacroCore[®] sampler fitted with a new, single-use, five foot long disposable polyvinyl chloride (PVC) liner. A portion of each 2-foot interval was placed in a separate re-sealable plastic bag. These bags were sealed and placed at ambient temperature for field screening with a MiniRAE Plus photo ionization detector (PID). Volatiles were allowed to accumulate in the headspace of each bag for approximately 15 minutes, and then the headspace of each sealed bag was scanned with the PID. Headspace screening of the soil samples indicated a concentration of 0 ppm at each boring location at intervals of two, four, six, eight, ten, and twelve feet bgs (Table 1, Field Volatile Measurements). The PID was calibrated on February 20, 2014 in general accordance with the manufacturer's recommended calibration procedures. The PID readings were recorded with the soil descriptions and indications of staining or odors, if present. Logs for each boring are presented in Appendix C.

Soil samples were not submitted for laboratory analysis because PID readings did not meet or exceed 10 ppm at the screened intervals noted above. A groundwater sample was collected at B-20-02 using a peristaltic GeoPump 2 with a Teflon[™]-lined polyethylene tube. A groundwater sample was collected from this boring because it was advanced in a planned cut area for a proposed drainage easement. Ultra Violet Fluorescence (UVF) field analysis was performed on the groundwater sample.

Soils collected from borings within the Study Area generally consisted of orangish brown Silty Sand (SM) or dark brownish gray Fat Clay (CH). GPS coordinates for each boring were obtained using a Trimble Pro-XRS DGPS system (Appendix D) with coordinates reported in US State Plane 1983 system, North Carolina 3200 zone, using the NAD 83 datum, with units in US survey feet.

4.0 GROUNDWATER MONITORING WELLS OR REMEDIATION WELLS

Groundwater monitoring wells and remediation wells were not observed within the proposed ROW or easement on this parcel.

5.0 DISCUSSION OF RESULTS

The geophysical survey conducted at the site indicated the presence of a probable UST on the southwestern part of Parcel 020 (near the northwestern corner of the metal canopy). However, field screening results were 0 ppm for soils collected at 2-foot intervals from borings advanced adjacent to the probable UST. The geophysical survey also indicated the presence of buried utility lines and conduits.

UVF analyses of the groundwater sample did not indicate petroleum impact in the groundwater at this location. UVF results are presented in Appendix E.

6.0 CONCLUSIONS

The geophysical data indicate the presence of a probable UST on Parcel 020. The EM and GPR data suggest Probable UST No. 1 is about the size of a 270-gallon capacity UST and the top is about 3.5 to 4.5 feet below ground surface.

Three soil borings B-20-01 through B-20-03 were advanced to evaluate potential petroleum impact within the Study Area, and to document soil conditions.

Soil and groundwater impact were not observed at Parcel 020 during the field investigation.

7.0 RECOMMENDATIONS

Based on the currently available information presented in this report, additional assessment is not recommended. However, if the area near borings B-20-01 and B-20-03 is excavated, care should be taken to investigate for the presence of the probable UST.

8.0 LIMITATIONS

This PSA was prepared for the use of the NCDOT. The scope of work performed at the site is limited to the tasks described in our cost proposal dated January 23, 2014. This report is not intended to represent an exhaustive research of all potential hazards that may exist. Schnabel makes no other declarations, or any express or implied warranty, as to the professional services provided under the terms of the agreement.

TABLES

Table 1, Sampling Intervals and Field Volatile Measurements

**TABLE 1
FIELD VOLATILE MEASUREMENTS
PARCEL 020
NCDOT B-4490, CUMBERLAND COUNTY**

Depth Below Ground Surface	Soil Borings		
	B-20-01	B-20-02	B-20-03
0 - 2 feet	0.0	0.0	0.0
2 - 4 feet	0.0	0.0	0.0
4 - 6 feet	0.0	0.0	0.0
6 - 8 feet	0.0	0.0	0.0
8 - 10 feet	0.0	0.0	0.0
10 - 12 feet	NS	0.0*	NS

Notes:

NS: Not Screened

*: Ultra Violet Fluorescence (UVF) performed on water sample

Field volatile measurements obtained with a MiniRae Photo Ionization Detector
Measurements in parts per million (ppm)

