

AECOM Technical Services of North Carolina, Inc.
701 Corporate Center Drive, Suite 475, Raleigh, North Carolina 27607
T 919.854.6200 F 919.854.6259 www.earthtech.aecom.com

## September 14, 2010

Mr. Ethan Caldwell, LG North Carolina Department of Transportation Geotechnical Engineering Unit 1589 Mail Service Center Raleigh, North Carolina 27699-1589

Reference: Preliminary Site Assessment

Claude Meachum Property (Parcel #21)

146 S. Bragg Blvd.

Spring Lake, Cumberland County, North Carolina

NCDOT Tip No. U-4444B WBS Element 36492.1.2

AECOM Project No. 60158550

#### Dear Mr. Caldwell:

AECOM Technical Services of North Carolina, Inc., (AECOM) has completed the Preliminary Site Assessment conducted at the above-referenced property. The work was performed in accordance with the Technical and Cost proposal dated July 6, 2010, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated July 7, 2010. Activities associated with the assessment consisted of conducting a geophysical investigation, collecting soil samples for laboratory analysis, and reviewing applicable North Carolina Department of Environment and Natural Resources (NCDENR) records. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

### **Location and Description**

The Claude Meachum Property (Parcel #21) is located at 146 S. Bragg Boulevard in Spring Lake, Cumberland County, North Carolina. The property is situated on the west side of Bragg Boulevard and in the north quadrant of the intersection of Bragg Boulevard and Second Street (Figure 1). Based on information supplied by the NCDOT and the site visit, AECOM understands that the site is a former gas station, currently housing Custom Exhaust auto repair, where three underground storage tanks (USTs) reportedly were removed. Two fill ports at the pump island were observed during the site visit. The tenant at the site indicated that the USTs were located on the north side of the building outside the right-of-way. The structures on the site include a block building with an asphalt parking lot in front and a gravel covered used car lot on the south side. A pump island with a large concrete area is located in front of the building (Figure 2). The NCDOT has advised that the proposed right-of-way/easement will affect the parking lot and the former pump island (Figure 2). Because of the location of the pump island,

Mr. Ethan Caldwell September 14, 2010 Page 2

the NCDOT requested a Preliminary Site Assessment. The scope of work as defined in the Request for Technical and Cost Proposal was to evaluate the proposed right-of-way with respect to the presence of known and unknown USTs and assess where contamination may exist on the right-of-way. If present, an estimate of the quantity of impacted soil was to be provided.

AECOM reviewed the on-line NCDENR Incident Management database and no Incident Number has been assigned to the property. AECOM also examined the UST registration database to obtain UST ownership information. According to the database, the USTs on the property are operated under Facility Number 0-024566. The operator and owner of the tanks were listed as follows:

Owner
Elizabeth M. Wade
2900 Stanford
Panama City, FL
No telephone given

Operator Spring Lake Auto Service 146 S. Bragg Blvd. Spring Lake, NC 28390 (919) 497-0368

#### **Geophysical Survey**

Prior to AECOM's mobilization to the site, Pyramid Environmental conducted a geophysical survey as part of this project to evaluate if USTs were present on the right-of-way/easement. The geophysical survey consisted of an electromagnetic survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, specifically USTs. A survey grid was laid out at the property with the Y-axis oriented approximately parallel to Bragg Boulevard and the X-axis oriented approximately perpendicular to Bragg Boulevard. The grid was located to cover the accessible portions of the proposed right-of-way. The survey lines were spaced 5 feet apart. Magnetic data was collected continuously along each survey line with a data logger. After collection, the data was reviewed in the field with graphical computer software. Following the electromagnetic survey, a ground penetrating radar (GPR) survey was conducted where needed to further evaluate any significant metallic anomalies.

Access was available to all areas of the right-of-way and several anomalies were detected with the geophysical survey. All of these anomalies were attributed to buried utility lines or conduits. The survey concluded that no metallic USTs were present on the right-of-way. A detailed report of findings and interpretations is presented in Attachment A.

#### **Site Assessment Activities**

On August 12, 2010, AECOM mobilized to the site to conduct a Geoprobe<sup>®</sup> direct push investigation to evaluate soil conditions within the proposed right-of-way/easement. Continuous sampling using direct push technology (Regional Probing of Wake Forest, North Carolina) resulted in generally good recovery of soil samples from the direct-push holes. Soil samples



Mr. Ethan Caldwell September 14, 2010 Page 3

were collected and contained in acetate sleeves inside the direct push sampler. Each of these sleeves was divided into 2-foot long sections for soil sample screening. Each 2-foot interval was placed in a resealable plastic bag and the bag was set aside for a sufficient amount of time to allow volatilization of organic compounds from the soil to the bag headspace. The probe of a flame ionization detector/photo ionization detector (FID/PID) was inserted into the bag and the reading was recorded. After terminating the sample hole, the soil sample from the depth interval with the highest FID/PID reading was submitted for analysis to SGS North America in Wilmington, North Carolina, using standard chain-of-custody procedures. The laboratory analyzed the soil samples for total petroleum hydrocarbons (TPH) in the diesel range organics (DRO) and gasoline range organics (GRO).

Seven direct-push holes (CM-1 through CM-7) were advanced within the right-of-way to a depth of 10 feet as shown in Figure 2 and Attachment B. Boring CM-1 was located to evaluate the conditions at the north end of the property; borings CM-2 through CM-4 were placed to assess the soil conditions around the pump island and concrete pad; and borings CM-5 through CM-7 were situated to evaluate the used car lot and the south end of the property (Attachment C). The lithology encountered by the direct-push samples generally was consistent throughout the site. The ground surface was covered with about 2 to 3 inches of asphalt or gravel. Below the surface to a depth of 4 to 6 feet was a medium brown, loose, coarse-grained sand. Underlying this material was a medium brown sand/clay. No bedrock was encountered in any of the borings. The "Geologic Map of North Carolina" dated 1985 indicates that the site is underlain by the Middendorf and Cape Fear Formations, each of which consists predominantly of sand and mudstone. The soil observed at the site is consistent with this parent rock. All the borings were terminated at a depth of 10 feet. No groundwater was observed in any of the borings. Based on field screening, soil samples were submitted for laboratory analyses, which are summarized in Table 1. Following completion, each boring was backfilled in accordance with 15A NCAC 2C.

#### **Analytical Results**

Based on the laboratory reports, summarized in Table 1 and presented in Attachment D, no petroleum hydrocarbon compounds identified as DRO and/or GRO were detected in any of the seven soil samples collected from the site on August 12, 2010. Consequently, no concentrations are present above applicable action levels.



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#### **Conclusions and Recommendations**

A Preliminary Site Assessment was conducted to evaluate the Claude Meachum Property (Parcel #21) located at 146 S. Bragg Boulevard in Spring Lake, Cumberland County, North Carolina. A geophysical investigation was conducted to evaluate the site for unknown USTs. The investigation indicated that no metallic USTs were present within the proposed right-of-way. Seven soil borings were advanced to evaluate the soil conditions throughout the proposed right-of-way. The laboratory reports of the soil samples from these borings suggest that no DRO and/or GRO concentrations were present above the action level in any of the four soil samples analyzed.

AECOM appreciates the opportunity to work with the NCDOT on this project. Because no compounds were detected above the method detection limits in the soil samples, no notification is required to the NCDENR. If you have any questions, please contact me at (919) 854-6238.

Muchael W. Branson

Michael W. Branson, P.G.

