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ENGINEERING

April 3, 2012

Mr. Michael Sabodish, Ph.D, PE
Froehling & Robertson, Inc.
310 Hubert Street
Raleigh, NC 27603-2302

RE:	State Project:	R-2519B
	WBS Element:	35609.1.1
	County:	Yancey
	Description:	Micaville – US 19 East from NC 90 in Yancey County to Multi-Lane Section West of Spruce Pine in Mitchell County

Subject: **Project 11821014.07, Report on Geophysical Surveys**
Parcel 64, James T. Fox Property, Yancey County, North Carolina

Dear Mr. Sabodish:

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

INTRODUCTION

The work described in this report was performed on January 19, 2012, by Schnabel under our 2011 contract with the NCDOT. The survey was performed over the accessible areas of the property as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the property are included on Figure 1. The property is located east of Sycamore Circle and on the south side of US 19 E in Micaville, NC. The purpose of the geophysical surveys was to investigate the presence of metal underground storage tanks (USTs) in the accessible areas of the right-of-way and/or easement.

The geophysical survey consisted of an electromagnetic (EM) induction survey using a Geonics EM61-MK2 instrument. The EM61 is a time domain metal detector that is used to locate metal objects buried up to about eight feet below ground surface. When collecting EM61 data, three or four time gates are recorded of the response decay rate. A photograph of the equipment used is shown on Figure 2.

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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. We recorded the locations of existing site features (metal objects, signs, etc.) with the Trimble system for later correlation with the geophysical data and locations provided by the NCDOT.

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.

DISCUSSION OF RESULTS

The contoured EM61 data collected over Parcel 64 are shown on Figures 3 and 4. The EM61 early time gate data are plotted on Figure 3. The early time gate data provide a more sensitive detection of metal objects than the later time gate data. Figure 4 shows the differential response between the top and bottom coils of the EM61 instrument. The differential response data filters 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.

The early time gate and differential results show anomalies apparently caused by known site features (Figures 3 and 4). GPR data were not collected at the site due to a lack of differential EM61 anomalies that suggest the presence of unknown USTs. The geophysical data do not indicate the presence of metallic USTs within the areas surveyed.

CONCLUSIONS

Our evaluation of the geophysical data collected on the subject property on Project R-2519B in Micaville, NC indicates that metallic USTs are unlikely to be encountered within 8 feet of the ground surface in the areas surveyed on the subject property.

LIMITATIONS

These services have been performed and this report prepared for Froehling & Robertson, Inc. and 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

Gerald C. Robblee, PE
Senior Associate

JW:JS:GR
Attachments: Figures (4)
CC: NCDOT, Terry Fox, LG
FILE: G:\2011-SDE-JOBS\11821014_00_NCDOT_2011_GEOTECHNICAL_UNIT_SERVICES\11821014_07_R-2519B_YANCEY_COUNTY\REPORT\PARCEL 64\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 64 (R-2519B).DOCX