FIGURES

Figure 1, Vicinity Map

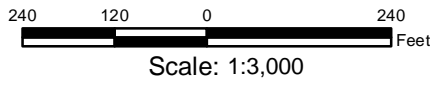
Figure 2, Site Map

Figure 3 and 3A, Boring Locations and Legend



 **PSA Properties**

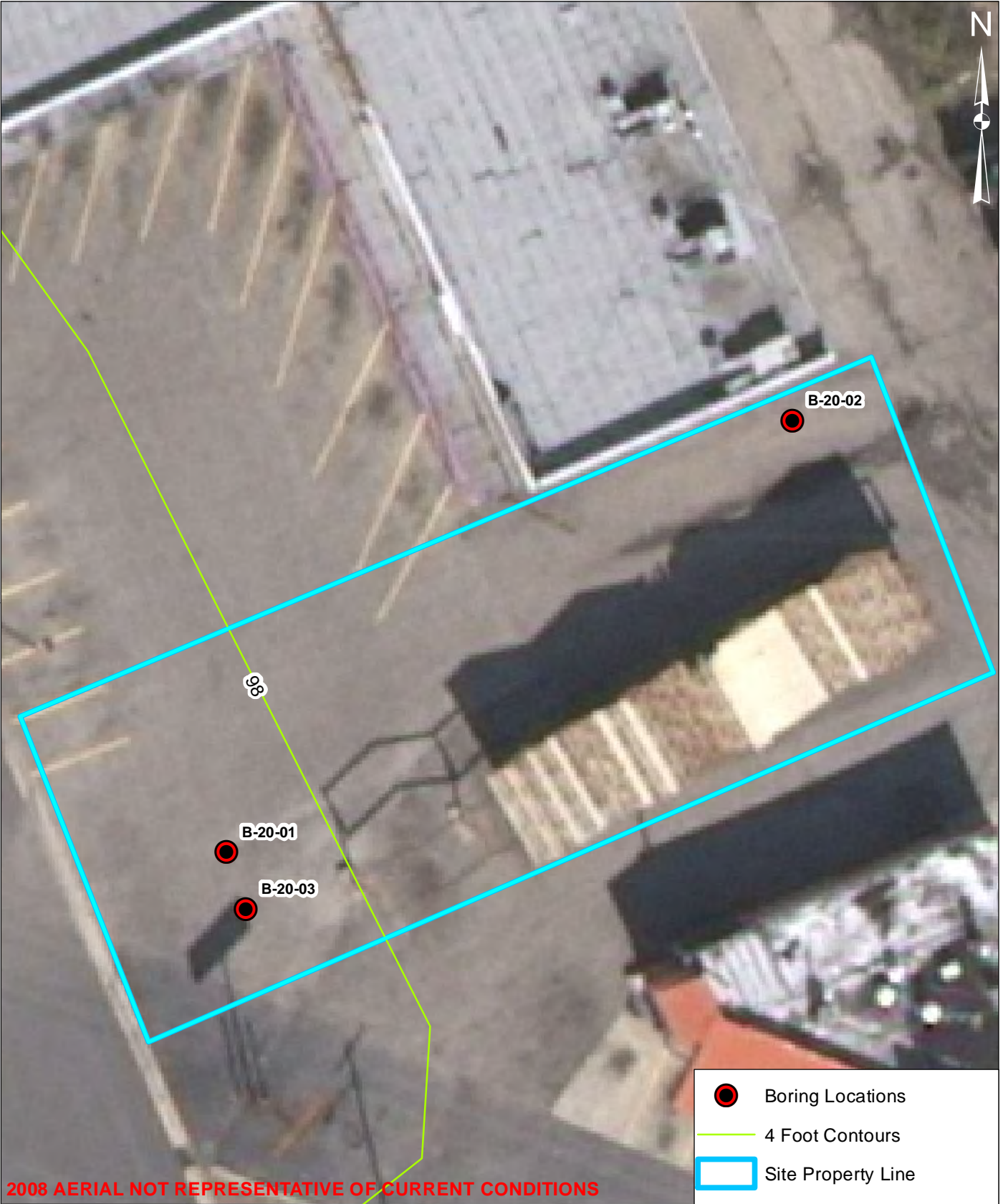
Source: 1. Cumberland County, NC, GIS Department
http://www.co.cumberland.nc.us/is_technology/gis.asp
 Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet






**SITE PROJECT B-4490, PSA PARCELS
 CUMBERLAND COUNTY, NORTH CAROLINA
 NC DEPARTMENT OF TRANSPORTATION
 PROJECT NO. 11821014.33**

