# PRELIMINARY SITE ASSESSMENT FOR

# PARCEL #004, LEIBURN R. STRICKLAND PROPERTY STATE PROJECT: R-2303B WBS ELEMENT: 34416.1.1

NC 24 FROM SR 1853 (JOHN NUNNERY RD.) IN CUMBERLAND COUNTY TO SR 1404 (DOWDY RD.) IN SAMPSON COUNTY

## PREPARED FOR:



# NCDOT GEOTECHNICAL ENGINEERING UNIT GEOENVIRONMENTAL SECTION 1589 MSC RALEIGH, NORTH CAROLINA 27699-1589

**JULY 26, 2011** 

## PREPARED BY:

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**CATLIN PROJECT NO. 211043** 

CORPORATE GEOLOGY LICENSE CERTIFICATION NO. C-118
CORPORATE LICENSURE NO. FOR ENGINEERING SERVICES C-0585

# **TABLE OF CONTENTS**

		<u>Page</u>
1.0	PURPOSE OF INVESTIGATION AND DESCRIPTION	1
2.0	METHODS	2
	2.1 FIELD METHODS	3
	2.2 LABORATORY TESTING	4
3.0	RESULTS	4
4.0	SUMMARY AND RECOMMENDATIONS	6
5.0	LIMITATIONS	7
6.0	SIGNATURES	8

# **TABLES**

TABLE 1 SUMMARY OF SOIL LABORATORY RESULTS – EPA METHOD 8015 – PARCEL #004, LEIBURN R. STRICKLAND PROPERTY

# **FIGURES**

FIGURE 1 GENERAL LOCATION

FIGURE 2 PARCEL #004, LEIBURN R. STRICKLAND PROPERTY

## **APPENDICES**

APPENDIX A	BORING LOGS
APPENDIX B	LABORATORY REPORT AND CHAIN OF CUSTODY RECORD
APPENDIX C	SCHNABEL GEOPHYSICAL REPORT
APPENDIX D	NCDENR UST FILE REVIEW INFORMATION

# Preliminary Site Assessment for Parcel #004, Leiburn R. Strickland Property

State Project: R-2303B
WBS Element: 34416.1.1
NC 24 from SR 1853 (John Nunnery Rd.) in Cumberland County
to SR 1404 (Dowdy Rd.) in Sampson County

July 26, 2011

## 1.0 PURPOSE OF INVESTIGATION AND DESCRIPTION

CATLIN Engineers and Scientists (CATLIN) were retained by the North Carolina Department of Transportation (NCDOT) Geotechnical Engineering Unit to provide a field investigation concluding with a Preliminary Site Assessment (PSA) for the above referenced property. In response to a Request for Technical and Cost Proposal (RFP) dated May 10, 2011 and discussions with NCDOT GeoEnvironmental Project Manager Mr. Terry Fox, LG, CATLIN submitted a proposal for conducting an investigation at five (5) parcels near Stedman and Autryville, North Carolina. Notice to Proceed was received from NCDOT in correspondence dated May 27, 2011.

Acquisition of the right-of-way is necessary for NC 24 roadway construction (above referenced State Project R-2303B) and specifically at the above referenced parcel. A site investigation is necessary to determine the presence of underground storage tanks (USTs) and/or contaminated soil in the proposed right-of-way and/or easement. Figure 1 illustrates the State Project location.

This report documents our activities and findings at Parcel #004 Leiburn R. Strickland Property. The site is illustrated on Figure 2. The following specific parcel information was provided by NCDOT:

# Parcel #004 Harold R. Draughon Property

Plan Sheet 05 Strickland Marathon 9007 Clinton Rd. Stedman, NC 28391

Property Owner: Strickland, Leiburn R. 2354 Cedar Creek Rd. Fayetteville, NC 28312

# Parcel #004 Harold R. Draughon Property (continued)

Facility ID #: 0-036802 Stricklands Inc.

> 2354 Cedar Creek Rd. Favetteville, NC 28312

**Responsible Party:** 

**UST Owner:** 

Groundwater Incident: 29271 Cary Oil Company

PO Box 5189 Cary, NC 27511

Currently this site operates as a gas station. The site is located on the north side of NC 24 (Clinton Rd.) at its intersection with John Nunnery Rd. There are two (2) USTs currently in operation. Several monitoring wells were observed on site. The site is illustrated on Figure 2.

The work scope as requested includes:

- Locate all USTs and determine approximate size and contents (if any).
- Determine if contaminated soils are present.
- If contamination is evident, estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map.
- Provide a Microstation file with the location of USTs, soil contamination and monitoring wells.
- Prepare a report including field activities, findings, and recommendations for each site in triplicate and electronically to the NCDOT GeoEnvironmental Section.

In addition to the RFP, NCDOT provided plan sheets associated with the CATLIN and NCDOT personnel agreed to roadway construction. approximate proposed boring and sample locations (10 within the right-of-way and/or easement for soil sample collection and total petroleum hydrocarbons (TPH) diesel and gasoline range organics (DRO and GRO) laboratory analysis.

#### 2.0 **METHODS**

Approximate proposed borings were discussed with NCDOT personnel before final Workplan submittal. Per NCDOT request, borings (soil samples) were located near known or suspect UST systems and proposed drainage features (as indicated on NCDOT provided plan sheets). A NCDENR UST file review was conducted at the NCDENR Fayetteville Regional Office.

CATLIN coordinated geophysical activities concurrently with soil boring and The geophysical investigation methods are detailed in the Schnable Engineering report provided in Appendix C. Final boring/sample

locations were determined based on proposed drainage feature locations, geophysical results, and field observations. CATLIN's field activities concluded on June 24, 2011.

## 2.1 FIELD METHODS

All field work was conducted in general accordance with state and federal guidelines and industry standards.

Underground utility locating was coordinated by CATLIN personnel. The North Carolina One Call Center (NC-1-Call) was contacted for underground utility location. Proposed boring locations were marked before NC-1-Call personnel were on-site. The areas around the proposed boring locations were checked and found to be clear of any underground utilities or alternate locations were indicated by NC-1-Call personnel.

CATLIN personnel gathered subsurface soil data at the site by Direct Push Technology (DPT) boring advancement using an AMS PowerProbe<sup>TM</sup> 9600D (PowerProbe). The borings were advanced to depth by static force and a 90-pound hydraulic percussion hammer. Two and one-quarter inch diameter by four-foot length steel is used as casing. Soil samples were continuously collected in four-foot long and one and one-half inch diameter clear liners. Liners are removed from the casing and then cut in half longitudinally to allow for visual/manual classification utilizing the Unified Soil Classification System (USCS).

Borings were identified by the parcel number (as indicated by NCDOT) followed by "DPT" and consecutive numbers starting with "01" at each parcel (example: 4-DPT-01). Soil samples were collected continuously from near the surface to boring termination. Soils were removed from the liners in two-foot intervals and placed in sealable polyethylene bags for organic vapor analysis (OVA) headspace screening utilizing a photo ionization detector (PID). The USCS, OVA/PID reading, and any indication of petroleum impact were recorded on field logs and have been transferred to the Boring Logs provided in Appendix A.

Soil samples were collected for laboratory analysis above the water table using roughly a one-foot interval of the two-foot sample revealing the highest OVA/PID reading. Sample identification was based on the boring identification followed by sample depth (in feet) below land surface (BLS) in parentheses [example: 4-DPT-01 (2-3')]. In some cases of elevated OVA/PID readings, additional borings were advanced for soil sample collection in an attempt to delineate suspected soil contamination.

Due to unknown locations of private utilities in the area of the orphan UST, a post-hole digger was utilized to collect a soil sample (4-DPT-13 (3-5').

New disposable nitrile gloves were worn during sampling activities. All samples were placed into laboratory provided glassware and packed on ice in an insulated cooler for transportation to the laboratory. Sample integrity was maintained by following proper Chain of Custody procedures. A copy of the Chain of Custody is provided following the analytical report in Appendix B.

Boreholes were abandoned to just below the surface using threeeighth inch bentonite chips. Bentonite and water were poured into the borehole simultaneously to facilitate hydration. Borings located in asphalt or gravel were topped with asphalt cold patch. Final borehole and sample locations were surveyed utilizing a Trimble<sup>®</sup> GPS survey instrument.

Thirteen (13) borings were advanced for soil sample collection and one sample was collected from each boring for laboratory analysis. Borings were advanced near the suspected UST, dispenser, and near the proposed drainage features across the property and northern portion of the property. Boring/sample locations are illustrated on Figure 2. Boring and sample collection was limited around the probable UST locations due to the presence private utilities not marked by the NC-One-Call service. Utilities and the proximity of John Nunnery Road limited boring and sampling to the west.

## 2.2 LABORATORY TESTING

Following boring advancement, selected soils were placed in the appropriately labeled glassware. In an attempt to provide information regarding petroleum impact to soils and groundwater with reasonable analytical expense, soil samples were analyzed for TPH DRO and GRO by Environmental Protection Agency (EPA) Methods 5030 and 3550 with analysis by modified 8015.

A total of 13 soil samples were submitted to SGS North America Inc. (NC Certification # 481). Chain of Custody documentation is included in Appendix B.

## 3.0 RESULTS

In the event a cut is required for roadway construction or utility installation, any soil samples revealing detectable TPH concentrations will be considered

petroleum impacted for handling and disposal purposes. The complete laboratory analytical reports are provided in Appendix B. Results of Schnabel's geophysical investigation including site photographs were submitted directly to NCDOT and a copy is provided in Appendix C. Schnabel's investigation results will be generally discussed in the following section. Copies of select documents from the NCDENR UST file review are provided in Appendix D.

The geophysical data indicated the presence of two (2) known (and active) USTs and two probable USTs. The western known UST is about 4,000-gallon capacity and is buried about 3.0 to 4.0 feet BLS. The eastern known UST is about 10,000-gallon capacity and is buried about 3.0 to 4.0 feet BLS. The southern probable UST is about 560-gallon capacity and is buried 1.5 to 2.5 feet BLS. The northern probable UST is about 1,500-gallon capacity and is buried 1.5 to 2.5 feet BLS. No other geophysical anomalies indicative of a potential UST were revealed. The UST locations and active dispenser canopy location are illustrated on Figure 2. Photographs of the site including the known UST locations are included in the geophysical report provided in Appendix C. Numerous monitoring wells were identified on site and the locations are illustrated on Figure 2 and figures provided in Appendix D.

According to information on file with NCDENR, the two (2) known USTs were installed in 2006 following removal of previous USTs. Soil and groundwater contamination were revealed during UST closure/removal activities and assessment/monitoring activities are on-going at the site. Historical water table information indicated a depth to water of approximately six (6) feet BLS. Nine (9) monitoring wells are illustrated on figures provided in Appendix D and were identified in the field.

Based on review of the dissolved contaminant isoconcentration plume figures provided in Appendix D, the highest groundwater contaminant concentrations are near the active dispenser canopy. A groundwater contour flow map indicates groundwater flow to the north (see Appendix D).

Borings 4-DPT-01 and 4-DPT-02 were terminated at eight (8) feet BLS. Depth to water was measured at approximately seven (7) feet BLS in borings 4-DPT-01 and 4-DPT-02. Borings 4-DPT-03 through 4-DPT-12 were terminated at four (4) feet BLS. The post-hole boring 4-DPT-13 was terminated at 3.5 feet BLS. Predominately sands were encountered with some mix of clays and silts. Damp to saturated soils were encountered in borings 4-DPT-01 and 4-DPT-02 at six (6) feet BLS. Soil samples were collected for laboratory analysis from within the two (2) foot interval with the highest OVA/PID reading. No physical indications (petroleum odor or staining) of petroleum impacted soils were noted in the field. Boring logs including USCS classification and OVA/PID screening results are provided in

Appendix A. Summarized analytical results are provided on Table 1 and Figure 2.

No TPH GRO concentrations were detected above the laboratory reporting limit in any of the soil samples. The soil samples collected from borings near the current USTs (4-DPT-02, 4-DPT-03, and 4-DPT-13) and the dispenser island (4-DPT-08) revealed minor TPH DRO concentrations [less than 9 milligrams per kilogram (mg/kg)]. No TPH concentrations were detected in the soil samples collected along the proposed drainage features.

