PSA REPORT

PRELIMINARY SITE ASSESSMENT PARCEL #001 WILLIAM B. & DEBORAH ANDERSON PROPERTY 100 DAVIDSON HIGHWAY CONCORD, CABARRUS COUNTY, NC STATE PROJECT B-5136 WBS ELEMENT 42295.1.1

$Prepared \ for$

North Carolina Department of Transportation Geotechnical Engineering Unit Geoenvironmental Section Century Center Complex, Building B 1020 Birch Ridge Drive Raleigh, NC 27610 Tel. (919) 250-4088

March 14, 2013, Revised April 24, 2013



URS Corporation – North Carolina 1600 Perimeter Park Drive, Suite 400 Morrisville, North Carolina 27560 Tel. 919-461-1100 Fax 919-461-1415

URS Job No. 3182 7879

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CERTIFICATION

This Report was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my thorough inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

2061



URS Corporation - North Carolina

Walter Plekan, L.G. NC License No.
Project Manager

4-27-13

SECTIONONE Introduction

1.1 INTRODUCTION

This report documents a Preliminary Site Assessment (PSA) conducted by URS Corporation – North Carolina (URS) on behalf of the North Carolina Department of Transportation (NCDOT). The assessment area includes a site located on the north side of Davidson Highway, just northwest of the intersection with US 29. This PSA was conducted in Concord, Cabarrus County, North Carolina (**Figure 1**) for the Craco Co LLC, Inches Away facility, owned by William B. & Deborah Anderson, located at 100 Davidson Drive (the Site). The PSA was performed only within the proposed right-of-way and/or easement for this parcel.

This PSA was performed in general accordance with:

- NCDOT's 30 November 2012 Request for Technical and Cost Proposal (RFP) for the Site property. The RFP established the following scope of work (SOW) for the project:
 - Locate USTs and estimate approximate size and contents (if any).
 - Evaluate whether contaminated soils are present with emphasis along planned drainage lines and ditches.
 - If contamination is evident, estimate the quantity of impacted soils and indicate the approximate area of soil contamination on a site map.
 - Prepare a report including field activities, findings, and recommendations for each site and submit to this office in triplicate and one electronic copy.
- URS's 21 December 2012 Technical and Cost Proposal for the Site property.
- NCDOT's 8 January 2013 Notice to Proceed for the Site property.

The scope of work included a geophysical survey, soil sampling using a direct push technology (DPT) rig, and laboratory analyses (Total Petroleum Hydrocarbons or TPH) of selected soil samples from within the Site property. The geophysical survey was first conducted by URS in order to identify potential UST and/or anomaly locations within the Site property. Based on the results of the geophysical survey and anecdotal evidence, boring locations were identified and the DPT borings were completed by a qualified drilling subcontractor (Probe Technology of Concord, North Carolina) under the supervision of a URS geologist. Soil borings were located in areas that were cleared of underground utilities by NC One-Call. Analysis of soil samples were performed by Pace Analytical Services, Inc. under direct contract with NCDOT.

1.2 BACKGROUND

The objective for this PSA is to assess the Site for USTs, impacted soil, and to delineate potential impacts found in soils. The major Site features and the surrounding area are shown on **Figures 1** and **2**. The parcel is bounded by Concord Parkway North and buffer to the south, David Highway to the west, and commercial and residential properties to the east and north. The property currently operates as a weight loss clinic.

A review of historical aerials (**Appendix A**) obtained from the Cabarrus County GIS indicates that the first structure was present prior to 1950 and looks to be a drive-in movie theatre. The

SECTIONONE Introduction

drive-in movie theater was apparently removed between 1956 and 1964, and replaced with a single commercial looking building which appears to have remained on the parcel through at least 1975. Between 1975 and 1986 the present day building appears to have been constructed, and based on the historical aerials, very little change is observed on the property from 1986 through present day.

A historic aerial photograph taken in 1964 suggests that the property may have previously operated as a gas station or commercial store. However, NCDENR's UST Registration Database does not provide any known Facility ID or groundwater Incident numbers associated with the property.

2.1 GEOPHYSICAL SURVEY

The primary objective of the geophysical survey was to locate potential USTs or anomalies within the property, and a secondary objective was to identify general locations of underground utilities at the property in advance of the planned subsurface investigation. The geophysical survey for the property was conducted by URS between January 22 and 24, 2013. Ground surface conditions consisted primarily of concrete or asphalt with some grassy areas.