Project Manager

Attachments

c: Project File





#### TABLE 1

# SOIL FIELD SCREENING AND ANALYTICAL RESULTS CLAUDE MEACHUM PROPERTY (PARCEL #21) SPRING LAKE, CUMBERLAND COUNTY, NORTH CAROLINA NCDOT PROJECT NO. U-4444B WBS ELEMENT 36492.1.2 AECOM PROJECT NO. 60158550

LOCATION	DEPTH (ft)	FID READING	SAMPLE ID	ANALYTICAL	ASSUMED
		(ppm)		RESULTS	ACTION LEVEL
		(FF)		(mg/kg)	(mg/kg)
CM-1	0 - 2	2.67			( )
	2 - 4	3.76	CM-1	DRO (BQL)	10
				GRO (BQL)	10
	4 - 6	2.24			
	6 - 8	2.91			
	8 - 10	3.05			
CM-2	0 - 2	4.08			
	2 - 4	4.06			
	4 - 6	3.53			
	6 - 8	4.22	CM-2	DRO (BQL)	10
				GRO (BQL)	10
	8 - 10	2.81			
CM-3	0 - 2	4.14			
	2 - 4	4.35	CM-3	DRO (BQL)	10
				GRO (BQL)	10
	4 - 6	3.68			
	6 - 8	3.47			
	8 - 10	2.41			
CM-4	0 - 2	2.72			
	2 - 4	3.43			
	4 - 6	2.65			
	6 - 8	3.61	CM-4	DRO (BQL)	10
				GRO (BQL)	10
	8 - 10	2.84			
CM-5	0 - 2	1.95			
	2 - 4	2.02	CM-5	DRO (BQL)	10
				GRO (BQL)	10
	4 - 6	1.63			
	6 - 8	1.06			
	8 - 10	0.85			
CM-6	0 - 2	2.56			
	2 - 4	3.68	CM-6	DRO (BQL)	10
				GRO (BQL)	10
	4 - 6	2.08			
	6 - 8	2.30			
27.5	8 - 10	1.20			
CM-7	0 - 2	2.11			
	2 - 4	2.39			
	4 - 6	2.29	CM	DDO (DOL)	10
	6 - 8	2.76	CM-7	DRO (BQL)	10
	8 - 10	1.89		GRO (BQL)	10
	8 - 10	1.09			

Soil samples were collected on August 12, 2010.

DRO - Diesel range organics.

GRO - Gasoline range organics.

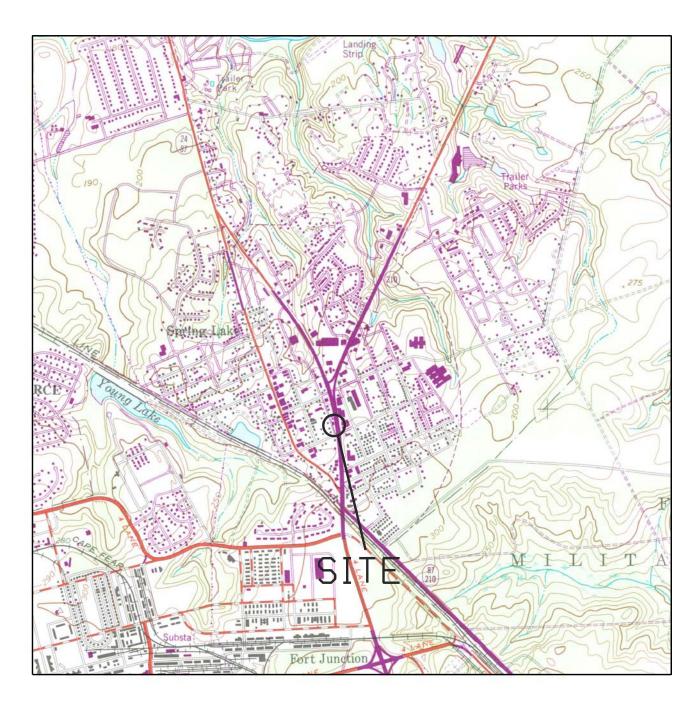
BQL - Below quantitation limit.

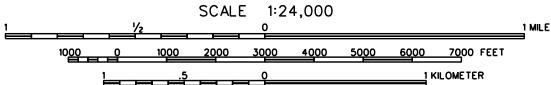
ppm - parts per million.

mg/kg - milligrams per kilogram.









SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: MANCHESTER, NC (REV 1987)



# FIGURE 1

VICINITY MAP

CLAUDE MEACHUM PROPERTY (PARCEL \*21)