The estimated extent of TPH impacted soil is illustrated on Figure 2. This area is based on TPH concentrations above the laboratory reporting limit, not regulatory standards/limits. The illustrated TPH impacted soil areas are limited to soils within the right-of-way.

The TPH impacted soil area around borings 4-DPT-02 and 4-DPT-3 encompasses approximately 1,800 ft<sup>2</sup> (as illustrated on Figure 2). Based on an assumed zone of contamination from the surface to the estimated water table depth of six (6) feet, (and subtracting the UST volumes) approximately 330 yds<sup>3</sup> of TPH impacted soils may be in the area. However, it should be noted the minor TPH DRO concentrations (less than 8 mg/kg) may be limited to the immediate area surrounding the borings and not reflective of clean fill around the USTs (installed in 2006).

The TPH impacted soil area around boring 4-DPT-08 encompasses approximately 410 ft<sup>2</sup> (as illustrated on Figure 2). Based on an assumed zone of contamination from the surface to the estimated water table depth of six (6) feet, approximately 90 yds<sup>3</sup> of TPH impacted soils may be in this area and a portion of this area is within the proposed drainage feature.

The TPH impacted soil area around boring 4-DPT-013 encompasses approximately 170 ft<sup>2</sup> (as illustrated on Figure 2). Based on an assumed zone of contamination from the surface to the estimated water table depth of six (6) feet, approximately 38 yds<sup>3</sup> of TPH impacted soils may be in this area. However, it should be noted this area is based on limited data from one sample location and "clean" sample locations do not define this area to the north, east, or west.

## 4.0 SUMMARY AND RECOMMENDATIONS

A preliminary site assessment was conducted at the subject site as requested by NCDOT. Right-of-Way acquisition for NC 24 roadway construction is proposed at the site. In the event a cut is required for roadway construction or utility installation, any soil samples revealing detectable TPH concentrations will be considered petroleum impacted for handling and disposal purposes.

Two (2) known USTs and an active dispenser island are located at the site. Two (2) probable USTs were also identified during the geophysical investigation.

No TPH concentrations were revealed in sample collected along the proposed drainage features.

Thirteen (13) borings were advanced for soil sample collection. Minor petroleum impacts were detected in soil samples collected near the active USTs and dispenser island/canopy. Minor petroleum impacts were also detected in a soil sample collected near the probable USTs located on the southeastern portion of the property. The total volume of impacted soils is approximately 460 yds<sup>3</sup> or roughly 700 tons.

Groundwater sample results reviewed at NCDENR indicate groundwater contamination in the area of the proposed drainage feature near the dispenser canopy. Nine (9) monitoring wells are currently at the site. The depth to water has been reported at approximately six (6) feet BLS across the site. If an excavation extends below the water table additional contaminant soil volume could be expected.

CATLIN recommends removing the active UST system and collecting composite soil samples for waste characterization or disposing of excavated soils as petroleum impacted waste. Additionally, the area of the Probable USTs should be further investigated (excavated) and any soils removed or tanks uncovered should be properly disposed.

Any utility or construction contractor should be notified of these (and/or future investigation) findings and be advised to be prepared to handle petroleum impacted soil near areas indicated on Figure 2. Additionally, based on NCDENR file review information provided in Appendix D, petroleum impacted groundwater is widespread across the site. Any saturated soils encountered may need to be handled as a petroleum impacted waste.

### 5.0 LIMITATIONS

This report is based on the agreed work scope and a review of available data from limited sampling. It is possible that this investigation may have failed to reveal the presence of contamination in the project area where such contamination may exist. Although CATLIN has used accepted methods appropriate for soil and groundwater sampling, CATLIN cannot guarantee that additional soil and/or groundwater contamination does not exist.

# 6.0 SIGNATURES

Benjamin J. Ashba

Project Manager

SEAL 1052 EOLOGIS REAL

G. Richard Garrett, P.G. Senior Project Manager

# **TABLES**

# TABLE 1 SUMMARY OF SOIL LABORATORY RESULTS EPA METHOD 8015

Parcel #004 Leiburn R. Strickland Property Strickland Marathon 9007 Clinton Rd. Stedman, North Carolina Facility ID: 0-036802

Groundwater Incident: 29271

Sample ID	Loca	ation	Contaminant of Concern	- Bu	Range	
Sample ID	Northing	Easting	Date Collected	Diesel Range Organics	Gasoline Organics	
4-DPT-01 (4-6ft)	455960.611	2103439.064	6/21/2011	<6.21	<4.01	
4-DPT-02 (3-4ft)	455943.311	2103456.938	6/21/2011	6.70	<3.78	
4-DPT-03 (1-2ft)	455937.353	2103418.982	6/21/2011	7.19	<3.83	
4-DPT-04 (3-4ft)	455909.345	2103431.486	6/21/2011	<6.46	<3.45	
4-DPT-05 (1-2ft)	455958.186	2103402.045	6/21/2011	<6.61	<3.58	
4-DPT-06 (1-2ft)	455956.594	2103483.069	6/21/2011	<6.40	<3.81	
4-DPT-07 (3-4ft)	455844.436	2103443.077	6/21/2011	<6.60	<3.71	
4-DPT-08 (1-2ft)	455856.369	2103435.420	6/21/2011	7.80	<3.67	
4-DPT-09 (3-4ft)	455868.819	2103464.017	6/21/2011	<6.56	<3.66	
4-DPT-10 (2-3ft)	455888.438	2103443.125	6/21/2011	<6.61	<3.95	
4-DPT-11 (3-4ft)	455850.620	2103460.406	6/21/2011	<6.42	<3.39	
4-DPT-12 (3-4ft)	455835.186	2103507.684	6/21/2011	<6.33	<3.75	
4-DPT-13 (3.5ft)	455841.026	2103501.526	6/24/2011	8.56	<3.57	

All results in milligrams per kilogram (mg/kg).

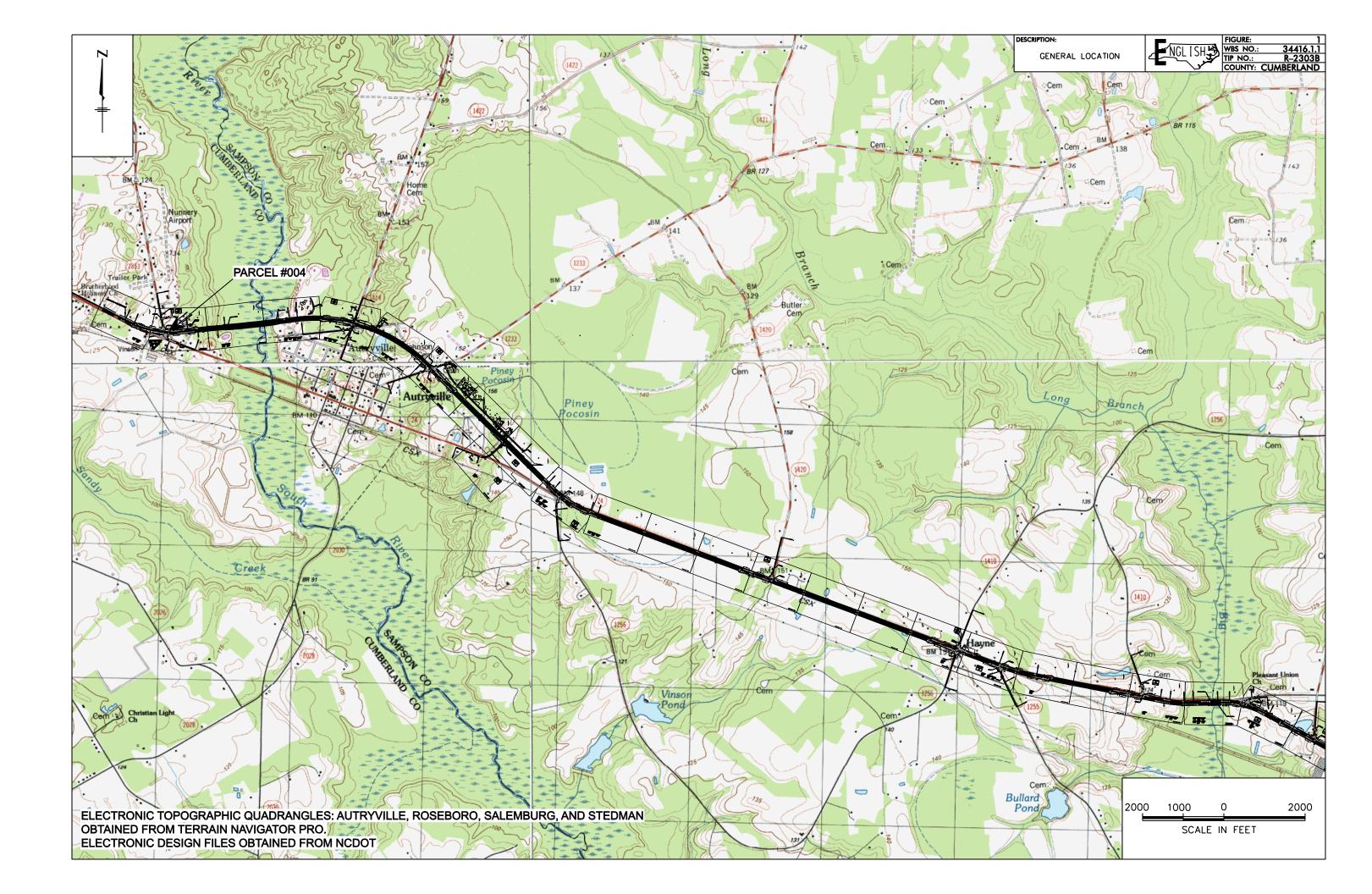
Location coordinates: US State Plane 1983, NC Zone 3200, NAD 1983, US Survey feet

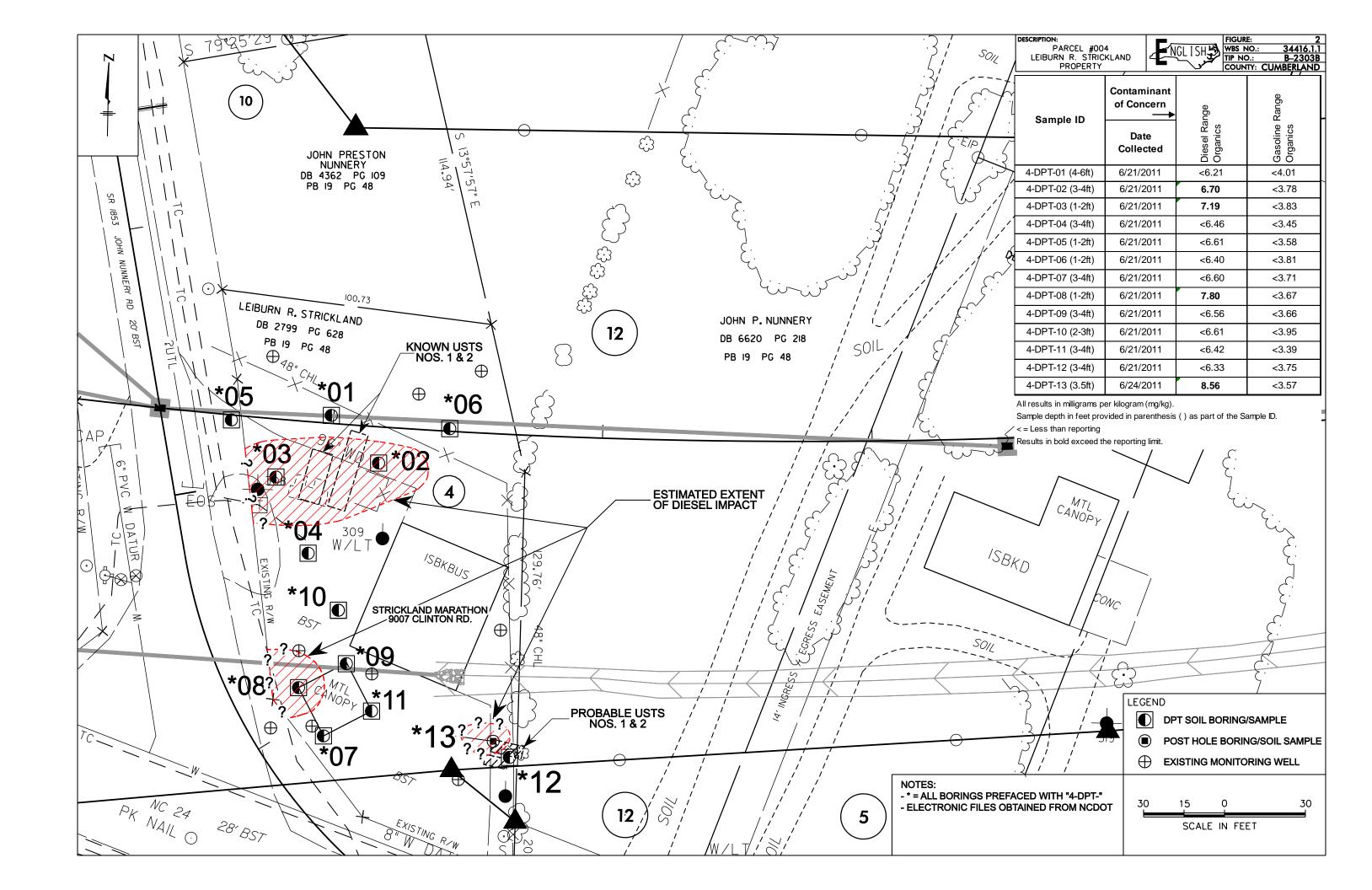
Sample depth in feet provided in parenthesis ( ) as part of the Sample ID.

