



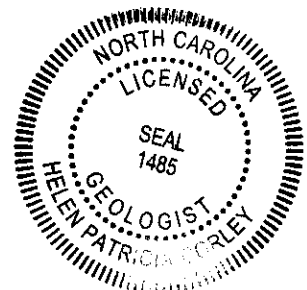
**NC Department of Transportation  
Preliminary Site Assessment  
State Project: U-3812  
WBS Element: 34977.1.1**

**Talmadge S Shepherd Property  
Parcel #7  
May 6, 2010**

**AMEC Earth and Environmental, Inc. of North Carolina  
AMEC Project: 562113812**

  
\_\_\_\_\_  
Troy Holzschuh  
Engineering Technician

  
\_\_\_\_\_  
Helen P. Corley, L.G.  
Senior Project Manager





**NC Department of Transportation  
Preliminary Site Assessment  
State Project: U-3812  
WBS Element: 34977.1.1**

**Talmadge S Shepherd Property  
Parcel #7  
May 6, 2010**

**AMEC Earth and Environmental, Inc. of North Carolina  
AMEC Project: 562113812**

  
\_\_\_\_\_  
Troy L. Holzschuh  
Engineering Technician

  
\_\_\_\_\_  
Helen P. Corley, L.G.  
Senior Project Manager



## TABLE OF CONTENTS

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
<b>1.1 Site Location.....</b>	<b>1</b>
<b>1.2 Site Description.....</b>	<b>2</b>
<b>2.0 GEOLOGY.....</b>	<b>2</b>
<b>2.1 Regional Geology.....</b>	<b>2</b>
<b>2.2 Site Geology.....</b>	<b>2</b>
<b>3.0 FIELD ACTIVITIES.....</b>	<b>3</b>
<b>3.1 Preliminary Activities.....</b>	<b>3</b>
<b>3.2 Site Reconnaissance.....</b>	<b>3</b>
<b>3.3 Geophysical Survey.....</b>	<b>3</b>
<b>3.4 Well Survey.....</b>	<b>4</b>
<b>3.5 Soil Sampling.....</b>	<b>4</b>
<b>4.0 SOIL SAMPLING RESULTS.....</b>	<b>5</b>
<b>5.0 CONCLUSIONS.....</b>	<b>5</b>
<b>6.0 RECOMMENDATIONS.....</b>	<b>6</b>

## **TABLES**

Table 1	Soil Sampling Analytical Results, DRO-GRO
---------	---

## **FIGURES**

Figure 1	Vicinity Map
Figure 2	Site Map with Sample Locations
Figure 3	Site Map with Analytical Data

## **APPENDICES**

Appendix A	Photo Log
Appendix B	Boring and Well Construction Logs
Appendix C	Geophysical Report
Appendix D	Laboratory Analytical Data

## 1.0 INTRODUCTION

In accordance with the North Carolina Department of Transportation (NCDOT) email, dated March 30, 2010, AMEC Earth and Environmental, Inc. of North Carolina (AMEC) has performed a Preliminary Site Assessment (PSA) for the Talmadge S. Shepherd Property (the Site) to be affected by a road improvement project along NC Highway (Hwy) 88 and NC Hwy 194. The Site is a residential property with one building that is identified as Parcel #7 within the NCDOT U-3812 design project. The property is located at 1586 NC Hwy 88 in West Jefferson, Ashe County, North Carolina.

NCDOT contracted AMEC to perform a PSA on the Talmadge S Shepherd Property due to the architectural style of the building indicating that it may have once operated as a garage or gas station. The PSA was performed to determine if soils have been impacted by petroleum compounds as a result of past or present uses of the property within the proposed expanded right-of-way (ROW). The investigation was specifically completed to determine the presence or absence of petroleum hydrocarbons along the proposed ROW. The investigation was conducted in accordance with AMEC's Technical and Cost proposal dated March 5, 2010.

The following report describes our field investigations and results of chemical analyses. It includes the evaluation of the analytical data with regards to the presence or absence of soil contamination within the proposed right-of-way and estimates the extent of soil contamination.

### 1.1 Site Location and History

The Talmadge S. Shepherd Property is located northeast of the intersection of NC Hwy 88 and NC Hwy 194 in West Jefferson, Ashe County, North Carolina. It is located within the Sedimentary and Metamorphic sediments of the Blue Ridge Belt Physiographic Province of western North Carolina. Figure 1 shows the site location and vicinity.

AMEC studied the NCDENR UST Database for Incident Management and Registered Facilities and did not find any incidents reported for this site.

## **1.2 Site Description**

One multi-occupant residential building constructed of masonite siding and brick occupies the Site. The northern half of the building was being used as a residence and the southern half unoccupied as of the date of this PSA field activity. The proposed road widening will traverse the entire western road frontage of Parcel #7. Two Underground Storage Tanks (USTs) exist, on the southwestern portion of the parcel, immediately west of the southern portion of the building. No monitoring wells are located at this parcel; however a residential water well is located near the southern edge of the Parcel. Appendix A includes a photo log for Site 1.

All of the properties surrounding the Parcel are residential.

## **2.0 GEOLOGY**

### **2.1 Regional Geology**

The Talmadge S. Shepherd Property is located within the Ashe Metamorphic Suite and Tallulah Falls Formation group of the Blue Ridge Belt Physiographic Province of western North Carolina. The Ashe Metamorphic Suite and Tallulah Falls Formation group is amphibolite with intrusive pegmatites.

### **2.2 Site Geology**

Site geology was observed through the sampling of six shallow direct push probe soil borings (SB) onsite. Borings extended to a total depth of eight feet below ground surface (bgs) or shallower in two borings due to refusal. Soils intercepted were fill overlying saprolite. The fill was tan to brown clayey silt, well sorted with sand and rock fragments. The saprolitic soil was orange-brown clayey silt with occasional crumbled quartz veins. Boring logs are presented in Appendix B.

Saturated conditions (ground water) were not encountered in any borings and the maximum total depth was eight feet bgs.

## **3.0 FIELD ACTIVITIES**

### **3.1 Preliminary Activities**

Prior to commencing field sampling activities at the site, several tasks were accomplished in preparation for the subsurface investigation. The Health and Safety Plan (HSP) was modified to include the site-specific health and safety information necessary for the field activities. North Carolina-1-Call was contacted to facilitate the location of underground utilities in the vicinity of selected boring locations SAEDACCO (South Atlantic Environmental Drilling and Construction Co.) of Fort Mill, South Carolina was retained by AMEC to perform the direct push sampling for soil borings. AMEC coordinated with Schnabel Engineering South (Schnabel) who performed two geophysical surveys (electromagnetic and ground penetrating radar) onsite during March. The geophysical results were reviewed and discussed at the completion of each survey. Prism Laboratories, Inc. was contacted for acquisition of sample bottles.

### **3.2 Site Reconnaissance**

AMEC personnel completed site reconnaissance on February 26, 2010. The area was visually examined for the presence of any UST or areas/obstructions that could potentially affect the subsurface investigation and boring locations were marked. Boring locations were marked on March 31, 2010.

### **3.3 Geophysical Survey**

Schnabel performed the geophysical surveys on March 15 and 23, 2010. Schnabel utilized a Geonics EM61-MK2 to perform the electromagnetic induction surveys and a Geophysical Survey Systems SIR-3000 to conduct the ground-penetrating radar (GPR) investigations. These instruments are specifically calibrated to detect metal anomalies that are buried deeply and are characteristically large. The data collected by Schnabel indicates two probable underground storage tanks present west of the southern portion of the building and just outside of the proposed expanded ROW on Parcel # 7. The GPR data suggests that the northern UST is buried approximately 1.5-2.5 feet below ground surface and measures 3.5 feet in diameter by approximately eight feet long (560 gallon capacity). The southern UST is buried approximately 0.5-1.5 feet below ground surface and measures 3.5

feet in diameter and approximately eight feet long (560 gallon capacity). The complete geophysical report can be found in Appendix C.

