FROEHLING & ROBERTSON, INC.


# PRELIMINARY SITE ASSESSMENT

**Douglas S. Allen Property (Parcel #86)**
**833 N. US 220 Hwy**
**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**

310 Hubert Street Raleigh, North Carolina 27603 919.828.3441

SINCE 1881

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NC License #F-0266

February 28, 2011

NORTH CAROLINA PROFESSIONAL SEAL 029927 ENGINEER MICHAEL S. SABODISH, JR.
2-28-11

**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**
**Douglas S. Allen (Parcel #86)**
**833 N. US 220 Hwy**
**Rockingham, NC**

Dear Mr. Caldwell:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the Douglas S. Allen 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

## TABLE OF CONTENTS

**Preliminary Site Assessment Report**
**Douglas S. Allen Property (Parcel #86)**
**Rockingham, Richmond County, North Carolina**
**F&R Project No. 66M-0178-0002**

## 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 Douglas S. Allen Property (Parcel #86) addressed as 833 N. US 220 Hwy, Rockingham, Richmond County, North Carolina. The site is located on the west side of north US 220 Hwy, approximately 675 north of the intersection of Billy Covington Road (Appendix I, Figure 1). Currently, the site is an active sign shop doing business as *Coltrane Sign Shop*. As indicated in the Request for Proposal, the site historically operated as a gas station. According to the North Carolina Department of Environment and Natural Resources (NCDENR) Underground Storage Tank (UST) Registry, there are no known Facility IDs or Groundwater Incidents associated with this site. For the purpose of this assessment, the area of investigation was limited to the existing Public Utility Easement (PUE). The PUE encompasses the area from the corners of the existing building to the approximate centerline of the existing dirt road at the front of the building. 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 roadway realignments and utility modifications along US Hwy 220 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 6 and 14, 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 was encountered on the south side of the building. The GPR data indicate the presence of two probable USTs located at the south corner of the existing building (See Figure No. 3). The GPR data indicate that the probable USTs are buried approximately 2 to 3.5 feet below ground surface, and are approximately 5.5 feet in diameter and approximately 12 feet long, resulting in tanks with a capacity of approximately 2,000 gallons each. It should be noted that the probably USTs are not located within the planned right-of-way/easement. 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 and 19, 2011 to perform the Preliminary Site Assessment. The assessment consisted of advancing seven borings into the soils at the project site. One of the borings, B-1, was advanced in the vicinity of the probably USTs. Borings B-2 and B-3 were advanced in the dirt/gravel access road to the south and west of the existing building, while four of the borings (B-4 through B-7) were advanced within the existing grassed/gravel island at the front of the existing building (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 USTs, site features and directives from the NCDOT during a previous site meeting.

Soil sample cores from the borings (B-1 through B-7) 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, silty sand (USCS - SM) from the ground surface to a depth of approximately three to four feet. From depths of approximately three feet to depths of approximately eight feet, subsurface conditions generally consisted of moist, brown/orange-brown, clayey sands (USCS - SC). From depths of approximately eight feet to boring termination, the subsurface soils generally consisted of moist, gray-orange, sandy silty clays and gray, sandy clays (USCS - CL). 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 where wet soils were observed at a depths of four to six feet below ground surface.

## 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**
**Douglas S. Allen Property (Parcel #86)**
**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-0178-0002-B1 | 1/18/11 | 7-8 | 0.3 | BQL | BQL |
| 66M-0178-0002-B2 | 1/18/11 | 9-10 | 0.1 | BQL | BQL |
| 66M-0178-0002-B3 | 1/18/11 | 6-7 | 0.5 | BQL | BQL |
| 66M-0178-0002-B4 | 1/18/11 | 6-7 | 0.3 | BQL | BQL |
| 66M-0178-0002-B5 | 1/18/11 | 7-8 | 0.2 | BQL | BQL |
| 66M-0178-0002-B6 | 1/19/11 | 9-10 | 0.0 | BQL | BQL |
| 66M-0178-0002-B7 | 1/19/11 | 6-7 | 0.4 | 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 Douglas P. Allen Property located at 833 N. US 220 Hwy, 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 two probable USTs, approximately 2,000 gallons in size were present at the site. One geoprobe boring was advanced in the vicinity of the USTs, and an additional six geoprobe borings were advanced at the site within the Public Utility 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 USTs or at the boring locations within the PUE at concentrations above laboratory quantitation limits.

If the proposed drainage easement activities will require the removal of the probable USTs, F&R recommends that the USTs 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 – TOPOGRPAHIC MAP**