< = Less than reporting limit

Results in bold exceed the reporting limit.

# **FIGURES**





# **APPENDICES**

# APPENDIX A BORING LOGS

# **BORING LOG**

CATLIN ENVIRO 1 OG 211043 NCDOT NC24-SR1404 GP.1 CATLIN GDT 7/25/1



211043 Cumberland LOCATION: PROJECT NO.: Stedman PROJECT NAME: **LOGGED BY:** Ben Ashba **BORING ID:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-01 455,960.61 EASTING: 2,103,439.06 CREW: **NORTHING: NM** SYSTEM: **BORING LOCATION:** N. of UST basin along proposed drainage **LAND ELEV.: Power Probe Direct Push** 0 HOUR DTW: ~7 BORING DEPTH: 8.0 **DRILL MACHINE:** METHOD: 6/21/11 6/21/11 24 HOUR DTW: N/A ROCK DEPTH: START DATE: **FINISH DATE: BLOW** V S C S L SOIL AND ROCK PID RESULTS MOI. LAB. DEPTH COUNT (ppm) DESCRIPTION G DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 4000 LAND SURFACE 0.0 GW 0.5 CONCRETE. GP Brown, Sandy GRAVEL. 02.0 **GP** S.A.A. Q:(4.0 4.0 **GP** S.A.A. Sat. 0.80 0.80 GP S.A.A. 8.0 Boring Terminated at Depth 8.0 ft

# **BORING LOG**

**CATLIN**Engineers and Scientists

211043 STATE: NC Stedman COUNTY: Cumberland LOCATION: PROJECT NO .: Ben Ashba **BORING ID:** PROJECT NAME: LOGGED BY: NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-02 NORTHING: 455,943.31 EASTING: 2,103,456.94 CREW: SYSTEM: BORING LOCATION: E. of UST basin LAND ELEV .: NM **Power Probe Direct Push DRILL MACHINE: METHOD:** 0 HOUR DTW: ~7 BORING DEPTH: 8.0 6/21/11 6/21/11 **FINISH DATE:** 24 HOUR DTW: N/A ROCK DEPTH: START DATE: **BLOW** USCS P SOIL AND ROCK PID RESULTS MOI. LAB. **DEPTH** COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 **471:0** SM Brown, vf. to coarse SAND w/ SILT. D 2.0 S.A.A. grading to clean f. SAND, varying D SP brown colors. 4.0 SP D **▲**70:7 S.A.A. 6.0 Light grayish-tan, Sandy CLAY. Med. CL W ▲20.1 plasticity. 8.0 Boring Terminated at Depth 8.0 ft CATLIN ENVIRO. LOG. 211043 NCDOT. NC24-SR1404 GPJ. CATLIN GDT. 7/25/11

# **BORING LOG**

CATLIN Engineers and Scientists

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									LLER	:	Michael	D. Ma	ason	4-DPT-0	13
NORTHI		455,93	37.35	121111111111111111111111111111111111111					12.00						
SYSTEM					G LOCAT	110-124			_					LAND ELEV.:	NM
	MACHINE:	Powe		be	METHO			ct Pu	_		0 HOUR D		N/A		4.0
START		6/21	/11		FINISH D	ATE:		6/21	/11	ı	24 HOUR	DTW:	N/A	ROCK DEPTH:	
DEPTH	BLOW COUNT 0.5 0.5 0.5			(p	ESULTS pm)		LAB.	U S C S	L O G	DEPTH			AND RO	ONI	VATION
			0 1	000 2	000 300	0 4000			7	0.0		LAND	SURF	ACE	
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2.0 -								1		2.0					-
		D	<b>▲</b> 16.0			· · · · · ·		SP		S./	A.A. w/ tr.	silt an	d clay	content @ 4' BL	S
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# **BORING LOG**

CATLIN Engineers and Scientists

211043 STATE: NC Cumberland LOCATION: PROJECT NO.: COUNTY: Stedman Ben Ashba PROJECT NAME: LOGGED BY: **BORING ID:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-04 455,909.35 EASTING: 2,103,431.49 CREW: **NORTHING:** SYSTEM: BORING LOCATION: S. of UST basin **LAND ELEV.:** NM **Direct Push Power Probe** 0 HOUR DTW: N/A BORING DEPTH: 4.0 **DRILL MACHINE: METHOD:** START DATE: 6/21/11 **FINISH DATE:** 6/21/11 24 HOUR DTW: N/A ROCK DEPTH: **BLOW** USCS LOG PID RESULTS SOIL AND ROCK MOI. **DEPTH** LAB. COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 2000 3000 1000 4000 0.0 LAND SURFACE 0.0 SP Fine SAND. Varying brown colors. 2.0 2.0 -DPT-04 (3-4') SP D S.A.A. 4.0 4.0 Boring Terminated at Depth 4.0 ft CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404 GP. LCATLIN GDT 7/25/11

# **BORING LOG**



211043 PROJECT NO.: COUNTY: Cumberland LOCATION: Stedman PROJECT NAME: LOGGED BY: Ben Ashba **BORING ID:** NC 24 from SR 1853 to SR 1404 DRILLER: Michael D. Mason 4-DPT-05 455,958.19 EASTING: 2,103,402.05 CREW: **NORTHING:** SYSTEM: NM BORING LOCATION: Western side of proposed drainage LAND ELEV .: **Power Probe Direct Push** N/A BORING DEPTH: **DRILL MACHINE:** METHOD: 0 HOUR DTW: 4.0 START DATE: 6/21/11 **FINISH DATE:** 6/21/11 24 HOUR DTW: N/A ROCK DEPTH: **BLOW** USCS LOG SOIL AND ROCK PID RESULTS **DEPTH** MOI. LAB. COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 4-DPT-05 (1-2') @ 1315 Vf to f. SAND. Dark brown grading to light D SP brown. 2.0 2.0 D SP S.A.A. 4.0 Boring Terminated at Depth 4.0 ft

# **BORING LOG**

CATLIN Engineers and Scientists

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-		NC 2	4 iron	ISK	003	0 0 5	K 14	U4		LLER		Michael			4-DPT-0	16
NORTHI	NG:	455,9	56.59	EAST	NG:	2,10	03,48	33.07	CRE	:W:					4-DP1-0	0
SYSTEM	A:									of p	ropo	sed drainag	е		LAND ELEV.:	NM
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START		6/21				ISH DA			6/21			24 HOUR			ROCK DEPTH:	
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# **BORING LOG**

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404 GP.) CATLIN GDT 7/25/11

CATLIN Engineers and Scientists

211043 STATE: NC Cumberland LOCATION: PROJECT NO .: COUNTY: Stedman PROJECT NAME: LOGGED BY: Ben Ashba **BORING ID:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-07 455,844.44 EASTING: 2,103,443.08 CREW: **NORTHING: NM** SYSTEM: **BORING LOCATION:** Southern corner of canopy **LAND ELEV.: Power Probe Direct Push DRILL MACHINE:** METHOD: 0 HOUR DTW: N/A BORING DEPTH: 4.0 6/21/11 6/21/11 START DATE: **FINISH DATE:** 24 HOUR DTW: N/A ROCK DEPTH: **BLOW** USCS SOIL AND ROCK PID RESULTS DEPTH MOI. LAB. COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 ASPHALT. GP 0.5 GRAVEL. 49.2 GP D SP Fine SAND. Varying brown colors to 2.0 2.0 orangish-brown. SP S.A.A. D 4.0 4.0 Boring Terminated at Depth 4.0 ft

# **BORING LOG**

CATLIN Engineers and Scientists

211043 STATE: NC COUNTY: Cumberland LOCATION: PROJECT NO .: Stedman Ben Ashba **PROJECT NAME:** LOGGED BY: **BORING ID:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-08 **NORTHING:** 455,856.37 EASTING: 2,103,435.42 CREW: SYSTEM: BORING LOCATION: W. side of canopy LAND ELEV .: NM Power Probe **Direct Push DRILL MACHINE:** METHOD: 0 HOUR DTW: N/A BORING DEPTH: 4.0 6/21/11 6/21/11 24 HOUR DTW: N/A ROCK DEPTH: **START DATE: FINISH DATE: BLOW** USCS SOIL AND ROCK PID RESULTS MOI. LAB. DEPTH COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 ASPHALT. GP 0.5 GRAVEL GP D 2.0 Fine SAND. Dark brown grading to SP 2.0 orangish-brown. D SP S.A.A. 4.0 4.0 Boring Terminated at Depth 4.0 ft CATLIN ENVIRO. LOG. 211043 NCDOT. NC24-SR1404 GPJ. CATLIN GDT. 7/25/11

# **BORING LOG**

CATLIN Engineers and Scientists

211043 STATE: NC COUNTY: Cumberland LOCATION: PROJECT NO .: Stedman Ben Ashba **BORING ID:** PROJECT NAME: LOGGED BY: NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-09 455,868.82 EASTING: 2,103,464.02 CREW: **NORTHING:** SYSTEM: **BORING LOCATION:** N. corner of canopy LAND ELEV.: NM **Power Probe Direct Push** N/A BORING DEPTH: **DRILL MACHINE:** METHOD: 0 HOUR DTW: 4.0 6/21/11 6/21/11 START DATE: **FINISH DATE:** 24 HOUR DTW: N/A ROCK DEPTH: **BLOW** USCS L PID RESULTS SOIL AND ROCK MOI. DEPTH LAB. COUNT (ppm) DESCRIPTION G DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 2000 3000 1000 4000 LAND SURFACE 0.0 0.0 GP ASPHALT. 6.0 D GP GRAVEL. SP Fine SAND. 2.0 2.0 GRAVEL. GW D ▲28.4 SP Fine SAND. Varying brown colors. SP 4.0 S.A.A. 4.0 Boring Terminated at Depth 4.0 ft CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404 GPJ CATLIN GDT 7/25/1

# **BORING LOG**

CATLINE Engineers and Scientists

211043 STATE: NC COUNTY: Cumberland LOCATION: PROJECT NO .: Stedman Ben Ashba PROJECT NAME: LOGGED BY: **BORING ID:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-10 **NORTHING:** 455,888.44 EASTING: 2,103,443.13 CREW: SYSTEM: **BORING LOCATION: Midpoint of Gas Supply line** LAND ELEV.: NM **Power Probe DRILL MACHINE: Direct Push** 0 HOUR DTW: N/A BORING DEPTH: **METHOD:** 4.0 6/21/11 6/21/11 START DATE: **FINISH DATE:** 24 HOUR DTW: N/A ROCK DEPTH: **BLOW** USCS L O G PID RESULTS SOIL AND ROCK MOI. **DEPTH** LAB. COUNT (ppm) DESCRIPTION **DEPTH ELEVATION** 0.5 0.5 0.5 0.5 2000 3000 1000 4000 0.0 LAND SURFACE 0.0 GP ASPHALT. Vf to f. SAND. Grayish-brown grading to D SP light brown to brown w/ depth. Black @ 2.0 ~2' BLS. No petro odor. 4-DPT-10 (2-3') @ 1430 SP S.A.A. D ▲25.7 4.0 4.0 Boring Terminated at Depth 4.0 ft CATLIN ENVIRO 1 OG 211043 NCDOT NC24-SR1404 GP.1 CATLIN GDT 7/25/11