### **3.4 Well Survey**

No well survey was performed as part of this PSA; however a residential water supply well was noted near the southern edge of the Parcel as shown in Figure 2.

### **3.5 Soil Sampling**

Soil boring occurred on April 9, 2010 at Parcel #7. Six direct push soil borings were conducted within the proposed expanded ROW on Parcel #7. Figure 2 presents the Site Map with sample locations and identifications. Soil borings were located within the proposed expanded ROW, using a focused soil boring placement pattern to target potential soil contamination near the probable USTs. Borings SB-1 through SB-5 were placed in close proximity to the probable USTs, while SB-6 was located to the south near the Parcel edge.

No signs of staining, odor or significant Photo Ionization Detector (PID) reading were detected in any of the soil borings. Soil samples were collected in accordance with EPA protocols in laboratory-supplied containers. The soil samples for Total Petroleum Hydrocarbons (TPH) –Gasoline Range Organics (GRO) analysis were collected using the 5030 prep method with methanol preservation. Samples for TPH-Diesel Range Organics (DRO) analysis were collected in 4oz. glass containers. Once placed in the containers, the samples were labeled with the sample number, time of collection, date of collection, name of the collector, and the requested analysis. The samples were packed on ice, and then hand delivered to Prism Laboratories, a North Carolina Certified Laboratory following proper chain-of-custody procedures.



## 4.0 SOIL SAMPLING RESULTS

AMEC conducted soil sampling at the Site on April 9, 2010. The purpose of the sampling was to determine if releases of petroleum hydrocarbons had occurred, and if so, to estimate the volume of soil that might require special handling during construction activities. The sampling was accomplished using direct push methods accompanied by field screening for organic vapors with a PID. The laboratory results with PID readings are tabulated in Table 1 and shown on Figure 3.

A minimum of one soil sample was collected from each of the 6 completed soil borings from Parcel #7. Typically, when impacted soil is identified, additional soil samples are obtained. PID readings did not warrant any additional samples. Analyses of soil samples for DRO and GRO did not indicate detectable concentrations in any of the 6 samples. Copies of the original laboratory report and chain-of-custody documentation are included as Appendix D.

## 5.0 CONCLUSIONS

The following conclusions are based upon AMEC's evaluation of field observations and laboratory analyses of samples collected from the Site on April 9, 2010.

- As of the date of the PSA field activities, the northern portion of the building was used as a residence while the southern building portion was unoccupied.
- Two probable USTs were identified just east beyond the proposed expanded ROW.
- Laboratory analyses of soil samples determined that GRO and DRO were not present above the 10 mg/kg reporting limit.

## 6.0 RECOMMENDATIONS

If NCDOT acquires Parcel #7, the Talmadge S. Shepherd Property, the two USTs must be closed by removal per the UST guidelines, thus requiring additional sampling.

If NCDOT does not acquire Parcel #7, as road improvement activities approach the ROW caution should be exercised so as not to intercept the UST or any previously unknown impacted soil. In the event that NCDOT encounters potential impacted soil, AMEC recommends the following action:

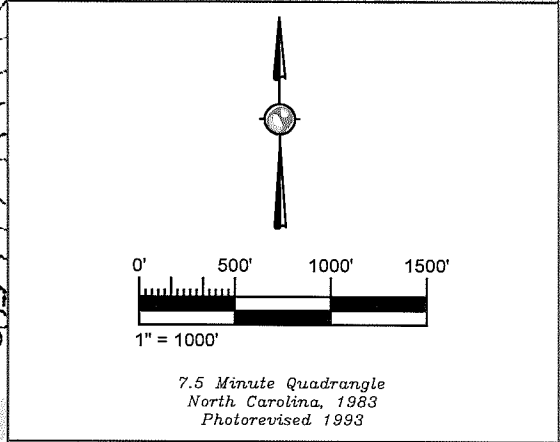
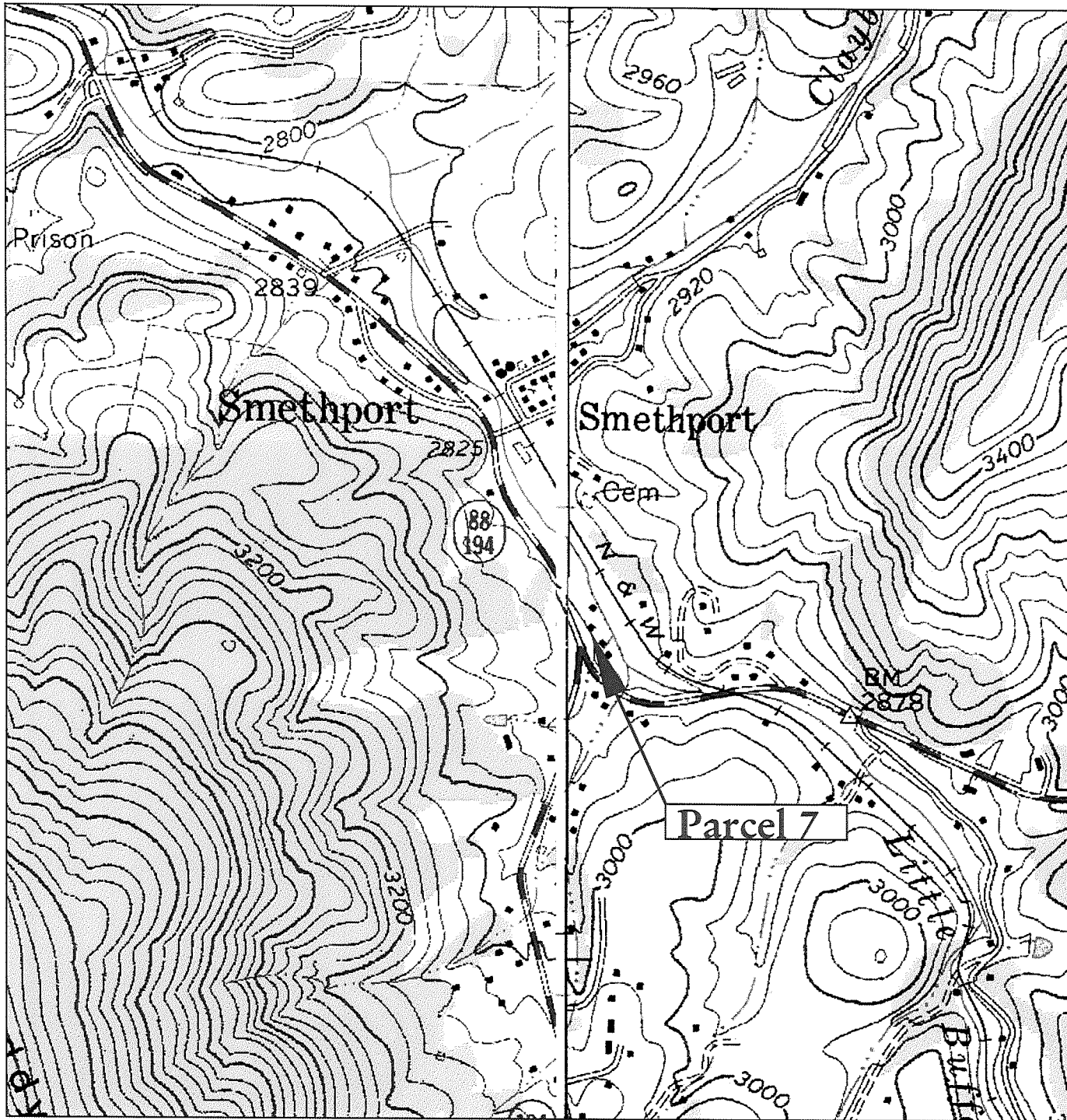
- Segregation during soil excavation then proper disposal of petroleum-impacted soil from the proposed roadway improvement during construction operations.

