



October 14, 2010

Terry W. Fox, LG
NCDOT, Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

RE: State Project: U-5132
 WBS Element: 45155.1.1
 County: Onslow
 Description: Jacksonville – NC 24 (Lejeune Blvd) Trumpet Interchange between SR
 1308 (Bell Fork Road) and the US 17 Bypass

**Subject: Project 09210013.28 Report on Geophysical Surveys
 Parcels 905 and 906, Onslow County, North Carolina**

Dear Mr. Fox:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we conducted on the subject site. The report includes two 8.5x11 and two 11x17 color figures.

INTRODUCTION

The work described in this report was conducted on September 13, 14, and 15, 2010, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the parcels as indicated by the NCDOT to support their environmental assessment of the subject properties (Louise Crumbley Property and Ronnie Henderson Property). Photographs of the parcels are included on Figure 1. The properties are located on the north side of NC 24 between SR 1308 (Bell Fork Road) and the US 17 Bypass in Jacksonville, NC. The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) and associated metal product lines in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies, including areas of reinforced concrete, were conducted using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna. Photographs of the equipment used are shown on Figure 2.

FIELD METHODOLOGY

Locations of geophysical data points were obtained using a sub-meter Trimble Pro-XRS DGPS system. 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. The locations of existing site features (monitoring wells, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings.

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 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 UST's. 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 Parcels 905 and 906 are shown on Figures 3 and 4. The EM61 early time gate results are plotted on Figure 3. The early time gate data provide the more sensitive detection of metal objects. Figure 4 shows the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as UST's.

The early time gate and differential results show anomalies apparently caused by buried utilities and known site features (Figures 3 and 4). The GPR data collected at the site do not indicate the presence of metallic UST's within the areas surveyed.

CONCLUSIONS

Our evaluation of the geophysical data collected on the subject properties on Project U-5132 in Jacksonville, NC indicates the following:

The geophysical data do not indicate the presence of metallic UST's in the areas surveyed on the subject properties.

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.

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



Jeremy S Strohmeyer, LG
Project Manager



Edward D Billington, LG
Senior Vice President

JW:JS:NB

Attachments: Figures (4)

FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.28 (U-5132, ONSLOW COUNTY)\REPORT\SCHNABEL GEOPHYSICAL REPORT ON U-5132.DOCX