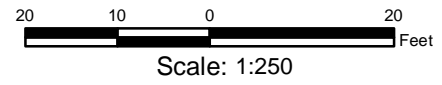
VICINITY MAP

FIGURE 1



-  Boring Locations
-  4 Foot Contours
-  Site Property Line

2008 AERIAL NOT REPRESENTATIVE OF CURRENT CONDITIONS



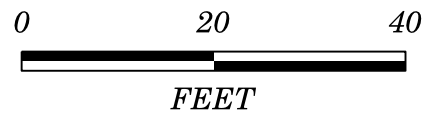
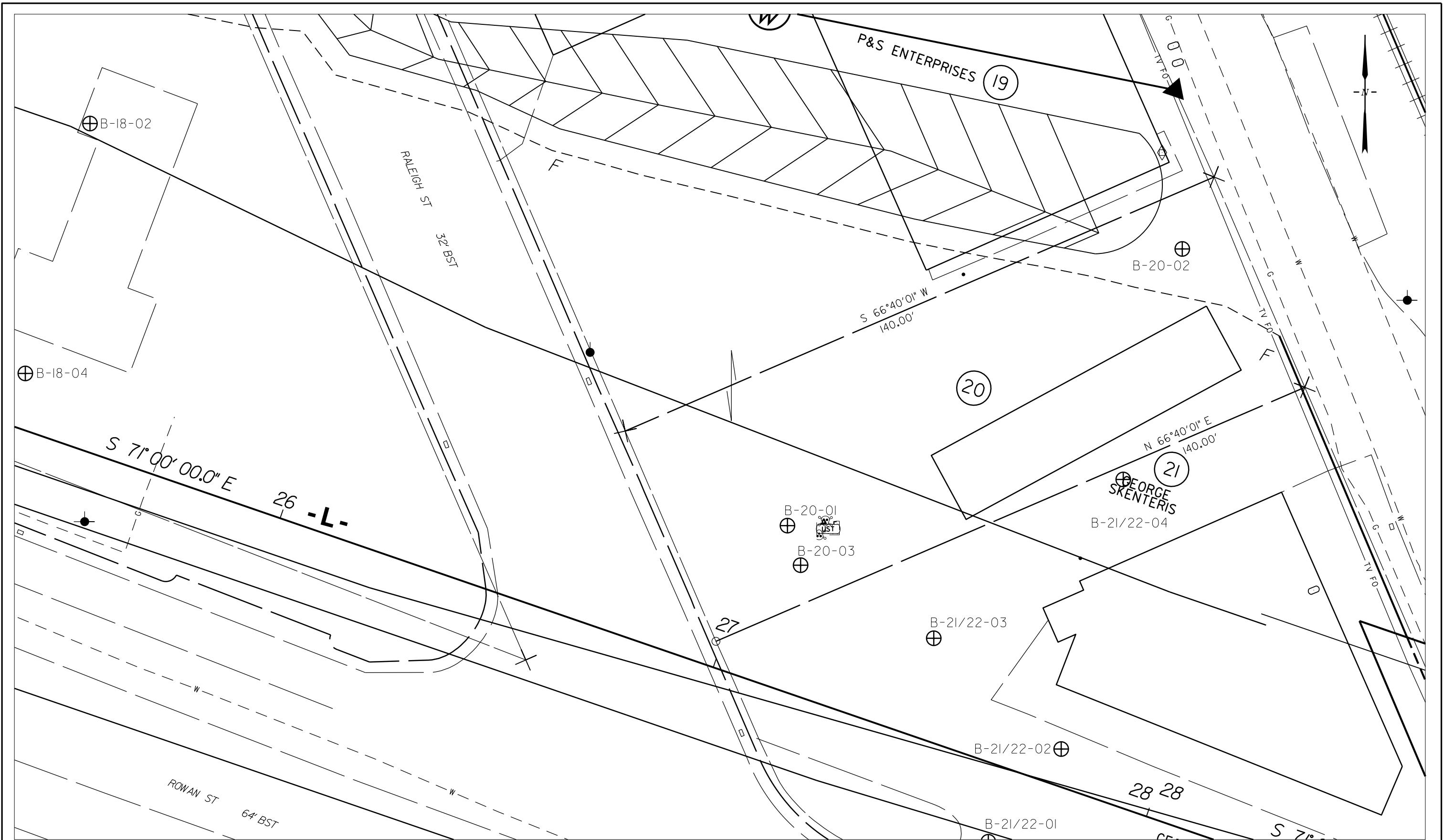
Source: 1. Cumberland County, NC, GIS Department
http://www.co.cumberland.nc.us/is_technology/gis.aspx
 Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet



SITE PROJECT B-4490, PARCELS 020
 CUMBERLAND COUNTY, NORTH CAROLINA
 NC DEPARTMENT OF TRANSPORTATION
 PROJECT NO. 11821014.33

SITE MAP
 PARCELS 020

FIGURE 2



NC Department of Transportation
 Geotechnical Engineering Unit
 State Project No. B-4490
 Cumberland County, North Carolina

BORING LOCATIONS
 Parcel 020

Figure 3

04/16/11

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	②③
Existing Fence Line	-x-x-x-
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: Boundary or Site	☠
Potential Soil Contamination: Boundary 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	○ MILEPOST 35
Switch	□ 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	-----

ROADS AND RELATED FEATURES:

Proposed Permanent Easement with Iron Pin and Cap Marker	◆
Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-----
Proposed Slope Stakes Fill	-----
Proposed Curb Ramp	○ CR
Curb Cut Future Ramp	○ CCFR
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	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○ S
Storm Sewer	-----

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	○ P
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	○ T
Telephone Booth	□ T
Telephone Pedestal	□ T
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	○ W
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	-----

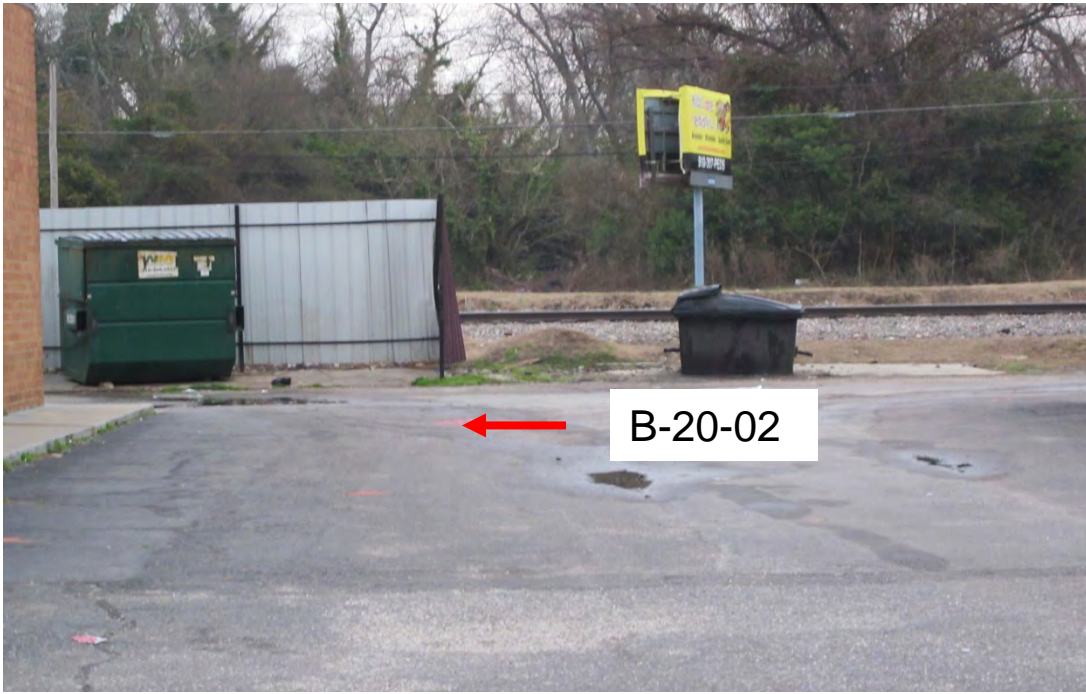
SANITARY SEWER:

Sanitary Sewer Manhole	○ SS
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.	⊕ UST
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.