## **TABLES**

**Table 1**  
**Soil Sampling Analytical Results, DRO-GRO**  
**Parcel 7**  
**Ashe County PSA**  
**Jefferson, North Carolina**

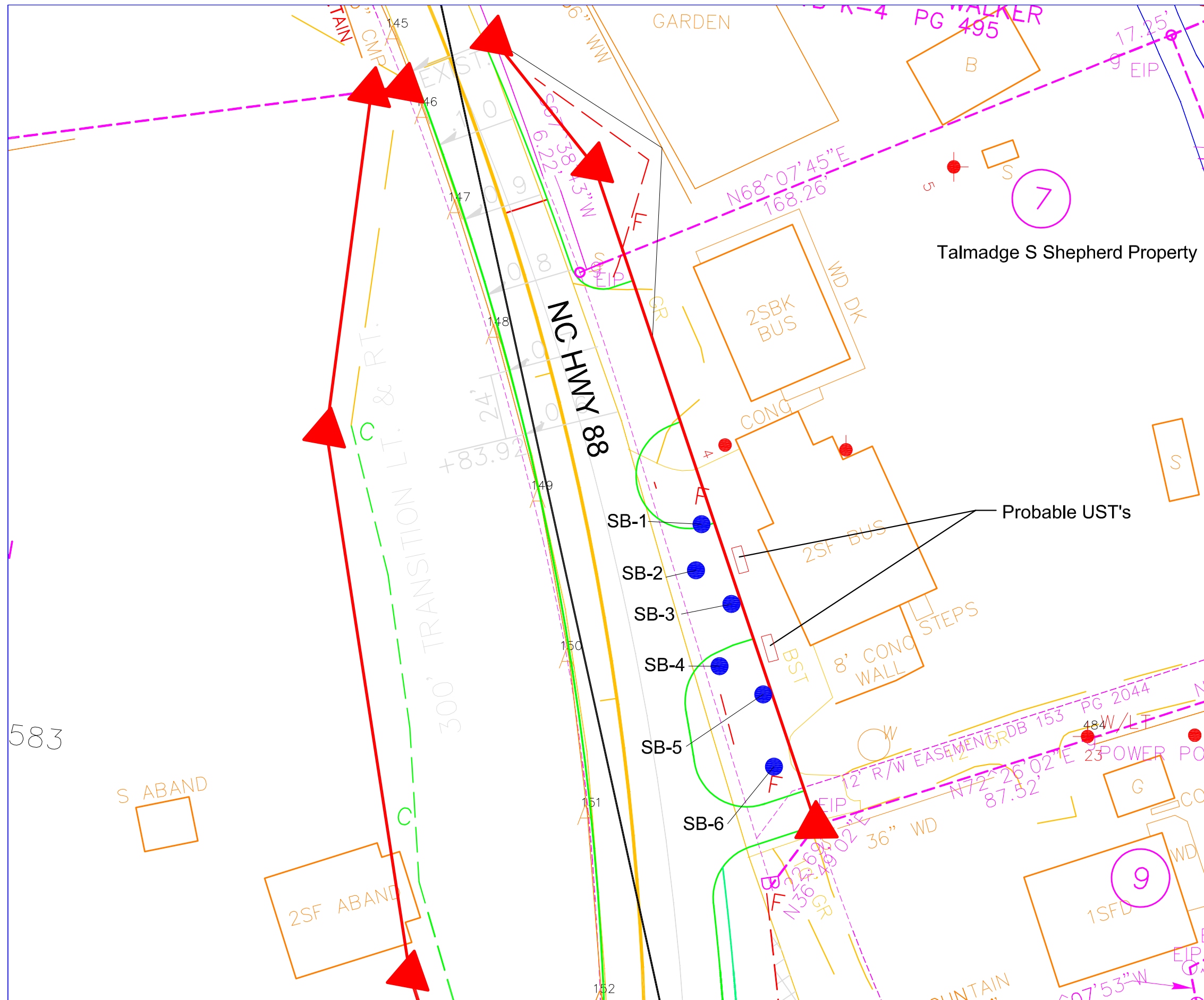
SAMPLE ID	SAMPLE DATE	SAMPLE DEPTH (ft bgs)	PID READINGS (ppm)	EPA Method 8015B	
				DRO (mg/kg)	GRO (mg/kg)
<b>NC Action Levels</b>				<b>10</b>	<b>10</b>
P7-SB-1	4/9/2010	5 - 6	0.0	<9.3	<6.6
P7-SB-2	4/9/2010	4 - 5	0.0	<8.1	<5.8
P7-SB-3	4/9/2010	5 - 6	0.0	<9.0	<6.5
P7-SB-4	4/9/2010	5 - 6	0.0	<8.6	<6.1
P7-SB-5	4/9/2010	4 - 5	0.0	<8.9	<6.4
P7-SB-6	4/9/2010	4 - 5	0.0	<9.8	<7.0
<b>NOTES:</b> bgs = below ground surface; ppm = parts per million <b>Bold</b> Concentrations Exceed Action Levels DRO = Diesel Range Organics GRO = Gasoline Range Organics Standards derived from the North Carolina UST Section Guidelines for Assessment and Corrective Action					

## FIGURES



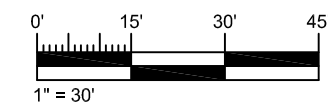
**Figure 1**  
**Site Vicinity Map**  
**Parcel 7**

DRAWING NAME: J:\NCDOT\ASHE\FIG1		DATE: 5/12/10	
SCALE: 1 INCH = 1,000 FEET		DR	CHK
		TLH	HPC
PREPARED FOR: NC Department of Transportation Geotechnical Unit WBS Element: 34977.1.1 TIP# U-3812			
Prepared By:		Figure:	
338 North Elm Street Suite 112 Greensboro, NC 27401 (336) 691-5398		Figure 1	