SPRING LAKE, CUMBERLAND COUNTY NORTH CAROLINA

AUGUST 2010 60158550

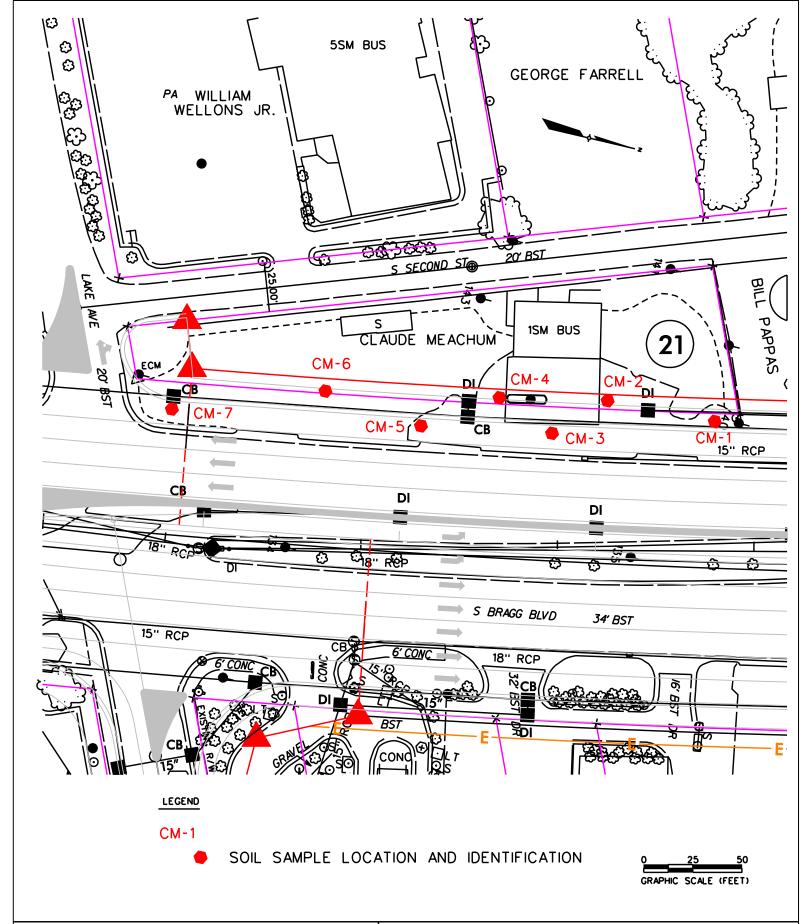




FIGURE 2

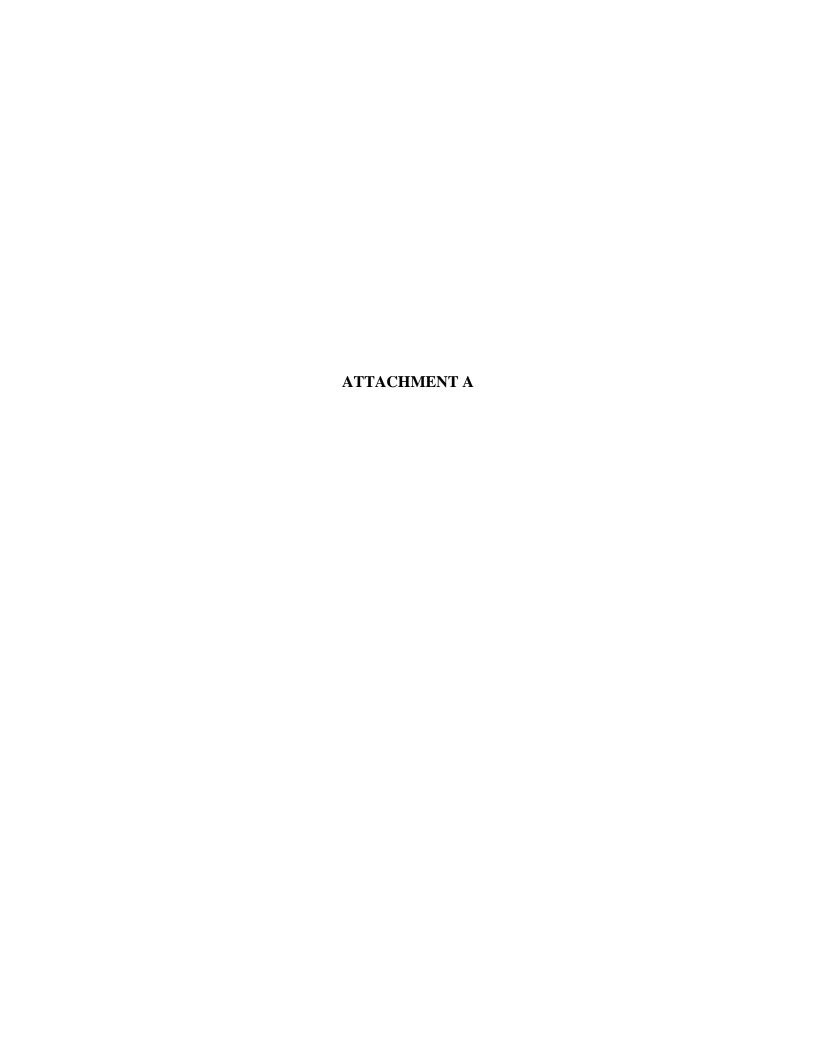
SITE MAP

CLAUDE MEACHUM PROPERTY (PARCEL •21)

SPRING LAKE, CUMBERLAND COUNTY, NORTH CAROLINA

AUGUST 2010

60158550



## GEOPHYSICAL INVESTIGATION REPORT

EM61 & GPR SURVEYS

CLAUDE MEACHUM PROPERTY (PARCEL 21)
South Bragg Boulevard
Spring Lake, North Carolina

August 30, 2010

Report prepared for: Michael W. Branson, PG

**AECOM Environment** 

701 Corporate Center Drive, Suite 475

Raleigh, North Carolina 27607

Mark J. Denil∕. P.G.

Reviewed by:

Douglas Canavello, P.G.

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C. P.O. Box 16265 GREENSBORO, NC 27416-0265 (336) 335-3174

## AECOM Environment GEOPHYSICAL INVESTIGATION REPORT CLAUDE MEACHUM PROPERTY (PARCEL 21) Spring Lake, North Carolina

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## 1.0 INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for AECOM Environmental across the proposed Right-of-Way (ROW) area at the Claude Meachum property (Parcel 21) located along the westerly side of South Bragg Boulevard at the intersection of South Bragg Boulevard and Lake Avenue in Spring Lake, North Carolina. Conducted on July 22 and August 3, 2010, the geophysical investigation was performed as part of the North Carolina Department of Transportation (NCDOT) preliminary site assessment project to determine if unknown, metallic underground storage tanks (USTs) are present beneath the proposed ROW area of the site.

The Claude Meachum property consists of a used car lot business in the southern portion of the site and an active auto repair garage in the northern portion of the property. The proposed ROW area encompasses the portion of property that lies between Bragg Boulevard and the auto repair garage. The proposed ROW area (geophysical survey area) has a maximum length and width of 320 feet and 60 feet, respectively.

AECOM Environment representative Mr. Michael Branson, PG identified the geophysical survey area to Pyramid Environmental personnel and provided site maps showing the boundaries of the proposed survey area prior to conducting the investigation. Photographs of the geophysical equipment used in this investigation and a portion of Parcel 21 are shown in **Figure 1**.

#### 2.0 FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 10-foot by 20-foot survey grid was established across the geophysical survey area (proposed ROW area) using measuring tapes and water-based marking paint. These grid marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection surveys and ground penetrating radar (GPR) surveys. The EM investigation was conducted on July 22, 2010

using a Geonics EM61-MK1 metal detection instrument. According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. All of the EM61 data were digitally collected at approximately 0.8 foot intervals along northerly-southerly, or easterly-westerly, parallel survey lines spaced five feet apart. All of the data were downloaded to a computer and reviewed in the field and office using the Geonics DAT61W and Surfer for Windows Version 7.0 software programs.

GPR surveys were conducted on August 3, 2010 across selected EM61 differential anomalies and steel reinforced concrete using a GSSI SIR-2000 unit equipped with a 400 MHz antenna. Data were digitally collected in a continuous mode along X-axis and/or Y-axis survey lines, spaced 2.5 to 5.0 feet apart using a vertical scan of 512 samples, at a rate of 48 scans per second. A 70 MHz high pass filter and an 800 MHz low pass filter were used during data acquisition with the 400 MHz antenna. GPR data were collected down to a maximum depth of approximately 5 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. All of the GPR data were downloaded to a field computer and reviewed in the field and office using Radprint software.

Contour plots of the EM61 bottom coil and differential results are presented in **Figures 2 and 3**, respectively. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines, small, isolated metal objects, and areas containing insignificant metal debris. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Preliminary contour plots of the EM61 bottom coil and EM61 differential results obtained from the survey area were emailed to Mr. Branson during the week of August 9, 2010.

## 3.0 <u>DISCUSSION OF RESULTS</u>

The linear EM61 bottom coil anomalies intersecting grid coordinates  $X=80 \ Y=276 \ \text{and}\ X=86 \ Y=300$  are probably in response to buried utility lines or conduits. The bottom coil anomalies centered near grid coordinates  $X=55 \ Y=132$ ,  $X=60 \ Y=43$ ,  $X=60 \ Y=92$ , and  $X=66 \ Y=35$  are probably in response to buried, small, miscellaneous metal objects or debris. The bottom coil anomalies centered near grid coordinates  $X=25 \ Y=30$ ,  $X=50 \ Y=35$ ,  $X=65 \ Y=338$ , and  $X=78 \ Y=118$  are probably in response to known surface equipment or objects.

GPR data suggest the high amplitude EM61 differential anomaly centered near grid coordinates X=60 Y=245 is in response to steel reinforced concrete, former pump island-related equipment and buried conduits. The geophysical investigation conducted at the Claude Meachum property suggests the proposed ROW area (surveyed portion of the site) does not contain buried, metallic USTs.

## 4.0 SUMMARY & CONCLUSIONS

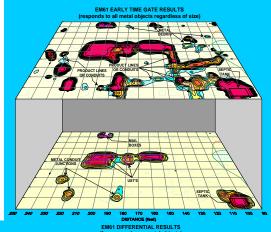
Our evaluation of the EM61 and GPR data collected across the proposed ROW area at the Claude Meachum property (Parcel 21) located along the west side of South Bragg Boulevard in Spring Lake, North Carolina, provides the following summary and conclusions:

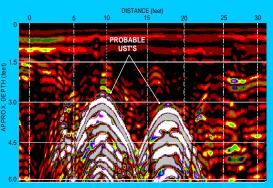
- The EM61 and GPR investigation provided reliable results for the detection of metallic
   USTs within the surveyed portion of the site.
- The linear EM61 bottom coil anomalies intersecting grid coordinates X=80 Y=276 and X=86 Y=300 are probably in response to buried utility lines or conduits. The bottom coil anomalies centered near grid coordinates X=55 Y=132, X=60 Y=43, X=60 Y=92, and X=66 Y=35 are probably in response to buried, small, miscellaneous metal objects or debris.

- GPR data suggest the high amplitude EM61 differential anomaly centered near grid coordinates X=60 Y=245 is in response to steel reinforced concrete, former pump island-related equipment and buried conduits.
- The geophysical investigation suggests the proposed ROW area at Parcel 21 does not contain unknown, metallic USTs.

## 5.0 LIMITATIONS

The geophysical investigation has been performed and this report prepared for AECOM Environmental in accordance with generally accepted guidelines for EM61 surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined that the surveyed portion of the site does not contain unknown, metallic USTs but that none were detected.