The geophysical investigation was conducted using the electromagnetic (EM) method augmented by ground-penetrating radar (GPR). The EM survey was completed using the hand-held Schonstedt GA-52Cx Magnetic Locator and the Geonics, Ltd. EM-61 MKII (EM-61). The GPR survey was completed using a Sensors & Software, Inc. Noggin PLUS Smart Cart System with a 250 MHz scanning antenna.

EM-61 data were collected along parallel profiles with a nominal spacing of 5 feet where accessible. EM-61 data were recorded at a rate of 8 readings per second, which equates to an along-profile data point spacing of less than 1 foot. URS utilized the Schonstedt GA-52Cx to conduct a search of the portions of the survey area not accessible due to the size of the EM-61 instrument in order to identify anomalies indicative of USTs (i.e. between trees, man-made obstructions, etc.).

A Trimble ProXRT global positioning system (GPS) was used to record positional data coincident with the EM-61 data. The ProXRT system provided real-time differential corrections via an Omnistar subscription service. The horizontal accuracy of the differential GPS (DGPS) data is generally 3 feet or better. URS also used the GPS system to record the locations of relevant site features within the survey area.

Prior to conducting the GPR investigation, URS performed in-field analysis of the EM-61 data to identify anomalies indicative of potential USTs. Preliminary interpretations were based on an evaluation of the magnitude of the EM response as well as the dimensions of the anomaly in plan view.

The GPR was used to conduct a broad search of the parcel in areas where metal detection methods proved unreliable due to metallic interference, or where further investigation of EM anomalies were determined necessary. GPR surveying consisted of in-field analysis of real-time data. As a result, no post-processing of the GPR data was completed. However, GPR anomalies that appeared to be indicative of USTs were saved to a data file. The objective of augmenting the EM-61 survey with follow-up GPR surveying was to further characterize EM-61 anomalies that could not be readily attributed to existing site features.

The EM-61 data were pre-processed using the program DAT61 MK2 (Geonics Ltd). The program was used to prepare the data for contouring in Surfer (Golden Software, Inc.). Contoured data represent EM-61 Channel 1 and differential responses. The Channel 1 response represents data recorded at the earliest time interval along the EM-61 response decay curve. These data are applicable to detection of subsurface objects including USTs and other underground obstructions (e.g. utility lines).

2.2 SOIL BORING INSTALLATION AND MEDIA SAMPLING

Two direct-push soil borings, P1-SB1 and P1-SB2, were installed on February 6, 2013 to assess the Site for impacted soil as shown on **Figure 2**. Soil samples were collected and logged continuously at each soil boring location. Soil sample aliquots were field screened for organic vapors with a MiniRae[®] brand photo-ionization detection (PID) instrument calibrated daily with 100 parts per million (ppm) isobutylene.

Soil samples from select intervals were collected from each boring during the soil investigations for laboratory analysis. The samples were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline range organics (GRO) and diesel range organics (DRO) using USEPA Method 8015B.

2.3 QUALITY CONTROL/QUALITY ASSURANCE PROCEDURES

While in the field, pertinent observations were recorded in a logbook maintained by the URS field representative. This included pertinent field data collection activities and other observations as appropriate. Each sample collected for laboratory analysis was assigned a unique sample identification number and placed in laboratory supplied containers appropriate for the parameters being analyzed. Samples collected for laboratory analyses were stored on ice in insulated coolers immediately following collection. Information on the custody, transfer, handling, and shipping of all samples was recorded on a chain-of-custody form that accompanied the samples to the laboratory.

Soil analytical data were evaluated based on the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (USEPA, October 1999). Sample results have been qualified based on the results of the data review process and are considered representative and valid for the purpose of this report.

3.1 GEOPHYSICAL SURVEY RESULTS

The results of the geophysical survey are presented in accordance with the NCDOT guidelines, dated May 19, 2009, for identifying and ranking potential USTs on NCDOT projects.

The EM-61 Channel 1 and differential response results are provided as plan view, color-enhanced contour maps in **Figures 3** and **4**, respectively. The results presented in **Figures 3** and **4** are superimposed on the parcel base drawing provided by NCDOT. The interpreted background response is represented by the light blue to light green contours and corresponds to the range of 0 to 100 milliVolts (mV).

The Channel 1 results in **Figure 3** indicate high response anomalies, red in color, where known metallic features exist. There appears to be slight increase in response values indicated by small orange anomalies in **Figure 3**, which do not correlate to surface features. Because the ground surface consists of a landscaped median over this portion of the site, the localized increase in response values suggests a slightly elevated background metallic signature of the materials beneath the surveyed area. These near-surface conditions may include fill materials with a relatively higher metallic mineral content or the presence of unreinforced concrete beneath the site.