APPENDIX A
PHOTOGRAPHS



Parcel 20, facing northeast toward B-20-02.



Parcel 020, facing southeast toward B-20-01 and 03.

APPENDIX B
GEOPHYSICS REPORT



March 27, 2014

Mr. Mohammed A. Mulla, P.E., CPM, MCE
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: State Project: B-4490
 WBS Element: 33727.1.1
 County: Cumberland
 Description: Replace Bridge No. 116 over CSX Railroad, North South Railroad, and
 Hillsboro Street on NC 24-210

**Subject: Project 11821014.33, Report on Geophysical Surveys
 Parcel 020, Unassigned AKA P&S Enterprises Property, Fayetteville, North
 Carolina**

Dear Mr. Mulla:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we performed on the subject property. The report includes two 11x17 inch color figures and three 8.5x11 inch color figures. This study was performed in accordance with our proposal for Geophysical Surveys to Locate Possible USTs dated December 26, 2013, as approved by Terry Farr on January 24, 2014, and our existing agreement dated June 2, 2011. Gordon Box provided a verbal notice to proceed on January 23, 2014.

INTRODUCTION

The field work described in this report was performed on January 28, 2014 and February 11 and February 17, 2014, by Schnabel. The purpose of the geophysical surveys was to evaluate the potential presence of metal underground storage tanks (USTs) in the accessible areas of Parcel 020. Photographs of the property are included on Figure 1. The property is located on the eastern side of Raleigh Street near the intersection with Rowan Street in Fayetteville, NC.

The geophysical surveys consisted of an electromagnetic (EM) induction survey and a ground penetrating radar (GPR) survey. The EM survey was performed using a Geonics EM61-MK2 (EM61) instrument. The EM61 is a time domain metal detector that stores data digitally for later processing and review. Sensitivity to metallic objects is dependent on the size, depth, and orientation of the buried object and the amount of

noise (i.e. response from spurious metallic objects) in the area. The EM61 can generally observe a single buried 55 gallon drum at a depth of 10 feet or less. The EM61 makes measurements by creating an electromagnetic pulse and then measuring the response from metallic objects over time after the pulse is generated. We measured and recorded the response at several time increments after the pulse to help evaluate relative size and depth of metallic objects in the subsurface.

The GPR survey was performed over selected EM61 anomalies using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna to further investigate and evaluate EM responses that could indicate a potential UST. The depth penetration of the GPR signal, when using a 400 MHz antenna, is normally limited to 6 feet or less.

Photographs of the equipment used are shown on Figure 2.

FIELD METHODOLOGY

We obtained locations of geophysical data points using a sub-meter Trimble Pro-XRS differential global positioning system (DGPS). References to direction and location in this report are based on the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 83 datum, with units in US survey feet. We also recorded the locations of existing site features (metal sign, other metal objects, etc.) with the DGPS for later correlation with the geophysical data and a site plan provided by the NCDOT. The Microstation data provided by the NCDOT appears to be offset from the DGPS data we collected. The amount (approximately 5 feet) and direction (WNW) of offset of the Microstation data appear to be consistent for all parcels where we collected data for this project.

The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced approximately one to two feet apart in orthogonal directions over anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcel 020 and the GPR survey area locations are shown on Figure 3, EM61 Early Time Gate Response, and Figure 4, EM61 Differential Response. Areas outside the colored, contoured EM61 data were not surveyed. Early time data refer to the response measured at a short time after the initial EM pulse is generated. Early time data typically contain responses from all metal objects, small or large and shallow or deep, within the sensitivity range of the instrument. Differential data represent the difference in response between the top and bottom coils of the EM61 instrument at a later time after the initial pulse than early time data. Differential data naturally tend to filter out the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as USTs.

We were able to access nearly all of the planned survey area with the exception of avoiding small obstacles in various locations throughout the parcel. The EM data contain multiple anomalies (as shown on Figures 3 and 4), most of which appear to be the result of buried utilities, reinforced concrete, or other

metal objects at the ground surface or at shallow depths. However, we collected GPR data over several EM anomalies of an unknown cause as shown on Figures 3 and 4 to further investigate the EM anomalies. The GPR data collected near the southwestern end of the canopy on Parcel 020 indicated the presence of a probable UST. The identification of Probable UST No. 1 was selected in accordance with the anomaly categories provided by the NCDOT in their letter, dated May 19, 2009, entitled "Geophysical Surveys to Identify USTs." Example GPR images from lines oriented over the marked location of Probable UST No. 1 are shown on Figures 3 and 4. The GPR data suggest the top of Probable UST No. 1 is approximately 3.5 to 4.5 feet below ground surface and that the probable UST is about 3 feet in diameter and about 5 feet long, equivalent to a capacity of a 270-gallon UST, based on the dimensions we interpreted for the probable UST and common UST sizes. Photographs of the approximate location of the probable UST that was marked in the field are included on Figure 5.

CONCLUSIONS

As shown in Figures 3 and 4, the EM data we collected over Parcel 020 covered nearly all of the planned survey area. The EM data include responses from several visible metallic objects at grade (e.g. canopy, sign, etc.).

The geophysical data indicate the presence of a probable UST on Parcel 020. The EM and GPR data suggest Probable UST No. 1 is about the size of a 270-gallon capacity UST and the top is about 3.5 to 4.5 feet below ground surface.

LIMITATIONS

These services have been performed and this report prepared for the North Carolina Department of Transportation in accordance with generally accepted guidelines for conducting geophysical surveys. It is generally recognized that the results of geophysical surveys are non-unique and may not represent actual subsurface conditions.

