



PRELIMINARY SITE ASSESSMENT

Albemarle Oil Holdings LLC Property (Parcel #85)

291 Billy Covington Road

Rockingham, NC

State Project: R-3421C

WBS Element: 34542.1.2

February 28, 2011

Prepared for:

North Carolina Department of Transportation

Geotechnical Engineering Unit

1020 Birch Ridge Drive

Raleigh, NC 27610



FROEHLING & ROBERTSON, INC.

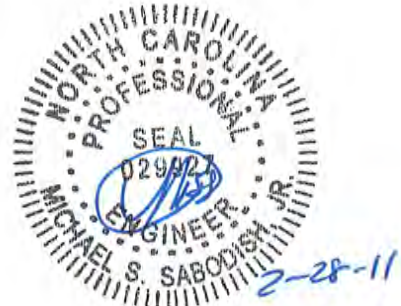
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February 28, 2011

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Ethan J. Caldwell, L.G., P.E.
GeoEnvironmental Project Manager



Re: State Project: R-3421C
WBS Element: 34542.1.2
US 220 Bypass from Southwest of SR 1304 (Harrington Road) to Future
US 220 Business/US 220 Bypass Interchange South of Ellerbe

Subject: Preliminary Site Assessment
Albemarle Oil Holdings Property (Parcel #85)
291 Billy Covington Road
Rockingham, NC

Dear Mr. Caldwell:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the Albemarle Oil Holdings Property in Rockingham, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1166-336E dated December 8, 2010 and revised December 12, 2010. This report documents our field activities, presents the results of laboratory analysis and provides recommendations regarding the property.

Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

Michael S. Sabodish, Jr., Ph.D., P.E.
Engineering and Remediation Services Manager

Christopher J. Burkhardt
Environmental Department Manager



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**Preliminary Site Assessment Report
Albemarle Oil Holdings Property (Parcel #85)
Rockingham, Richmond County, North Carolina
F&R Project No. 66M-0178-0004**

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment Report (PSA) to document soil assessment activities performed at the Albemarle Oil Holdings Property (Parcel #85) addressed as 291 Billy Covington Road, Rockingham, Richmond County, North Carolina. The site is located on the southwest quadrant of the intersection of Billy Covington Road and US 220 Hwy (Appendix I, Figure 1). Currently, the site is an active gasoline service station. According to the North Carolina Department of Environment and Natural Resources (NCDENR) Underground Storage Tank (UST) Registry, there are three USTs currently in use and Groundwater Incident #16883 has been assigned to the site. For the purpose of this assessment, the area of investigation was limited to the existing right of way and focused on the proposed drainage modifications. This work was performed in general accordance with F&R's Proposal No. 1166-336E dated December 8, 2010 and revised December 12, 2010. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide recommendations regarding the property.

Based on conversations and a site visit with NCDOT, it has been determined that the proposed drainage modifications extending from US Hwy 220 to Billy Covington Road will impact the project site (See Figure No.3). As such, the NCDOT requested a Preliminary Site Assessment be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs which may exist/existed at the project site.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Schnabel Engineering conducted a geophysical survey of the project site to locate suspect metal underground storage tanks (USTs) in the accessible areas of the right-of-way and/or easement. The geophysical work was conducted on January 5, 6 and 13, 2011 under Schnabel's 2009 contract with NCDOT.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were investigated using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna. The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart,



while the GPR data were collected along survey lines spaced 1 to 2 feet apart in orthogonal directions. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review.

Based on the results of the geophysical survey, one anomaly of unknown cause, in addition to those apparently caused by reinforced concrete, buried utilities and known site features (known UST) were encountered. The GPR data indicate the presence of one probable UST located approximately 40 to 45 feet west of the southernmost corner of the existing canopy (See Figure No. 3). The GPR data indicate that the probable UST is buried approximately 2 to 3 feet below ground surface, and is approximately 3 feet in diameter and approximately 3 feet long, resulting in a tank with a capacity of approximately 150 gallons. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

Prior to performing the Preliminary Site Assessments, F&R attended a site meeting with NCDOT on November 29, 2010, to observe existing site conditions and determine the quantity of soil borings and their locations.

F&R returned to the site on January 18, 2011 to perform the Preliminary Site Assessment. The assessment consisted of advancing four borings into the soils at the project site. Three of the borings (B-1 through B-3) were advanced within the proposed drainage area, while Boring B-4 was advanced adjacent to the probable UST (Appendix I, Figure 3). The borings were advanced using direct-push technology (Geoprobe) to depths ranging from 10 to 12 feet below ground surface (bgs). As directed by the NCDOT, boring in the vicinity of the probable UST was terminated at a depth of 12 feet, while the remaining borings were terminated at a depth of 10 feet bgs. Boring locations were determined by F&R staff based on the location of the probable UST, site features and directives from the NCDOT during a previous site meeting.

Soil sample cores from the borings (B-1 through B-4) were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a photo-ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC concentrations were performed using a MiniRae 2000 PID which produces results in parts per million (ppm). A representative soil sample was collected from one foot sections of each sleeve and placed in a re-sealable plastic bag and the vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID measurements can be found in the Environmental Borings Logs in Appendix III.



The soil sample which exhibited the highest PID concentration or the sample at boring termination was submitted for laboratory analysis for diesel range organics (DRO) by EPA Method 3510 and gasoline range organics (GRO) by EPA Method 5030 with preparation by EPA Method 8015C.

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and delivered by courier to SGS North America, Inc. (SGS) in Wilmington, North Carolina following standard chain-of custody procedures.

4.0 Subsurface Conditions

As indicated in the attached Environmental Boring Logs (Appendix III), the subsurface conditions at the boring locations generally consisted of moist, brown-orange brown, silty sand (USCS - SM) from the ground surface to a depth of approximately three feet. From depths of approximately three feet to depths of approximately seven feet, subsurface conditions generally consisted of moist and moist to wet, brown-orange and orange, silty sandy clays (USCS - CL) and clayey sands (USCS - SC). From depths of approximately seven feet to boring termination, the subsurface soils generally consisted of moist, orange-tan-gray slightly clayey silty sands (USCS - SM) and moist, orange-tan-gray, sandy clay and clayey sand (USCS - CL and SC). A formal determination of the groundwater table was not made during the drilling activities. Most of the collected soil samples were observed to be moist, with the exception of Boring B-2 and Boring B-3 where wet soils were observed at a depth of three and five feet below ground surface, respectively.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons were not encountered at the borings advanced during the assessment, as the laboratory results indicate the concentration of DRO and GRO of soil samples collected from the borings are Below Quantitation Limits (BQL). The laboratory analytical results can be found in the attached Appendix V of this report.