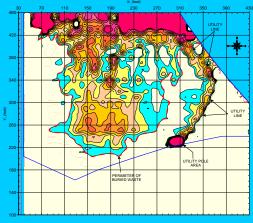


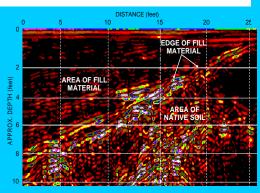


# **FIGURES**

(on the following pages)

Figures shown on this page are for esthetic purposes only and are not related to the geophysical results discussed in this report.







The photograph shows the Geonics EM61 metal detector that was used to conduct the metal detection survey across the proposed ROW area at the Claude Meachum property on July 22, 2010.

The photographs show the SIR-2000 GPR system equipped with a 400 MHz antenna that were used to conduct the ground penetrating radar investigation at the Claude Meachum property on August 3, 2010.



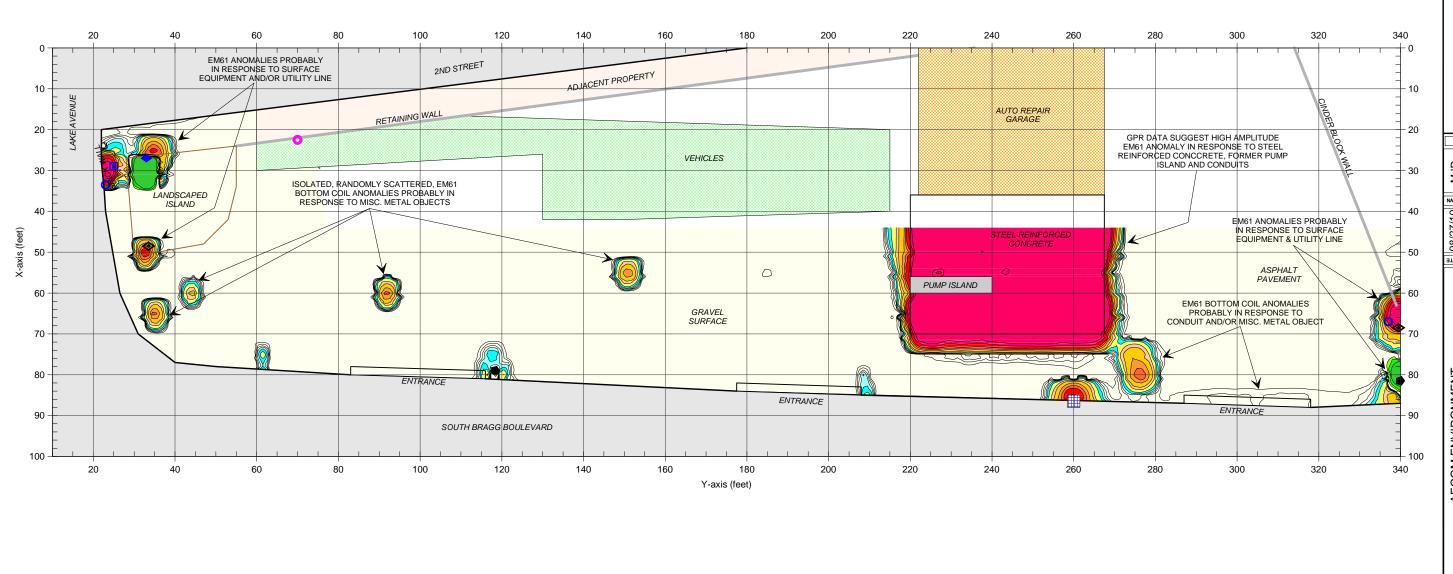


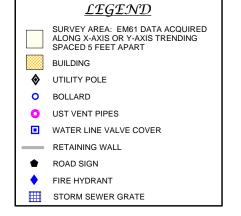
The photograph shows the Claude Meachum property located along the west side of South Bragg Boulevard in Spring Lake, North Carolina. The photograph is viewed in a southwesterly direction.

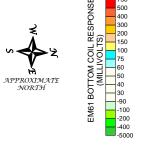


CLIENT	AECOM ENVIRONMENT	B 08/29/10 B MJD									
SITE	CLAUDE MEACHUM PROPERTY (PARCEL 21	) State of the sta									
СПУ	SPRING LAKE	A									
шге	GEOPHYSICAL RESULTS										