The effects of surface and near-surface conditions appear to be muted in the differential response data, thus facilitating the identification of deeper anomalies characteristic of USTs. Because the differential response data in **Figure 4** depict more well-defined footprints of EM signatures and enable muting of surface effects, these response data were utilized to select the target locations for inclusion in the follow-up GPR survey. In this particular instance, no anomalies indicative of a potential UST was identified in **Figure 4**.

The results of the sweep search with the Schonstedt in areas inaccessible by the EM-61 and GPR did not identify anomalies indicative of buried metallic obstructions.

Due to the small area for this particular parcel, a follow-up GPR survey across the survey area was conducted. The instrument did not indicate reflections consistent with the characteristics of USTs.

3.2 SOIL SAMPLING RESULTS

A total of two soil borings were advanced to approximately 10 ft bgs during the PSA investigation at the Site property. Boring locations are shown in **Figure 2** and analytical results (TPH) are summarized in **Table 1**. The soil was described as reddish sandy clay. The boring logs are included as **Appendix B** and the complete laboratory report is included in **Appendix C**.

As shown in **Appendix B**, soil headspace screening in the field detected very low concentrations of organic vapors (0-4 parts per million). TPH (GRO) was not detected in any of the soil samples collected for laboratory analysis. TPH (DRO) was detected in the soil sample collected from boring P1-SB2 (P1-SB2-6) at a concentration of 10.7 milligrams per kilogram (mg/kg) at approximately six ft bgs. This concentration just barely exceeds the NCDENR Non-UST Petroleum Action Level of 10 mg/kg.

The approximate extents of potential impacts associated with P1-SB2-6 are depicted as a conservative approach. The areas shown is approximately 100 square feet, using a uniform depth of 3-ft; the volume of impacted soil that potentially could be encountered at depth is approximately 11 cubic yards.

3.3 SUMMARY

The following summarizes the findings of NCDOT Parcel 1 - Craco Co LLC, Inches Away facility, owned by William B. & Deborah Anderson, located at 100 Davidson Drive:

- Historical files reviewed did not indicate the past use of the property as a gas/service station. NCDENR incident number were not identified for the site;
- The geophysical survey did not indicate the presence of USTs or associated features;
- Field screening did not detect the presence of organic vapors above background concentrations;
- Soil Sample P1-SB-2 reported a concentration in excess of the regulatory standards for TPH (DRO), however, a constituent analysis of this sample for VOCs and SVOCs would likely not exceed NCDENRs' more stringent soil-to-groundwater maximums soil contaminant concentration action levels. As soil impacts were not evident in the field, additional soil borings were not installed; and
- Future site workers are unlikely to encounter the impacted soil due to the depth (approx. 6 ft bls). The estimated area of impacted soil is depicted Figure 2.

SECTIONFOUR Limitations

Opinions relating to environmental, geologic, and geotechnical conditions at this parcel are based on limited data, and actual conditions may vary from those encountered at the times and locations where the data was obtained, despite the use of due professional care. The geophysical investigation was conducted in accordance with reasonable and accepted engineering geophysics practices, and the interpretations and conclusions are rendered in a manner consistent with other consultants in our profession. All geophysical techniques have some level of uncertainty and limitations. No other representations of the reported information is expressed or implied, and no warranty or guarantee is included or intended. The results of the geophysical survey are presented in accordance with the NCDOT guidelines, dated May 19, 2009, for identifying and ranking potential USTs on NCDOT projects.



SECTIONFIVE References

URS Corporation, *Technical and Cost Proposal, Preliminary Site Assessment*, Rev, December 21, 2012.

- United States Environmental Protection Agency, Contract Laboratory Program National Functional Guidelines for Organic Data Review, 1999.
- North Carolina Department of Transportation, *Request for Technical and Cost Proposal*, *Preliminary Site Assessment*, *B-5136*(42295.1.1), November 30, 2012.
- North Carolina Department of Transportation, Notice to Proceed Preliminary Site Assessment, B-5136(42295.1.1), January 14, 2013.