# **BORING LOG**

CATLIN Engineers and Scientists

211043 STATE: NC COUNTY: Cumberland LOCATION: Stedman PROJECT NO.: LOGGED BY: Ben Ashba **BORING ID: PROJECT NAME:** NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-11 455,850.62 EASTING: 2,103,460.41 CREW: **NORTHING:** NM SYSTEM: BORING LOCATION: E. side of canopy LAND ELEV.: **Power Probe Direct Push** N/A BORING DEPTH: 4.0 0 HOUR DTW: **DRILL MACHINE: METHOD:** 6/21/11 6/21/11 24 HOUR DTW: N/A ROCK DEPTH: START DATE: **FINISH DATE: BLOW** USCS L O G SOIL AND ROCK PID RESULTS MOI. LAB. DEPTH COUNT DESCRIPTION (ppm) DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 GP O.S. ASPHALT. SP Brown, Vf. to f. SAND w/ tr. coarse grains. 2.0 2.0 -DPT-11 SP S.A.A. D 4.0 Boring Terminated at Depth 4.0 ft

# **BORING LOG**

CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404 GPJ CATLIN GDT 7/25/1



PROJECT NO.: 211043 STATE: NC COUNTY: Cumberland LOCATION: Stedman Ben Ashba **BORING ID:** PROJECT NAME: LOGGED BY: NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-12 455,835.19 EASTING: 2,103,507.68 CREW: **NORTHING:** NM SYSTEM: BORING LOCATION: E. of orphan USTs LAND ELEV .: **Power Probe Direct Push** N/A BORING DEPTH: 4.0 **DRILL MACHINE:** METHOD: 0 HOUR DTW: 6/21/11 6/21/11 N/A ROCK DEPTH: START DATE: **FINISH DATE:** 24 HOUR DTW: **BLOW** USCS L O G SOIL AND ROCK PID RESULTS MOI. LAB. **DEPTH** COUNT (ppm) DESCRIPTION DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 0.0 LAND SURFACE 0.0 SP D Vf. to f. SAND. Varying browns. 2.0 2.0 -DPT-12 SP S.A.A. D (3-4') @ 1500 4.0 4.0 Boring Terminated at Depth 4.0 ft

# **BORING LOG**

CATLIN Engineers and Scientists

PROJECT NO.: 211043 STATE: NC COUNTY: Cumberland LOCATION: Stedman LOGGED BY: Ben Ashba **BORING ID:** PROJECT NAME: NC 24 from SR 1853 to SR 1404 Michael D. Mason DRILLER: 4-DPT-13 **NORTHING:** 455,841.03 EASTING: 2,103,501.53 CREW: SYSTEM: BORING LOCATION: N. of orphan USTs NM LAND ELEV.: Hand Auger Post Hole Dig N/A BORING DEPTH: **DRILL MACHINE:** METHOD: 0 HOUR DTW: 3.5 6/24/11 6/24/11 N/A ROCK DEPTH: START DATE: **FINISH DATE:** 24 HOUR DTW: **BLOW** L O G SOIL AND ROCK PID RESULTS MOI. LAB. SCS DEPTH COUNT DESCRIPTION (ppm) DEPTH **ELEVATION** 0.5 0.5 0.5 0.5 1000 2000 3000 4000 LAND SURFACE 0.0 0.0 D SP F. SAND. 2.0 2.0 4-DPT-12 (3.5') @ 0830 SP D S.A.A. 3.5 4.0 4.0 Boring Terminated at Depth 3.5 ft CATLIN ENVIRO LOG 211043 NCDOT NC24-SR1404 GP.L CATLIN GDT 7/25/1

# APPENDIX B LABORATORY REPORT AND CHAIN OF CUSTODY RECORD



### **Laboratory Report of Analysis**

To: Ben Ashba

RICHARD CATLIN & ASSOCIATES

P.O. Box 10279 Wilmington, NC 28404

Report Number: 31101647

Client Project: Strickland Prop-Parcel 4

Dear Ben Ashba,

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. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. 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 A. 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.

SGS North America Inc.	
Barbara A. Hager	Date
Project Manager	
harhara hager@sgs.com	

Print Date: 07/05/2011 N.C. Certification # 481



#### **Laboratory Qualifiers**

## **Report Definitions**

DL Method, Instrument, or Estimated Detection Limit per Analytical Method

CL Control Limits for the recovery result of a parameter

LOQ Reporting Limit
DF Dilution Factor

RPD Relative Percent Difference

LCS(D) Laboratory Control Spike (Duplicate)

MS(D) Matrix Spike (Duplicate)

MB Method Blank

#### **Qualifier Definitions**

\* Recovery or RPD outside of control limits

B Analyte was detected in the Lab Method Blank at a level above the LOQ

U Undetected (Reported as ND or < LOD)

V Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise

and detection limit

A Amount detected is less than the Lower Method Calibration Limit

J Amount detected is between the Method Detection Limit and the Lower Calibration Limit

O The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in

the sample may be biased high

E Amount detected is greater than the Upper Calibration Limit

S The amount of analyte present has saturated the detector. This situation results in an

underestimation of the affected analyte(s)

Q Indicates the presence of a quantitative interference. This situation may result in an

underestimation of the affected analyte(s)

Indicates the presence of a qualitative interference that could cause a false positive or an

overestimation of the affected analyte(s)

DPE Indicates the presence of a peak in the polychlorinated diphenylether channel that could

cause a false positive or an overestimation of the affected analyte(s)

TIC Tentatively Identified Compound

EMC Estimated Maximum possible Concentration due to ion ratio failure

ND Not Detected

K Result is estimated due to ion ratio failure in High Resolution PCB Analysis

P RPD > 40% between results of dual columns

D Spike or surrogate was diluted out in order to achieve a parameter result within instrument calibration

range

M1 Mis-identified peak

M2 Software did not integrate peak

M3 Incorrect baseline construction (i.e. not all of peak included; two peaks integrated as one)
M4 Pattern integration required (i.e. DRO, GRO, PCB, Toxaphene and Technical Chlordane)

M5 Other - Explained in case narrative

Note Results pages that include a value for "Solids (%)" have been adjusted for moisture content.



# **Sample Summary**

Client Sample ID	Lab Sample ID	<u>Collected</u>	Received	<u>Matrix</u>
4-DPT-01 (4-6ft)	31101647001	06/21/2011 12:15	06/24/2011 11:30	Soil-Solid as dr
4-DPT-02 (3-4ft)	31101647002	06/21/2011 12:30	06/24/2011 11:30	Soil-Solid as dr
4-DPT-03 (1-2ft)	31101647003	06/21/2011 12:45	06/24/2011 11:30	Soil-Solid as dr
4-DPT-04 (3-4ft)	31101647004	06/21/2011 13:00	06/24/2011 11:30	Soil-Solid as dr
4-DPT-05 (1-2ft)	31101647005	06/21/2011 13:15	06/24/2011 11:30	Soil-Solid as dr
4-DPT-06 (1-2ft)	31101647006	06/21/2011 13:30	06/24/2011 11:30	Soil-Solid as dr
4-DPT-07 (3-4ft)	31101647007	06/21/2011 13:45	06/24/2011 11:30	Soil-Solid as dr
4-DPT-08 (1-2ft)	31101647008	06/21/2011 14:00	06/24/2011 11:30	Soil-Solid as dr
4-DPT-09 (3-4ft)	31101647009	06/21/2011 14:15	06/24/2011 11:30	Soil-Solid as dr
4-DPT-10 (2-3ft)	31101647010	06/21/2011 14:30	06/24/2011 11:30	Soil-Solid as dr
4-DPT-11 (3-4ft)	31101647011	06/21/2011 14:45	06/24/2011 11:30	Soil-Solid as dr
4-DPT-12 (3-4ft)	31101647012	06/21/2011 15:00	06/24/2011 11:30	Soil-Solid as dr
4-DPT-13 (3-5ft)	31101647013	06/24/2011 08:30	06/24/2011 11:30	Soil-Solid as dr



### Results of 4-DPT-01 (4-6ft)

Client Sample ID: 4-DPT-01 (4-6ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647001-A Lab Project ID: 31101647 Collection Date: 06/21/2011 12:15 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 97

## Results by SW-846 8015C GRO

Parameter	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		4.01	mg/kg	1	06/27/2011 12:59

**Surrogates** 

4-Bromofluorobenzene 101 70.0-130 % 1 06/27/2011 12:59

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 12:59

Prep Batch: VXX1698

Prep Method: SW-846 5035

Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: 5.13 g

Prep Extract Vol: 5 mL

Print Date: 07/05/2011 N.C. Certification # 481



### Results of 4-DPT-01 (4-6ft)

Client Sample ID: 4-DPT-01 (4-6ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647001-C Lab Project ID: 31101647 Collection Date: 06/21/2011 12:15 Received Date: 06/24/2011 11:30

Matrix: Soil-Solid as dry weight

Solids (%): 97

## Results by SW-846 8015C DRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.21	mg/kg	1	06/30/2011 16:38

### **Surrogates**

o-Terphenyl 59.7 40.0-140 % 1 06/30/2011 16:38

## **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 16:38

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 33.11 g

Prep Extract Vol: 10 mL

Print Date: 07/05/2011 N.C. Certification # 481



# Results of 4-DPT-02 (3-4ft)

Client Sample ID: 4-DPT-02 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647002-A Lab Project ID: 31101647 Collection Date: 06/21/2011 12:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 93

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	Qual	LOQ/CI	_ <u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.78	mg/kg	1	06/27/2011 13:26

# **Surrogates**

4-Bromofluorobenzene 98.8 70.0-130 % 1 06/27/2011 13:26

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 13:26

Prep Batch: VXX1698
Prep Method: SW-846 5035

Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.71 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-02 (3-4ft)

Client Sample ID: 4-DPT-02 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647002-C Lab Project ID: 31101647 Collection Date: 06/21/2011 12:30 Received Date: 06/24/2011 11:30

Matrix: Soil-Solid as dry weight

Solids (%): 93

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	6.70		6.66	mg/kg	1	06/30/2011 17:06

**Surrogates** 

o-Terphenyl 61.4 40.0-140 % 1 06/30/2011 17:06

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 17:06

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.35 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-03 (1-2ft)

Client Sample ID: 4-DPT-03 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647003-A Lab Project ID: 31101647 Collection Date: 06/21/2011 12:45 Received Date: 06/24/2011 11:30

Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.83	mg/kg	1	06/27/2011 13:53

# **Surrogates**

4-Bromofluorobenzene 97.4 70.0-130 % 1 06/27/2011 13:53

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 13:53

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.55 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-03 (1-2ft)

Client Sample ID: 4-DPT-03 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647003-C Lab Project ID: 31101647 Collection Date: 06/21/2011 12:45 Received Date: 06/24/2011 11:30

Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	7.19		6.67	mg/kg	1	06/30/2011 17:34

# **Surrogates**

o-Terphenyl 62.6 40.0-140 % 1 06/30/2011 17:34

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 17:34

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 31.82 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-04 (3-4ft)

Client Sample ID: 4-DPT-04 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647004-A Lab Project ID: 31101647 Collection Date: 06/21/2011 13:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.45	mg/kg	1	06/27/2011 14:20

# **Surrogates**

4-Bromofluorobenzene 98.7 70.0-130 % 1 06/27/2011 14:20

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 14:20

Prep Batch: VXX1698
Prep Method: SW-846 5035

Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **6.16 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-04 (3-4ft)

Client Sample ID: 4-DPT-04 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647004-C Lab Project ID: 31101647 Collection Date: 06/21/2011 13:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.46	mg/kg	1	06/30/2011 18:03

**Surrogates** 

o-Terphenyl 62.3 40.0-140 % 1 06/30/2011 18:03

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 18:03

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.87 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-05 (1-2ft)

Client Sample ID: 4-DPT-05 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647005-A Lab Project ID: 31101647 Collection Date: 06/21/2011 13:15 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 96