Table 1
Soil Sampling Analytical Results
Albemarle Oil Holdings LLC Property (Parcel #85)
Rockingham, Richmond County, North Carolina

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	EPA Method 8015B	
				DRO (mg/kg)	GRO (mg/kg)
66M-0178-0004-B1	1/18/2011	6-7	1.2	BQL	BQL
66M-0178-0004-B2	1/18/2011	8-9	0.8	BQL	BQL
66M-0178-0004-B3	1/18/2011	6-7	0.8	BQL	BQL
66M-0178-0004-B4	1/18/2011	9-10	1.5	BQL	BQL
NC DENR Action Level				10	10

Notes:

ft bgs = feet below ground surface

ppm = parts per million

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

BQL = Below Quantitation Limit

Bold indicates soil analytical results above NCDENR Action Levels

NCDENR Action Level determined from the North Carolina UST Section Guidelines for Assessment and Corrective Ac

6.0 Conclusions and Recommendations

F&R conducted a PSA at the Albemarle Oil Holdings Property located at 291 Billy Covington Road, Rockingham, Richmond County, North Carolina. A geophysical investigation was performed by Schnabel Engineering to investigate the possible existence of unknown USTs at the site. Based on the results of the geophysical survey, it was determined that one probable UST, approximately 150 gallons in size was present at the site. One geoprobe boring was advanced in the vicinity of the UST, and an additional three geoprobe borings were advanced at the site in the vicinity of the grassed right-of-way drainage easement. Based on the results of laboratory testing, it has been determined that petroleum impacted soils do not exist at the boring location adjacent to the probable UST or at the boring locations within the drainage easement at concentrations above laboratory quantitation limits.



If the proposed drainage easement activities will require the removal of the proposed UST, F&R recommends that the UST be removed and disposed of in accordance with all NCDENR rules and regulations.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.

Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.