Parcel 64 (James T. Fox Property), looking southeast

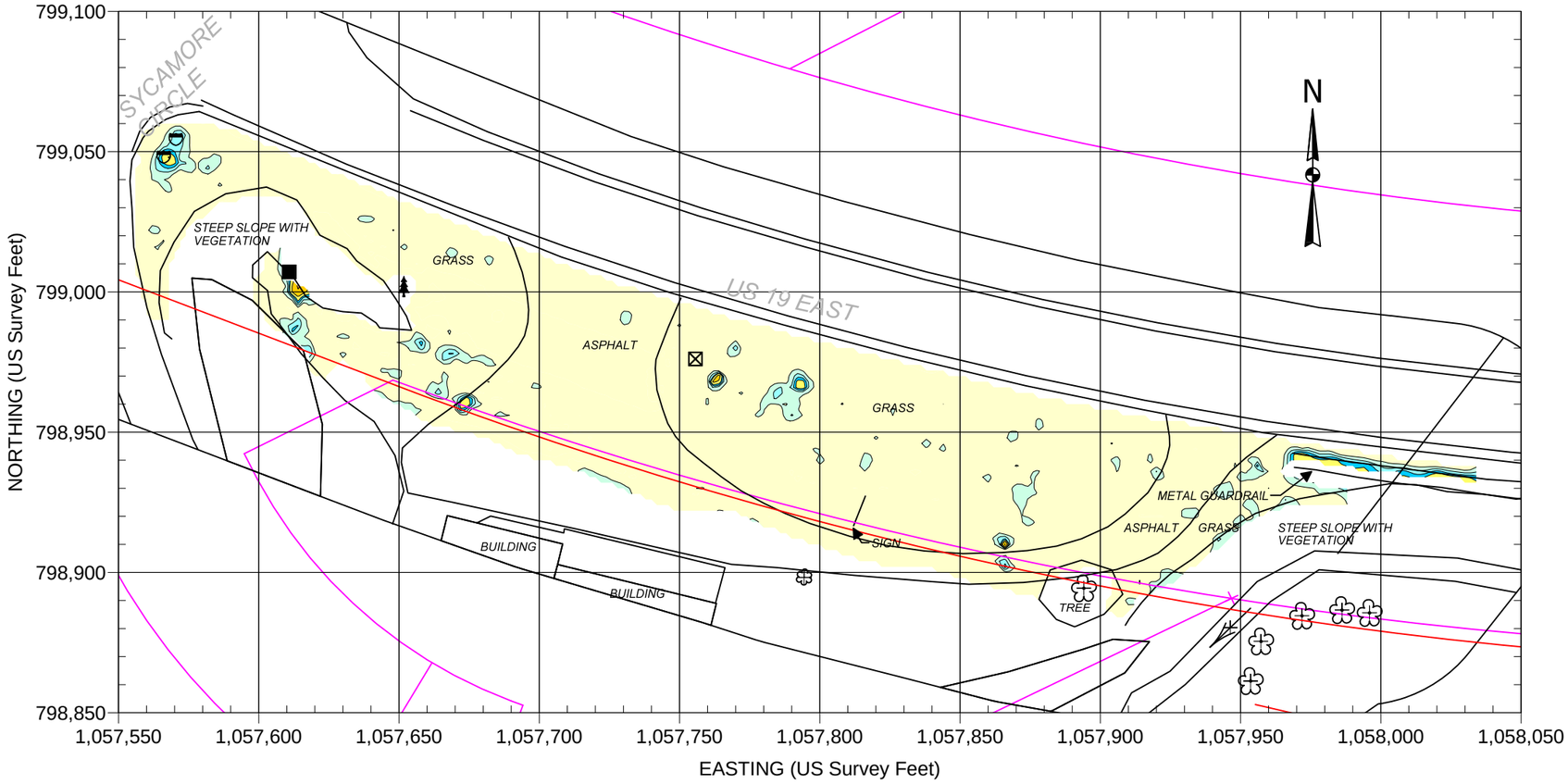
Parcel 64 (James T. Fox Property), looking southwest

Schnabel ENGINEERING	STATE PROJECT R-2519B NC DEPT. OF TRANSPORTATION YANCEY COUNTY, NC PROJECT NO. 11821014.07	PARCEL 64 SITE PHOTOS FIGURE 1

Geonics EM61-MK2 Metal Detector with Trimble DGPS Unit

Note: Stock photograph – not taken on site.

Schnabel ENGINEERING	STATE PROJECT R-2519B NC DEPT. OF TRANSPORTATION YANCEY COUNTY, NC PROJECT NO. 11821014.07	PHOTOS OF GEOPHYSICAL EQUIPMENT USED FIGURE 2



EXPLANATION

- EDGE OF NCDOT PROPOSED R/W
- PROPERTY LINE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- STORMSEWER INLET

REF.: NCDOT FILE: r2519b_rdy_psh_s13.dgn
(FOR SOME SITE FEATURES)

EM61 Early Time Gate Response (mV)

-15000 -100 0 50 100 150 200 300 500 750 1000 2000

Scale in US Survey Feet

0 50 100 150

Note: The contour plot shows the earliest and more sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on January 19, 2012, 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.