**Figure No. 3 – BORING LOCATION PLAN**


**SITE VICINITY MAP** North

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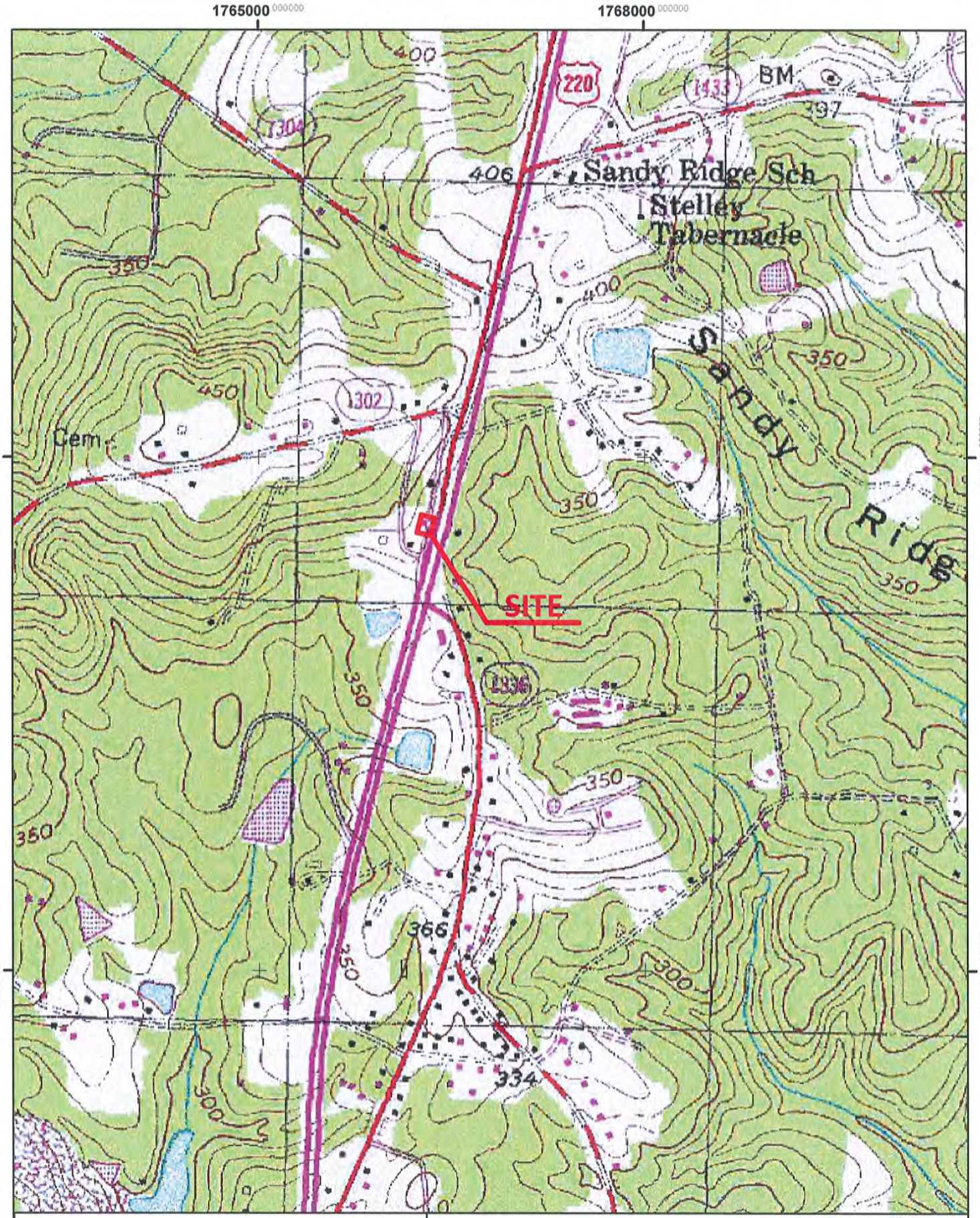
| | |
|---|---|
| CLIENT: NCDOT | |
| PROJECT: Douglas S. Allen Property | |
| LOCATION: Rockingham, Richmond County, North Carolina | |
| F&R PROJECT No.: 66M-0178-0002 | FIGURE No.: 1 |
| DRAWN BY: D. Racey | |
| DATE: February 2011 | SCALE: Not to scale |




# Topographic Plan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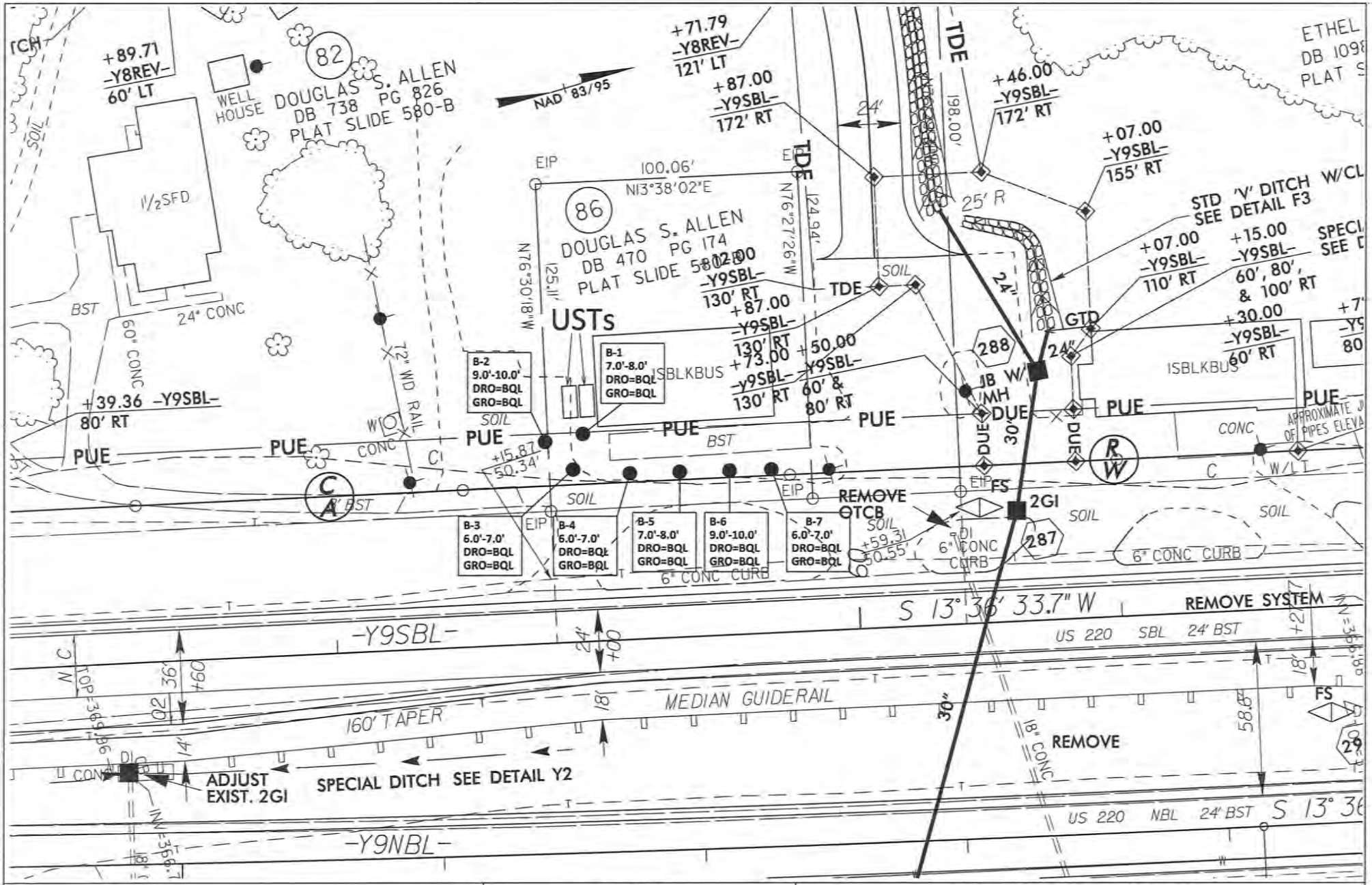
T 919.828.3441 I F 919.582-0304


| | |
|---|---|
| Client: | NCDOT |
| Project: | Douglas S. Allen Property |
| Location | Rockingham, Richmond County, NC |
| F&R Project No.: | 66M-0178-0002 |
| Data: | F&R(NAD 83 State Plane, FEET: CORS96) |
| Date: | February 2011 |