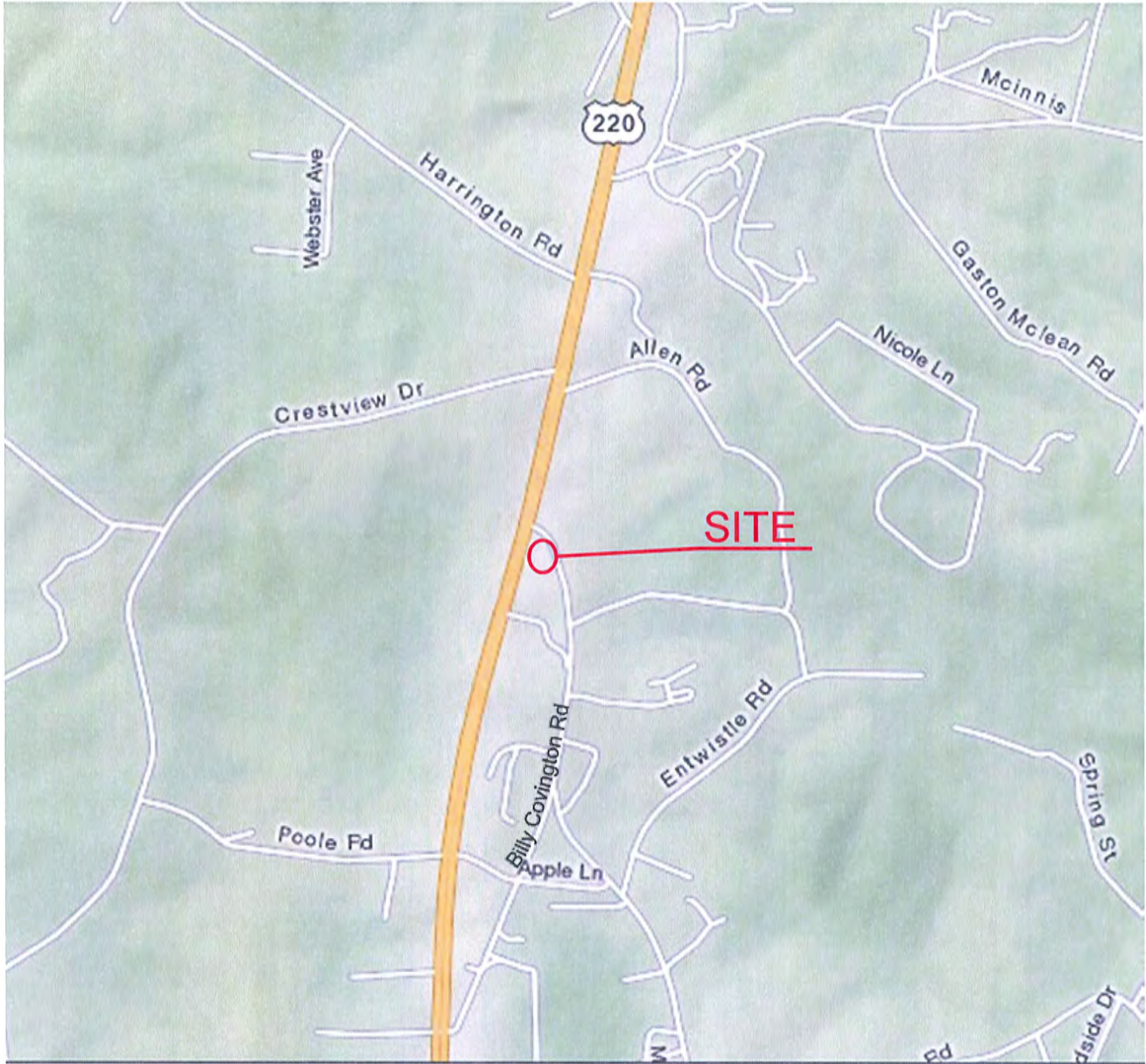


APPENDIX I

Figure No. 1 – SITE VICINITY MAP

Figure No. 2 – TOPOGRAPHIC MAP

Figure No. 3 – BORING LOCATION PLAN



SITE VICINITY MAP

North 

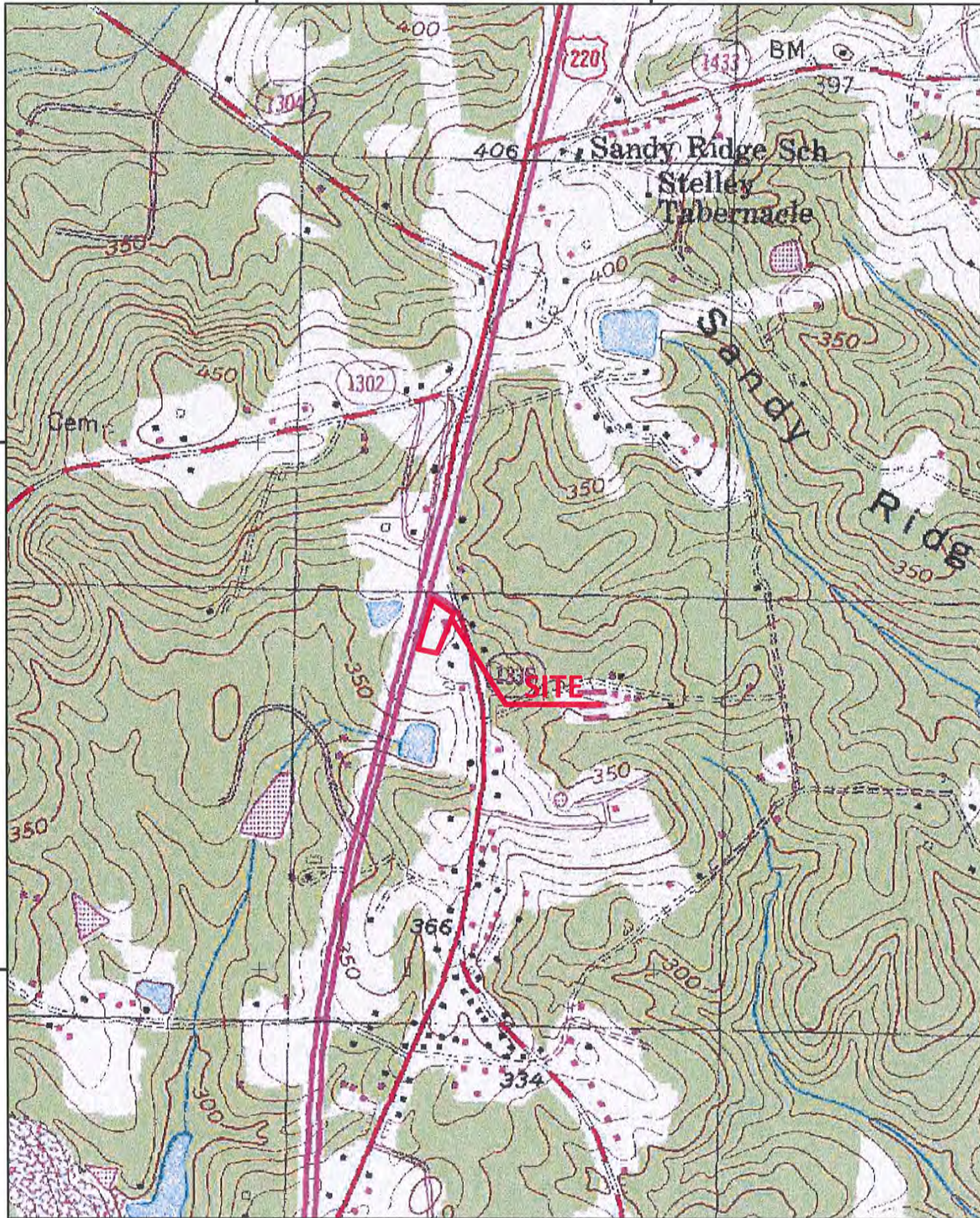


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CLIENT: NCDOT		FIGURE No.: 1
PROJECT: Albemarle Oil Holdings LLC Property		
LOCATION: Rockingham, Richmond County, North Carolina		
F&R PROJECT No.: 66M-0178-0004		
DRAWN BY: D. Racey		
DATE: February 2011	SCALE: Not to scale	

1765000 000000

1768000 000000



452000 000000

452000 000000

448000 000000

448000 000000

Topographic Plan



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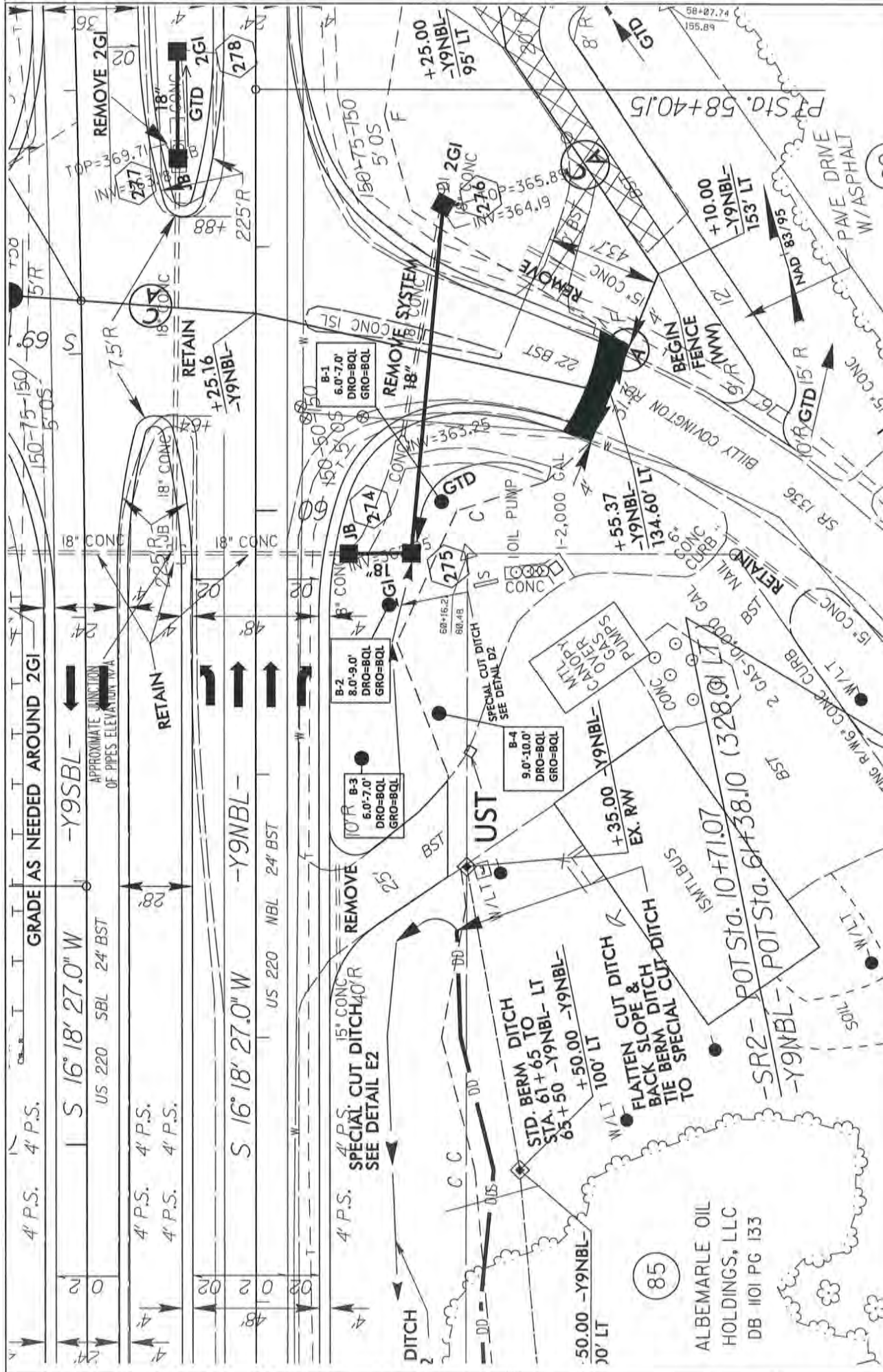
Client:	NCDOT
Project:	Albemarle Oil Holdings Property
Location:	Rockingham, Richmond County, NC
F&R Project No.:	66M-0178-0004
Data:	F&R(NAD 83 State Plane, FEET: CORS96)
Date:	February 2011