GEOPHYSICAL EQUIPMENT & SITE PHOTOGRAPHS





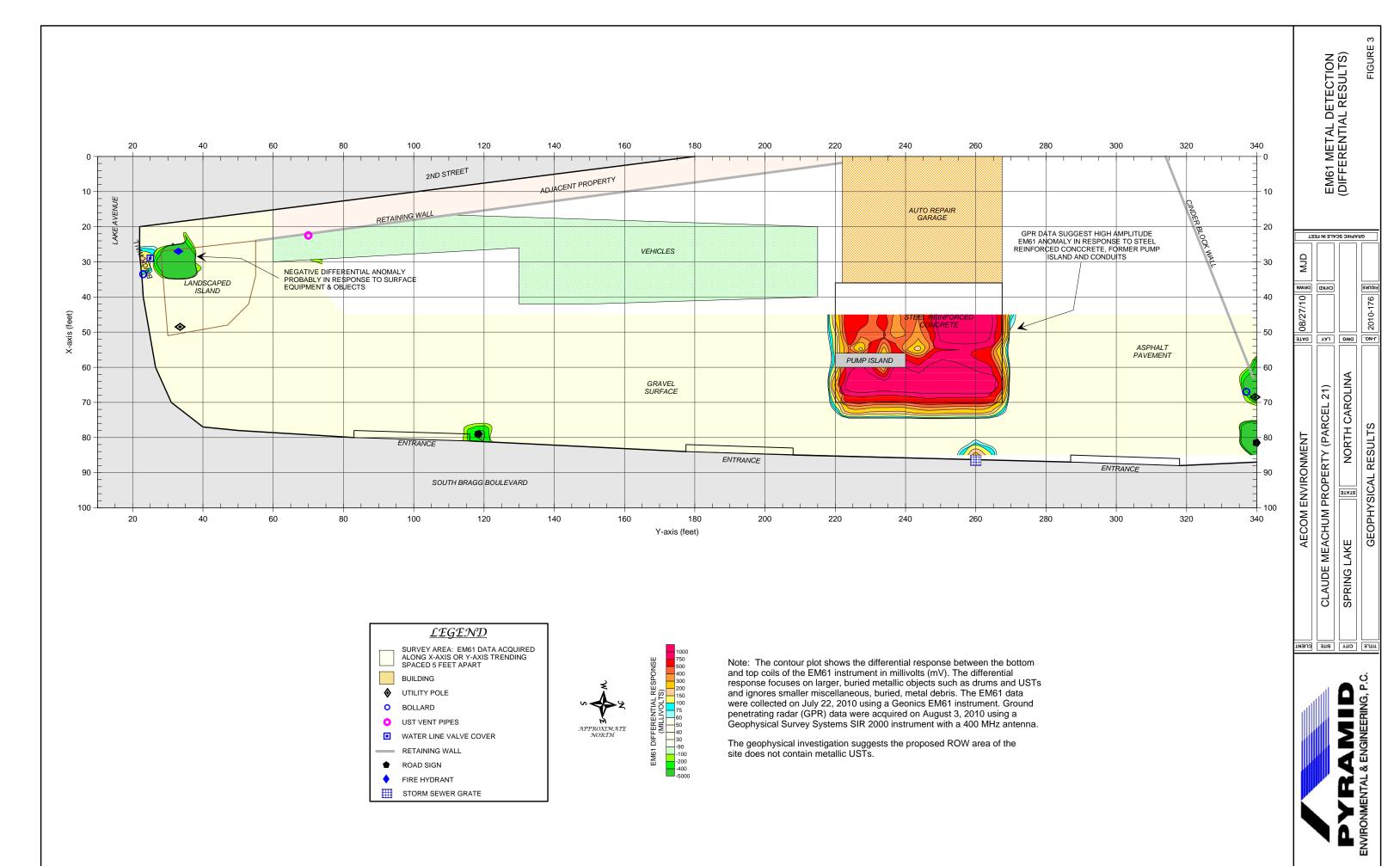


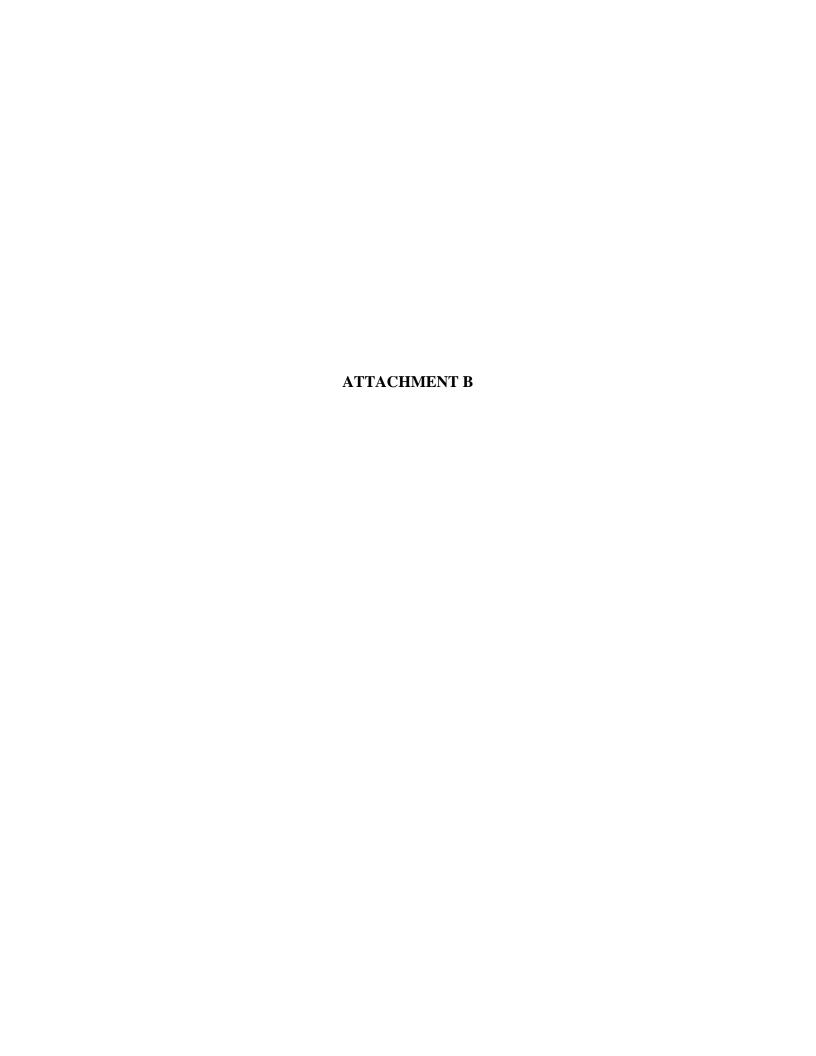
The contour plot shows the bottom coil (most sensitive) response of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The EM metal detection data were collected on July 22, 2010 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were acquired on August 3, 2010 using a Geophysical Survey Systems SIR 2000 instrument with a 400 MHz antenna.

The geophysical investigation suggests the proposed ROW area of the site does not contain metallic USTs.

EM61 METAL DETECTION (BOTTOM COIL RESULTS)

T3:	H IN EE	DS DIHAA	яэ
MJD			
DRWN	сн.кр		FIGURE
08/27/10			2010-176
<b>JTA</b>	YAJ	DMC	J-NO.
AECOM ENVIRONMENT	PERTY (PARCEL 21)	NORTH CAROLINA	GEOPHYSICAL RESULTS
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AECOM EI	CLAUDE MEACHUM PROPERTY (PARCEL 21)	SPRING LAKE	GEOPHYS
ССІЕИТ	SITE	ΥПЭ	ЭЛТІТ





PROJE	CT CLAU	JDE MEAC	HUM PRO	OPERTY (F	PARCEL 21) BORING NUMBER CM-1
CLIEN	T NCDO	Γ			<b>PAGE</b> 1
PROJE	CT NUM	IBER <u>6015</u>	8550 (WE	SS 36492.1.	2) ELEVATION
CONTI	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT C	EOPROBE	,		DRILLER OPPER
					PREPARED BY BRANSON
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			2.67		2" ASPHALT/GRAVEL, MEDIUM BROWN, LOOSE, COARSE-GRAINED SAND, DRY, NO ODOR.
			3.76		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
			2.24		AS ABOVE, DRY, NO ODOR.
5.0			_,_,		
			2.91		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
			3.05		AS ABOVE, DRY, NO ODOR.
10.0					BORING TERMINATED AT 10 FEET. NO GROUNDWATER ENCOUNTERED
15.0					



PROJE	CT CLAU	JDE MEAC	CHUM PRO	OPERTY (F	PARCEL 21) BORING NUMBER CM-2
CLIEN	T NCDO	Γ			<b>PAGE</b> 1
PROJE	ECT NUM	IBER <u>6015</u>	58550 (WE	3S 36492.1.	
CONT	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT C	GEOPROBE	<u> </u>		DRILLER OPPER
					PREPARED BY BRANSON
PEDELL	G) GDVG	DI OWG	07/4	- GAMPA E	
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			4.08		2" ASPHALT/GRAVEL, MEDIUM BROWN, LOOSE, COARSE-GRAINED
					SAND, DRY, NO ODOR.
			4.06		AS ABOVE, DRY, NO ODOR.
			3.53		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
5.0					
			4.22		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
					ANALISIS.
			2.81		AS ABOVE, DRY, NO ODOR.
10.0					
					BORING TERMINATED AT 10 FEET. NO GROUNDWATER ENCOUNTERED
					ENCOCITERED
15.0					
15.0		1			



PROJE	CT CLAU	JDE MEAC	HUM PRO	OPERTY (P	ARCEL 21) BORING NUMBER CM-3
CLIEN	T NCDOT	Γ			<b>PAGE</b> 1
PROJE	CT NUM	BER 6015	8550 (WB	S 36492.1.	ELEVATION
CONTI	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT G	EOPROBE			DRILLER OPPER
					PREPARED BY BRANSON
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			4.14		2" A SPHALT/GRAVEL MEDIUM BROWN LOOSE COARSE-GRAINED

DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			4.14		2" ASPHALT/GRAVEL, MEDIUM BROWN, LOOSE, COARSE-GRAINED SAND, DRY, NO ODOR.
			4.35		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
5.0			3.68		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
			3.47		AS ABOVE, DRY, NO ODOR.
			2.41		AS ABOVE, DRY, NO ODOR.
10.0					BORING TERMINATED AT 10 FEET. NO GROUNDWATER ENCOUNTERED
450					
15.0					
20.0					



PROJE	CT CLAU	JDE MEAC	HUM PRO	OPERTY (F	PARCEL 21) BORING NUMBER CM-4
CLIEN	T NCDO	Γ			PAGE 1
PROJE	ECT NUM	IBER <u>6015</u>	58550 (WE	SS 36492.1.	
CONT	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT C	GEOPROBE	<u> </u>		DRILLER OPPER
					PREPARED BY BRANSON
DEBEH	CASING	DI OWE	OVA	L CAMPIE	
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	(ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			2.72		2" ASPHALT/GRAVEL, MEDIUM BROWN, LOOSE, COARSE-GRAINED
					SAND, DRY, NO ODOR.
			3.43		AS ABOVE, DRY, NO ODOR.
			2.65		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
5.0					
			3.61		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
					ANALISIS.
			2.04		
			2.84		AS ABOVE, DRY, NO ODOR.
10.0					DODING TED MALATED AT 10 FFFT. NO GROUNDWATER
					BORING TERMINATED AT 10 FEET. NO GROUNDWATER ENCOUNTERED
15.0					
15.0					