Scale: 1:12,000 1 inch = 1,000 feet

Figure 2

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## LEGEND

● Approximate Geoprobe Boring Location

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

## BORING LOCATION PLAN

| | | |
|---|---|---|
| CLIENT: NCDOT | | |
| PROJECT: Douglas S. Allen Property | | |
| LOCATION: Rockingham, Richmond County, North Carolina | | |
| F&R PROJECT No.: 66M-0178-0002 | | FIGURE No.: 3 |
| DRAWN BY: D. Racey | CHECKED BY: M. Sabodish, P.E. | |
| DATE: February 2011 | SCALE: 1"=50' | |

# APPENDIX II

# GEOPHYSICAL REPORT PREPARED BY SCHNABEL ENGINEERING

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 86, 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 three 8.5x11 color figures.

## INTRODUCTION

The work described in this report was conducted on January 6 and 14, 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 west side of US 220 Hwy approximately 675 feet north of the intersection of Billy Covington Road 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.

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T/ 336-274-9456 F/ 336-274-9486
11A Oak Branch Drive / Greensboro, NC / 27407

## 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 86 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 an anomaly of unknown cause on the south side of the building, in addition to anomalies apparently caused by reinforced concrete, buried utilities, or known site features (Figures 3 and 4). The GPR data indicate the presence of two probable USTs on the south side of the building. The USTs are not inside the limits of the planned right-of way and/or easement.

Example GPR images showing the reflections from the probable USTs are shown on Figures 3 and 4. Figures 3 and 4 also include the location of the probable USTs as marked in the field. The GPR data indicate that the probable USTs are buried approximately 2.0 to 3.5 feet below ground surface. The GPR data indicate that the probable USTs are about 5.5 feet in diameter and about 12.0 feet long, equivalent to a capacity of about 2,000 gallons each. Photographs of the probable UST locations, as marked in the field, are included on Figure 5.

## 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 probable USTs on Parcel 86. The USTs are not located inside the planned right-of-way and/or easement. The probable USTs are both about 2,000-gallon capacity and are buried about 2.0 to 3.5 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 (5)
FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.35 (R-3421C, RICHMOND COUNTY)\REPORT\PARCEL 86\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 86 (R-3421C).DOCX

Parcel 86 – Douglas S. Allen Property, looking southwest

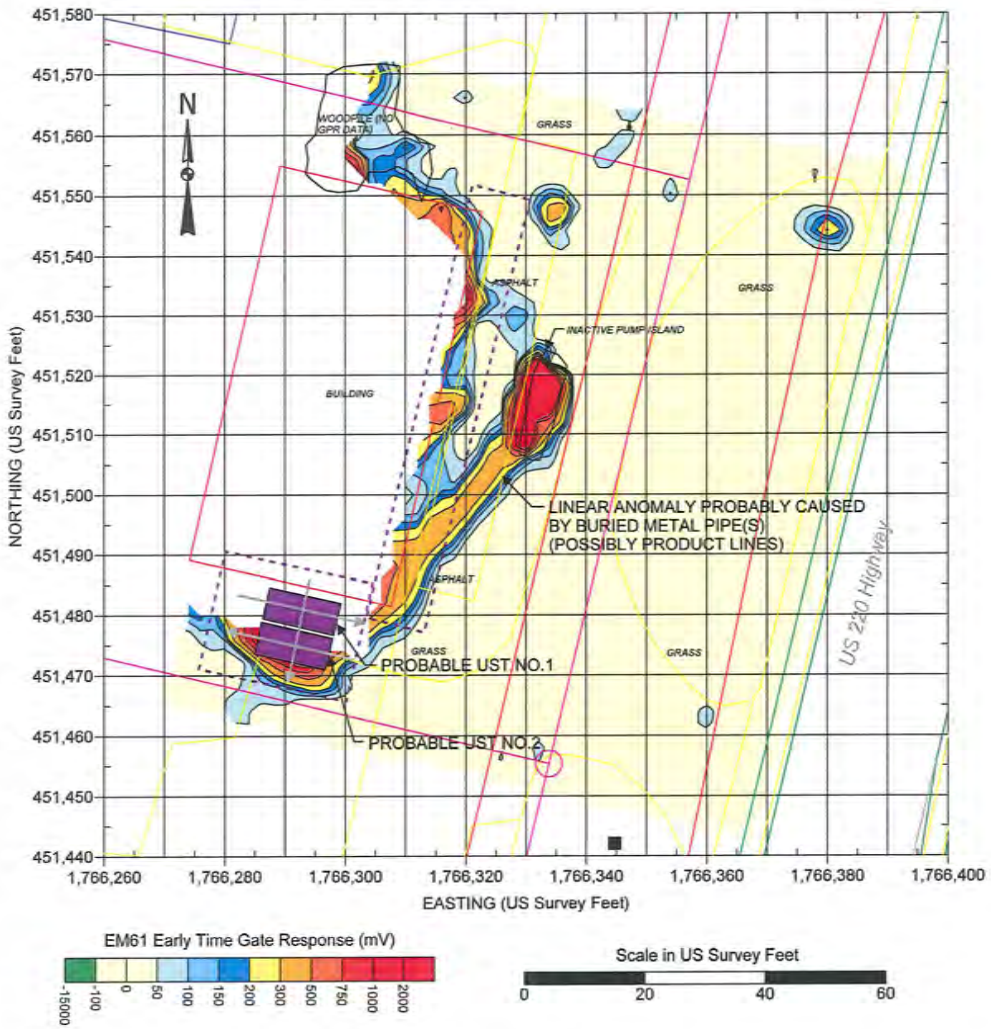
Parcel 86 – Douglas S. Allen Property, looking northwest

| | | |
|---|---|---|
| Schnabel ENGINEERING | STATE PROJECT R-3421C<br>NC DEPT. OF TRANSPORTATION<br>RICHMOND CO., NORTH CAROLINA<br>PROJECT NO. 09210013.35 | PARCEL 86<br>SITE PHOTOS<br>FIGURE 1 |