Parcel 905 – Louise Crumbley Property, looking east



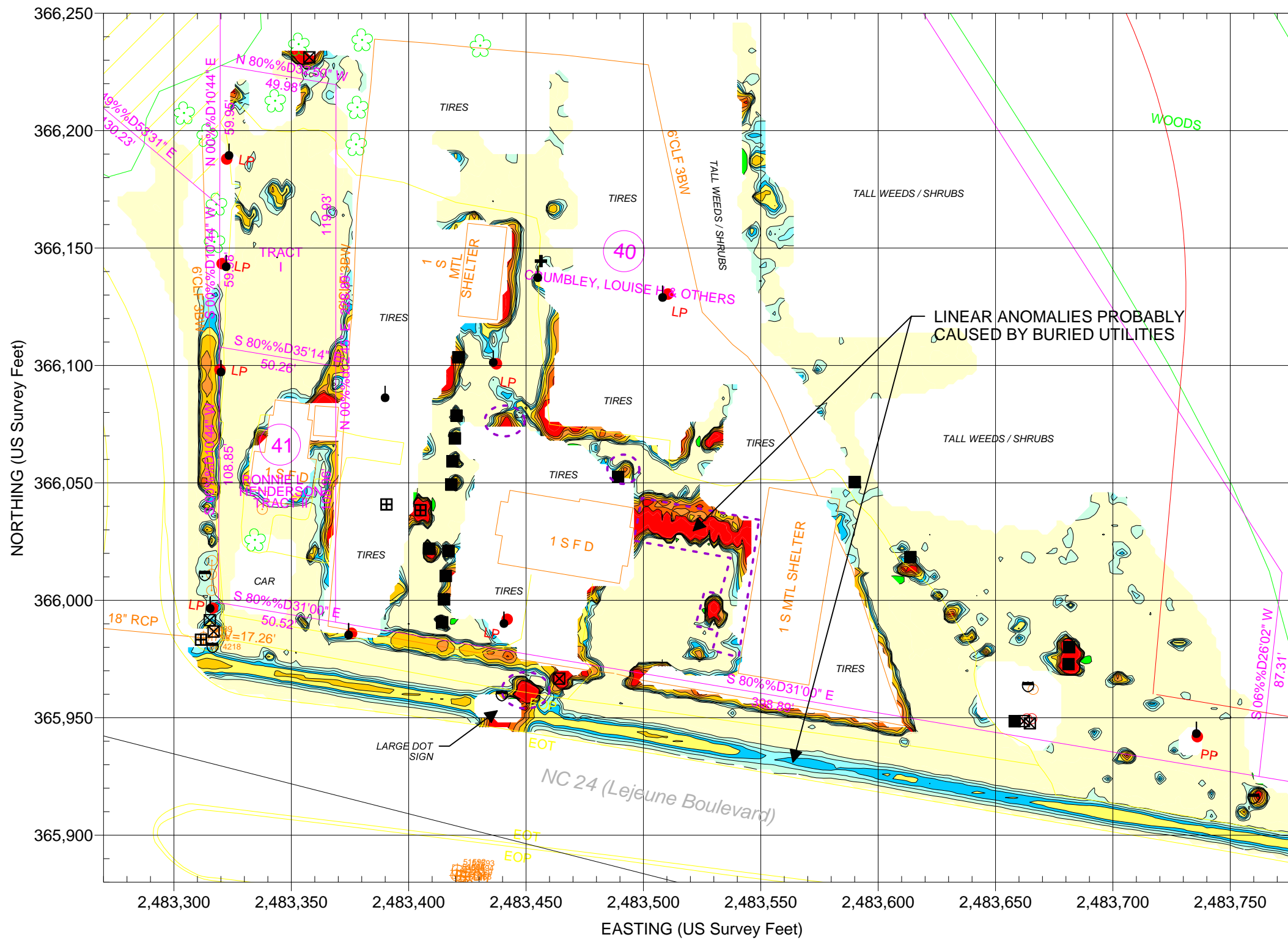
Parcel 906 – Ronnie Henderson Property, looking north



Geonics EM61-MK2

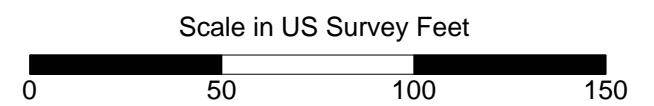
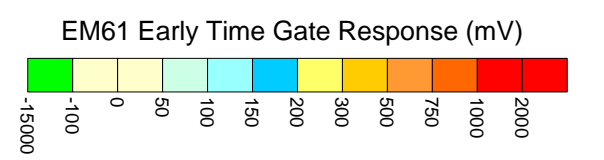