PROJE	CT CLAU	JDE MEAC	HUM PRO	OPERTY (F	PARCEL 21) BORING NUMBER CM-5
CLIEN	T NCDO	Γ			<b>PAGE</b> 1
PROJE	CT NUM	IBER <u>6015</u>	58550 (WB	S 36492.1.	
CONTI	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT C	GEOPROBE			DRILLER OPPER
					PREPARED BY BRANSON
	7	1			
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			1.95		MEDIUM BROWN, LOOSE, COARSE-GRAINED SAND, DRY, NO ODOR.
			2.02		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR
					ANALYSIS.
			1.63		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
5.0					
			1.06		AS ABOVE, DRY, NO ODOR.
			0.85		AS ABOVE, DRY, NO ODOR.
10.0					
					BORING TERMINATED AT 10 FEET. NO GROUNDWATER
					ENCOUNTERED
15.0					
Ī	I			I	



PROJE	CT CLAU	JDE MEAC	HUM PRO	PERTY (P	PARCEL 21) BORING NUMBER CM-6
CLIEN	T NCDO	Γ			PAGE 1
PROJE	CT NUM	IBER <u>6015</u>	58550 (WB	S 36492.1.	
CONTI	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT C	GEOPROBE			DRILLER OPPER
					PREPARED BY BRANSON
		T			
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			2.56		MEDIUM BROWN, LOOSE, COARSE-GRAINED SAND, DRY, NO ODOR.
			3.68		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR ANALYSIS.
					ANAL 1 SIS.
			2.08		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
5.0					
			2.20		
			2.30		AS ABOVE, DRY, NO ODOR.
			1.20		AG ADOVE DRY NO ODOD
			1.20		AS ABOVE, DRY, NO ODOR.
10.0					BORING TERMINATED AT 10 FEET. NO GROUNDWATER
					ENCOUNTERED
15.0					



PROJE	CT CLAU	JDE MEAC	HUM PRO	OPERTY (P	PARCEL 21) BORING NUMBER CM-7
CLIEN	T NCDOT	ſ			PAGE 1
PROJE	CT NUM	BER 6015	58550 (WB	S 36492.1.	2) ELEVATION
CONTI	RACTOR	REGIONA	AL PROBI	NG	<b>DATE</b> 8/12/2010
EQUIP	MENT G	EOPROBE	1		DRILLER OPPER
					PREPARED BY BRANSON
DEPTH IN FEET	CASING BLOWS FOOT	BLOWS PER 6 INCHES	OVA (ppm)	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
			2.11		MEDIUM BROWN, LOOSE, COARSE-GRAINED SAND, DRY, NO ODOR.
			2.11		
			2.39		AS ABOVE, DRY, NO ODOR.
			2.29		MEDIUM BROWN SAND/CLAY, STIFF, DRY, NO ODOR.
5.0			2.2)		
			2.76		AS ABOVE, DRY, NO ODOR. SUBMIT TO LABORATORY FOR
					ANALYSIS.
			1.89		AS ABOVE DRY NO ODOR
			1.07		AS ABOVE, DRY, NO ODOR.
10.0					DODING TED MALTED AT 10 FEET, NO CD OVINDWATED
					BORING TERMINATED AT 10 FEET. NO GROUNDWATER ENCOUNTERED
					ENCOCIVIENCE
4					
15.0					