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	DF	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.58	mg/kg	1	06/27/2011 14:47

# **Surrogates**

4-Bromofluorobenzene 97.7 70.0-130 % 1 06/27/2011 14:47

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 14:47

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.81 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-05 (1-2ft)

Client Sample ID: 4-DPT-05 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647005-C Lab Project ID: 31101647 Collection Date: 06/21/2011 13:15 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 96

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.61	mg/kg	1	06/30/2011 18:31

**Surrogates** 

o-Terphenyl 62.9 40.0-140 % 1 06/30/2011 18:31

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 18:31

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 31.49 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-06 (1-2ft)

Client Sample ID: 4-DPT-06 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647006-A Lab Project ID: 31101647 Collection Date: 06/21/2011 13:30 Received Date: 06/24/2011 11:30

Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.81	mg/kg	1	06/27/2011 15:14

# **Surrogates**

4-Bromofluorobenzene 100 70.0-130 % 1 06/27/2011 15:14

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 15:14

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02
Prep Initial Wt./Vol.: 5.52 g

Prep Extract Vol: 5 mL



# Results of 4-DPT-06 (1-2ft)

Client Sample ID: 4-DPT-06 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647006-C Lab Project ID: 31101647 Collection Date: 06/21/2011 13:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by **SW-846 8015C DRO**

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.40	mg/kg	1	06/30/2011 19:00

# **Surrogates**

o-Terphenyl 61.0 40.0-140 % 1 06/30/2011 19:00

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 19:00

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.88 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-07 (3-4ft)

Client Sample ID: 4-DPT-07 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647007-A Lab Project ID: 31101647 Collection Date: 06/21/2011 13:45 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C GRO

Parameter	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.71	mg/kg	1	06/27/2011 15:41

# **Surrogates**

4-Bromofluorobenzene 97.5 70.0-130 % 1 06/27/2011 15:41

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 15:41

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: 5.72 g Prep Extract Vol: 5 mL



# Results of 4-DPT-07 (3-4ft)

Client Sample ID: 4-DPT-07 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647007-C Lab Project ID: 31101647 Collection Date: 06/21/2011 13:45 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.60	mg/kg	1	06/30/2011 19:28

# **Surrogates**

o-Terphenyl 64.0 40.0-140 % 1 06/30/2011 19:28

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 19:28

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30

Prep Initial Wt./Vol.: **32.11 g**Prep Extract Vol: **10 mL** 



# Results of 4-DPT-08 (1-2ft)

Client Sample ID: 4-DPT-08 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647008-A Lab Project ID: 31101647 Collection Date: 06/21/2011 14:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.67	mg/kg	1	06/27/2011 16:09

# **Surrogates**

4-Bromofluorobenzene 98.1 70.0-130 % 1 06/27/2011 16:09

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 16:09

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.71 g** Prep Extract Vol: **5 mL** 



# Results of 4-DPT-08 (1-2ft)

Client Sample ID: 4-DPT-08 (1-2ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647008-C Lab Project ID: 31101647 Collection Date: 06/21/2011 14:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	7.80		6.53	mg/kg	1	07/1/2011 11:23

**Surrogates** 

o-Terphenyl 64.2 40.0-140 % 1 07/1/2011 11:23

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 07/01/2011 11:23

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.13 g
Prep Extract Vol: 10 mL



# Results of 4-DPT-09 (3-4ft)

Client Sample ID: 4-DPT-09 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647009-A Lab Project ID: 31101647 Collection Date: 06/21/2011 14:15 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 96

# Results by SW-846 8015C GRO

Parameter	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.66	mg/kg	1	06/27/2011 16:36

# **Surrogates**

4-Bromofluorobenzene 97.0 70.0-130 % 1 06/27/2011 16:36

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 16:36

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.68 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-09 (3-4ft)

Client Sample ID: 4-DPT-09 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647009-C Lab Project ID: 31101647 Collection Date: 06/21/2011 14:15 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 96

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.56	mg/kg	1	06/30/2011 20:25

**Surrogates** 

o-Terphenyl 59.8 40.0-140 % 1 06/30/2011 20:25

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 20:25

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 31.64 g

Prep Extract Vol: 10 mL



# Results of 4-DPT-10 (2-3ft)

Client Sample ID: 4-DPT-10 (2-3ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647010-A Lab Project ID: 31101647 Collection Date: 06/21/2011 14:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 92

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.95	mg/kg	1	06/27/2011 17:03

# **Surrogates**

4-Bromofluorobenzene 97.7 70.0-130 % 1 06/27/2011 17:03

# **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 17:03

Prep Batch: VXX1698
Prep Method: SW-846 5035

Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.49 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-10 (2-3ft)

Client Sample ID: 4-DPT-10 (2-3ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647010-C Lab Project ID: 31101647 Collection Date: 06/21/2011 14:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 92

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.61	mg/kg	1	06/30/2011 20:54

**Surrogates** 

o-Terphenyl 54.6 40.0-140 % 1 06/30/2011 20:54

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 20:54

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.81 g

Prep Extract Vol. 10 mL



# Results of 4-DPT-11 (3-4ft)

Client Sample ID: 4-DPT-11 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647011-A Lab Project ID: 31101647 Collection Date: 06/21/2011 14:45 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.39	mg/kg	1	06/27/2011 17:30

# **Surrogates**

4-Bromofluorobenzene 100 70.0-130 % 1 06/27/2011 17:30

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 17:30

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **6.21 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-11 (3-4ft)

Client Sample ID: 4-DPT-11 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647011-C Lab Project ID: 31101647 Collection Date: 06/21/2011 14:45 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 95

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.42	mg/kg	1	06/30/2011 21:22

# **Surrogates**

o-Terphenyl 64.3 40.0-140 % 1 06/30/2011 21:22

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 21:22

Prep Batch: XXX1485
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:30
Prep Initial Wt./Vol.: 32.75 g

Prep Extract Vol: 10 mL

Print Date: 07/05/2011

N.C. Certification # 481



# Results of 4-DPT-12 (3-4ft)

Client Sample ID: 4-DPT-12 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647012-A Lab Project ID: 31101647 Collection Date: 06/21/2011 15:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 97

# Results by SW-846 8015C GRO

Parameter	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.75	mg/kg	1	06/27/2011 17:56

# **Surrogates**

4-Bromofluorobenzene 101 70.0-130 % 1 06/27/2011 17:56

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 17:56

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02
Prep Initial Wt./Vol.: 5.52 g

Prep Extract Vol: 5 mL



# Results of 4-DPT-12 (3-4ft)

Client Sample ID: 4-DPT-12 (3-4ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647012-C Lab Project ID: 31101647 Collection Date: 06/21/2011 15:00 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 97

# Results by SW-846 8015C DRO

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	ND		6.33	mg/kg	1	06/30/2011 21:50

# **Surrogates**

o-Terphenyl 60.0 40.0-140 % 1 06/30/2011 21:50

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 06/30/2011 21:50

Prep Batch: XXX1485
Prep Method: SW-846 3541

Prep Date/Time: 06/29/2011 11:30

Prep Initial Wt./Vol.: 32.7 g Prep Extract Vol: 10 mL



# Results of 4-DPT-13 (3-5ft)

Client Sample ID: 4-DPT-13 (3-5ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647013-A Lab Project ID: 31101647 Collection Date: 06/24/2011 08:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by SW-846 8015C GRO

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics (GRO)	ND		3.57	mg/kg	1	06/27/2011 18:23

# **Surrogates**

4-Bromofluorobenzene 100 70.0-130 % 1 06/27/2011 18:23

#### **Batch Information**

Analytical Batch: VGC1280

Analytical Method: SW-846 8015C GRO

Instrument: GC4
Analyst: LMC

Analytical Date/Time: 06/27/2011 18:23

Prep Batch: VXX1698
Prep Method: SW-846 5035
Prep Date/Time: 06/27/2011 11:02

Prep Initial Wt./Vol.: **5.97 g**Prep Extract Vol: **5 mL** 



# Results of 4-DPT-13 (3-5ft)

Client Sample ID: 4-DPT-13 (3-5ft)

Client Project ID: Strickland Prop-Parcel 4

Lab Sample ID: 31101647013-C Lab Project ID: 31101647 Collection Date: 06/24/2011 08:30 Received Date: 06/24/2011 11:30 Matrix: Soil-Solid as dry weight

Solids (%): 94

# Results by **SW-846 8015C DRO**

<u>Parameter</u>	Result	<u>Qual</u>	LOQ/CL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics (DRO)	8.56		6.82	mg/kg	1	07/1/2011 7:45

**Surrogates** 

o-Terphenyl 69.5 40.0-140 % 1 07/1/2011 7:45

# **Batch Information**

Analytical Batch: XGC1337

Analytical Method: SW-846 8015C DRO

Instrument: GC6
Analyst: DTF

Analytical Date/Time: 07/01/2011 07:45

Prep Batch: XXX1487
Prep Method: SW-846 3541
Prep Date/Time: 06/29/2011 11:34
Prep Initial Wt./Vol.: 31.29 g

Prep Extract Vol: 10 mL



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

Locations Nationwide

 New Jersey
 North Carolina Alaska

www.us.sgs.com

101901

 New York
 Ohio Maryland

ABSENT Samples Received Cold? (Circle) YES) NO REMARKS Я Chain of Custody Seal: (Circle) Temperature °C: 5.20 C BROKEN STD PAGE INTACT Special Deliverable Requirements: Summary EDP Requested Turnaround Time: جَ<sub>ح</sub>ر Special Instructions: Shipping Ticket No: Shipping Carrier: □ RUSH Analysis Required SGS Reference: GRAB COMP 0 MATRIX かって ben.ashar@astlinusa.com Comporan Court wes: 34416.1.1 CONTACT: DEN ASKE CCATUN HONE NO: 915 1452-5861 Received By: Received By: Received By: Received By: 1475 1445 1500 1300 TIME 1215 1245 1300 1315 1330 1345 1400 10/111 DATE PROJECT: Strick And Prop. - PREPARENT 4 Time Time Time (1.41) (3-4) Date Date (1-5,) CLIENT CATTLY /NCOGT SAMPLE IDENTIFICATION (2-4) (1-21) (3-4") 4-DPT-03 (1-2) 4-001-01 (4-6') 4-001-04 70-100-h 4-DPT-02 4-0PT-05 4-065-07 4-DPT-09 Ben BCATLIN 4-DPT-12 collected/Relinquished By:(3) INVOICE TO:

NCOOT Relinquished By: (2) Relinquished By: (3) Relinquished By: (4) REPORTS TO: LAB NO.

□ 200 V≿Potter Drive **Anchorage, AK 99518** Tel: (907) 562-2343 Fax: (907) 561-5301 X500 Business Drive **Wilmington, NC 28405** Tel: (910) 350-1903 Fax: (910) 350-1557

White - Rotained by Lab Pink - Retained by Client

# SGS North America Inc.

# Sample Receipt Checklist (SRC)

Client:	Catlin	_ Work Order No.:	31101647
1.	Shipped Hand Delivered	Notes:	
2.	x COC Present on Receipt No COC Additional Transmittal Forms		
3.	Custody Tape on Container No Custody Tape		
4.	_x_Samples Intact Samples Broken / Leaking		
5.	<ul> <li>X Chilled on Receipt Actual Temp.(s) in °C:</li> <li>Ambient on Receipt</li> <li>Walk-in on Ice; Coming down to temp.</li> <li>Received Outside of Temperature Specification</li> </ul>		
6.	x Sufficient Sample Submitted Insufficient Sample Submitted		
7.	Chlorine absent HNO3 < 2 HCL < 2 Additional Preservatives verified (see notes)	NA	
8.	x Received Within Holding Time Not Received Within Holding Time	-	
9.	x No Discrepancies Noted Discrepancies Noted		
10.	No Headspace present in VOC vials Headspace present in VOC vials >6mm		
Comments: _	<del></del>		
<del></del>			
	Inspe	ected and Logged in by: <u>TF</u> Date:	Fri-6/24/11 00:00

# APPENDIX C SCHNABEL GEOPHYSICAL REPORT



July 20, 2011

Mr. Richard Garrett, LG Catlin Engineers and Scientists, Inc. P.O. Box 10279 Wilmington, NC 28404-0279

RE: State Project: R-2303B

WBS Element: 34416.1.1

County: Cumberland - Sampson

Description: NC 24 from SR 1853 (John Nunnery Rd) in Cumberland County to SR

1404 (Dowdy Rd) in Sampson County

Subject: Project 09210013.41, Report on Geophysical Surveys

Parcel 4, Leiburn R. Strickland Property, Cumberland County, North Carolina

Dear Mr. Garrett:

**SCHNABEL ENGINEERING SOUTH, PC** (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 four 8.5x11 color figures.

#### INTRODUCTION

The work described in this report was conducted on May 26, and June 7, 2011, by Schnabel under our 2009 contract with the NCDOT. The work was conducted over the accessible areas of the property as indicated by the NCDOT to support their environmental assessment of the subject property. Photographs of the property are included on Figure 1. The property is located on the north side of NC 24 (Clinton Road) at the intersection of John Nunnery Road in Stedman, NC. The purpose of the geophysical surveys was to locate suspect metal underground storage tanks (USTs) in the accessible areas of the right-of-way and/or easement.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61-MK2 instrument. The EM61 metal detector is used to locate metal objects buried up to about eight feet below ground surface. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies, including areas of reinforced concrete, were conducted using a Geophysical Survey Systems SIR-3000 system equipped with a 400 MHz antenna. Photographs of the equipment used are shown on Figure 2.