Geonics EM61-MK2

GSSI SIR-3000

| | | |
|---|---|---|
| Schnabel ENGINEERING | STATE PROJECT R-3421C<br>NC DEPT. OF TRANSPORTATION<br>RICHMOND CO., NORTH CAROLINA<br>PROJECT NO. 09210013.35 | PHOTOS OF GEOPHYSICAL EQUIPMENT USED<br>FIGURE 2 |




EM61 Early Time Gate Response (mV)

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

Scale in US Survey Feet

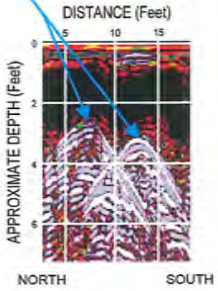
0 20 40 60

## EXPLANATION

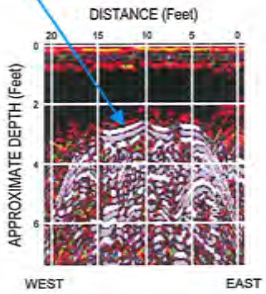
- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- STORM SEWER INLET
- UST LID
- DOT PROPOSED R/W
- DOT PROPOSED UTILITY EASEMENT
- PROPERTY LINE
- UTILITY (AS MARKED BY OTHERS OR AS PROVIDED BY NCDOT [VARIOUS COLORS])
- EXAMPLE GPR LINE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

REF.: NCDOT FILE: r3421c_rdy_psh23.dgn
(FOR SOME SITE FEATURES)

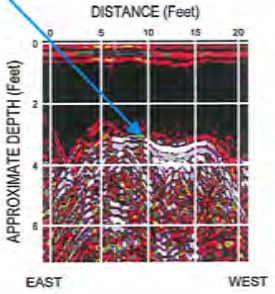
EXAMPLE GPR RESPONSE FROM THE SHORT AXES OF PROBABLE USTS NOS. 1 AND 2




EXAMPLE GPR RESPONSE FROM THE LONG AXIS OF PROBABLE UST NO. 1




EXAMPLE GPR RESPONSE FROM THE LONG AXIS OF PROBABLE UST NO. 2



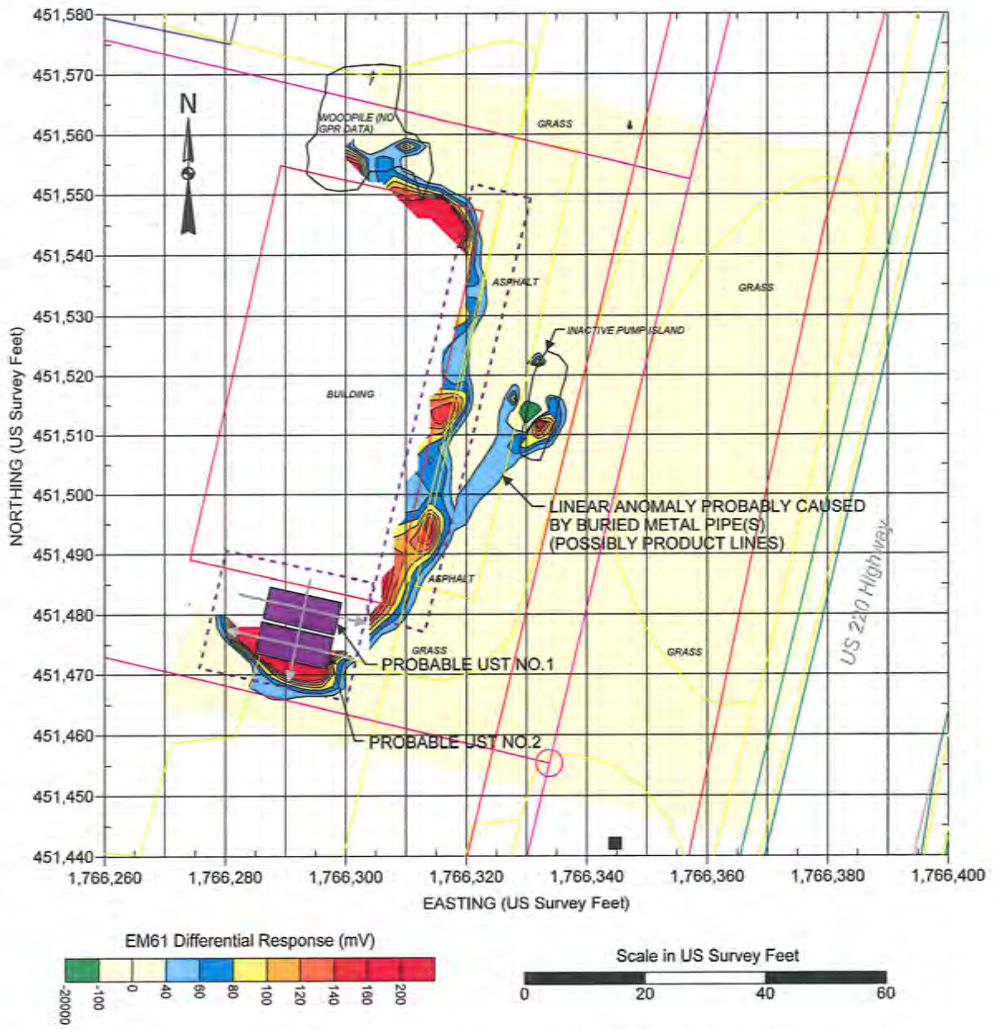

Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on January 6, 2011, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum. GPR data were acquired on January 14, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

Schnabel ENGINEERING

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

PARCEL 86
EARLY TIME GATE RESPONSE

FIGURE 3




EM61 Differential Response (mV)

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

Scale in US Survey Feet

0 20 40 60

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 6, 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 14, 2011, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