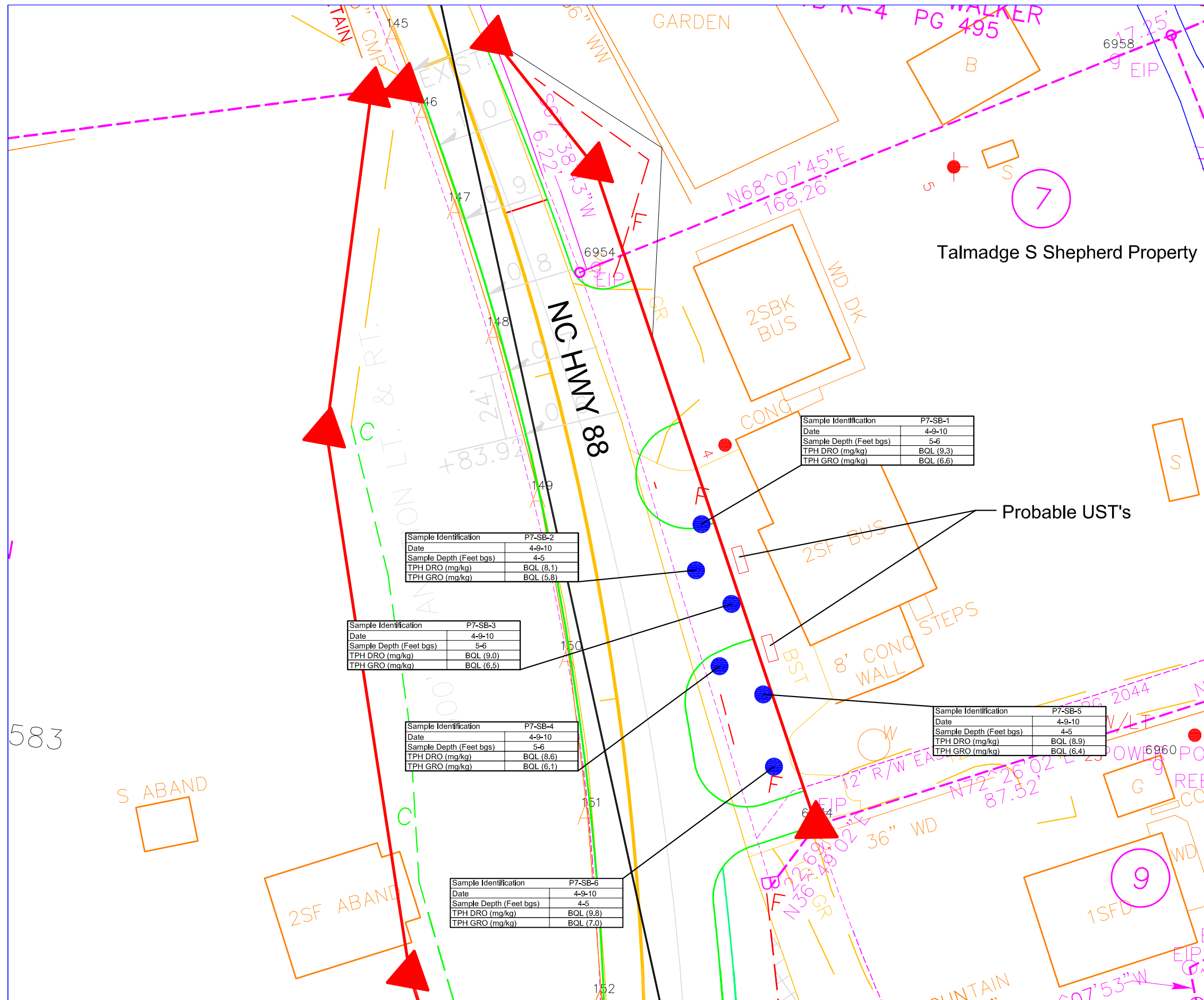
**LEGEND**

-  Proposed Right of Way
-  Existing Right of Way
-  Property Boundaries
-  C Cut/Fill Line
-  F Cut/Fill Line
-  Boring Locations



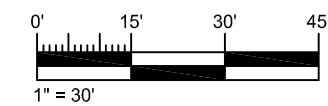
**Figure 2**  
**Site Map With Sample Locations**  
**Parcel 7 Talmadge S Shepherd Property**

**NC Department of Transportation**  
**Geotechnical Unit**  
**WBS Element: 34977.1.1**  
**TIP# U-3812**



**LEGEND**

- Proposed Right of Way
- Existing Right of Way
- Property Boundaries
- Cut/Fill Line
- Cut/Fill Line
- Boring Locations



**Figure 3**  
**Site Map With Analytical Data**  
**Parcel 7 Talmadge S Shepherd Property**

**NC Department of Transportation**  
**Geotechnical Unit**  
**WBS Element: 34977.1.1**  
**TIP# U-3812**



**APPENDIX A**


**PHOTO LOG**

**Photo Log**

PAGE 1 of 1



<b>Photo No.</b> 1	<b>Date:</b> 02/26/10	
<b>Direction Photo Taken:</b> Southeast		
<b>Description:</b> View of Parcel 7 Proposed ROW		

<b>Photo No.</b> 2	<b>Date:</b> 04/09/10	
<b>Direction Photo Taken:</b> North		
<b>Description:</b> View of one of the two probable UST's		

**APPENDIX B**  
**BORING LOGS**















**APPENDIX C**  
**GEOPHYSICAL SURVEY REPORT**



April 26, 2010

Mr. Ethan Caldwell, LG, EI  
NCDOT, Geotechnical Engineering Unit  
1020 Birch Ridge Drive  
Raleigh, NC 27610

RE:           State Project:   U-3812  
              WBS Element:  34977.1.1  
              County:       Ashe  
              Description:   Jefferson – NC 88 from NC 194 to US 221 Bus

**Subject:       Report on Geophysical Surveys for Parcel 7, West Jefferson, NC  
                  Schnabel Engineering Project 09210013.17**

Dear Mr. Caldwell:

Schnabel Engineering South, P.C. (Schnabel) is pleased to present this report on the geophysical surveys we conducted on the subject property. The report includes two 11x17 color figures and three 8.5x11 color figures.

## **1.0 INTRODUCTION**

The work described in this report was conducted on March 15 and 23, 2010, by Schnabel under our 2009 contract with the NCDOT. The work was conducted within the accessible areas of the proposed right-of-way and/or easement as indicated by the NCDOT to support their environmental assessment of Parcel 7 (Talmadge S. Shepherd Property). Photographs of the parcel are included on Figure 1. The purpose of the geophysical surveys was to locate possible metal underground storage tanks (UST's) and associated metal product lines in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies, including areas of reinforced concrete, and of planned boring locations 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.

## **2.0 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 (building, curbs, 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 two orthogonal directions over anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of UST's. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

Preliminary results for Parcel 7 were sent to Ethan Caldwell of the NCDOT on March 30, 2010.

## **3.0 DISCUSSION OF RESULTS**

The contoured EM61 data for Parcel 7 are shown on Figures 3 and 4. The EM61 early time gate results are plotted on Figure 3. The early time gate data provide the more sensitive detection of metal objects. Figure 4 shows the difference between the response of the top and bottom coils of the EM61 instrument (differential response). The difference is taken to remove the effect of surface and very shallowly buried metallic objects. Typically, the differential response emphasizes anomalies from deeper and larger objects such as UST's.

The early time gate and differential results show anomalies apparently caused by buried utilities and/or known site features (Figures 3 and 4). The GPR data collected to the west of the southern building on Parcel 7 indicated the presence of two probable UST's. The two UST's do not appear to be within the planned right-of way and/or easement but are located close to the right-of way line. Example GPR images showing the reflections from the two probable UST's on Parcel 7 are shown on Figures 3 and 4. Figures 3 and 4 also include the locations of the probable UST's as marked in the field. The GPR data indicate that the southern probable UST (UST No.1) on Parcel 7 is buried approximately 0.5 to 1.5 feet below ground surface and is about 3.5 feet in diameter and about 8 feet long, equivalent to a capacity of about 560 gallons. The GPR data indicate that northern probable UST (UST No. 2) on Parcel 7 is buried approximately 1.5 to 2.5 feet below ground surface and is about 3.5 feet in diameter and about 8 feet long, equivalent to a capacity of about 560 gallons. Photographs of the probable UST locations, as marked in the field, are included on Figure 5.

#### 4.0 CONCLUSIONS

Our evaluation of the geophysical data collected on Parcel 7 on Project U-3812 in West Jefferson, NC indicates the following:

The geophysical data indicate the presence of two probable UST's on Parcel 7. The UST's appear to be 4 to 6 feet outside the planned right-of-way and/or easement. The southern probable UST (probable UST No.1) is about 560-gallon capacity and is buried about 0.5 to 1.5 feet below ground surface. The northern probable UST (probable UST No.2) is also about 560-gallon capacity and is buried about 1.5 to 2.5 feet below ground surface.

#### 5.0 LIMITATIONS

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

Thank you for the opportunity to serve you on this project. Please call if you need additional information or have any questions.