#### FIELD METHODOLOGY

Locations of geophysical data points were obtained using a sub-meter Trimble Pro-XRS DGPS system. References to direction and location in this report are based on the US State Plane 1983 System, North Carolina 3200 Zone, using the NAD 83 datum, with units in US survey feet. The locations of existing site features (monitoring wells, signs, etc.) were recorded for later correlation with the geophysical data and for location references to the NCDOT drawings.

The EM61 data were collected along parallel survey lines spaced approximately 2.5 feet apart. The EM61 and DGPS data were recorded digitally using a field computer and later transferred to a desktop computer for data processing. The GPR data were collected along survey lines spaced one to two feet apart in orthogonal directions over areas of reinforced concrete and anomalous EM readings not attributed to cultural features. The GPR data were reviewed in the field to evaluate the possible presence of USTs. The GPR data also were recorded digitally and later transferred to a desktop computer for further review.

#### **DISCUSSION OF RESULTS**

The contoured EM61 data collected over Parcel 4 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 anomalies of unknown cause, in addition to those apparently caused by reinforced concrete, buried utilities, or known site features (Figures 3 and 4). The GPR data collected northwest of the northwest corner of the building indicated the presence of two known USTs located approximately 20 to 30 feet northwest of the northwestern building corner. The USTs are inside the limits of the planned right-of way and/or easement. Figures 3 and 4 show the location of the known USTs as marked in the field. Example GPR images showing the reflections from the known USTs are shown on Figures 3, 4, and 5. The GPR data indicate that the known USTs are buried approximately 3.0 to 4.0 feet below ground surface. The GPR data indicate that the western known UST (Known UST No. 1) is about 8 feet in diameter and about 20 feet long, equivalent to a capacity of about 4,000 gallons. The GPR data indicate that the eastern known UST (Known UST No. 2) is about 8 feet in diameter and about 30 feet long, equivalent to a capacity of about 10,000 gallons. Photographs of the known UST locations, as marked in the field, are included on Figure 6.

The GPR data collected southeast of the southeastern corner of the building indicated the presence of two probable USTs located within approximately 20 to 30 feet southeast of the southeastern corner of the building. The probable USTs are inside or partially 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, 4, and 5. Figures 3 and 4 include the locations of the probable USTs as marked in the field. The GPR data indicate that the probable USTs are buried approximately 1.5 to 2.5 feet below ground surface. The GPR data indicate that southern probable UST (Probable UST No. 1) is about 3.5 feet in diameter and about 7.5 feet long, equivalent to a capacity of about 560 gallons. The GPR data indicate that the

NCDOT, Geotechnical Engineering Unit State Project R-2303B, Cumberland - Sampson Counties

northern probable UST (Probable UST No. 2) is about 5.0 feet in diameter and about 9 feet long, equivalent to a capacity of about 1,500 gallons. Photographs of the known and probable UST locations, as marked in the field, are included on Figure 6.

#### **CONCLUSIONS**

Our evaluation of the geophysical data collected on the subject property on Project R-2303B in Stedman, NC indicates the following:

The geophysical data indicate the presence of two known USTs and two probable USTs on Parcel 4. The four USTs are partially or totally within the planned right-of-way and/or easement. The western known UST is about 4,000-gallon capacity and is buried about 3.0 to 4.0 feet below ground surface. The eastern known UST is about 10,000-gallon capacity and is buried about 3.0 to 4.0 feet below ground surface. The southern probable UST is about 560-gallon capacity and is buried 1.5 to 2.5 feet below ground surface. The northern probable UST is about 1,500-gallon capacity and is buried 1.5 to 2.5 feet below ground surface.

#### **LIMITATIONS**

These services have been performed and this report prepared for Catlin Engineers and Scientists, 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

JS:NB

Attachments: Figures (6)

FILE: G:12009 PROJECTS:09210013 (NCDOT 2009 GEOTECH UNIT SERVICES))09210013.41 (R-2303B, CUMBERLAND-SAMPSON CO.))REPORT\PARCEL 4\SCHNABEL GEOPHYSICAL REPORT ON PARCEL 4 (R-2303B).DOCX