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

Scale: 1:12,000 1 inch = 1,000 feet | Figure 2

1765000 000000

1768000 000000



BORING LOCATION PLAN


<p>CLIENT: NCDOT PROJECT: Albermarle Oil Holdings LLC Property LOCATION: Rockingham, Richmond County, North Carolina F&R PROJECT No.: 66M-0178-0004 DRAWN BY: D. Racey DATE: February 2011</p>	<p>FIGURE No.: 3</p> <p>CHECKED BY: M. Sabodish, P.E. SCALE: 1"=50'</p>
---	---

LEGEND

- Approximate Geoprobe Boring Location

SCALE (FEET)
 0 25' 50'
 1"=50'

SINCE FROEHLING & ROBERTSON, INC.
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APPENDIX II

GEOPHYSICAL REPORT PREPARED BY SCHNABEL ENGINEERING



January 31, 2011

Mr. Christopher Burkhardt
Froehling & Robertson, Inc.
310 Hubert Street
Raleigh, NC 27603

RE: State Project: R-3421C
 WBS Element: 34542.1.2
 County: Richmond
 Description: US 220 Bypass from Southwest of SR 1304 (Harrington Road) to Future
 US 220 Business/US 220 Bypass Interchange South of Ellerbe

**Subject: Project 09210013.35 Report on Geophysical Surveys
 Parcel 85, Richmond County, North Carolina**

Dear Mr. Burkhardt:

SCHNABEL ENGINEERING SOUTH, PC (Schnabel) is pleased to present this report on the geophysical surveys we conducted on the subject property. We understand this letter report will be included as an appendix in your report to the NCDOT. The report includes two 11x17 color figures and four 8.5x11 color figures.

INTRODUCTION

The work described in this report was conducted on January 5, 6, and 13, 2011, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the parcel as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the parcel are included on Figure 1. The property is located on the southeast quadrant of the intersection of Billy Covington Road and US 220 Hwy in Rockingham, NC. The purpose of the geophysical surveys was to locate suspect metal underground storage tanks (USTs) 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 areas of reinforced concrete and 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 85 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 USTs.

The early time gate and differential results show one anomaly of unknown cause, in addition to anomalies apparently caused by reinforced concrete, buried utilities, or known site features, such as the known UST (Figures 3 and 4). The GPR data indicate the presence of one possible UST and one known UST. The known UST is not inside the limits of the planned right-of-way and/or easement. The possible UST may be partially inside the limits of the planned right-of-way and/or easement. The possible UST is located approximately 40 to 45 feet west of the southernmost corner of the canopy.

Example GPR images showing the reflections from the possible and known USTs are shown on Figure 5. Figures 3 and 4 show the location of the possible and known USTs as marked in the field. The GPR data indicate that the possible UST is buried approximately 2.0 to 3.0 feet below ground surface, and is about 3.0 feet in diameter and about 3.0 feet long, equivalent to a capacity of about 150 gallons. The GPR data indicate that the known UST is buried approximately 3.5 to 4.5 feet below ground surface, and is about 5.0 feet in diameter and about 12 feet long, equivalent to a capacity of about 2,000 gallons. Photographs of the possible and known UST locations, as marked in the field, are included on Figure 6.

CONCLUSIONS

Our evaluation of the geophysical data collected on the subject property on Project R-3421C in Rockingham, NC indicates the following:

The geophysical data indicate the presence of two USTs on Parcel 85: one possible UST and one known UST. The possible UST may be partially located inside the planned right-of-way and/or easement. The known UST is not located inside the planned right-of-way and/or easement. The possible UST is about 150-gallon capacity and is buried about 2.0 to 3.0 feet below ground surface. The known UST is about 2,000-gallon capacity and is buried about 3.5 to 4.5 feet below ground surface.

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



Edward D. Billington, LG
Senior Vice President

PS:JW:JS:NB

Attachments: Figures (6)

FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.35 (R-3421C, RICHMOND COUNTY)\REPORT\PARCEL 85\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 85 (R-3421C).DOCX