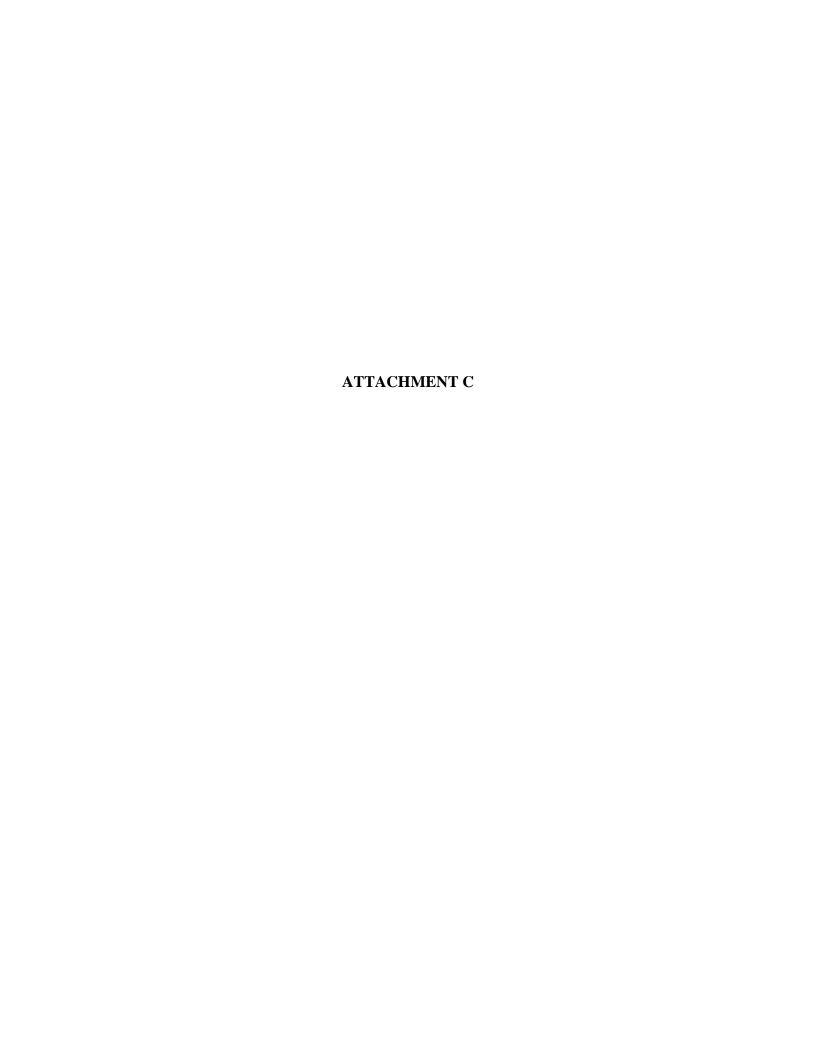




PHOTO 1 - BORING IN PROPOSED R/W LOOKING SOUTH



PHOTO 2 - BORING IN PROPOSED R/W LOOKING WEST



PHOTO 3 - BORINGS WITHIN PROPOSED R/W LOOKING NORTH



PHOTO 4 - BORING WITHIN PROPOSED R/W LOOKING WEST



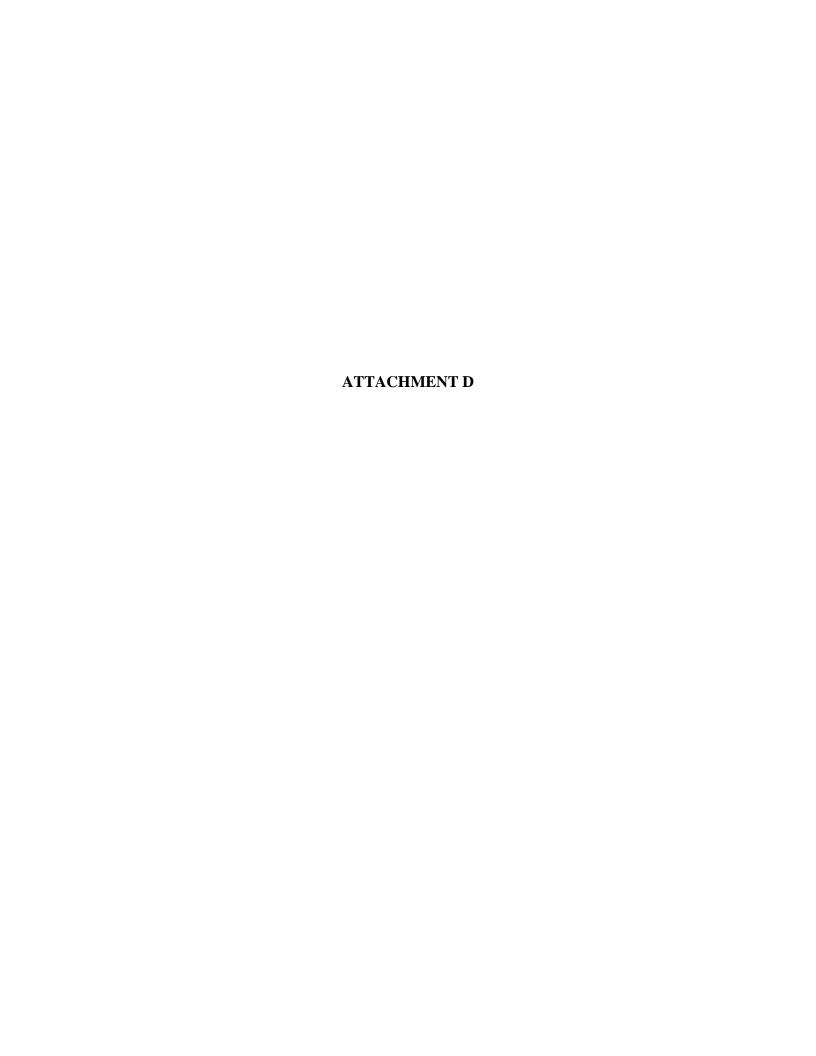
PHOTO 5 - BORING WITHIN PROPOSED R/W LOOKING SOUTHWEST



PHOTO 6 - BORING WITHIN PROPOSED R/W LOOKING NORTH



PHOTO 7 - BORING WITHIN PROPOSED R/W LOOKING WEST





Mike Branson AECOM 701 Corporate Center Drive Suite 475 Raleigh, NC 27607

Report Number:

G1037-104

Client Project:

NCDOT

Dear Mike Branson,

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 Barbara Hager 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.

Barbara Hager

# List of Reporting Abbreviations And Data Qualifiers

B = Compound also detected in batch blank

BQL = Below Quantification 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

UJ = Target analytes with recoveries that are 10% < R < LCL; # of MEs are allowable and compounds are not detected in the sample.

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.

## Results for Total Petroleum Hydrocarbons by GC/FID 8015

Client Sample ID: CM-1

Client Project ID: NCDOT

Lab Sample ID: G1037-104-1A

Lab Project ID: G1037-104

Report Basis: Dry Weight

Analyzed By: LMC

Date Collected: 8/12/2010 7:40

Date Received: 8/13/2010

Matrix: Soil

Solids 96.01

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.63		mg/Kg	1	08/19/10 09:04
Surrogate Spike Results		•				
BFB		Added 100	Result 94.4	Recovery 94.4	Flag	<b>Limits</b> 70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081810 Analytical Method: 8015

Instrument ID: GC4

Analyst: LMC

Prep Method: 5035

Initial Wt/Vol: 5.55 g Final Volume: 5 mL

Analyst: \_\_\_\_\_\_\_

Reviewed By:

Client Sample ID: CM-2 Analyzed By: LMC

Client Project ID: NCDOT

Lab Sample ID: G1037-104-2A

Lab Project ID: G1037-104

Matrix: Soil

Report Basis: Dry Weight Solids 89.99

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.11		mg/Kg	1	08/19/10 09:31
Surrogate Spike Results		Added	Result	Pagayanı	Flag	Limits
BFB		100	95.1	Recovery 95.1	riag	70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081810 Prep Method: 5035
Analytical Method: 8015 Initial Wt/Vol: 6.53 g
Instrument ID: GC4 Final Volume: 5 mL

Analyst: LMC

Analyst: \_\_\_\_\_\_\_

Reviewed By: ARO,XLS

Client Sample ID: CM-3

Client Project ID: NCDOT

Lab Sample ID: G1037-104-3A

Lab Project ID: G1037-104

Report Basis: Dry Weight

Analyzed By: LMC

Date Collected: 8/12/2010 8:15

Date Received: 8/13/2010

Matrix: Soil

Solids 96.72

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.66		mg/Kg	1	08/19/10 09:58
Surrogate Spike Results						
BFB		<b>Added</b> 100	Result 96.2	Recovery 96.2	Flag	<b>Limits</b> 70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081810 Analytical Method: 8015

Instrument ID: GC4

Analyst: LMC

Prep Method: 5035

Initial Wt/Vol: 5.48 g Final Volume: 5 mL

Analyst: 11MC

Reviewed By: GRO.XLS

Client Sample ID: CM-4

Client Project ID: NCDOT

Lab Sample ID: G1037-104-4A

Lab Project ID: G1037-104 Report Basis: Dry Weight Analyzed By: LMC

Date Collected: 8/12/2010 8:30

Date Received: 8/13/2010

Matrix: Soil

Solids 86.95

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	4.87		mg/Kg	1	08/19/10 16:58
Surrogate Spike Results				_		
BFB		Added 100	Result 94.9	Recovery 94.9	Flag	<b>Limits</b> 70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081910 Analytical Method: 8015

Instrument ID: GC4

Analyst: LMC

Prep Method: 5035 Initial Wt/Vol: 7.08 g

Final Volume: 5 mL

Analyst: \_\_\_\_\_

Reviewed By: GRO.XLS

Client Sample ID: CM-5

Client Project ID: NCDOT

Lab Sample ID: G1037-104-5A

Lab Project ID: G1037-104

Report Basis: Dry Weight

Analyzed By: LMC

Date Collected: 8/12/2010 8:45

Date Received: 8/13/2010

Matrix: Soil

Solids 95.45

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.09		mg/Kg	1	08/19/10 17:25
Surrogate Spike Results						
BFB		Added 100	Result 94.6	Recovery 94.6	Flag	<b>Limits</b> 70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081910 Analytical Method: 8015

Instrument ID: GC4

Analyst: LMC

Prep Method: 5035 Initial Wt/Vol: 6.18 g

Final Volume: 5 mL

Analyst:

Reviewed By:

Client Sample ID: CM-6

Client Project ID: NCDOT

Lab Sample ID: G1037-104-6A

Lab Project ID: G1037-104

Report Basis: Dry Weight

Analyzed By: LMC

Date Collected: 8/12/2010 9:00

Date Received: 8/13/2010

Matrix: Soil

Solids 93.08

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.32		mg/Kg	1	08/19/10 17:52
Surrogate Spike Results						
BFB		Added 100	Result 95.4	Recovery 95.4	Flag	<b>Limits</b> 70-130
Comments:						

#### **Batch Information**

Analytical Batch: VP081910

Analytical Method: 8015 Instrument ID: GC4

Analyst: LMC

Prep Method: 5035

Initial Wt/Vol: 6.06 g Final Volume: 5 mL

Analyst: \_\_\_\_\_

Reviewed By:

Client Sample ID: CM-7

Client Project ID: NCDOT

Lab Sample ID: G1037-104-7A

Lab Project ID: G1037-104

Report Basis: Dry Weight

Analyzed By: LMC

Date Collected: 8/12/2010 9:15

Date Received: 8/13/2010

Matrix: Soil

Solids 89.21

Analyte	Result	RL		Units	Dilution Factor	Date Analyzed
Gasoline Range Organics	BQL	5.25		mg/Kg	1	08/19/10 18:19
Surrogate Spike Results						
BFB		Added 100	Result 97.7	<b>Recovery</b> 97.7	Flag	<b>Limits</b> 70-130