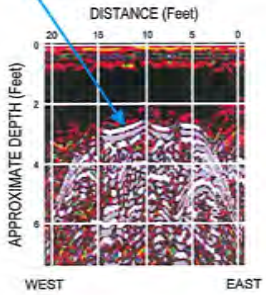
## EXPLANATION

- SIGN
- UTILITY POLE
- GUY WIRE
- MISCELLANEOUS METALLIC OBJECT
- UTILITY MANHOLE, METER, BOX, ETC.
- LIGHT POLE
- STORM SEWER INLET
- UST LID
- DOT PROPOSED R/W
- 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

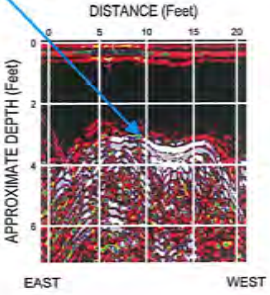
REF.: NCDOT FILE: r3421c_rdy_psh23.dgn
(FOR SOME SITE FEATURES)

EXAMPLE GPR RESPONSE FROM THE SHORT AXES OF PROBABLE USTS NOS. 1 AND 2


EXAMPLE GPR RESPONSE FROM THE LONG AXIS OF PROBABLE UST NO. 1




EXAMPLE GPR RESPONSE FROM THE LONG AXIS OF PROBABLE UST NO. 2

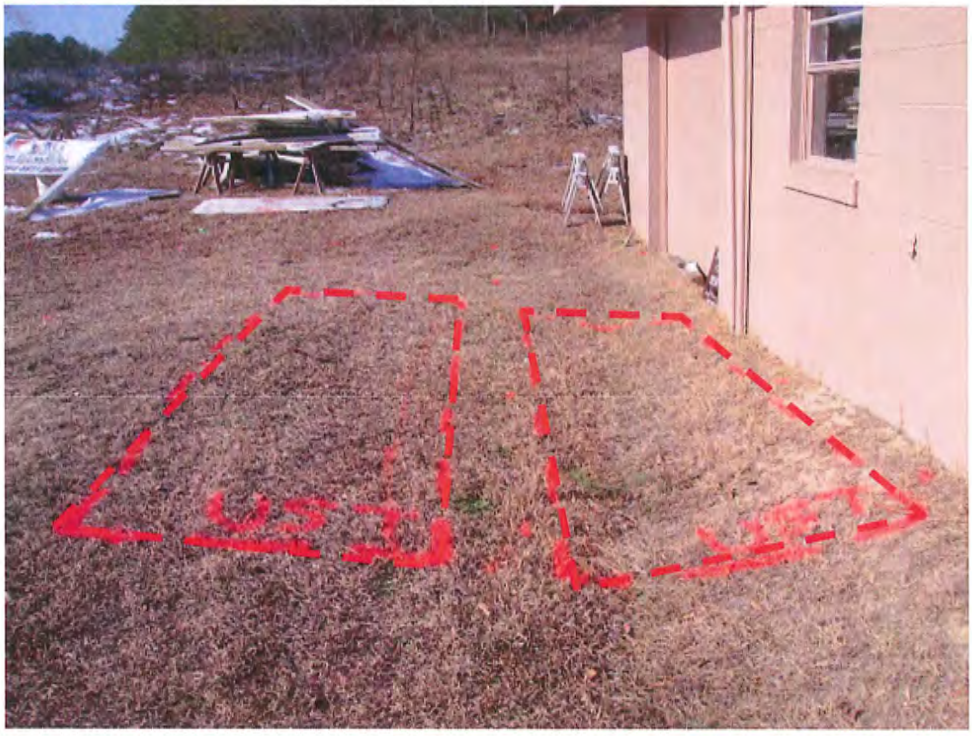



Schnabel ENGINEERING

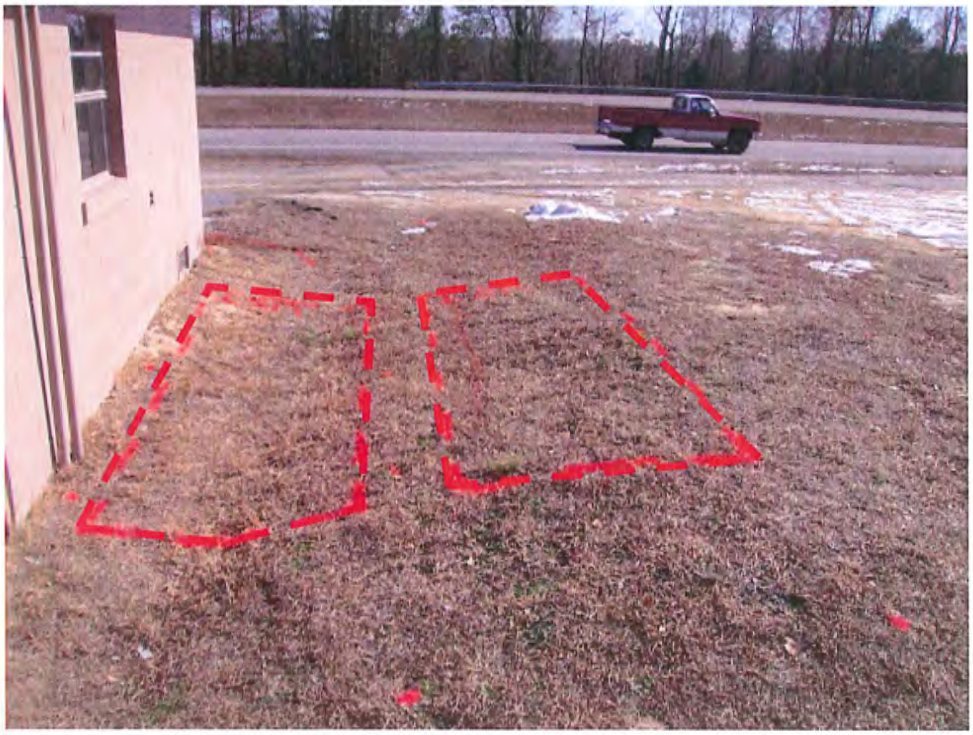
STATE PROJECT R-3421C
RICHMOND COUNTY, NORTH CAROLINA
NC DEPARTMENT OF TRANSPORTATION
PROJECT NO. 09210013.35

PARCEL 86
DIFFERENTIAL
RESPONSE

FIGURE 4



Parcel 86 – Douglas S. Allen Property, looking west. Photo shows approximate marked location of the probable USTs near the south side of the building.