Sincerely,

**SCHNABEL ENGINEERING SOUTH, PC**



James W. Whitt  
Staff Geophysicist



Edward D. Billington, LG  
Senior Vice President

JW:NB

Attachment: Figures (5)

FILE: G:\2009 PROJECTS\09210013 (NCDOT 2009 GEOTECH UNIT SERVICES)\09210013.17 (U-3812, ASHE COUNTY)\REPORT\PARCEL 7\PARCEL 7 (U-3812).DOC



Parcel 7 – Talmadge S. Shepherd Property, looking northeast



Parcel 7 – Talmadge S. Shepherd Property, looking southeast





Geonics EM61-MK2



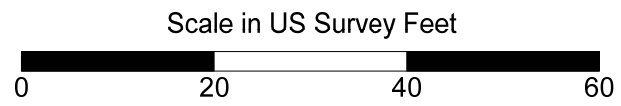
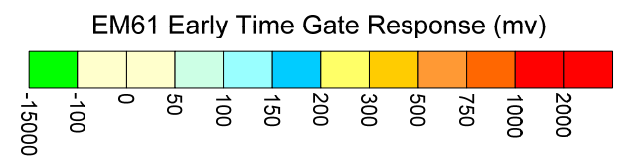
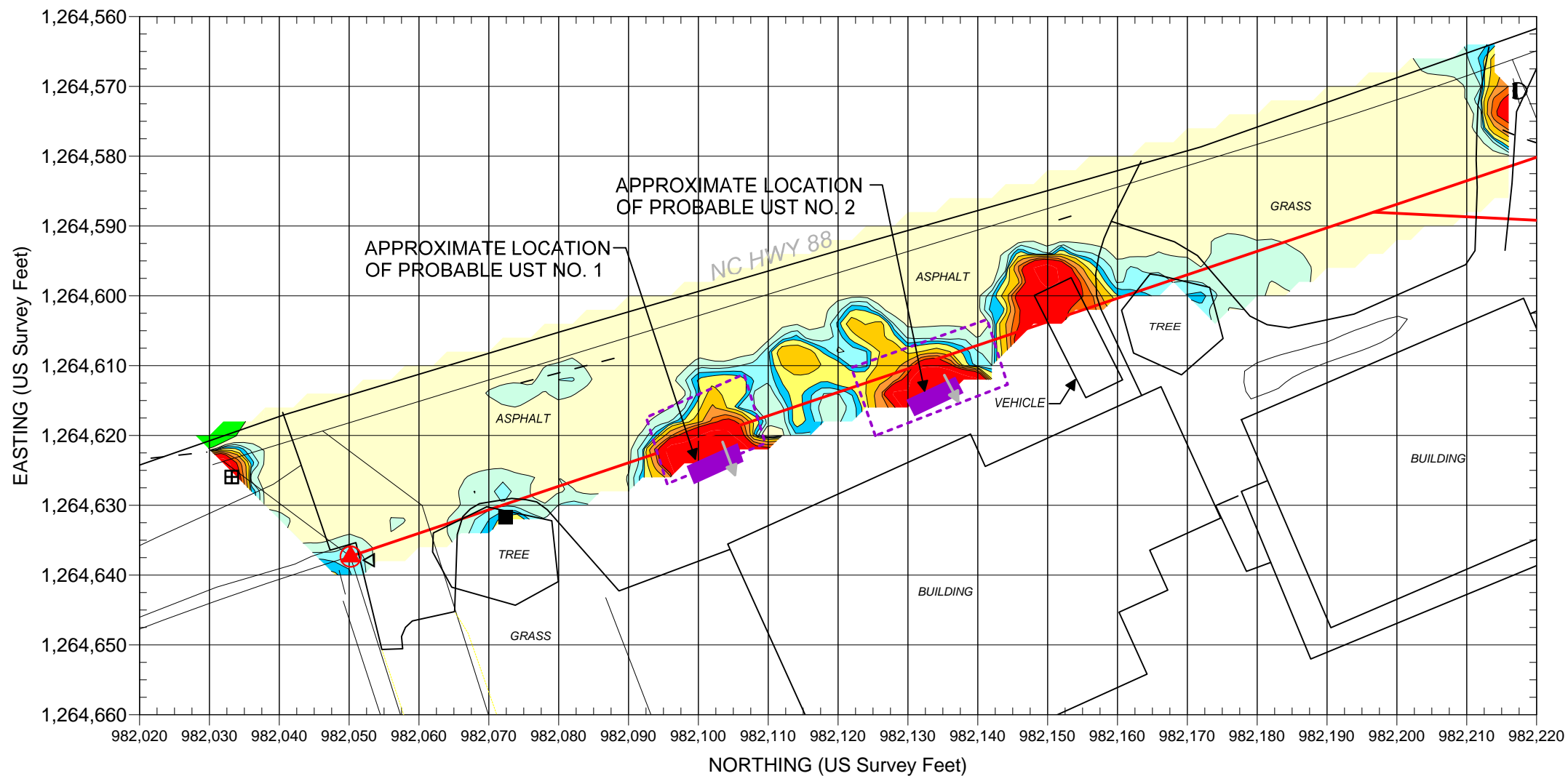
GSSI SIR-3000



STATE PROJECT U-3812  
ASHE CO., NORTH CAROLINA  
NC DEPT. OF TRANSPORTATION  
PROJECT NO. 09210013.17

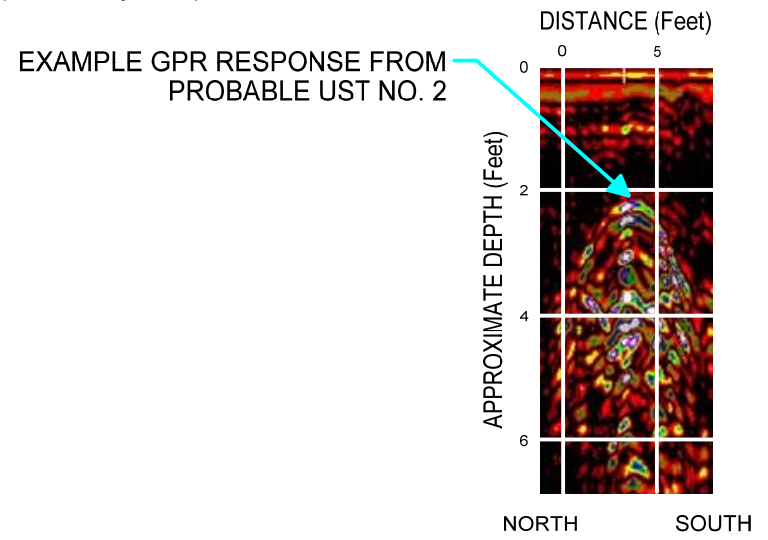
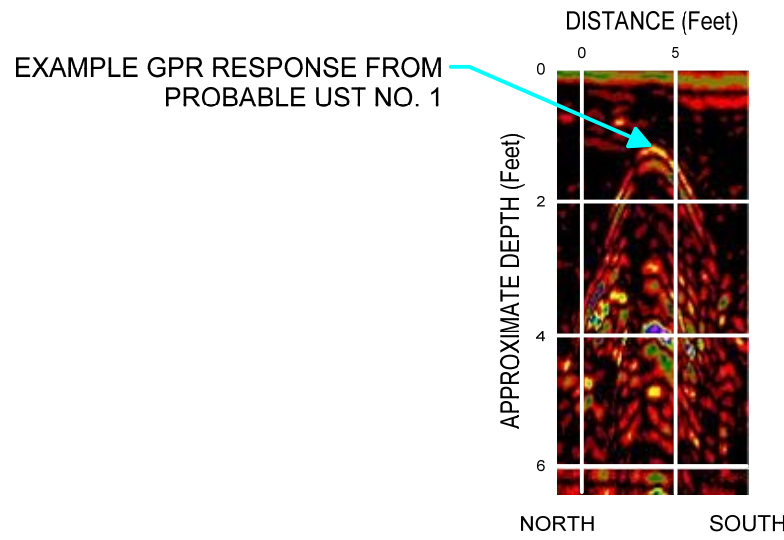
PHOTOS OF  
GEOPHYSICAL  
EQUIPMENT USED