Parcel 4 – Leiburn R. Strickland Property, looking northeast



Parcel 4 – Leiburn R. Strickland Property, looking southeast



STATE PROJECT R-2303B NC DEPT. OF TRANSPORTATION CUMBERLAND-SAMPSON COS., NC PROJECT NO. 09210013.41

PARCEL 4 SITE PHOTOS

FIGURE 1



Geonics EM61-MK2

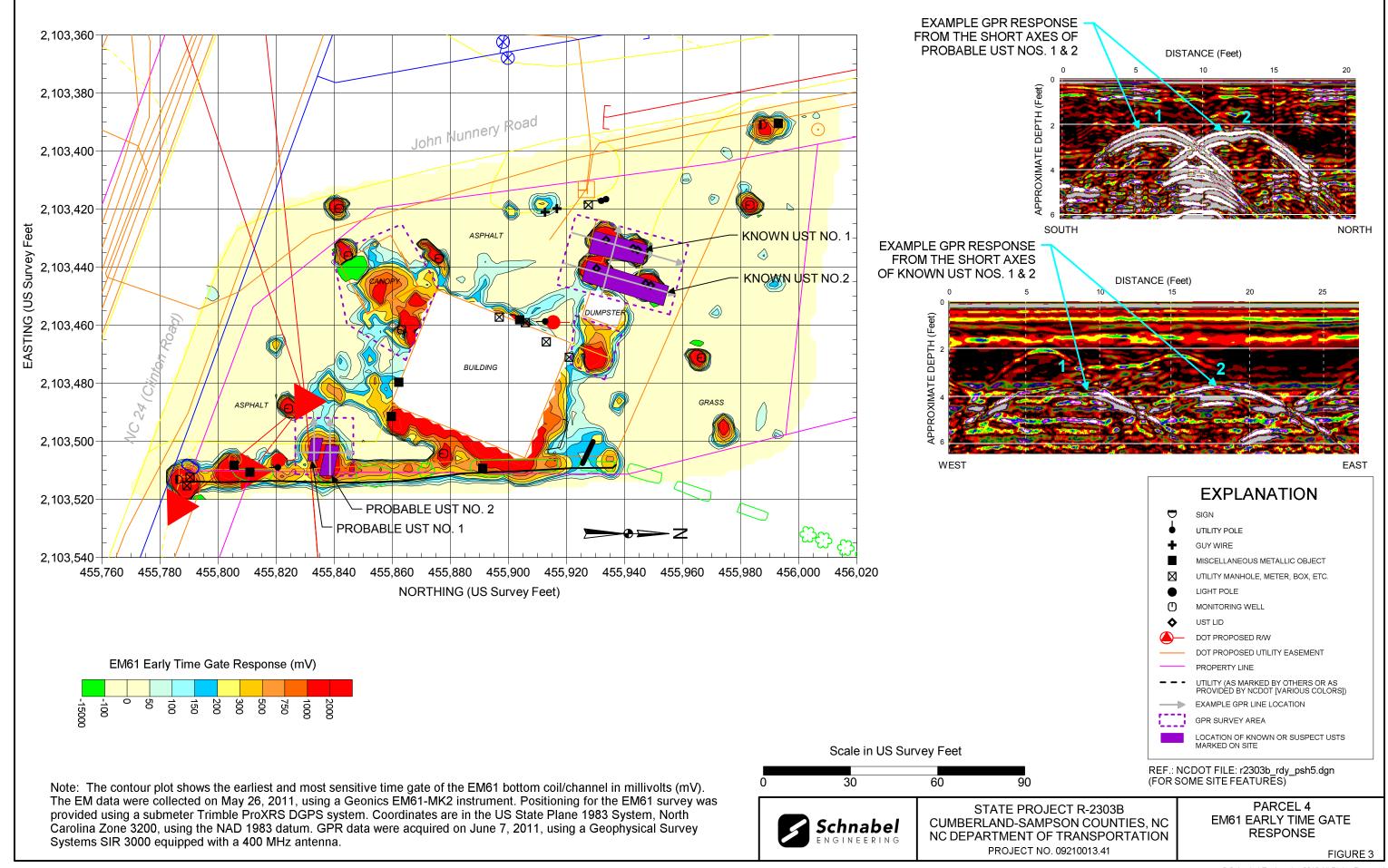


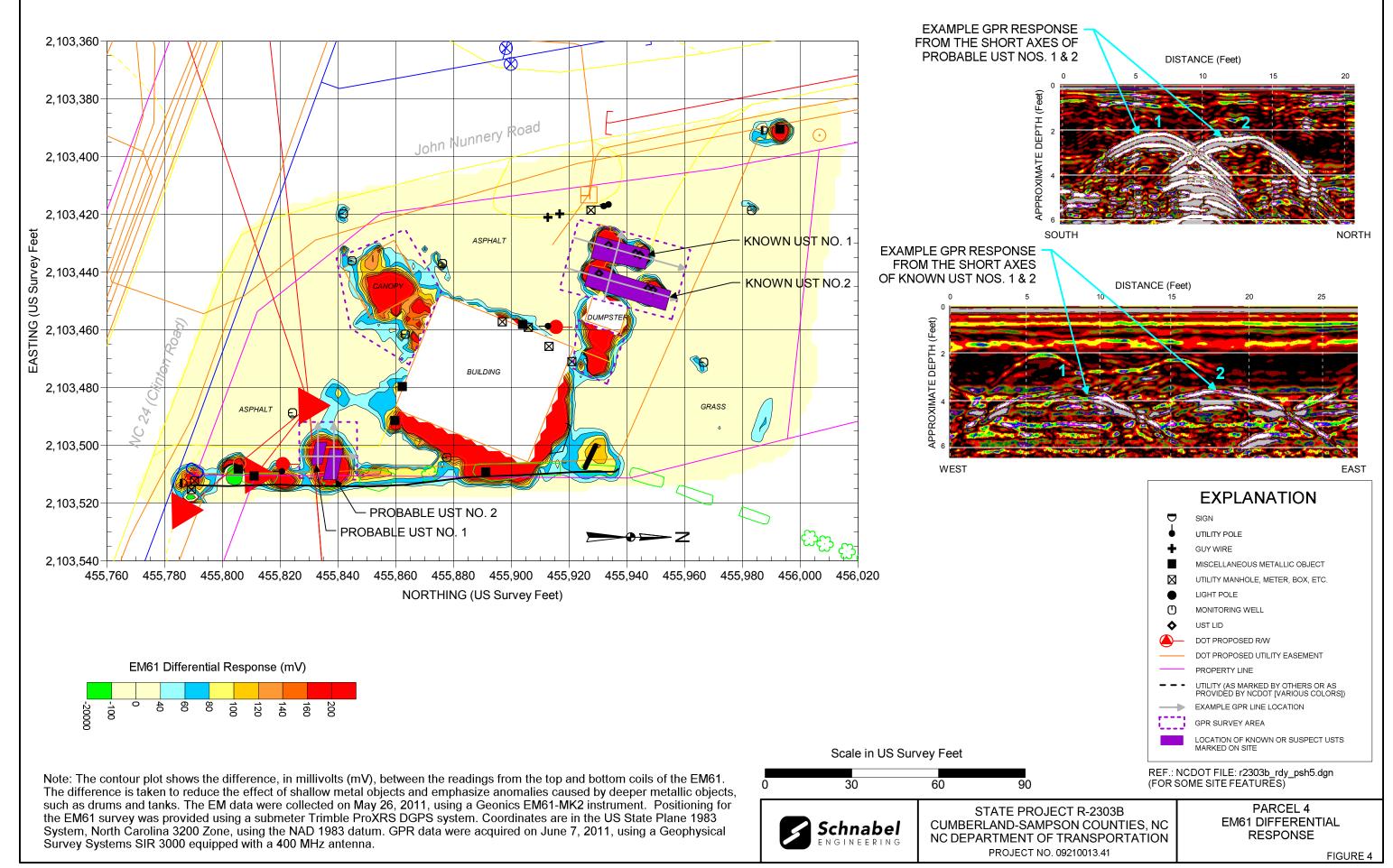
GSSI SIR-3000

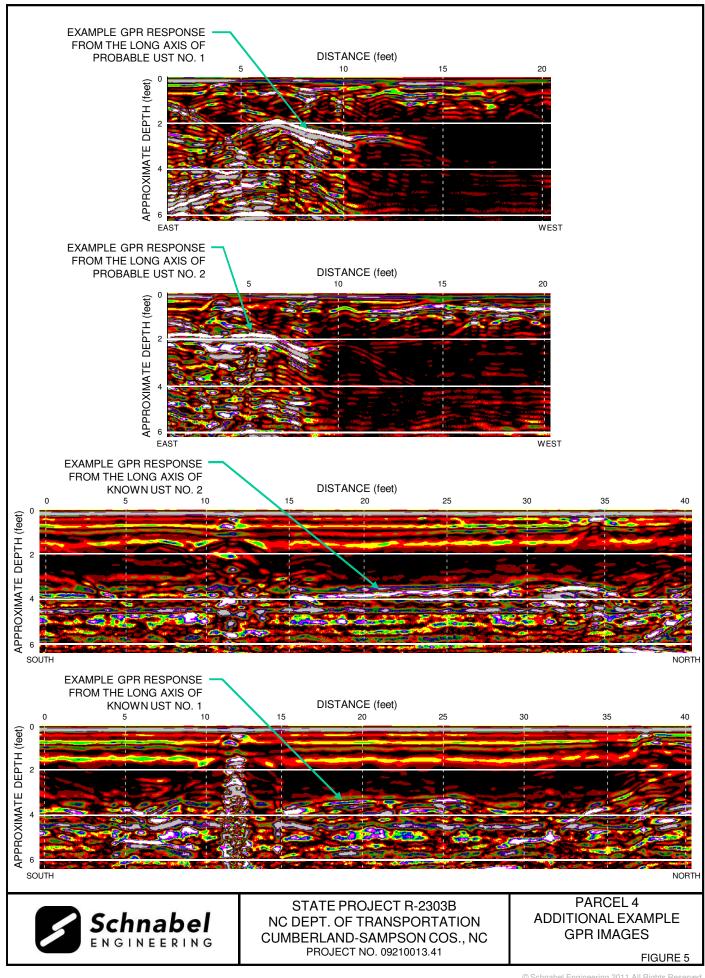


STATE PROJECT R-2303B NC DEPT. OF TRANSPORTATION CUMBERLAND-SAMPSON COS., NC PROJECT NO. 09210013.41 PHOTOS OF GEOPHYSICAL EQUIPMENT USED

FIGURE 2









Parcel 4 – Leiburn R. Strickland Property, looking south. Photo shows approximate marked location of the two known USTs on the northwest side of the property.



Parcel 4 – Leiburn R. Strickland Property, looking north. Photo shows approximate marked location of the two probable USTs on the southeast side of the property.



STATE PROJECT R-2303B NC DEPT. OF TRANSPORTATION CUMBERLAND-SAMPSON COS., NC PROJECT NO. 09210013.41

PHOTOS OF UST LOCATIONS

FIGURE 6

# APPENDIX D NCDENR UST FILE REVIEW INFORMATION

# UST CLOSURE SOIL ANALYTICAL DATA

STRICKLANDS #3
9007 HIGHWAY 24
AUTRYVILLE, NORTH CAROLINA
ATC PROJECT NO. 45.03451.0048
NCDENR FACILITY ID NO: 0-003898

		,													196	
Sample ID	Date	OVA Reading (ppm)	Sample Location	Contam- inants	Sample Depth (ft)	TPH - GRO	BENZENE	TOLUENE	ETHYL- BENZENE	TOTAL	BTEX	MTBE	NAPH- THALENE	CS-C8 Aliphatics	C9-C12 Alphatics	Co-Co-C
SW-1	1/17/06	4.1	Sidewall		3-4	0.24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-2	1/17/06	586	Sidewall	Gasoline	3-4	370	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-3	1/17/06	6.1	Sidewall	Gasoline	3-4	<3.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-4	1/17/06	5.7	Sidewall	Gasoline	3-4	<0.085	NA	NA	NA	NA	NA	NA	NA	NA	NA .	NA
SW-5	1/17/06	16.3	Sidewall	Gasoline	3-4	<0.087	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-6	01/17/06	10.6	Sidewall	Gasoline	3-4	0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-7	01/17/06	4.0	Sidewall	Gasoline	3-4	<0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-8	01/17/06	3.2	Sidewall	Gasoline	3-4	<0.082	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-9	01/17/06	2.6	Sidewall	Gasoline	3-4	<0.081	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SW-10	01/17/06	1.3	Sidewall	Gasoline	3-4	< 0.077	NA	NA	NA	NA	NA	NA	NA	NA-	NA	NA
SP-1	01/17/06	1,468	Stockpile	Gasoline		230	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP-2	01/17/06	1,663	Stockpile	Gasoline		380	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP-3	02/09/06	118	Stockpile	Gasoline		2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP-4	02/09/06	158	Stockpile	Gasoline		0.95	NA "	NA	NA	NA	NA	NA	NA	NA	NA	NA
OE-SW-11	02/09/06	10.5	Sidewall	Gasoline	4	NA	<0.0042	<0.0042	< 0.0042	<0.0042	ND	< 0.0042	< 0.0042	30	<4.4	<1.3
D-1	02/13/06	474	Dispensers	Gasoline	2	320	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D-2	02/13/06	38.9	Dispensers	Gasoline	2	<0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D-OE-BOTTOM	02/13/06	5.8	Dispensers	Gasoline	3.5	NA	< 0.0047	0.0084	< 0.0047	<0.0047	0.0084	< 0.0047	< 0.0047	34	<4.9	<1.5
SP-5	02/13/06	98.2	Stockpile	Gasoline		4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SP-6	02/13/06	79.8	Stockpile	Gasoline		3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PP-1	02/13/06	1.0	Product Line	Gasoline	3	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PP-2	02/13/06	1.0	Product Line	Gasoline	3	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OE-SW-1	02/13/06	10.6	Product Line	Gasoline	2	NA	0.015	0.046	0.067	0.345	0.473	0.027	0.033	34	7.8	6.5
OE-SW-2	02/13/06	3.1	Product Line	Gasoline	3	NA	< 0.0053	< 0.0053	< 0.0053	< 0.00532	ND	< 0.0053	< 0.0053	33	<4.7	<1.4
OE-SW-3	02/13/06	669	Product Line	Gasoline	4	NA	<0.480	<0.480	0.880	7.9	8.780	<0.480	5.8	64	140	86
OE-SW-4	02/13/06	2,829	Product Line	Gasoline	5	NA	<2.5	6.7	57	346	409.7	<2.5	66	220	2,300	1,700
OE-BOTTOM	02/13/06	2,863	Product Line	Gasoline	6	NA	<2.2	3.6	49	313	365.6	<2.2	58	<880	3,400	2,200
	NCDENR Action Level:								_		-				_	_
			Soil-to-Gro	undwater	MSCC:		0.0056	7	0.24	5		0.92	0.58	72	3,255	34
			R	esidential	MSCC:		22	3,200	1,560	32,000		156	63	939	9,386	469
			Industrial/ Co	mmercial	MSCC:	-	200	82,000	40,000	200,000		4,088	1,635	24,528	245,280	12,264

- 4. ppm = parts per million.
- 5. MSCC = Maximum Soil Contaminant Concentrations.
- 6. Bold indicates concentrations above NCDENR Action Level or MSCCs.

<sup>1.</sup> TPH = Total petroleum hydrocarbons.

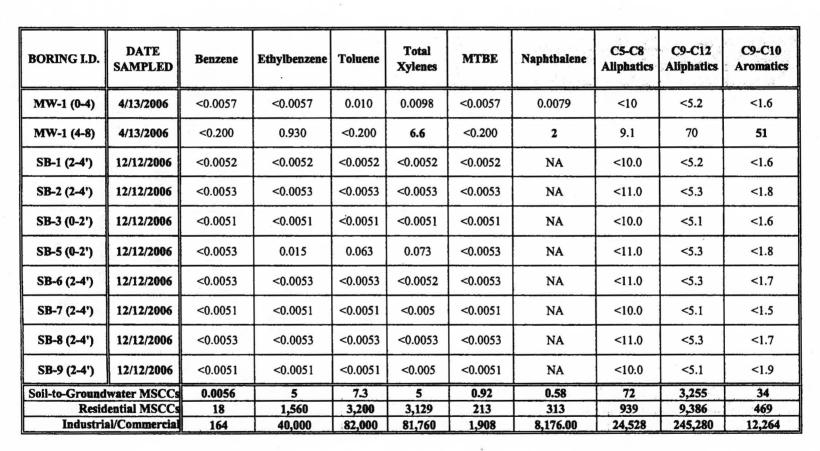
<sup>2.</sup> Concentrations reported in milligrams per kilogram (mg/kg).

<sup>3. &</sup>quot;<" = not detected at or above the laboratory detection limit.

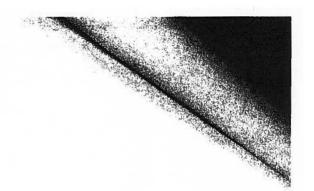
## TABLE 8

### SOIL ANALYTICAL DATA

STRICKLANDS #3
9007 HIGHWAY 24
AUTRYVILLE, NORTH CAROLINA
ATC PROJECT NO. 45.03451.0048
NCDENR FACILITY ID NO: 0-003898



- 1. All measurements are in milligrams per kilogram (mg/kg).
- 2. MSCC = Maximum Soil Contaminant Concentration established by NCDENR.
- 3. mg/kg = milligrams per kilogram
- 4. ND or "<" = None detected above method detection limit.
- 5. NE = Not established.
- 6. NA = Not analyzed.
- 7. Values in **BOLD** indicate concentrations above Soil-to-Groundwater MSCCs