Parcel 86 – Douglas S. Allen Property, looking east. Photo shows approximate marked location of the probable USTs near the south side of the building.

| | | |
|---|---|---|
| Schnabel ENGINEERING | STATE PROJECT R-3421C<br>RICHMOND CO., NORTH CAROLINA<br>NC DEPT. OF TRANSPORTATION<br>PROJECT NO. 09210013.35 | PARCEL 86<br>PHOTOS OF PROBABLE<br>UST LOCATIONS<br>FIGURE 5 |

# APPENDIX III

# ENVIRONMENTAL BORING LOGS

# ENVIRONMENTAL BORING LOG

SINCE 1881

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

Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen Property), Rockingham, Richmond County, NC**

Boring No.: **B-1** **(1 of 1)** Total Depth **12.0'** 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 | |
| | | | | 1.0 | 0.1 | |
| | | | | 2.0 | 0.1 | |
| | 3.0 | Moist, orange-brown, silty SAND (SM). | | 3.0 | 0.1 | |
| | 4.0 | Moist, orange-brown, clayey SAND (SC). | | 4.0 | 0.1 | |
| | 5.0 | Moist, gray, silty CLAY (CL). | | 5.0 | 0.1 | |
| | | | | 6.0 | 0.1 | |
| | 7.0 | Moist, gray-orange, clayey SAND (SC). | | 7.0 | 0.3 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 8.0 | Moist, orange-brown, silty SAND (SM). | | 8.0 | 0.1 | |
| | 9.0 | Moist, gray-orange, sandy silty CLAY (CL). | | 9.0 | 0.1 | |
| | 10.0 | Moist, gray, silty CLAY (CL). | | 10.0 | 0 | |
| | 11.0 | Moist, gray-orange, sandy CLAY (CL). | | 11.0 | 0 | |
| | 12.0 | Geoprobe Boring Terminated at 12.0 feet. | | 12.0 | | |

ENV_BORING_LOG 66M0178-0002_BORELOGS.GPJ F&R.GDT 2/23/11

# ENVIRONMENTAL BORING LOG

SINCE 1881

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

Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen 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, dark brown to brown, silty SAND (SM). | | 0.0 | 0.1 | |
| | | | | 1.5 | 0.1 | |
| | | | | 3.0 | 0.1 | |
| | 4.5 | Moist to wet, gray, silty CLAY (CL). | | 4.5 | 0.1 | |
| | 6.0 | Moist, gray-brown, clayey SAND (SC). | | 6.0 | 0.1 | |
| | | | | 7.0 | 0 | |
| | 8.0 | Moist, gray, clayey SAND (SC). | | 8.0 | 0.1 | |
| | 9.0 | Moist, orange-gray, sandy CLAY (CL). | | 9.0 | 0.1 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

# ENVIRONMENTAL BORING LOG

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Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen 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, brown, silty SAND (SM). | | 0.0 | 0.1 | |
| | | | | 1.0 | 0.1 | |
| | | | | 2.0 | 0.2 | |
| | 3.0 | Moist, tan, silty SAND (SM). | | 3.0 | 0.2 | |
| | 4.0 | Moist, orange-tan, clayey SAND (SC). | | 4.0 | 0.1 | |
| | | | | 5.0 | 0.1 | |
| | 6.0 | Moist, brown, silty SAND (SM). | | 6.0 | 0.5 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 7.0 | Moist, gray, sandy CLAY (CL). | | 7.0 | 0.1 | |
| | | | | 8.0 | 0.2 | |
| | | | | 9.0 | 0.2 | |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

# ENVIRONMENTAL BORING LOG

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**FROEHLING & ROBERTSON, INC.**
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Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen 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, brown, silty SAND (SM). | | 0.0 | 0.1 | |
| | | | | 1.0 | 0.1 | |
| | | | | 2.0 | 0.2 | |
| | | | | 3.0 | 0.1 | |
| | 4.0 | Moist, orange-brown to tan, silty SAND (SM). | | 4.0 | 0.2 | |
| | | | | 5.0 | 0.2 | |
| | 6.0 | Moist, gray, clayey SAND (SC). | | 6.0 | 0.3 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 7.0 | Moist, gray-orange, silty sandy CLAY (CL). | | 7.0 | 0.1 | |
| | | | | 8.0 | 0.1 | |
| | 9.0 | Moist, gray-orange, clayey SAND (SC). | | 9.0 | 0.1 | |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

# ENVIRONMENTAL BORING LOG

SINCE 1881

**FROEHLING & ROBERTSON, INC.**
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Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen Property), Rockingham, Richmond County, NC**

Boring No.: **B-5** **(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 | |
| | | | | 1.0 | 0.1 | |
| | | | | 2.0 | 0.1 | |
| | 3.0 | Moist, brown-orange, silty SAND (SM). | | 3.0 | 0.1 | |
| | | | | 4.0 | 0.1 | |
| | | | | 5.0 | 0.1 | |
| | | | | 6.0 | 0.1 | |
| | | | | 7.0 | 0.2 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 8.0 | Moist, orange, clayey SAND (SC). | | 8.0 | 0.1 | |
| | 9.0 | Moist, gray-orange, silty CLAY (CL). | | 9.0 | 0.1 | |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

# ENVIRONMENTAL BORING LOG

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Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen Property), Rockingham, Richmond County, NC**

Boring No.: **B-6** **(1 of 1)** Total Depth **10.0'** Elev: Location: **See Boring Location Plan**

Type of Boring: **Geoprobe** Started: **1/19/11** Completed: **1/19/11** Driller: **Regional Probing**

| Elevation | Depth | DESCRIPTION OF MATERIALS (Classification) | * Sample Interval | Sample Depth (feet) | PID (ppm) | REMARKS |
|---|---|---|---|---|---|---|
| | | Moist, brown to tan, silty SAND (SM). | | 0.0 | 3.2 | |
| | | | | 1.0 | 0 | |
| | | | | 2.0 | 0.1 | |
| | | | | 3.0 | 0 | |
| | | | | 4.0 | 0 | |
| | | | | 5.0 | 0 | |
| | 6.0 | Moist, brown-orange, silty SAND (SM). | | 6.0 | 0.1 | |
| | 7.0 | Moist, brown, clayey SAND (SC). | | 7.0 | 0 | |
| | 8.0 | Moist, gray-orange, sandy silty CLAY (CL). | | 8.0 | 0 | |
| | 9.0 | Moist, gray-orange, silty CLAY (CL). | | 9.0 | 0 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