**NCDOT, Geotechnical Engineering Unit
State Project B-4490, Cumberland County**

We appreciate the opportunity to have provided these services. Please call if you need additional information or have any questions.

Sincerely,

SCHNABEL ENGINEERING SOUTH, PC



James W. Whitt, LG
Senior Staff Geophysicist



Gregory B. Kuntz, LG
Senior Associate

JWW:JCD:GBK

Attachments: Figures (5)

CC: NCDOT, Gordon Box

FILE: G:\2011-SDE-JOBS\11821014_00_NCDOT_2011_GEOTECHNICAL_UNIT_SERVICES\11821014_33_B-4490_CUMBERLAND_COUNTY\REPORT\GEOPHYSICS\PARCEL 20\SCHNABEL
GEOPHYSICAL REPORT ON PARCEL 20 (B-4490) FINAL.DOCX

Attachments:

- Figure 1 - Parcel 020 Site Photos
- Figure 2 - Photos of Geophysical Equipment Used
- Figure 3 - EM61 Early Time Gate Response
- Figure 4 - EM61 Differential Response
- Figure 5 - Parcel 020 Photos of Probable UST Location



Parcel 020 (Unassigned aka P&S Enterprises Property), looking southeast



Parcel 020 (Unassigned aka P&S Enterprises Property), looking northeast



Geonics EM61-MK2 Metal Detector with Trimble DGPS Unit



GSSI SIR-3000 Ground-Penetrating Radar with 400 MHz Antenna

Note: Stock photographs – not taken on site.