Parcel 85 – Albemarle Oil Holdings LLC Property, looking southeast



Parcel 85 – Albemarle Oil Holdings LLC Property, looking southeast



STATE PROJECT R-3421C
NC DEPT. OF TRANSPORTATION
RICHMOND CO., NORTH CAROLINA
PROJECT NO. 09210013.35

PARCEL 85
SITE PHOTOS

FIGURE 1



Geonics EM61-MK2



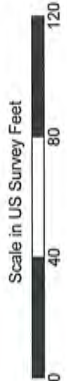
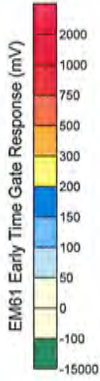
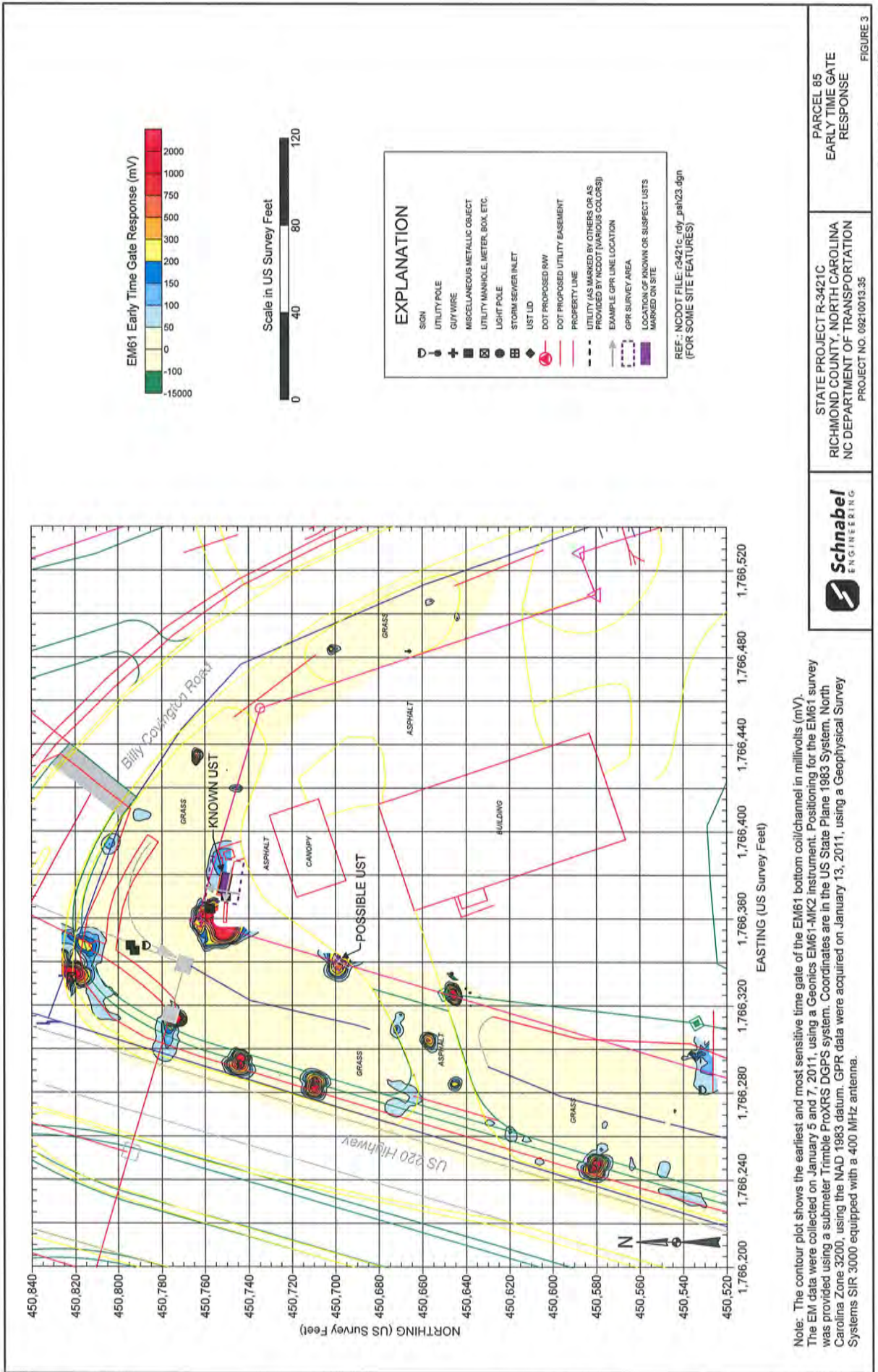
GSSI SIR-3000



STATE PROJECT R-3421C
NC DEPT. OF TRANSPORTATION
RICHMOND CO., NORTH CAROLINA
PROJECT NO. 09210013.35

PHOTOS OF
GEOPHYSICAL
EQUIPMENT USED

FIGURE 2



EXPLANATION	
Symbol	Description
Circle with 'D'	SIGN
Circle with vertical line	UTILITY POLE
Circle with horizontal line	GUY WIRE
Circle with diagonal lines	MISCELLANEOUS METALLIC OBJECT
Circle with 'X'	UTILITY MANHOLE, METER, BOX, ETC.
Circle with vertical lines	LIGHT POLE
Circle with horizontal lines	STORM SEWER INLET
Circle with diagonal lines (top-left to bottom-right)	UST LID
Circle with diagonal lines (bottom-left to top-right)	DOT PROPOSED RAW
Circle with diagonal lines (top-right to bottom-left)	DOT PROPOSED UTILITY BASEMENT
Circle with diagonal lines (bottom-right to top-left)	PROPERTY LINE
Circle with diagonal lines (various colors)	UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT (VARIOUS COLORS))
Circle with diagonal lines (various colors)	EXAMPLE GPR LINE LOCATION
Circle with diagonal lines (various colors)	GPR SURVEY AREA
Circle with diagonal lines (various colors)	LOCATION OF KNOWN OR SUSPECT USTS MARKED ON SITE

REF: NCDOT FILE: r3421c_01y_psh23.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 January 5 and 7, 2011, 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 January 13, 2011, using a Geophysical Survey Systems SIR-3000 equipped with a 400 MHz antenna.