# ENVIRONMENTAL BORING LOG

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Report No.: **66M-0178-0002** Date: **February 2011**

Client: **NCDOT**

Project: **US 220 PSAs (Doug S. Allen Property), Rockingham, Richmond County, NC**

Boring No.: **B-7** **(1 of 1)** Total Depth **10.0'** Elev: Location: **See Boring Location Plan**

Type of Boring: **Geoprobe** Started: **1/19/11** Completed: **1/19/11** 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 | Moist, tan-brown, silty SAND (SM). | | 2.0 | 0 | |
| | | | | 3.0 | 0 | |
| | 4.0 | Moist, orange-brown, silty SAND (SM). | | 4.0 | 0 | |
| | 5.0 | Moist, orange-brown, clayey SAND (SC). | | 5.0 | 0 | |
| | | | | 6.0 | 0.4 | Sample submitted for laboratory analysis for TPH DRO/GRO |
| | 7.0 | Moist, orange-gray, sandy silty CLAY (CL). | | 7.0 | 0 | |
| | | | | 8.0 | 0 | |
| | | | | 9.0 | 0 | |
| | 10.0 | Geoprobe Boring Terminated at 10.0 feet. | | 10.0 | | |

ENV_BORING_LOG 66M0178-0002_BORELOGS.GPJ F&R.GDT 2/23/11

**APPENDIX IV**

**SITE PHOTOS**

Photo #1: Location of probable USTs and Boring B-1 at south corner of building.


Photo #2: Location of Boring B-1 and B-2 looking northwest.


Photo #3: Location of Borings B-3 through B-7 looking northeast.


Photo #4: Location of Borings B-4 through B-7 looking northwest

# APPENDIX V

# LABORATORY ANALYTICAL RESULTS

SGS

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

% soilds = 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-0178-0002 B-1 7'-8'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-15D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 16:28
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 88.1
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.03 | MG/KG | 1 | 25-Jan-11 4:03 |
| **Surrogates** | | | | | |
| OTP | 62.2 | 40-140 | % | 1 | 25-Jan-11 4:03 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 32.31
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-1 7'-8'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-15A
Lab Project ID: G625-166

Collection Date: 18-Jan-11 16:28
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 88.1
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.22 | MG/KG | 1 | 23-Jan-11 19:36 |

**Surrogates**

| | | | | | |
|---|---|---|---|---|---|
| BFB | 100.0 | - | % | 1 | 23-Jan-11 19:36 |

**Batch Information**

Analytical Batch: VP012311
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.52
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-2 9'-10'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-16D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 16:45
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 84.2
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.37 | MG/KG | 1 | 25-Jan-11 4:31 |
| **Surrogates** | | | | | |
| OTP | 61.5 | 40-140 | % | 1 | 25-Jan-11 4:31 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 32.23
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-2 9'-10'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-16A
Lab Project ID: G625-166

Collection Date: 18-Jan-11 16:45
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 84.2
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 4.97 | MG/KG | 1 | 23-Jan-11 20:03 |
| **Surrogates** | | | | | |
| BFB | 100.0 | - | % | 1 | 23-Jan-11 20:03 |

**Batch Information**

Analytical Batch: VP012311
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 7.17
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-3 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-17D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:00
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 87.2
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.26 | MG/KG | 1 | 25-Jan-11 4:58 |
| **Surrogates** | | | | | |
| OTP | 69.8 | 40-140 | % | 1 | 25-Jan-11 4:58 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.6
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-3 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-17A
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:00
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 87.2
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.50 | MG/KG | 1 | 23-Jan-11 20:29 |

**Surrogates**

| | | | | | |
|---|---|---|---|---|---|
| BFB | 104.0 | - | % | 1 | 23-Jan-11 20:29 |

**Batch Information**

Analytical Batch: VP012311
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.26
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-4 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-18D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:11
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 87.2
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.00 | MG/KG | 1 | 25-Jan-11 5:27 |
| **Surrogates** | | | | | |
| OTP | 64.8 | 40-140 | % | 1 | 25-Jan-11 5:27 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 32.76
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-4 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-18A
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:11
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 87.2
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.38 | MG/KG | 1 | 23-Jan-11 20:56 |

**Surrogates**

| | | | | | |
|---|---|---|---|---|---|
| BFB | 102.0 | - | % | 1 | 23-Jan-11 20:56 |

**Batch Information**

Analytical Batch: VP012311
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.4
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-5 7'-8'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-19D
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:26
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 89.8
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.02 | MG/KG | 1 | 25-Jan-11 5:55 |
| **Surrogates** | | | | | |
| OTP | 67.8 | 40-140 | % | 1 | 25-Jan-11 5:55 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.72
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-5 7'-8'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-19A
Lab Project ID: G625-166

Collection Date: 18-Jan-11 17:26
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 89.8
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.30 | MG/KG | 1 | 23-Jan-11 21:23 |
| **Surrogates** | | | | | |
| BFB | 99.2 | - | % | 1 | 23-Jan-11 21:23 |

**Batch Information**

Analytical Batch: VP012311
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.3
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-6 9'-10'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-20D
Lab Project ID: G625-166

Collection Date: 19-Jan-11 8:50
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 82.2
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 7.63 | MG/KG | 1 | 25-Jan-11 6:23 |
| **Surrogates** | | | | | |
| OTP | 58.4 | 40-140 | % | 1 | 25-Jan-11 6:23 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 31.89
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-6 9'-10'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-20A
Lab Project ID: G625-166

Collection Date: 19-Jan-11 8:50
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 82.2
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.75 | MG/KG | 1 | 25-Jan-11 17:44 |

**Surrogates**

| | | | | | |
|---|---|---|---|---|---|
| BFB | 99.2 | - | % | 1 | 25-Jan-11 17:44 |

**Batch Information**

Analytical Batch: VP012511
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.35
Prep Extract Vol: 5