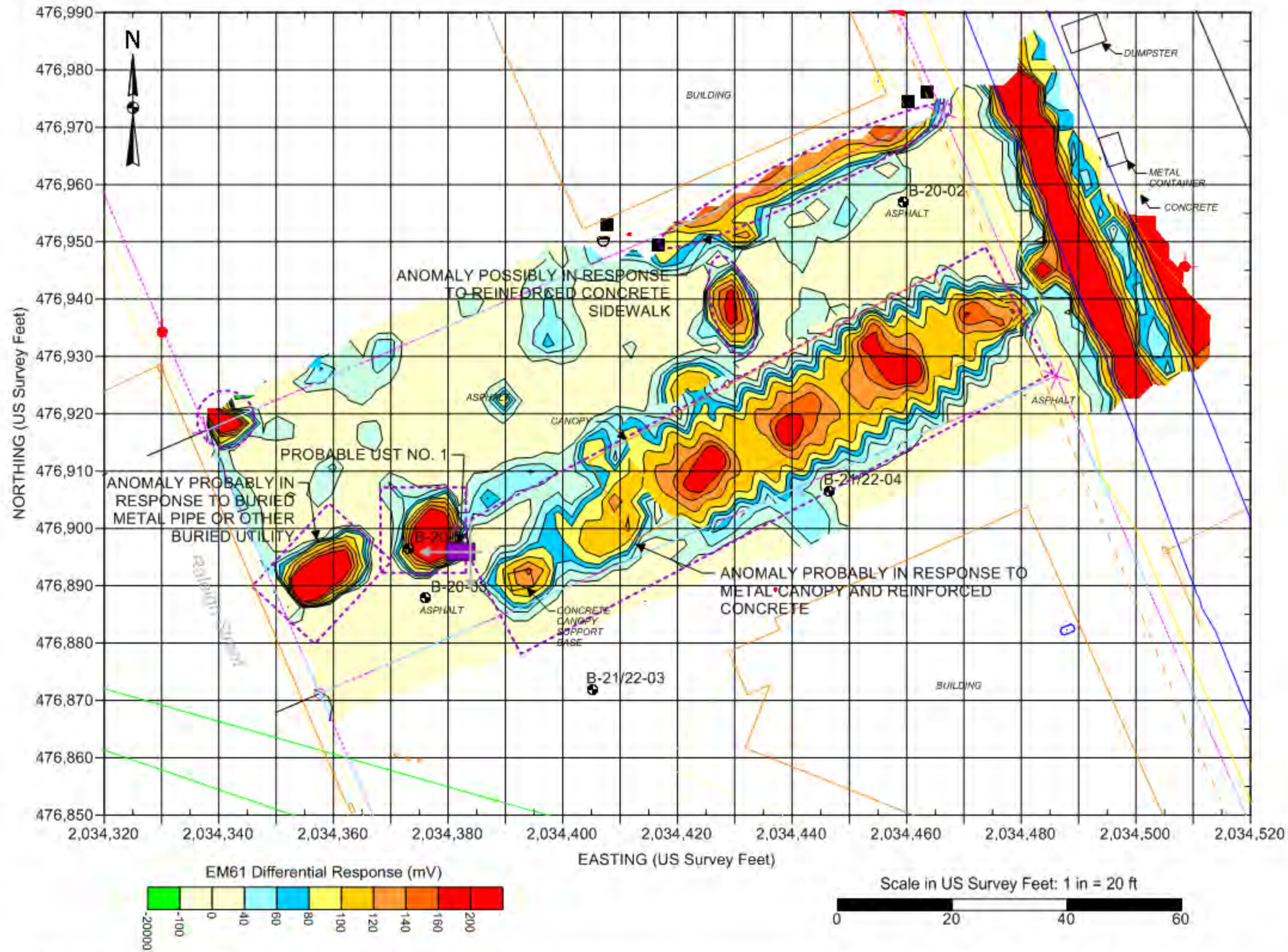


STATE PROJECT B-4490
NC DEPT. OF TRANSPORTATION
CUMBERLAND CO., NORTH CAROLINA
PROJECT NO. 11821014.33

PHOTOS OF
GEOPHYSICAL
EQUIPMENT USED

FIGURE 2

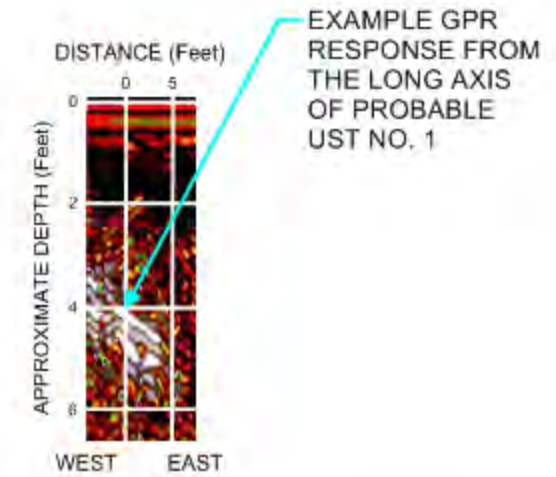
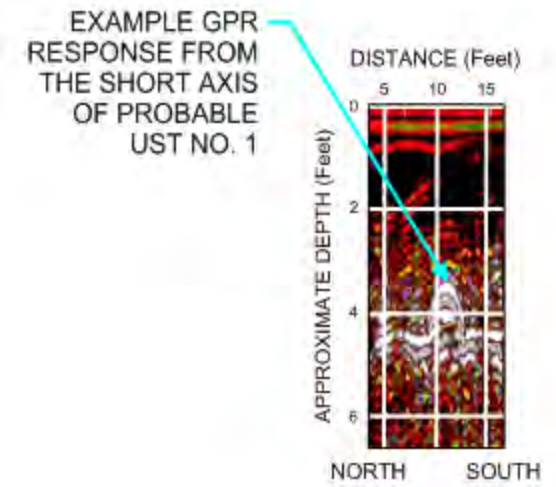
PARCEL 020



EXPLANATION

- SIGN
- MISCELLANEOUS METALLIC OBJECT
- EDGE OF NCDOT PROPOSED R/W
- PROPERTY LINE
- GPR SURVEY AREA
- LOCATION OF SUSPECT USTS MARKED ON SITE
- EXAMPLE GPR LINE LOCATION
- BORING LOCATION

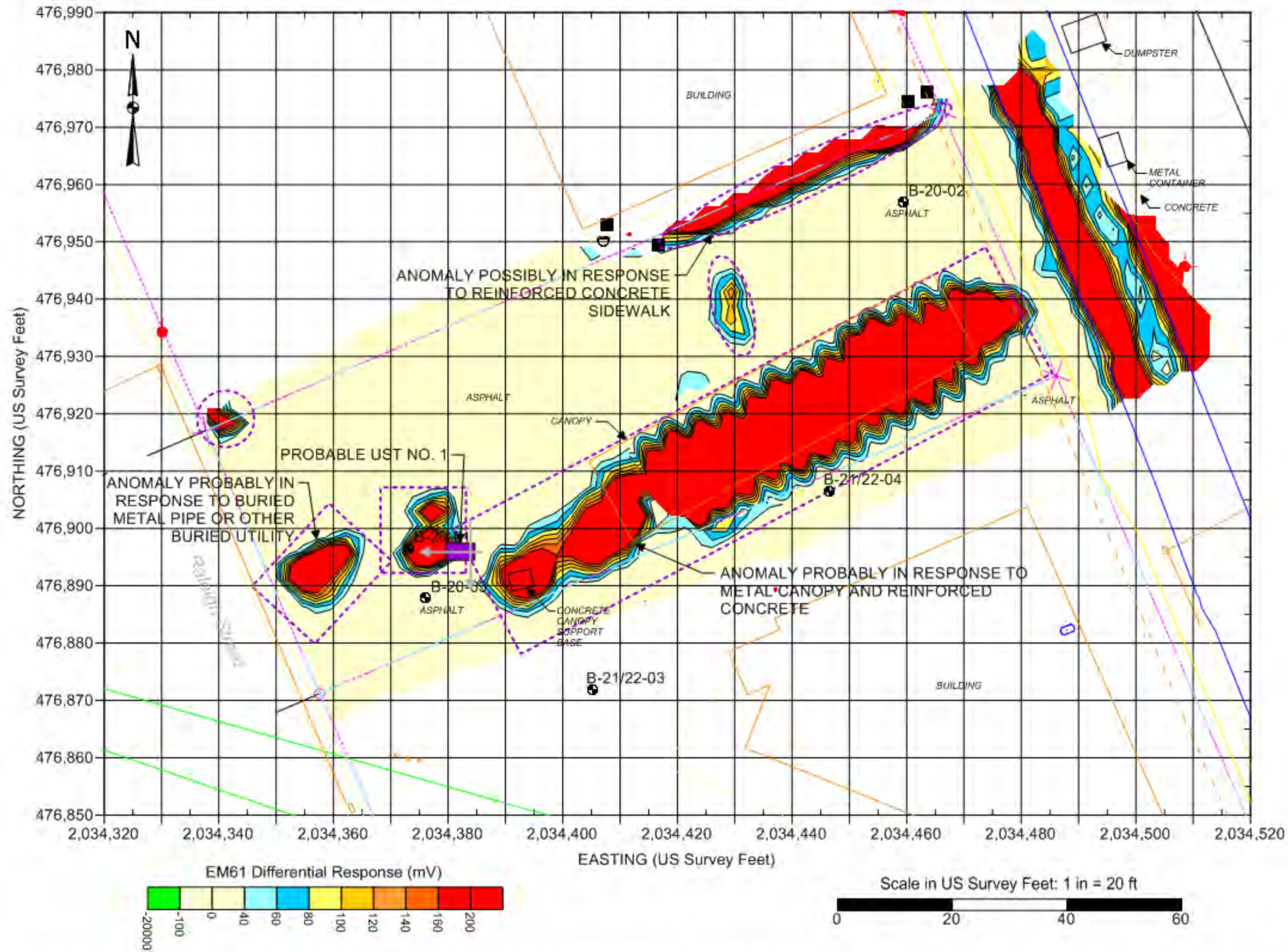
BASE PLAN FROM NCDOT FILE:
 B-4490_rdy_psh_07.dgn &
 B-4490_rdy_psh_08.dgn
 (FOR SOME SITE FEATURES)



Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on January 28, 2014, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on February 11 and February 17, 2014, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT B-4490 NC DEPARTMENT OF TRANSPORTATION CUMBERLAND COUNTY, NC PROJECT NO. 11821014.33	EM61 EARLY TIME GATE RESPONSE & EXAMPLE GPR IMAGES FIGURE 3
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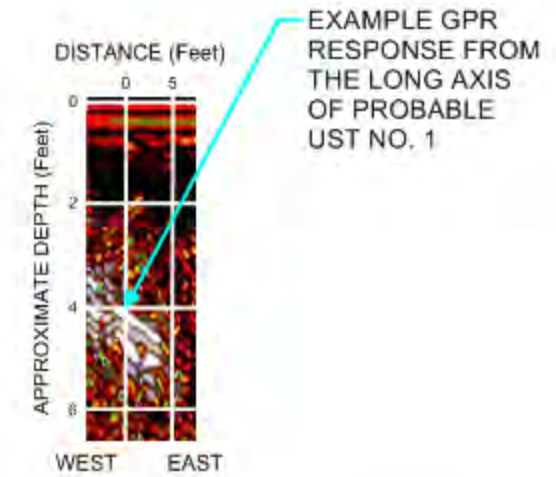
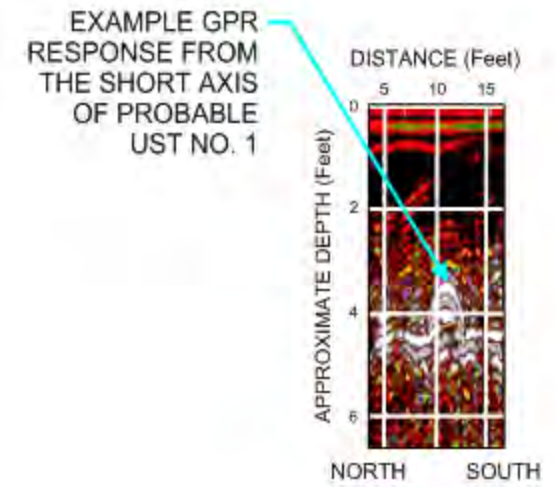
PARCEL 020



EXPLANATION

- SIGN
- MISCELLANEOUS METALLIC OBJECT
- EDGE OF NCDOT PROPOSED R/W
- PROPERTY LINE
- GPR SURVEY AREA
- LOCATION OF SUSPECT USTS MARKED ON SITE
- EXAMPLE GPR LINE LOCATION
- BORING LOCATION

BASE PLAN FROM NCDOT FILE:
 B-4490_rdy_psh_07.dgn &
 B-4490_rdy_psh_08.dgn
 (FOR SOME SITE FEATURES)



Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on January 28, 2014, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on February 11 and February 17, 2014, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT B-4490 NC DEPARTMENT OF TRANSPORTATION CUMBERLAND COUNTY, NC PROJECT NO. 11821014.33	EM61 DIFFERENTIAL RESPONSE & EXAMPLE GPR IMAGES FIGURE 4
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Parcel 020 (Unassigned AKA P&S Enterprises Property), looking east. Photo shows approximate marked location of Probable UST No. 1 near the southwest end of the canopy on Parcel 020.



Parcel 020 (Unassigned AKA P&S Enterprises Property), looking north. Photo shows approximate marked location of Probable UST No. 1 near the southwest end of the canopy on Parcel 020.

APPENDIX C
SOIL BORING LOGS



Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: B-20-01
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina
Contractor Foreman: W. Hall
Schnabel Representative: B. Bradley
Equipment: Geoprobe 7822DT
Method: 3-1/4" Probe Rod,
Macrocore
Hammer Type:
Dates Started: 2/20/14 **Finished:** 2/20/14
X: 476896.446 m **Y:** 2034373.187 m
Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations						
	Date	Time	Depth	Casing	Caved	
Encountered	2/20	7:53 AM	7.0'	---	---	

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
0.2	Asphalt PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
5.1	SILTY SAND; wet, dark grayish black, estimated 5 - 10% organics, probable RESIDUAL material	SM			5		PID = 0.0 ppm	
9.0	SILTY SAND WITH CLAY; wet, light gray, estimated 5 - 10% medium grained sand, probable RESIDUAL material	SM					PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.