FIGURE 2



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 SUSPECT UST MARKED ON SITE

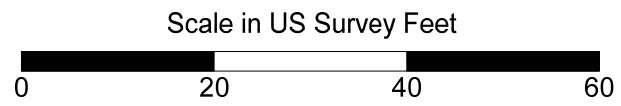
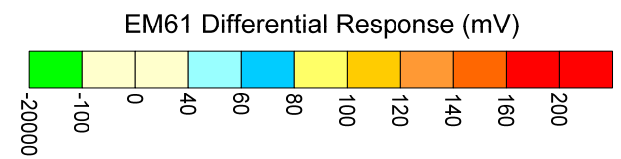
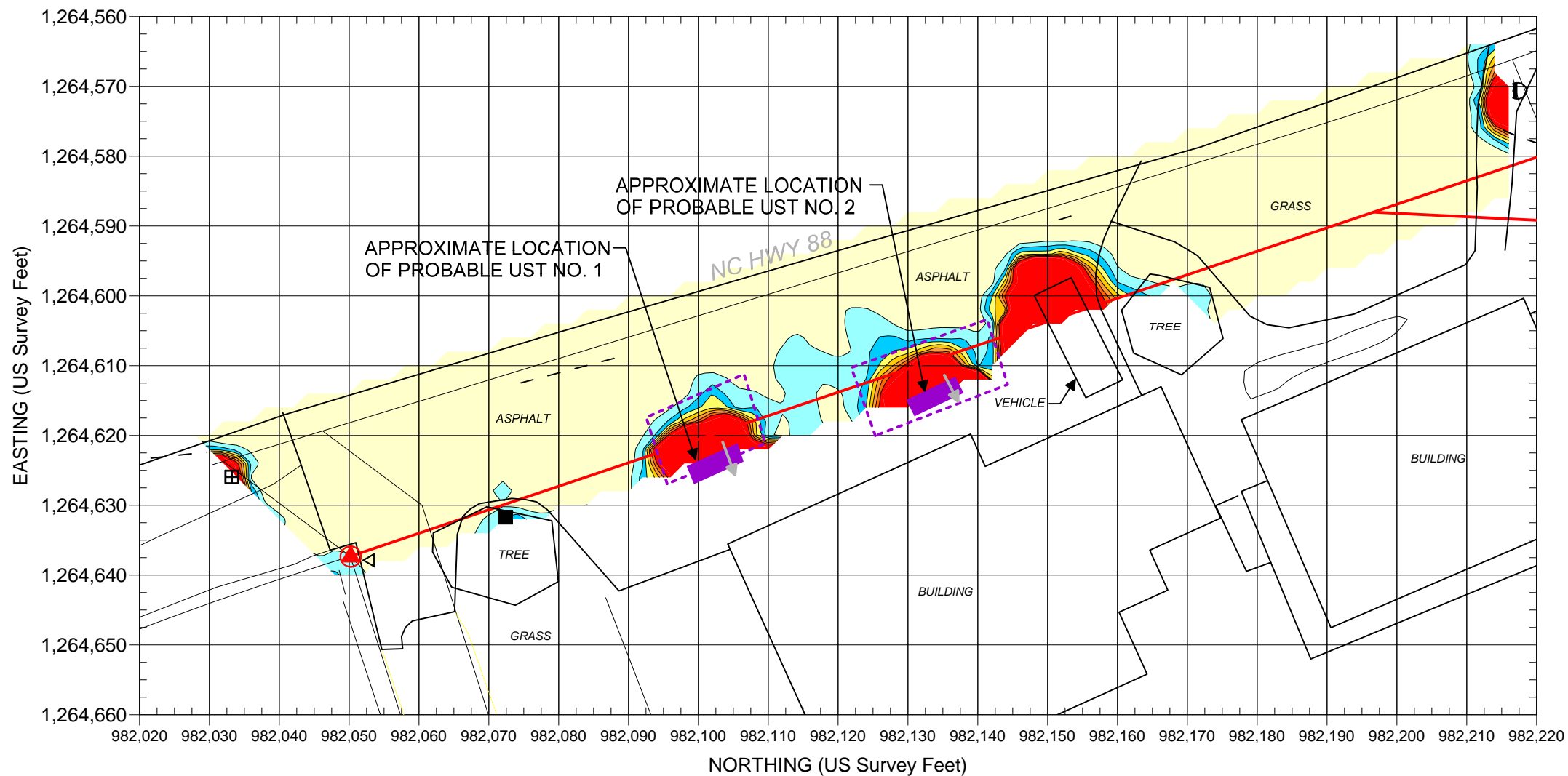
REF.: NCDOT FILE: u3812\_rdy\_psh04.dgn  
(FOR SOME SITE FEATURES)



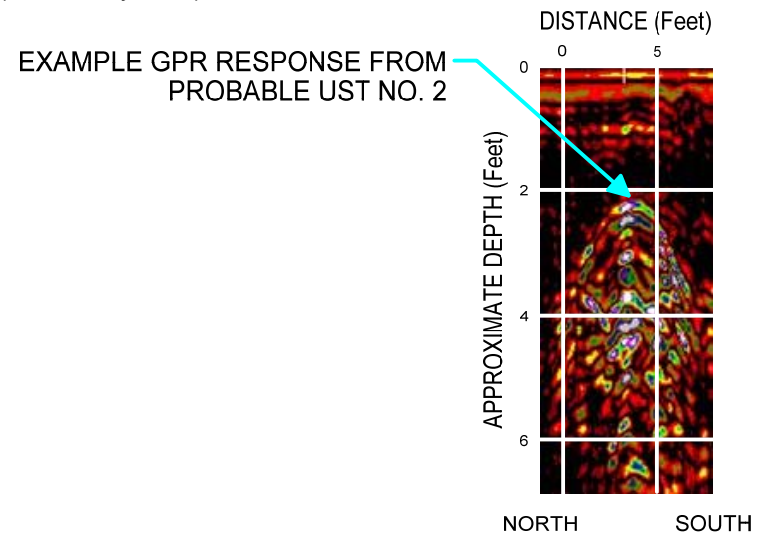
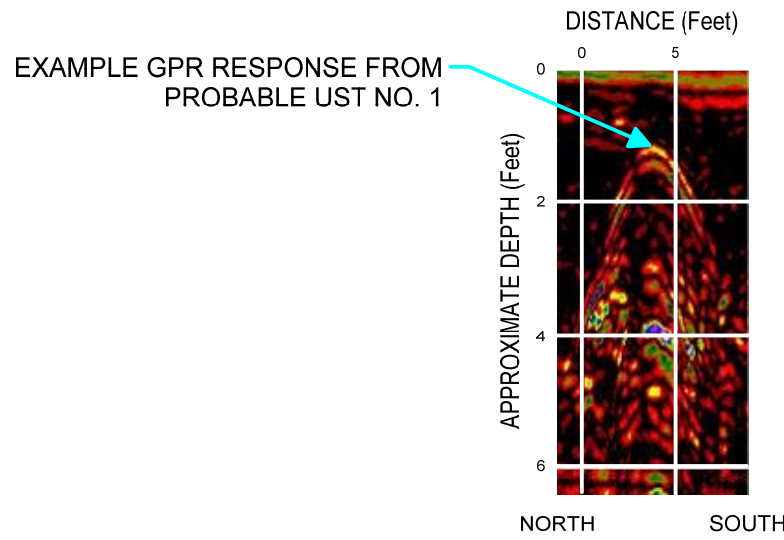
Note: The contour plot shows the earliest and most sensitive time gate of the EM61 bottom coil/channel in millivolts (mV). The EM data were collected on March 15, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina Zone 3200, using the NAD 1983 datum. GPR data were acquired on March 23, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT U-3812 ASHE COUNTY, NORTH CAROLINA NC DEPARTMENT OF TRANSPORTATION PROJECT NO. 09210013.17	PARCEL 7 EM61 EARLY TIME GATE RESPONSE
	FIGURE 3	





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 SUSPECT UST MARKED ON SITE



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 March 15, 2010, using a Geonics EM61-MK2 instrument. Positioning for the EM61 survey was provided using a submeter Trimble ProXRS DGPS system. Coordinates are in the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 1983 datum. GPR data were acquired on March 23, 2010, using a Geophysical Survey Systems SIR 3000 equipped with a 400 MHz antenna.