GSSI SIR-3000



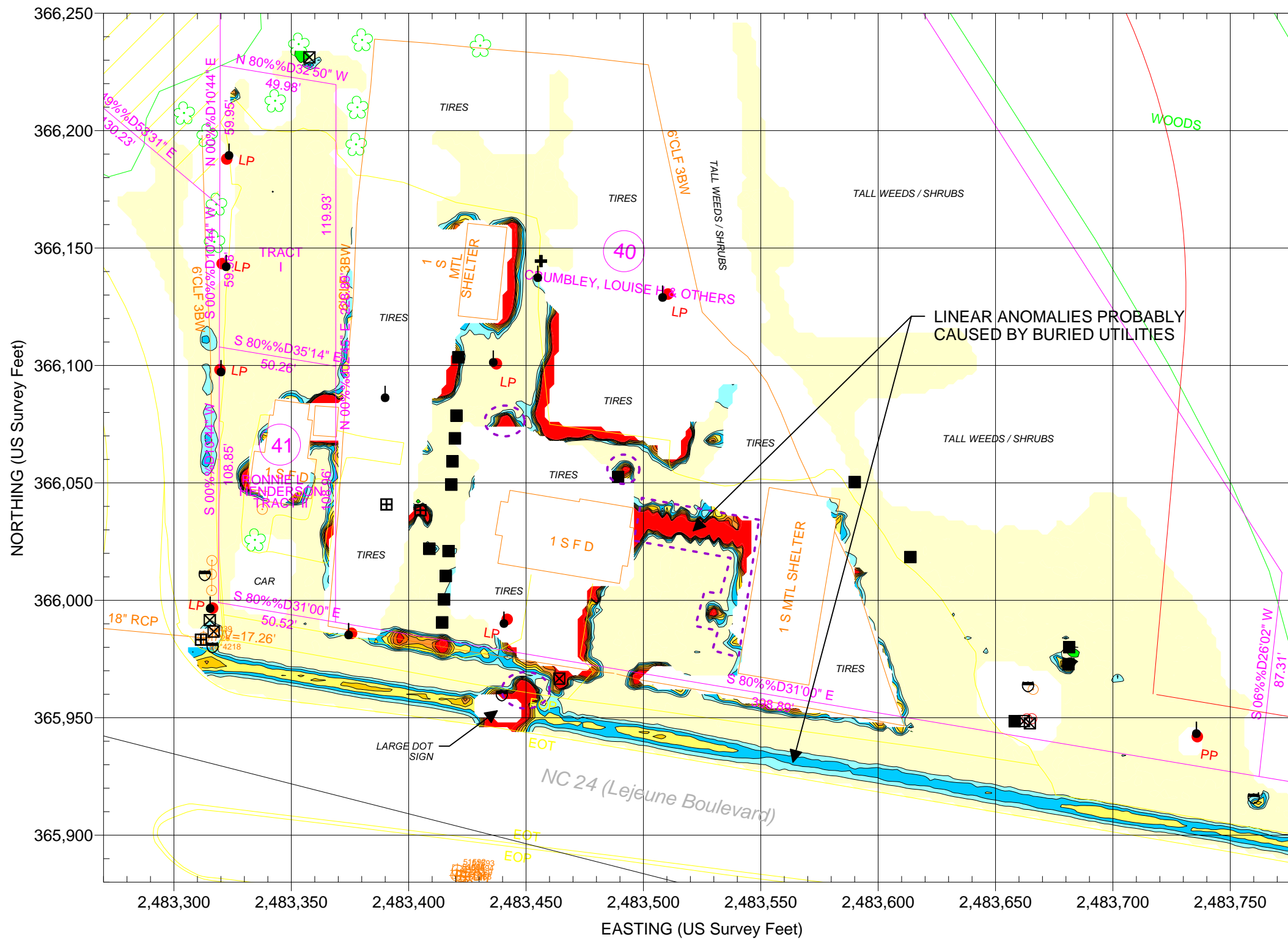
EXPLANATION	
	SIGN
	UTILITY POLE
	GUY WIRE
	MISCELLANEOUS METALLIC OBJECT
	UTILITY MANHOLE, METER, BOX, ETC.
	STORM SEWER INLET
	DOT PROPOSED RW
	PROPERTY LINE
	GPR SURVEY AREA

REF.: NCDOT FILE: u5132_rdy_psh06.dgn
(FOR SOME SITE FEATURES)



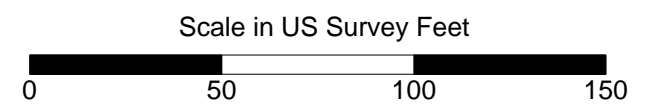
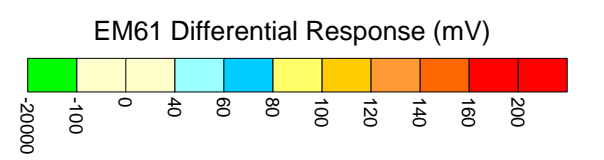
Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on September 13 through 15, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum. GPR data were acquired on September 15, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT U-5132	PARCELS 905 & 906
	NC DEPARTMENT OF TRANSPORTATION	EM61 EARLY TIME GATE RESPONSE
	ONSLOW COUNTY, NORTH CAROLINA	
	PROJECT NO. 09210013.28	FIGURE 3



EXPLANATION	
	SIGN
	UTILITY POLE
	GUY WIRE
	MISCELLANEOUS METALLIC OBJECT
	UTILITY MANHOLE, METER, BOX, ETC.
	STORM SEWER INLET
	DOT PROPOSED RW
	PROPERTY LINE
	GPR SURVEY AREA

REF.: NCDOT FILE: u5132_rdy_psh06.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 September 13 through 15, 2010, 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 September 15, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT U-5132	PARCELS 905 & 906
	NC DEPARTMENT OF TRANSPORTATION	EM61 DIFFERENTIAL RESPONSE
	ONSLow COUNTY, NORTH CAROLINA	
	PROJECT NO. 09210013.28	FIGURE 4