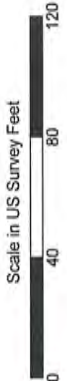
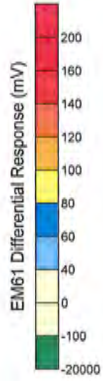
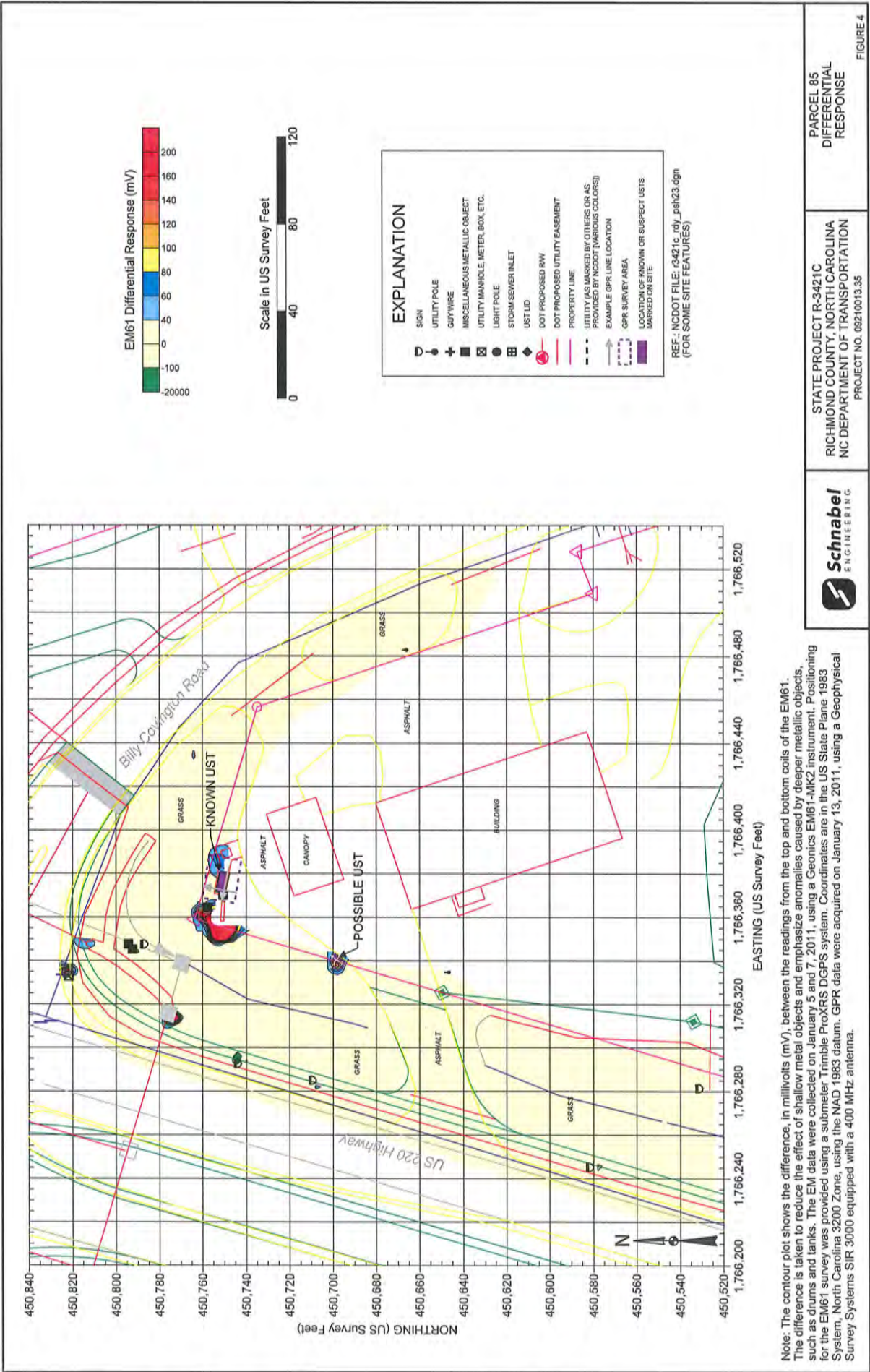


STATE PROJECT R-3421C
RICHMOND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 08210013.35

PARCEL 85
EARLY TIME GATE
RESPONSE

FIGURE 3

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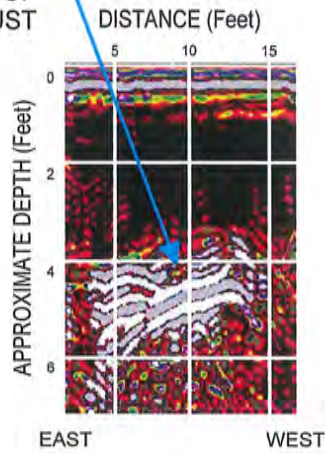
EXPLANATION	
	SIGN
	UTILITY POLE
	GOP/WIRE
	MISCELLANEOUS METALLIC OBJECT
	UTILITY MANHOLE, METER, BOX, ETC.
	LIGHT POLE
	STORM SEWER INLET
	UST UD
	DOT PROPOSED RW
	DOT PROPOSED UTILITY EASEMENT
	PROPERTY LINE
	UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT (VARIOUS COLORS))
	EXAMPLE GPR LINE LOCATION
	GPR SURVEY AREA
	LOCATION OF KNOWN OR SUSPECT USTS MARKED ON SITE

REF.: NCDOT FILE: r3421c_rdy_jst23.dgn
(FOR SOME SITE FEATURES)

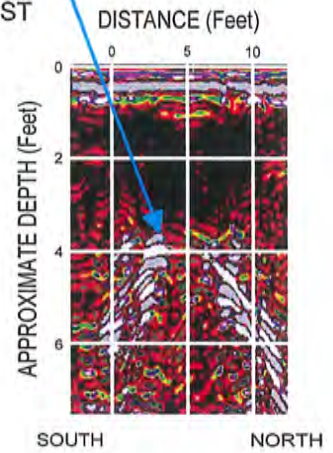
Note: The contour plot shows the difference, in millivolts (mV), between the readings from the top and bottom coils of the EM61. The difference is taken to reduce the effect of shallow metal objects and emphasize anomalies caused by deeper metallic objects, such as drums and tanks. The EM data were collected on January 5 and 7, 2011, 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 January 13, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.



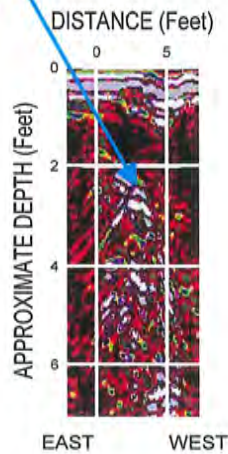
EXAMPLE GPR RESPONSE FROM THE LONG AXIS OF THE KNOWN UST



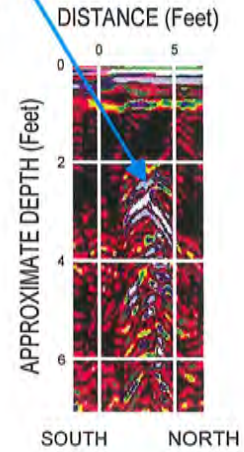
EXAMPLE GPR RESPONSE FROM THE SHORT AXIS OF THE KNOWN UST



EXAMPLE GPR RESPONSE FROM THE X-AXIS OF THE POSSIBLE UST



EXAMPLE GPR RESPONSE FROM THE Y-AXIS OF THE POSSIBLE UST





Parcel 85 – Albemarle Oil Holdings LLC Property, looking south. Photo shows approximate marked location of the known UST near the north side of the canopy.



Parcel 85 – Albemarle Oil Holdings LLC Property, looking southeast. Photo shows approximate marked location of the possible UST near the west side of the canopy.