	STATE PROJECT U-3812	PARCEL 7
	ASHE COUNTY, NORTH CAROLINA	EM61 DIFFERENTIAL
	NC DEPARTMENT OF TRANSPORTATION	RESPONSE
	PROJECT NO. 09210013.17	FIGURE 4



Parcel 7 – Talmadge S. Shepherd Property, looking northeast. Photo shows approximate marked location of the probable UST near the southwest corner of the southern building.



Parcel 7 – Talmadge S. Shepherd Property, looking northeast. Photo shows approximate marked location of the probable UST near the middle of the front side of the southern building.



STATE PROJECT U-3812  
 ASHE CO., NORTH CAROLINA  
 NC DEPT. OF TRANSPORTATION  
 PROJECT NO. 09210013.17

PHOTOS OF  
 PROBABLE  
 UST LOCATIONS

FIGURE 5

**APPENDIX D**  
**LABORATORY ANALYTICAL RESULTS**



## Case Narrative

**Date:** 04/21/10  
**Company:** N. C. Department of Transportation  
**Contact:** Helen Corley  
**Address:** c/o AMEC Earth & Environmental, Inc.  
101 W. Friendly Ave. Suite 603  
Greensboro, NC 27401

**Client Project ID:** NCDOT: Ashe Co. PSA (Parcel 7)  
**Prism COC Group No:** G0410279  
**Collection Date(s):** 04/09/10  
**Lab Submittal Date(s):** 04/09/10  
**Client Project Name Or No:** WBS #34977.1.1

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 9 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

### Semi Volatile Analysis

No Anomalies Reported

### Volatile Analysis

No Anomalies Reported

### Metals Analysis

N/A

### Wet Lab and Micro Analysis

N/A

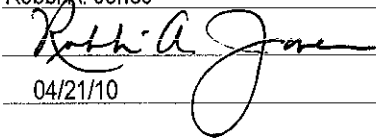
Please call if you have any questions relating to this analytical report.

**Data Reviewed by:** Robbi A. Jones

**Signature:** 

**Review Date:** 04/21/10

**Project Manager:** Robbi A. Jones

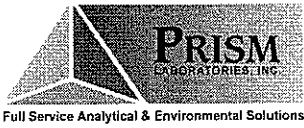
**Signature:** 

**Approval Date:** 04/21/10

### **Data Qualifiers Key Reference:**

- B: Compound also detected in the method blank.
- #: Result outside of the QC limits.
- DO: Compound diluted out.
- E: Estimated concentration, calibration range exceeded.
- J: The analyte was positively identified but the value is estimated below the reporting limit.
- H: Estimated concentration with a high bias.
- L: Estimated concentration with a low bias.
- M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil

Client Sample ID: P7-SB-1 (5-6)  
 Prism Sample ID: 276347  
 COC Group: G0410279  
 Time Collected: 04/09/10 11:05  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
<b>Percent Solids Determination</b>									
Percent Solids	75.3	%			1	SM2540 G	04/13/10 13:00	jbrayton	
<b>Diesel Range Organics (DRO) by GC-FID</b>									
Diesel Range Organics (DRO)	BRL	mg/kg	9.3	1.5	1	8015B	04/16/10 22:02	jvogel	Q49472
Sample Preparation:			25.04 g	/	1 mL	3545	04/15/10 16:00	athao	P27278
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						o-Terphenyl	66	49 - 124	
<b>Sample Weight Determination</b>									
Weight 1	6.54	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	6.43	g			1	GRO	04/13/10 0:00	lbrown	
<b>Gasoline Range Organics (GRO) by GC-FID</b>									
Gasoline Range Organics (GRO)	BRL	mg/kg	6.6	4.2	50	8015B	04/15/10 16:29	heasler	Q49464
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						aaa-TFT	114	55 - 129	

**Sample Comment(s):**

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil

Client Sample ID: P7-SB-2 (4-5)  
 Prism Sample ID: 276348  
 COC Group: G0410279  
 Time Collected: 04/09/10 11:15  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
-----------	--------	-------	--------------	-----	-----------------	--------	--------------------	---------	----------

**Percent Solids Determination**

Percent Solids	85.7	%			1	SM2540 G	04/13/10 13:00	jbrayton	
----------------	------	---	--	--	---	----------	----------------	----------	--

**Diesel Range Organics (DRO) by GC-FID**

Diesel Range Organics (DRO)	BRL	mg/kg	8.1	1.3	1	8015B	04/16/10 22:38	jvoegel	Q49472
-----------------------------	-----	-------	-----	-----	---	-------	----------------	---------	--------

Sample Preparation: 25.06 g / 1 mL 3545 04/15/10 16:00 athao P27278

Surrogate	% Recovery	Control Limits
o-Terphenyl	86	49 - 124

**Sample Weight Determination**

Weight 1	7.24	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	9.65	g			1	GRO	04/13/10 0:00	lbrown	

**Gasoline Range Organics (GRO) by GC-FID**

Gasoline Range Organics (GRO)	BRL	mg/kg	5.8	3.7	50	8015B	04/15/10 18:03	heasler	Q49464
-------------------------------	-----	-------	-----	-----	----	-------	----------------	---------	--------

Surrogate	% Recovery	Control Limits
aaa-TFT	125	55 - 129

**Sample Comment(s):**

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil  
 Client Sample ID: P7-SB-3 (5-6)  
 Prism Sample ID: 276349  
 COC Group: G0410279  
 Time Collected: 04/09/10 11:30  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
-----------	--------	-------	--------------	-----	-----------------	--------	--------------------	---------	----------

**Percent Solids Determination**

Percent Solids	77.5	%			1	SM2540 G	04/13/10 13:00	jbrayton	
----------------	------	---	--	--	---	----------	----------------	----------	--

**Diesel Range Organics (DRO) by GC-FID**

Diesel Range Organics (DRO)	BRL	mg/kg	9.0	1.5	1	8015B	04/16/10 23:14	jvogel	Q49472
-----------------------------	-----	-------	-----	-----	---	-------	----------------	--------	--------

Sample Preparation: 25.03 g / 1 mL 3545 04/15/10 16:00 athao P27278

Surrogate	% Recovery	Control Limits
o-Terphenyl	77	49 - 124

**Sample Weight Determination**

Weight 1	6.73	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	7.42	g			1	GRO	04/13/10 0:00	lbrown	

**Gasoline Range Organics (GRO) by GC-FID**

Gasoline Range Organics (GRO)	BRL	mg/kg	6.5	4.0	50	8015B	04/15/10 18:35	heasler	Q49464
-------------------------------	-----	-------	-----	-----	----	-------	----------------	---------	--------

Surrogate	% Recovery	Control Limits
aaa-TFT	111	55 - 129

**Sample Comment(s):**

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

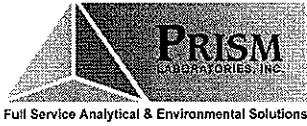
All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil

Client Sample ID: P7-SB-4 (5-6)  
 Prism Sample ID: 276350  
 COC Group: G0410279  
 Time Collected: 04/09/10 11:45  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
-----------	--------	-------	--------------	-----	-----------------	--------	--------------------	---------	----------

**Percent Solids Determination**

Percent Solids	81.5	%			1	SM2540 G	04/13/10 13:00	jbrayton	
----------------	------	---	--	--	---	----------	----------------	----------	--

**Diesel Range Organics (DRO) by GC-FID**

Diesel Range Organics (DRO)	BRL	mg/kg	8.6	1.4	1	8015B	04/17/10 5:41	jvogel	Q49477
-----------------------------	-----	-------	-----	-----	---	-------	---------------	--------	--------

Sample Preparation: 25 g / 1 mL 3545 04/16/10 7:30 athao P27282

Surrogate	% Recovery	Control Limits
o-Terphenyl	78	49 - 124

**Sample Weight Determination**

Weight 1	6.63	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	6.54	g			1	GRO	04/13/10 0:00	lbrown	

**Gasoline Range Organics (GRO) by GC-FID**

Gasoline Range Organics (GRO)	BRL	mg/kg	6.1	3.8	50	8015B	04/15/10 19:06	heasler	Q49464
-------------------------------	-----	-------	-----	-----	----	-------	----------------	---------	--------

Surrogate recovery was outside the control limits. No target compounds were detected in this sample that were associated with this surrogate. No further action was taken.