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-7 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-21D
Lab Project ID: G625-166

Collection Date: 19-Jan-11 9:09
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 89.9
Basis: Dry

**Results by 8015DRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Oil Range Organics | BQL | 6.60 | MG/KG | 1 | 25-Jan-11 7:47 |
| **Surrogates** | | | | | |
| OTP | 61.8 | 40-140 | % | 1 | 25-Jan-11 7:47 |

**Batch Information**

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

Prep Batch:
Prep Method: 3541
Prep Date/Time:
Initial Prep Wt./Vol.: 33.69
Prep Extract Vol: 10

Print Date: 1/26/2011

Client Sample ID: **66M-0178-0002 B-7 6'-7'**
Client Project ID: NCDOT Richmond City
Lab Sample ID: G625-166-21A
Lab Project ID: G625-166

Collection Date: 19-Jan-11 9:09
Received Date: 21-Jan-11
Matrix: SOIL
Solids: 89.9
Basis: Dry

**Results by 8015GRO**

| Parameter | Result | RL/CL | Units | DF | Date Analyzed |
|---|---|---|---|---|---|
| Gasoline Range Organics | BQL | 5.23 | MG/KG | 1 | 25-Jan-11 18:10 |
| **Surrogates** | | | | | |
| BFB | 97.8 | - | % | 1 | 25-Jan-11 18:10 |

**Batch Information**

Analytical Batch: VP012511
Analytical Method: 8015GRO
Instrument: GC4
Analyst: LMC

Prep Batch:
Prep Method: 5035
Prep Date/Time:
Initial Prep Wt./Vol.: 6.38
Prep Extract Vol: 5

SGS

# CHAIN OF CUSTODY RECORD
## SGS North America Inc.

Locations Nationwide
- Alaska
- Maryland
- New Jersey
- New York
- North Carolina
- Ohio

www.us.sgs.com

100967

(1) CLIENT: F+R (NCDOT) | SGS Reference: | PAGE 2 OF 4

CONTACT: M. SABOOSH | PHONE NO:(919) 828-3441

PROJECT: NCDOT Richmond Cty | SITE/PWSID#:

REPORTS TO: MSABOOSH@FANDR.COM | FAX NO.:( )

INVOICE TO: NCDOT | QUOTE #WBS element #34542.1.2

P.O. NUMBER: 4300163800

(2)

| LAB NO. | SAMPLE IDENTIFICATION | DATE | TIME | MATRIX | No CONTAINERS | SAMPLE TYPE C=COMP G=GRAB | Preservatives Used: N/A, MeOH. / Analysis Required (3): DRO, GRO | REMARKS |
|---|---|---|---|---|---|---|---|---|
| | 6611-0178-0004 B-1 6'-7' | 1/18/11 | 2:05 | Soil | 2 | G | X X | |
| | 6611-0178-0004 B-2 8'-9' | | 2:25 | | | | X X | |
| | 6611-0178-0004 B-3 6'-7' | | 2:45 | | | | X X | |
| | 6611-0178-0004 B-4 9'-10' | | 3:05 | | | | X X | |
| | 6611-0178-0002 B-1 7'-8' | | 4:28 | | | | X X | |
| | 6611-0178-0002 B-2 9'-10' | | 4:45 | | | | X X | |
| | 6611-0178-0002 B-3 6'-7' | | 5:00 | | | | X X | |
| | 6611-0178-0002 B-4 6'-7' | | 5:11 | | | | X X | |
| | 6611-0178-0002 B-5 7'-8' | | 5:26 | | | | X X | |
| XXXXXXXXXX | | | | | | | | |

28

(5)

| Collected/Relinquished By:(1) | Date | Time | Received By: |
|---|---|---|---|
| M. SABOOSH | 1/20/11 | 12:50 | |
| 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: |

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C 2.8 | 2.8

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD


☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557


White - Retained by Lab
Pink - Retained by Client

# CHAIN OF CUSTODY RECORD
## SGS North America Inc.

Locations Nationwide
- Alaska
- New Jersey
- North Carolina
- Maryland
- New York
- Ohio

www.us.sgs.com

100968

(1) CLIENT: F&K (NCDOT)

CONTACT: M. SABOOISH PHONE NO:( 919 )828-3441

PROJECT: NCDOT Richmond Cty SITE/PWSID# :

REPORTS TO:

MSABOOISH@FANDK.com FAX NO.:( )

INVOICE TO: NCDOT QUOTE #: UBS element# 34542.1.2

P.O. NUMBER: 4300163800

SGS Reference:

PAGE 3 OF 4

(2)

| LAB NO. | SAMPLE IDENTIFICATION | DATE | TIME | MATRIX | No CONTAINERS | SAMPLE TYPE C=COMP G=GRAB | Preservatives Used / Analysis Required (3) DRO | GRO | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| | 6617-0178-0002 B-6 9'-10' | 1-19-11 | 8:50 | Soil | 3 | G | X | X | |
| | 6617-0178-0002 B-7 6'-7' | | 9:09 | | | | | | |
| | 6617-0178-0001 B-4 4'-5' | | 9:34 | | | | | | |
| | 6617-0178-0001 B-1 2'-3' | | 9:47 | | | | | | |
| | 6617-0178-0001 B-2 7'-8' | | 10:24 | | | | | | |
| | 6617-0178-0001 B-3 11'-12' | | 10:45 | | | | | | |
| | 6617-0178-0001 B-5 6'-7' | | 11:15 | | | | | | |
| | 6617-0178-0001 B-1 9'-10' | | 12:00 | | | | | | |
| | 6617-0178-0001 B-2 9'-10' | | 12:30 | | | | | | |
| | 6617-0178-0001 B-8 9'-10' | | 1:13 | | | | | | |

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(5)

| Collected/Relinquished By:(1) | Date | Time | Received By: |
|---|---|---|---|
| M. SABOOISH | 1/20/11 | 1250 | |
| 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: |

(4)

Shipping Carrier:

Shipping Ticket No:

Samples Received Cold? (Circle) YES NO

Temperature °C 2.8, 2.0

Special Deliverable Requirements:

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Special Instructions:

Requested Turnaround Time:

☐ RUSH _____ Date Needed ☒ STD


☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557


White - Retained by Lab
Pink - Retained by Client

SINCE


1881

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

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