STATE PROJECT R-3421C
RICHMOND CO., NORTH CAROLINA
NC DEPT. OF TRANSPORTATION
PROJECT NO. 09210013.35

PHOTOS OF
UST LOCATIONS

FIGURE 6



APPENDIX III
ENVIRONMENTAL BORING LOGS

ENVIRONMENTAL BORING LOG



FROEHLING & ROBERTSON, INC.
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
 ENGINEERS • LABORATORIES
 "OVER 125 YEARS OF SERVICE"

Report No.: **66M-0178-0004**

Date: **February 2011**

Client: NCDOT						
Project: Albemarle Oil Holdings LLC Property, Rockingham, Richmond County, NC						
Boring No.: B-1 (1 of 1)		Total Depth: 10.0'	Elev:		Location: See Boring Location Plan	
Type of Boring: Geoprobe			Started: 1/18/11	Completed: 1/18/11	Driller: Regional Probing	
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Interval	Sample Depth (feet)	PID (ppm)	REMARKS
		Moist, brown, silty SAND (SM).		0.0	0	
				1.0	0	
				2.0	0	
	3.0	Moist, brown-orange, silty SAND (SM).		3.0	0	
				4.0	0	
	5.0	Moist, brown-orange, clayey silty SAND (SM).		5.0	0	
	6.0	Moist, brown-orange, clayey SAND (SC).		6.0	1.2	Sample submitted for laboratory analysis for TPH DRO/GRO
	7.0	Moist, orange, clayey SAND (SC).		7.0	0	
				8.0	0.2	
				9.0	0.2	
	10.0	Geoprobe Boring Terminated at 10.0 feet.		10.0		

ENV BORING LOG 66M0178-0004 BORELOGS.GPJ F&R.GDT 2/28/11

ENVIRONMENTAL BORING LOG



FROEHLING & ROBERTSON, INC.
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
 ENGINEERS • LABORATORIES
 "OVER 125 YEARS OF SERVICE"

Report No.: **66M-0178-0004**

Date: **February 2011**

Client: NCDOT						
Project: Albemarle Oil Holdings LLC Property, Rockingham, Richmond County, NC						
Boring No.: B-2 (1 of 1)		Total Depth: 10.0'	Elev:		Location: See Boring Location Plan	
Type of Boring: Geoprobe			Started: 1/18/11	Completed: 1/18/11	Driller: Regional Probing	
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Interval	Sample Depth (feet)	PID (ppm)	REMARKS
		Moist, brown, silty SAND (SM).		0.0	0	
				1.0	0	
				2.0	0	
	3.0	Moist to wet, orange, clayey SAND (SC).		3.0	0.1	
				4.0	0.1	
				5.0	0.1	
				6.0	0.7	
	7.0	Moist, orange, silty SAND (SM).		7.0	0.2	
	8.0	Moist, orange/tan/gray, clayey silty SAND (SM).		8.0	0.8	Sample submitted for laboratory analysis for TPH DRO/GRO
	9.0	Moist, orange-gray, silty SAND (SM).		9.0	0.3	
	10.0	Geoprobe Boring Terminated at 10.0 feet.		10.0		

ENV BORING LOG 66M0178-0004 BORELOGS.GPJ F&R.GDT 2/28/11

ENVIRONMENTAL BORING LOG



FROEHLING & ROBERTSON, INC.
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
 ENGINEERS • LABORATORIES
 "OVER 125 YEARS OF SERVICE"

Report No.: **66M-0178-0004**

Date: **February 2011**

Client: NCDOT						
Project: Albemarle Oil Holdings LLC Property, Rockingham, Richmond County, NC						
Boring No.: B-3 (1 of 1)		Total Depth: 10.0'	Elev:	Location: See Boring Location Plan		
Type of Boring: Geoprobe		Started: 1/18/11	Completed: 1/18/11	Driller: Regional Probing		
Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Interval	Sample Depth (feet)	PID (ppm)	REMARKS
		Moist, orange-brown & brown, silty SAND (SM).		0.0	0.4	
				1.0	0.1	
	2.0	Moist, orange & orange-tan, sandy CLAY (CL).		2.0	0	
				3.0	0.1	
				4.0	0.2	
	5.0	Moist to wet, orange, clayey SAND (SC).		5.0	0.2	
	6.0	Moist, brown, silty SAND (SM).		6.0	0.8	Sample submitted for laboratory analysis for TPH DRO/GRO
	7.0	Moist, orange-tan, clayey SAND (SC),		7.0	0.4	
	8.0	Moist, orange-tan, sandy CLAY (CL).		8.0	0.4	
	9.0	Moist, red-gray-orange, sandy CLAY (CL).		9.0	0.6	
	10.0	Geoprobe Boring Terminated at 10.0 feet.		10.0		

ENVIRONMENTAL BORING LOG



FROEHLING & ROBERTSON, INC.
 GEOTECHNICAL • ENVIRONMENTAL • MATERIALS
 ENGINEERS • LABORATORIES
 "OVER 125 YEARS OF SERVICE"

Report No.: **66M-0178-0004**

Date: **February 2011**

Client: **NCDOT**

Project: **Albemarle Oil Holdings LLC Property, Rockingham, Richmond County, NC**

Boring No.: **B-4 (1 of 1)** Total Depth **10.0'** Elev: Location: **See Boring Location Plan**

Type of Boring: **Geoprobe** Started: **1/18/11** Completed: **1/18/11** Driller: **Regional Probing**

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample Interval	Sample Depth (feet)	PID (ppm)	REMARKS
		Moist, dark brown, silty SAND (SM).		0.0	0.1	
				1.0	0.1	
				2.0	0.1	
	3.0	Moist, brown-orange, clayey SAND (SC).		3.0	0.3	
	4.0	Moist, brown, silty SAND (SM).		4.0	0.1	
	5.0	Moist, orange, clayey SAND (SC).		5.0	0.2	
				6.0	0.2	
				7.0	0.2	
				8.0	1.0	
	9.0	Moist, orange-tan, silty SAND (SM).		9.0	1.5	
	10.0	Moist, orange-tan, clayey SAND (SC).		10.0	0.3	
	11.0	Moist, gray-orange, silty CLAY (CL).		11.0	1.1	
	12.0	Geoprobe Boring Terminated at 12.0 feet.		12.0		

ENV BORING LOG 66M0178-0004_BORELOGS.GPJ F&R.GDI 2/28/11



APPENDIX IV
SITE PHOTOS



Photo #1: Overall view of the site looking east



Photo #2: Location of Borings B-2, B-3 and B-4 looking north. Boring B-1 located behind Geoprobe rig.



Photo #4: Location of Boring B-4, near probable UST looking east.



Photo #4: Location of Boring B-1 looking south.