Surrogate	% Recovery	Control Limits
aaa-TFT	134 #	55 - 129

**Sample Comment(s):**

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

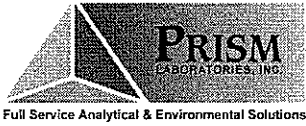
Angela D. Overcash, V.P. Laboratory Services

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409





NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil

Client Sample ID: P7-SB-5 (4-5)  
 Prism Sample ID: 276351  
 COC Group: G0410279  
 Time Collected: 04/09/10 11:55  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
<b><u>Percent Solids Determination</u></b>									
Percent Solids	78.0	%			1	SM2540 G	04/13/10 13:00	jbrayton	
<b><u>Diesel Range Organics (DRO) by GC-FID</u></b>									
Diesel Range Organics (DRO)	BRL	mg/kg	8.9	1.4	1	8015B	04/17/10 6:17	jvogel	Q49477
Sample Preparation:			25.07 g	/	1 mL	3545	04/16/10 7:30	athao	P27282
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						o-Terphenyl	72	49 - 124	
<b><u>Sample Weight Determination</u></b>									
Weight 1	5.48	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	5.48	g			1	GRO	04/13/10 0:00	lbrown	
<b><u>Gasoline Range Organics (GRO) by GC-FID</u></b>									
Gasoline Range Organics (GRO)	BRL	mg/kg	6.4	4.0	50	8015B	04/15/10 19:37	heasler	Q49464
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						aaa-TFT	97	55 - 129	

**Sample Comment(s):**

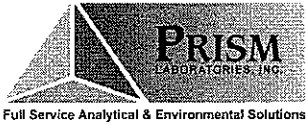
BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Laboratory Report

04/21/10

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA (Parcel 7)  
 Project No.: WBS #34977.1.1  
 Sample Matrix: Soil

Client Sample ID: P7-SB-6 (4-5)  
 Prism Sample ID: 276352  
 COC Group: G0410279  
 Time Collected: 04/09/10 12:10  
 Time Submitted: 04/09/10 14:50

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
-----------	--------	-------	--------------	-----	-----------------	--------	--------------------	---------	----------

**Percent Solids Determination**

Percent Solids	71.8	%			1	SM2540 G	04/13/10 13:00	jbrayton	
----------------	------	---	--	--	---	----------	----------------	----------	--

**Diesel Range Organics (DRO) by GC-FID**

Diesel Range Organics (DRO)	BRL	mg/kg	9.8	1.6	1	8015B	04/17/10 7:28	jvogel	Q49477
-----------------------------	-----	-------	-----	-----	---	-------	---------------	--------	--------

Sample Preparation: 24.97 g / 1 mL 3545 04/16/10 7:30 athao P27282

Surrogate	% Recovery	Control Limits
o-Terphenyl	81	49 - 124

**Sample Weight Determination**

Weight 1	6.39	g			1	GRO	04/13/10 0:00	lbrown	
Weight 2	6.32	g			1	GRO	04/13/10 0:00	lbrown	

**Gasoline Range Organics (GRO) by GC-FID**

Gasoline Range Organics (GRO)	BRL	mg/kg	7.0	4.4	50	8015B	04/15/10 20:08	heasler	Q49464
-------------------------------	-----	-------	-----	-----	----	-------	----------------	---------	--------

Surrogate recovery was outside the control limits. No target compounds were detected in this sample that were associated with this surrogate. No further action was taken.

Surrogate	% Recovery	Control Limits
aaa-TFT	144 #	55 - 129

**Sample Comment(s):**

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

This report should not be reproduced, except in its entirety, without the written consent of Prism Laboratories, Inc.

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

4/21/2010

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 Project No.: (Parcel 7)  
 WBS #34977.1.1

COC Group Number: G0410279  
 Date/Time Submitted: 4/9/2010 14:50

## Gasoline Range Organics (GRO) by GC-FID, method 8015B

Method Blank							QC Batch ID
	Result	RL	Control Limit	Units			
Gasoline Range Organics (GRO)	ND	5	<2.5	mg/kg			Q49464

Laboratory Control Sample							QC Batch ID
	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
Gasoline Range Organics (GRO)	48.90	50	mg/kg	98	67-116		Q49464

Matrix Spike							QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
276347 Gasoline Range Organics (GRO)	54.35	50	mg/kg	109	57-113		Q49464

Matrix Spike Duplicate									QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %		
276347 Gasoline Range Organics (GRO)	53.50	50	mg/kg	107	57-113	2	0 - 23		Q49464

## Diesel Range Organics (DRO) by GC-FID, method 8015B

Method Blank							QC Batch ID
	Result	RL	Control Limit	Units			
Diesel Range Organics (DRO)	ND	7	<3.5	mg/kg			Q49472

Laboratory Control Sample							QC Batch ID
	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
Diesel Range Organics (DRO)	54.6	80	mg/kg	68	55-109		Q49472

Matrix Spike							QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
275759 Diesel Range Organics (DRO)	69.9	80	mg/kg	87	50-117		Q49472

Matrix Spike Duplicate									QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %		
275759 Diesel Range Organics (DRO)	73.4	80	mg/kg	92	50-117	5	0 - 24		Q49472



NC Certification No. 402  
 SC Certification No. 99012  
 NC Drinking Water Cert. No. 37735

# Level II QC Report

4/21/2010

N. C. Department of Transportation  
 Attn: Helen Corley  
 c/o AMEC Earth & Environmental, Inc.  
 101 W. Friendly Ave. Suite 603  
 Greensboro, NC 27401

Project ID: NCDOT: Ashe Co. PSA  
 Project No.: (Parcel 7)  
 WBS #34977.1.1

COC Group Number: G0410279  
 Date/Time Submitted: 4/9/2010 14:50

**Diesel Range Organics (DRO) by GC-FID, method 8015B**

Method Blank							QC Batch ID		
	Result	RL	Control Limit	Units					
Diesel Range Organics (DRO)	ND	7	<3.5	mg/kg			Q49477		
Laboratory Control Sample							QC Batch ID		
	Result	Spike Amount		Units	Recovery %	Recovery Ranges %			
Diesel Range Organics (DRO)	57.7	80		mg/kg	72	55-109	Q49477		
Matrix Spike							QC Batch ID		
Sample ID:	Result	Spike Amount		Units	Recovery %	Recovery Ranges %			
276350 Diesel Range Organics (DRO)	54.2	80		mg/kg	68	50-117	Q49477		
Matrix Spike Duplicate							QC Batch ID		
Sample ID:	Result	Spike Amount		Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	
276350 Diesel Range Organics (DRO)	53.5	80		mg/kg	67	50-117	1	0 - 24	Q49477

#-See Case Narrative