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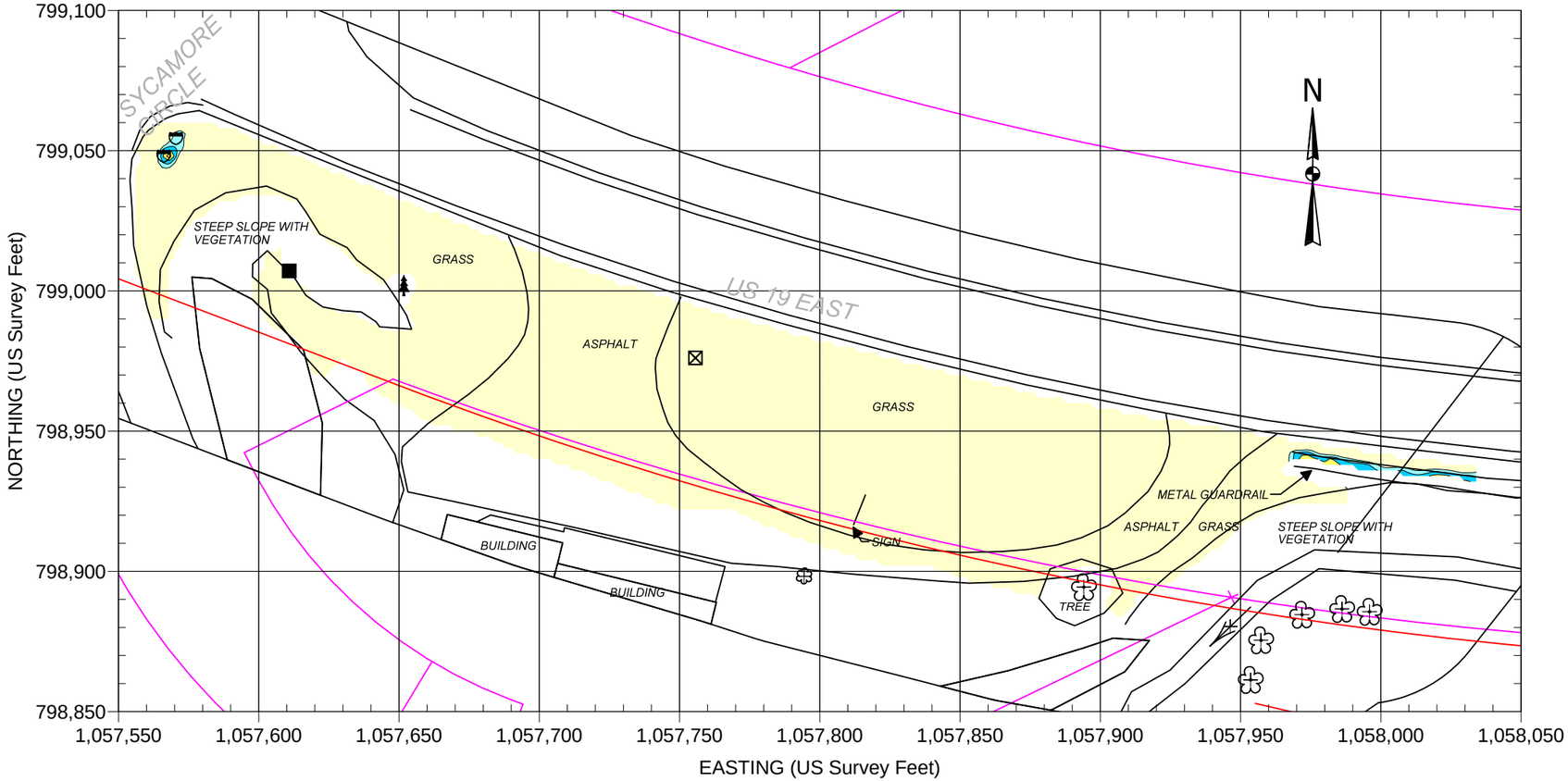
PARCEL 64
EM61 EARLY TIME GATE RESPONSE

FIGURE 3



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(FOR SOME SITE FEATURES)

EM61 Differential Response (mV)

-20000 -100 0 40 60 80 100 120 140 160 200

Scale in US Survey Feet

0 50 100 150

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 19, 2012, 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.

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PARCEL 64
EM61 DIFFERENTIAL RESPONSE

FIGURE 4