APPENDIX V

LABORATORY ANALYTICAL RESULTS



Michael Sabodish
NC Dept. of Transportation
310 Hubert Street
Raleigh, NC 27603

Report Number: G625-166

Client Project: NCDOT Richmond City

Dear Michael Sabodish,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Lori Lockamy at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America, Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America, Inc.

Michael Page

Digitally signed by Michael Page
DN: CN = Michael Page, C = US, OU = SGS Environmental
Reason: I have reviewed this document for Lori Lockamy
Date: 2011.01.26 16:52:37 -05'00'

Project Manager
Lori Lockamy

Date

List of Reporting Abbreviations and Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantitation Limit (RL or MDL)

DF = Dilution Factor

Dup = Duplicate

D = Detected, but RPD is > 40% between results in dual column method.

E = Estimated concentration, exceeds calibration range.

J = Estimated concentration, below calibration range and above MDL

LCS(D) = Laboratory Control Spike (Duplicate)

MDL = Method Detection Limit

MS(D) = Matrix Spike (Duplicate)

PQL = Practical Quantitation Limit

RL/CL = Reporting Limit / Control Limit

RPD = Relative Percent Difference

mg/kg = milligram per kilogram, ppm, parts per million

ug/kg = micrograms per kilogram, ppb, parts per billion

mg/L = milligram per liter, ppm, parts per million

ug/L = micrograms per liter, ppb, parts per billion

% Rec = Percent Recovery

% solids = Percent Solids

Special Notes:

- 1) Metals and mercury samples are digested with a hot block, see the standard operating procedure document for details.
- 2) Uncertainty for all reported data is less than or equal to 30 percent.



Print Date: 1/26/2011

Client Sample ID: 66M-0178-0004 B-1 6'-7'
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-11D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 14:05
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 90.0
Basis: Dry

Results by 8015DRO

<u>Parameter</u>	<u>Result</u>	<u>RL/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Oil Range Organics	BQL	7.07	MG/KG	1	25-Jan-11 1:14

Surrogates

OTP	68.7	40-140	%	1	25-Jan-11 1:14
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Batch Information

Analytical Batch: EP012411
Analytical Method: 8015DRO
Instrument: GC6
Analyst: DTF

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.41
Prep Extract Vol: 10



Print Date: 1/26/2011

Client Sample ID: 66M-0178-0004 B-2 8'-9'
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-12D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 14:25
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 84.5
Basis: Dry

Results by 8015DRO

<u>Parameter</u>	<u>Result</u>	<u>RL/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Oil Range Organics	BQL	7.01	MG/KG	1	25-Jan-11 1:42

Surrogates

OTP	59.7	40-140	%	1	25-Jan-11 1:42
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Batch Information

Analytical Batch: EP012411
Analytical Method: 8015DRO
Instrument: GC6
Analyst: DTF

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 33.74
Prep Extract Vol: 10



Print Date: 1/26/2011

Client Sample ID: 66M-0178-0004 B-3 6'-7'
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-13D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 14:45
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 93.1
Basis: Dry

Results by 8015DRO

<u>Parameter</u>	<u>Result</u>	<u>RL/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Oil Range Organics	BQL	6.78	MG/KG	1	25-Jan-11 3:06

Surrogates

OTP	67.9	40-140	%	1	25-Jan-11 3:06
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Batch Information

Analytical Batch: EP012411
Analytical Method: 8015DRO
Instrument: GC6
Analyst: DTF

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.7
Prep Extract Vol: 10



Print Date: 1/26/2011

Client Sample ID: 66M-0178-0004 B-4 9'-10'
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-14D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 15:05
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 85.8
Basis: Dry

Results by 8015DRO

<u>Parameter</u>	<u>Result</u>	<u>RL/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Oil Range Organics	BQL	7.35	MG/KG	1	25-Jan-11 3:35

Surrogates

OTP	69.2	40-140	%	1	25-Jan-11 3:35
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Batch Information

Analytical Batch: EP012411
Analytical Method: 8015DRO
Instrument: GC6
Analyst: DTF

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.75
Prep Extract Vol: 10



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 • Maryland
 • New York
 • Ohio
 www.us.sgs.com

100967

1 CLIENT: FAR (NCOOT) PHONE NO: (919) 825-3441 SITE/PSID#: _____
 CONTACT: M. SABODISH REPORTS TO: _____
 PROJECT: NCOOT Richard City FAX NO.: ()
 QUOTE # 468 ELEMENT #34542.1.2
 INVOICE TO: M. SABODISH C/F AND R. COY P.O. NUMBER: 430663800
 NCOOT

2

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX	No CONTAINERS	SAMPLE TYPE	Preservatives Used	M/A Meth	Analysis Required	REMARKS
66M-0178-0004	B-1	1-18-11	2:05	Soil	3	G	X	X	X	
66M-0178-0004	B-2		2:25				X	X	X	
66M-0178-0004	B-3		2:45				X	X	X	
66M-0178-0004	C-1		3:05				X	X	X	
66M-0178-0004	B-4		4:28				X	X	X	
66M-0178-0002	B-1		4:45				X	X	X	
66M-0178-0002	B-2		5:00				X	X	X	
66M-0178-0002	B-3		5:11				X	X	X	
66M-0178-0002	B-4		5:26				X	X	X	
66M-0178-0002	C-1		5:36				X	X	X	
66M-0178-0002	C-2						X	X	X	
66M-0178-0002	C-3						X	X	X	
66M-0178-0002	C-4						X	X	X	
66M-0178-0002	C-5						X	X	X	
66M-0178-0002	C-6						X	X	X	
66M-0178-0002	C-7						X	X	X	
66M-0178-0002	C-8						X	X	X	
66M-0178-0002	C-9						X	X	X	
66M-0178-0002	C-10						X	X	X	

3

4 Shipping Carrier: _____
 Shipping Ticket No: _____
 Samples Received Cold? (Circled) YES NO
 Temperature: 27.8 °C
 Chain of Custody Seal: (Circle) ABSENT
 INTACT BROKEN

5 Collected/Relinquished By: (1) M. SABODISH Date: 1/20/11 Time: 12:50 Received By: [Signature]
 Relinquished By: (2) _____ Date: _____ Time: _____ Received By: _____
 Relinquished By: (3) _____ Date: _____ Time: _____ Received By: _____
 Relinquished By: (4) _____ Date: 1/21/11 Time: 10:30 Received By: [Signature]

Requested Turnaround Time: _____ Date Needed: STD
 RUSH

SINCE



1881



HQ: 3015 DUMBARTON ROAD RICHMOND, VIRGINIA 23228 T 804.264.2701 F 804.264.1202 www.fandr.com

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