GEO PROBE LOG

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: **B-20-02**
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina
Contractor Foreman: W. Hall
Schnabel Representative: B. Bradley
Equipment: Geoprobe 7822DT
Method: 3-1/4" Probe Rod,
Macrocore
Hammer Type:
Dates Started: 2/20/14 **Finished:** 2/20/14
X: 476956.851 m **Y:** 2034459.376 m
Ground Surface Elevation: **Total Depth:** 12.0 ft

Groundwater Observations						
	Date	Time	Depth	Casing	Caved	
Encountered	2/20	8:09 AM	7.5'	---	---	

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
0.2	Asphalt	FILL						
	PROBABLE FILL, sampled as silty sand; moist, orangeish brown							
2.0	SILTY SAND; wet, grayish white and orangeish gray, estimated 15 - 25% medium grained sand, probable RESIDUAL material	SM			5		PID = 0.0 ppm	
8.5	FAT CLAY; moist, dark brownish gray, estimated 5 - 10% wood, estimated 5 - 10% organics, probable RESIDUAL material	CH			10		PID = 0.0 ppm	
12.0							PID = 0.0 ppm	

Bottom of Geo Probe at 12.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

TEST BORING LOG PSA.GPJ SCHNABEL DATA TEMPLATE 2008_07_06.GDT 3/27/14



GEO PROBE LOG

Project: Preliminary Site Assessments
Cumberland County
Fayetteville, North Carolina

Geo Probe Number: **B-20-03**
Contract Number: B-4490
Sheet: 1 of 1

Contractor: Saedacco, Inc.
Fort Mill, South Carolina
Contractor Foreman: W. Hall
Schnabel Representative: B. Bradley
Equipment: Geoprobe 7822DT
Method: 3-1/4" Probe Rod,
Macrocore
Hammer Type:
Dates Started: 2/20/14 **Finished:** 2/20/14
X: 476887.811 m **Y:** 2034376.053 m
Ground Surface Elevation: **Total Depth:** 10.0 ft

Groundwater Observations						
	Date	Time	Depth	Casing	Caved	
Encountered	2/20	7:57 AM	7.0'	---	---	

DEPTH (ft)	MATERIAL DESCRIPTION	SYMBOL	ELEV (ft)	STRATUM	SAMPLING DATA		TESTS	REMARKS
					DEPTH	DATA		
0.2	Asphalt PROBABLE FILL, sampled as silty sand; moist, orangeish brown	FILL					PID = 0.0 ppm	
5.1	SILTY SAND; wet, dark grayish black, estimated 5 - 10% organics, probable RESIDUAL material	SM			5		PID = 0.0 ppm	
8.5	SILTY SAND WITH CLAY; wet, light gray, estimated 5 - 10% medium grained sand, probable RESIDUAL material	SM					PID = 0.0 ppm	
10.0					10		PID = 0.0 ppm	

Bottom of Geo Probe at 10.0 ft.
Boring terminated at selected depth.
Boring backfilled with bentonite and cuttings upon completion.

APPENDIX D
SOIL BORING GPS COORDINATES

**SOIL BORING GPS COORDINATES
NCDOT B-4490, CUMBERLAND COUNTY**

Soil Boring GPS Coordinates		
Boring Identification	Easting	Northing
	X	Y
B-20-01	2034373.187	476896.446
B-20-02	2034459.376	476956.851
B-20-03	2034376.053	476887.811

* NC State Plane 1983 System, NC 3200 Zone,
NAD 83 Datum, US Survey Feet

APPENDIX E
UVF ANALYSIS RESULTS



Hydrocarbon Analysis Results

Client: NCDOT
Address:

Samples taken
Samples extracted
Samples analysed

Contact:

Project: FAYETTEVILLE PSAS, B-4490

Operator BLB

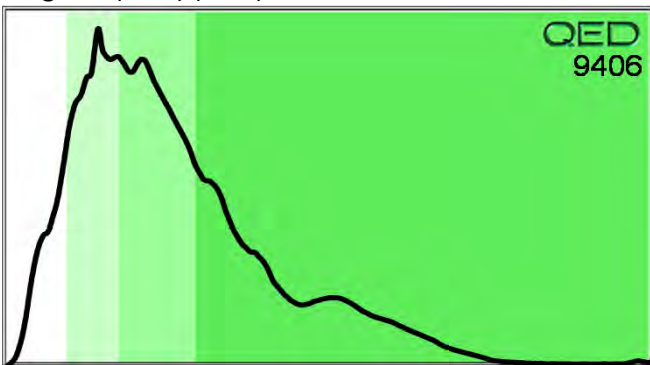
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	B-07-10 8 FT	20.0	21.8	35.1	13.5	48.6	23.3	<0.1	<0.01	95.7	3.3	1.1	Deg.Gas (PFM) (FCM)
s	B-07-09 4 FT	20.0	94.9	153	48.4	201.4	37.6	1.07	0.032	98.6	1.2	0.2	Deg.Gas (FCM) 65.7%
w	B-20-02	1.0	<0.025	<0.025	<0.025	<0.025	0.01	<0.005	<0.005	0	0	100	No TPH present

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

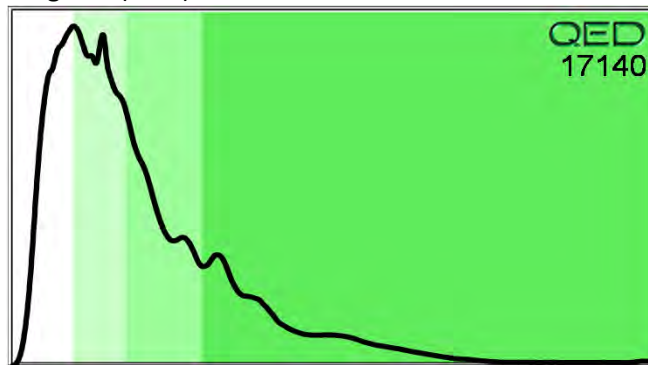
Deg.Gas (PFM) (FCM)

B-07-10 8 FT



Deg.Gas (FCM) 65.7%

B-07-09 4 FT



#DIV/0!

B-20-02