## STRICKLANDS#3 9007 HIGHWAY 24 AUTRYVILLE, NORTH CAROLINA ATC PROJECT NO. 45.03451.0048 Page 1

ANAL	YTICAL:			EPA M	ETHOD	624/6200E				MADEP VP	н	EPA METHO 3030C
BORING LD.	DATE SAMPLED:	Benzene	Toluene	Ethyl- benzene	Total Xylenes	мтве	Isopropyl- ether (IPE)	Naph- thalene	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Lead
	4/14/2006	<10	87	840	5,600	<50	<50	<50	<4000	20,000	13,000	46.4
	2/28/2007	<10	<50	130	860	<20	<50	<50	540	9,400	7,200	12.9
	8/30/2007	<1	78	NA	NA	<5	<5	<5	1400	27,000	16,000	69.6
	1/14/2008	<20	110	1,600	9,300	<20	<20	<100	<2000	49,000	17,000	72.8
MW-1	9/5/2008	<0.1	2	110	560	<0.2	<0.1	<0.1	240	1,000	10,000	25.9
	3/25/2009	<1	<1	21	120	<i< td=""><td>&lt;1</td><td>45</td><td>99</td><td>4,700</td><td>6,900</td><td>22.7</td></i<>	<1	45	99	4,700	6,900	22.7
	9/3/2009	<0.1	0.57	52	251	<0.2	<0.1	<0.1	<300	7,000	6,800	24.9
	3/19/2010	<0.1	<0.1	1.3	7.8	<0.2	<0.1	<0.1	NA	NA	NA	32.8
	9/23/2010	<1	3	170	1,070	<2	<1	260	NA	NA	NA	71.3
	3/25/2011	<0.1	0.32	50	218	<0.2	<0.1	<0.1	NA	NA	NA	<10
	6/7/2006	<1	<5	80	157	<5	<5	<5	590	3,100	2,100	11.9
	2/28/2007	<1	<5	<5	<5	. <5	<5	<5	<200	900	670	11.7
	8/30/2007	<1	<5	28	93	<5	<5	<5	490	2,000	1,300	<10
	1/14/2008	<1	3.3	68	189	<1	<1	<5	340	1,700	900	15.5
MW-2	9/5/2008	<0.1	<0.1	0.31	1.44	<0.2	<0.1	<0.1	<200	30	150	<10
	3/25/2009	<1	<]	<1	<1	<1	<1	<1	<30	<35	<10	23.9
1, 1, 1, 1	9/3/2009	<0.1	<0.2	0.39	0.36	<0.2	<0.1	1	<30	<35	13,000 7,200 16,000 17,000 10,000 6,900 6,800 NA NA NA 2,100 670 1,300 900 150	15.1
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA		35.3
	9/23/2010	<0.1	<0.1	1.50	4.43	<0.2	<0.1	<0.1	NA	NA		18.1
	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	<10
	6/7/2006	7.8	920	370	1,000	<5	<5	<5	2,300	1,800	C9-C10 Aromatics  13,000 7,200 16,000 17,000 10,000 6,900 6,800 NA NA NA 2,100 670 1,300 900 150 <10 14 NA NA NA S60 <30 <30 <10 <10 NA	104
	2/28/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100		29.8
	8/30/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100		37.5
	1/14/2008	<1	<1	<1	<i< td=""><td>&lt;1</td><td>&lt;1</td><td>&lt;5</td><td>&lt;200</td><td>&lt;100</td><td></td><td>35.3</td></i<>	<1	<1	<5	<200	<100		35.3
MW-3	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70	PROCESS	19.5
	3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35		12
	9/3/2009	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<30	<35		17.7
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA		<10
	9/23/2010	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA	7000000	69.4
	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	39.4
	6/7/2006	<1	<5	<5	5.3	<5	<5	<5	<200	<100		136
	2/28/2007	<1	<5	<5	<5	<5	<b>&lt;</b> 5	<5	<200	<100		<10.0
	8/30/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100		<10
	1/14/2008	<1	<1	<1	<1	<1	<1	<5	<200	<100		10.3
MW-4	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70		21.2
	3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	-	19.3
	9/3/2009	<0.1	<0.2	<0.1	<0.1	<0.2.	<0.1	<0.1	<30	<35		27.5
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	00.5000	41.7
	9/23/2010	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA		74.6
5	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA		60.7
	GW Standards: GCLs:	5,000	600 260,000	600 84,500	500 85,500	20,000	70,000	6,000	420 NE	4,200 NE		15,000

- Notes:

  1. All measurements are in micrograms per liter (ug/L)

  2. \*\* or ND = None detected above method detection limit.

  3. NC 2L GW Standard = Title 15A NCAC 2L .0202 Groundwater Su

  4. GCL = Gross Contaminant Level established by NCDENR.

  5. NE = Not established.

  6. NA = Not analyzed.

  7. MTBE = Methyl tertiary butyl ether

  8. Values in BOLD indicate levels above 2L Groundwater Standards.

  9. September 23, 2010 data analyzed by Standard Method 6200B.

# STRICKLANDS #3 **9007 HIGHWAY 24 AUTRYVILLE, NORTH CAROLINA** ATC PROJECT NO. 45.03451.0048 Page 2

ANAL	YTICAL:			EPA M	ETHOD 6	524/6200B		EPA METHOI 3030C				
BORING I.D.	DATE SAMPLED:	Benzene	Toluene	Ethyl- benzene	Total Xylenes	мтве	Isopropylether (IPE)	Naph- thalene	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Lead
3 V.	2/28/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	<30	76.8
100	8/30/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	Aromatics	71.7
	1/14/2008	<1	1.9	<1	<1	<1	<1	<5	<200	<100	<30	115
	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70	<30	18.9
MW-5	3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	<10	37
	9/3/2009	<0.1	<0.2	0.41	1.83	<0.2	. <0.1	<0.1	<30	<35	<10	22.5
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	24.8
	9/23/2010	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA	NA	45.9
	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	24
Filipine:	2/28/2007	<1	<5	<5	<5	<5	<5	<5	220	<100	<30	359
	8/30/2008	<1	<5	<5	<5	<5	<5	<5	<200	110	76	79
	1/14/2008	<1	<1	<1	<1	<1	<1	<5	<200	<100	<30	47.3
	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70	<30	21.1
MW-6	3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	<10	17.4
	9/3/2009	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<30	<35	<10	20.5
	3/19/2010	<0.1	<0.1	<0.1	11.3	<0.2	<0.1	1.9	NA	NA	NA	15.9
37.5	9/23/2010	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA	NA	29.3
	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	16.3
different states	2/28/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	<30	359
	8/30/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	37	92.5
	1/14/2008	<1	<1	<1	<1	<1	<1	<5	<200	<100	<30	81.8
	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70	<30	56.2
MW-7_	3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	<10	81.5
	9/3/2009	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<30	<35	<10	27.7
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	35.1
44	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	35.1
17.1	9/23/2010	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA	NA	49.4
	3/25/2011	<0:1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	45.7
	2/28/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	<30	32.7
	8/30/2007	<1	<5	<5	<5	<5	<5	<5	<200	<100	<30	12.1
	1/14/2008	<1	<1	<1	<1	<1	<1	<5	<200	<100	<30	82.9
MW-8	9/5/2008	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<200	<70	<30	26.9
*******	:3/25/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	<10	17.8
	9/3/2009	<0.1	<0.2	<0.1	<0.1	<0.2	<0.1	<0.1	<30	<35	<10	14.3
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	15.6
	9/23/2010 -	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	NA	NA	NA	25.9
	3/25/2011	<0.1	<0.2	<0.2	<0.4	<0.2	<0.1	<0.1	NA	NA	NA	12.9
2L (	GW Standards:	1	600	600	500	20	70	6	420	4,200	210	15

- Notes:

  1. All measurements are in micrograms per liter (ug/L)

  2. "<" or ND = None detected above method detection limit.

  3. NC 2L GW Standard = Title 15A NCAC 2L .0202 Groundwater Standard.

  4. GCL = Gross Contaminant Level established by NCDENR.

  5. NE = Not established.

- 5. NL= Not established.
  6. NA = Not analyzed.
  7. MTBE = Methyl tertiary butyl ether
  8. Values in BOLD indicate levels above 2L Groundwater Standards.
  9. September 23, 2010 data malyzed by Standard Method 6200B.

# STRICKLANDS #3 9007 HIGHWAY 24 AUTRYVILLE, NORTH CAROLINA ATC PROJECT NO. 45.03451.0048

Page 3

1:-:	YTICAL:	EPA METHOD 624/6200B MADEP VPH										EPA METHOD 3030C
BORING I.D.	DATE SAMPLED:	Benzene	Toluene	Ethyl- benzene	Total Xylenes	мтве	Isopropyl- ether (IPE)	Naph- thalene	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Lead
	2/28/2007	<1	240	110	740	<5	<5	<5	580	2,400	1,000	<10.0
	8/30/2007	<1	<5	<5	8.4	<5	<5	<5	<200	<100	30	<10
	1/14/2008	<1	<1	<1	<1	<1	<1	<5	<200	<100	<30	<10
MW-1D	9/5/2008	<0.1	0.19	1.1	0.25	<0.2	<0.1	<0.1	<200	<70	<30	<10
WW-ID	3/24/2009	<1	<1	<1	<1	<1	<1	<1	<30	<35	11	<10
1	9/3/2009	<0.1	0.64	3.4	5.7	<0.2	<0.1	1.9	<30	37	27	12
	3/19/2010	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	<10
	9/23/2010	<0.1	<0.1	<0.1	0.16	<0.2	<0.1	1.8	NA	NA	NA	<10
1	3/25/2011	<0.1	<0.1	<0.1	<0.2	<0.2	<0.1	<0.1	NA	NA	NA	<10
2L	GW Standards:	1	600	600	500	20	70	6	420	4,200	210	15
	GCLs:	5,000	260,000	84,500	85,500	20,000	70,000	6,000	NE	NE	NE	15,000

- 1. All measurements are in micrograms per liter (ug/L)
- 2. "<" or ND = None detected above method detection limit.
- 3. NC 2L GW Standard = Title 15A NCAC 2L .0202 Groundwater Standard
- 4. GCL = Gross Contaminant Level established by NCDENR.
- 5. NE = Not established.
- 6. NA = Not analyzed.
- 7. MTBE = Methyl tertiary butyl ether
- 8. Values in BOLD indicate levels above 2L Groundwater Standards.
- 9. September 23, 2010 data analyzed by Standard Method 6200B.

#### STRICKLANDS #3 9007 HIGHWAY 24 AUTRYVILLE, NORTH CAROLINA ATC PROJECT NO. 45.03451.0048 NCDENR FACILITY ID NO: 0-003898

	ANALYTICAL:				EPA ME	THOD 62	4			MADEP	VPH & MAI	DEP EPH	EPA METHOD 3030C
BORING I.D.	DATE SAMPLED:	Benzene	Toluene	Ethyl- benzene	Total Xylenes	Total BTEX	мтве	Isopropyl- ether (IPE)	Naph- thalene	C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics	Lead
MW-1	4/14/2006	<10	87	840	5,600	6,527	<50	<50	<50	<4000	20,000	13,000	46.4
	2/28/2007	<10	<50	130	860	990	<20	<50	<50	540	9,400	7,200	12.9
MW-2	6/7/2006	<1	<5	80	157	237	<5	্ব	<5	590	3,100	2,100	11.9
	2/28/2007	<1	<5	<5	<	ND	<5	<5	<5	<200	900	670	11.7
MW-3	6/7/2006	7.8	920	370	1,000	2,298	<5	<5	<5	2,300	1,800	560	104
	2/28/2007	<1	<5	<5	<5	ND	<5	<5	<5	<200	<100	<30	29.8
MW-4	6/7/2006	<1 .	<	<5	5.3	5.3	<5	<5	<5	<200	<100	<30	136
	2/28/2007	<1	<5	<5	<5	ND	<5.	<5	<5	<200	<100	<30	<10.0
MW-5	2/28/2007	<1	<5	<5	<5	ND	<5	<5	<5	<200	<100	⊲30	76.8
MW-6	2/28/2007	<1	<5	<5	<5	ND	<5	<5	<5	220	<100	<30	359
MW-7	2/28/2007	<1	<5	<5	<5	ND	<5	<5	<5	<200	<100	<30	359
MW-8	2/28/2007	<1	<5	<5	<5	ND	<5	<5	<5	<200	<100	<30	32.7
MW-1D	2/28/2007	<1	240	110	740	1,090	<5	<5	<5	580	2,400	1,000	<10.0
PW-4	2/28/2007	<1	<5	<5	<5	ND	ব	<	<5	NA	NA	NA	NA
PW-13	2/28/2007	<1	<5	<5	<5	ND	<5	<	<5	NA	NA	NA	NA
2L	GW Standards: GCLs		1,000 257,500	550 84,500	530 87,500	NE NE	200,000	70,000	21 15,500	420 NE	4,200 NE	210 NE	15 15,000

- 1. All measurements are in micrograms per liter (ug/L)
- 2. "<" or ND = None detected above method detection limit.
- 3. NC 2L GW Standard = Title 15A NCAC 2L .0202 Groundwater Standard
- 4. GCL = Gross Contaminant Level established by NCDENR.
- 5. NE = Not established.
- 6. NA = Not analyzed.
- 7. MTBE = Methyl tertiary butyl ether
- 8. Values in BOLD indicate levels above 2L Groundwater Standards.