#### Comments:

#### **Batch Information**

Analytical Batch: VP081910 Analytical Method: 8015

Instrument ID: GC4
Analyst: LMC

Prep Method: 5035 Initial Wt/Vol: 6.41 g

Final Volume: 5 mL

Analyst: \_\_\_\_\_\_

Reviewed By:

Client Sample ID: CM-1
Client Project ID: NCDOT

Lab Sample ID: G1037-104-1D Lab Project ID: G1037-104 Date Collected: 8/12/2010 7:40

Date Received: 8/13/2010

Matrix: Soil Solids 96.01

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.44	mg/Kg	1	08/18/10 05:15
Surrogate Spike Results		Spike Added	Control Limits	Spike Result	Percent Recovery
OTP		40	40-140	29.9	74.8

#### **Comments:**

#### **Batch Information**

Analytical Batch: EP081710 Analytical Method: 8015 Instrument: GC6

Analyst: DTF

Prep batch: 17210 Prep Method: 3541 Prep Date: 08/16/10 Initial Prep Wt/Vol: 32.33 G Prep Final Vol: 10 mL

1 Reviewed By: DROXLS

Client Sample ID: CM-2
Client Project ID: NCDOT

Lab Sample ID: G1037-104-2D Lab Project ID: G1037-104 Date Collected: 8/12/2010 8:00

Date Received: 8/13/2010

Matrix: Soil Solids 89.99

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.54	mg/Kg	1	08/18/10 05:44
Surrogate Spike Results		Spike Added	Control Limits	Spike Result	Percent Recovery
OTP		40	40-140	28.6	71.6

#### Comments:

#### **Batch Information**

Analytical Batch: EP081710 Analytical Method: 8015 Instrument: GC6

Analyst: DTF

Prep batch: 17210 Prep Method: 3541 Prep Date: 08/16/10 Initial Prep Wt/Vol: 33.99 G

Prep Final Vol: 10 mL

Analyst: FA

Reviewed By: DRO.XLS

Client Sample ID: CM-3
Client Project ID: NCDOT

Lab Sample ID: G1037-104-3D Lab Project ID: G1037-104 Date Collected: 8/12/2010 8:15

Date Received: 8/13/2010

Matrix: Soil Solids 96.72

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.31	mg/Kg	1	08/18/10 16:54
Surrogate Spike Results		Spike Added	Control Limits	Spike Result	Percent
OTP		40	40-140	31.4	Recovery 78.4

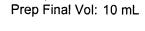
#### Comments:

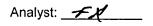
#### **Batch Information**

Analytical Batch: EP081810 Analytical Method: 8015

Instrument: GC6
Analyst: DTF

Prep batch: 17210 Prep Method: 3541 Prep Date: 08/16/10 Initial Prep Wt/Vol: 32.79 G







Client Sample ID: CM-4 Client Project ID: NCDOT

Lab Sample ID: G1037-104-4D Lab Project ID: G1037-104

Date Collected: 8/12/2010 8:30

Date Received: 8/13/2010

Matrix: Soil Solids 86.95

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.97	mg/Kg	1	08/18/10 17:23
Surrogate Spike Results		Spike Added	Control Limits	Spike Result	Percent Recovery
OTP		40	40-140	29.8	74.5

#### Comments:

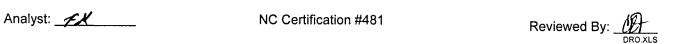
#### **Batch Information**

Analytical Batch: EP081810 Analytical Method: 8015 Instrument: GC6

Analyst: DTF

Prep batch: 17210 Prep Method: 3541 Prep Date: 08/16/10 Initial Prep Wt/Vol: 33.02 G

Prep Final Vol: 10 mL



Client Sample ID: CM-5 Client Project ID: NCDOT

Lab Sample ID: G1037-104-5D Lab Project ID: G1037-104

Date Collected: 8/12/2010 8:45

Date Received: 8/13/2010

Matrix: Soil Solids 95.45

Report Basis: Dry Weight

Parameter	Resuit	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.33	mg/Kg	1	08/18/10 17:51
Surrogate Spike Results OTP		Spike Added 40	Control Limits 40-140	Spike Result 32	Percent Recovery 80

#### Comments:

#### **Batch Information**

Analytical Batch: EP081810 Analytical Method: 8015

Instrument: GC6

Analyst: DTF

Prep batch: 17210 Prep Method: 3541

Prep Date: 08/16/10 Initial Prep Wt/Vol: 33.08 G Prep Final Vol: 10 mL

Analyst: FX

Client Sample ID: CM-6 Date Collected: 8/12/2010 9:00
Client Project ID: NCDOT Date Received: 8/13/2010

Lab Sample ID: G1037-104-6D Matrix: Soil
Lab Project ID: G1037-104 Solids 93.08

Penert Pagin: Dry Weigh

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.70	mg/Kg	1	08/19/10 01:49
Surrogate Spike Results		Spike Added	Control Limits	Spike Result	Percent Recovery
OTP		40	40-140	31.3	78.3

#### Comments:

#### **Batch Information**

Analytical Batch: EP081810 Prep batch: 17217

Analytical Method: 8015 Prep Method: 3541

Instrument: GC6 Prep Date: 08/16/10

Analyst: DTF Initial Prep Wt/Vol: 32.06 G

Prep Final Vol: 10 mL

Analyst: NC Certification #481 Reviewed By: DRO.XI

Client Sample ID: CM-7
Client Project ID: NCDOT

Lab Sample ID: G1037-104-7D Lab Project ID: G1037-104 Date Collected: 8/12/2010 9:15

Date Received: 8/13/2010

Matrix: Soil Solids 89.21

Report Basis: Dry Weight

Parameter	Result	RL	Units	Dilution Factor	Date Analyzed
Diesel Range Organics	BQL	6.51	mg/Kg	1	08/19/10 02:18
Surrogate Spike Results OTP		Spike Added 40	Control Limits 40-140	Spike Result 22.5	Percent Recovery 56.3

#### Comments:

#### **Batch Information**

Analytical Batch: EP081810 Analytical Method: 8015 Instrument: GC6

Analyst: DTF

Prep batch: 17217 Prep Method: 3541 Prep Date: 08/16/10 Initial Prep Wt/Vol: 34.43 G Prep Final Vol: 10 mL

Reviewed By: DRO.XLS

Analyst: FX



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

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ABSENT Samples Received Cold? (Circle YES) NO REMARKS Я Chain of Custody Seal: (Circle) BROKEN Temperature  $c_2 > 9$ **X**STD PAGE INTACT Special Deliverable Requirements: Shipping Carrier: Cou Rist Requested Turnaround Time: Shipping Ticket No: Special Instructions: Preservatives N.C. ☐RUSH. SGS Reference: Analysis Required (e) SAMPLE TYPE COMP GRAB J U 0 ишα 3  $\omega$ 3 3 3 M 3 Solt Soir 5010 MATRIX 5010 5012 5017 5016 36492.12 Mark Received By: MIKE BLANSCH PHONE NO. 9 PSY 628 Received By: SITE/PWSID#: Me Acion Received By: Received By 22.50 0830 07.60 FAX NO.: 914 ) 8546259 080 08/5 TIME 0900 5369 P.O. NUMBER:  $\omega_{BS}$ 8/12/10 Sticke 8/12/10 8/12/10 8/15/10 8/12/10 8/12/10/1310 DATE 01:210/12/18 Time Time Time QUOTE #: Date Date SAMPLE IDENTIFICATION Cm-6 CM-2 Cm-4 S-WJ CM-3 ローとし Cm-1 Collected/Reinquished By:(1) NOON CLIENT: AECOM REPORTS TO: AS OVE INVOICE TO: NCDOT hause Relinquished By: (2) Relinquished By: (3) Relinquished By: (4) CONTACT: PROJECT: LAB NO.

White - Retained by Lab Pink - Retained by Client

<sup>□ 200</sup> W. Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561∕**-65**01 □ 5500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557