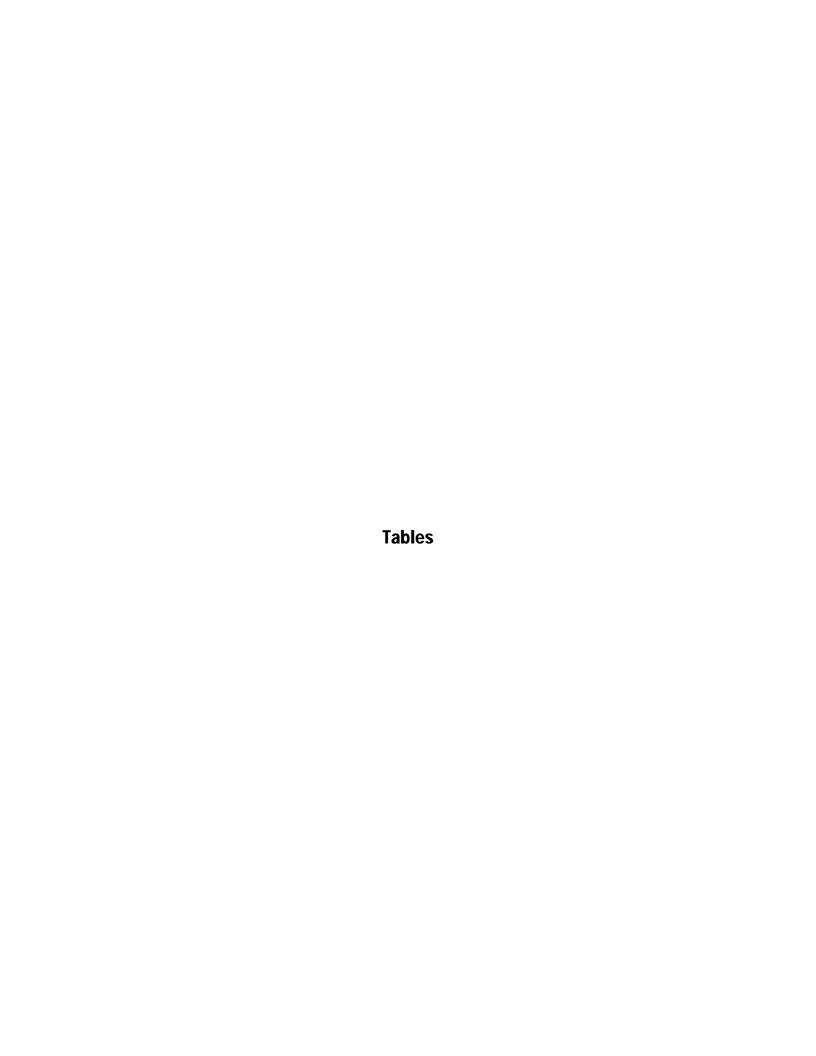


Table 1 Parcel 001 - William B. Deborah Anderson Property Summary of Analytical Results - Solid Samples

TIP #B-5136 42295.1.1

Analytical	EPA 8015 Modified by EPA 3546	EPA 8015 Modified by EPA 5035A/5030B		
Sample ID	Constituent o	of Concern	TPH - Diesel Range Organics (DRO)	TPH - Gasoline Range Organics (GRO)
	Date Collected (mm/dd/yy)	Sample Depth (ft. BGS)	mg/kg	mg/kg
P1-SB1-10	02/06/2013	10	ND	ND
P1-SB2-6	02/06/2013 6		10.7	ND
NCDENR UST Sec	10	10		
NCDENR Non-UST Petroleum Action Level			10	10

NOTES:

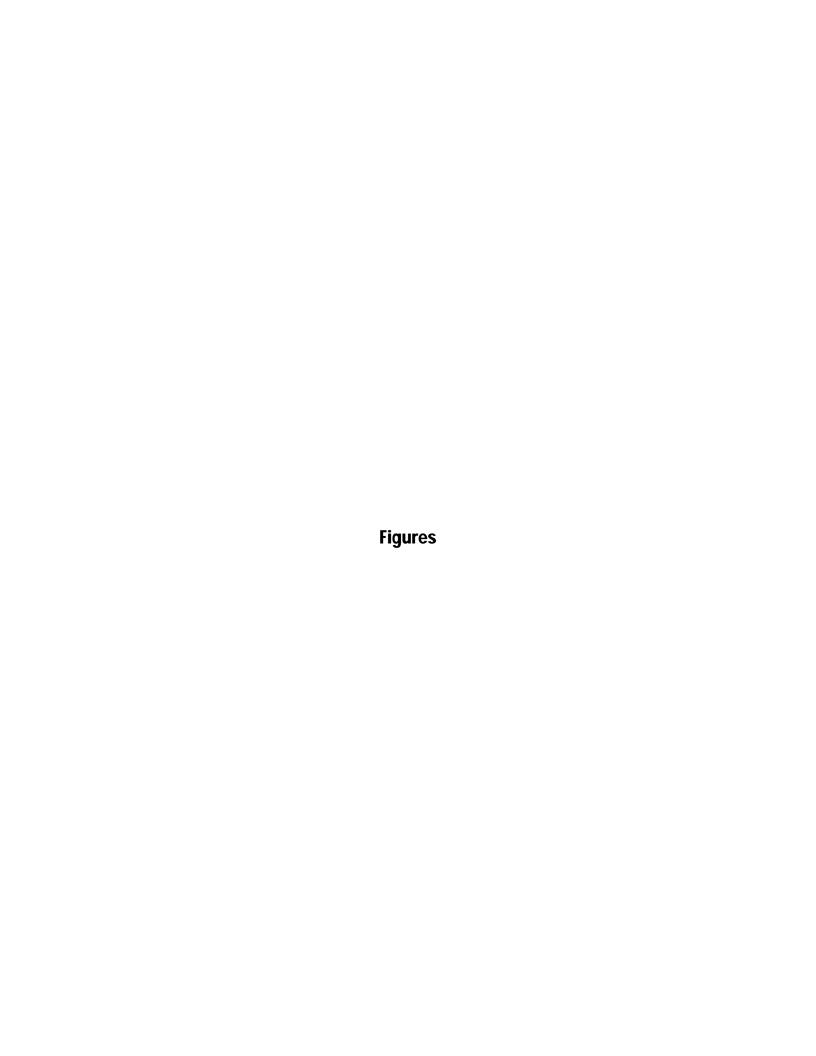
ND = Not Detected

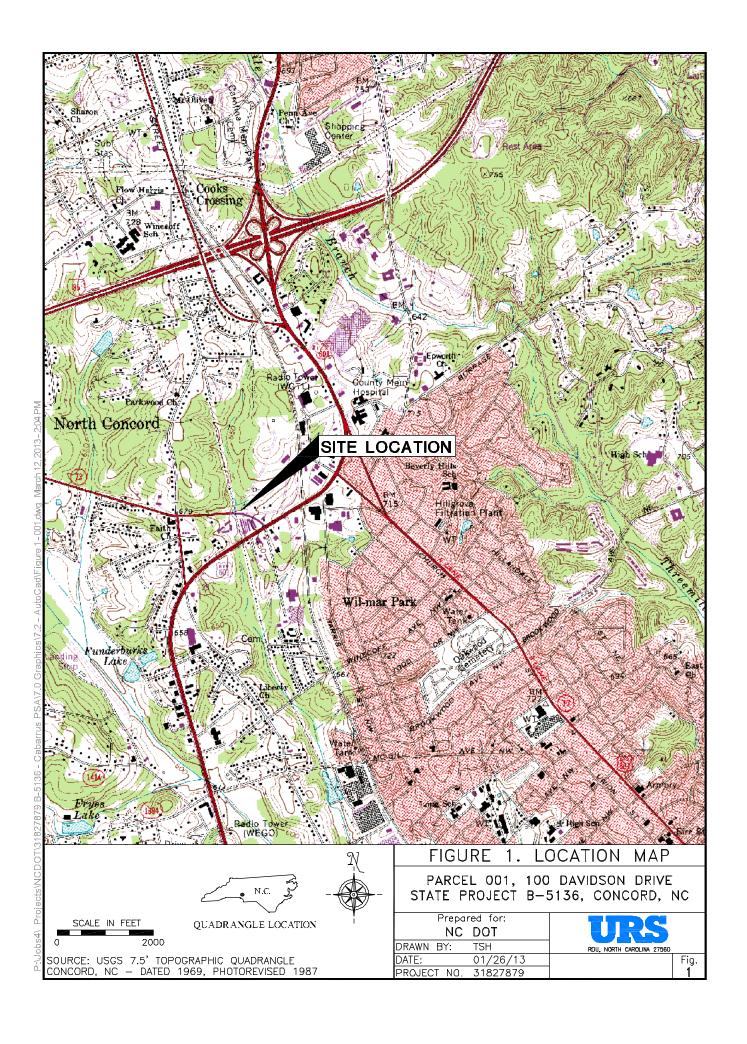
TPH = Total Petroleum Hydrocarbons

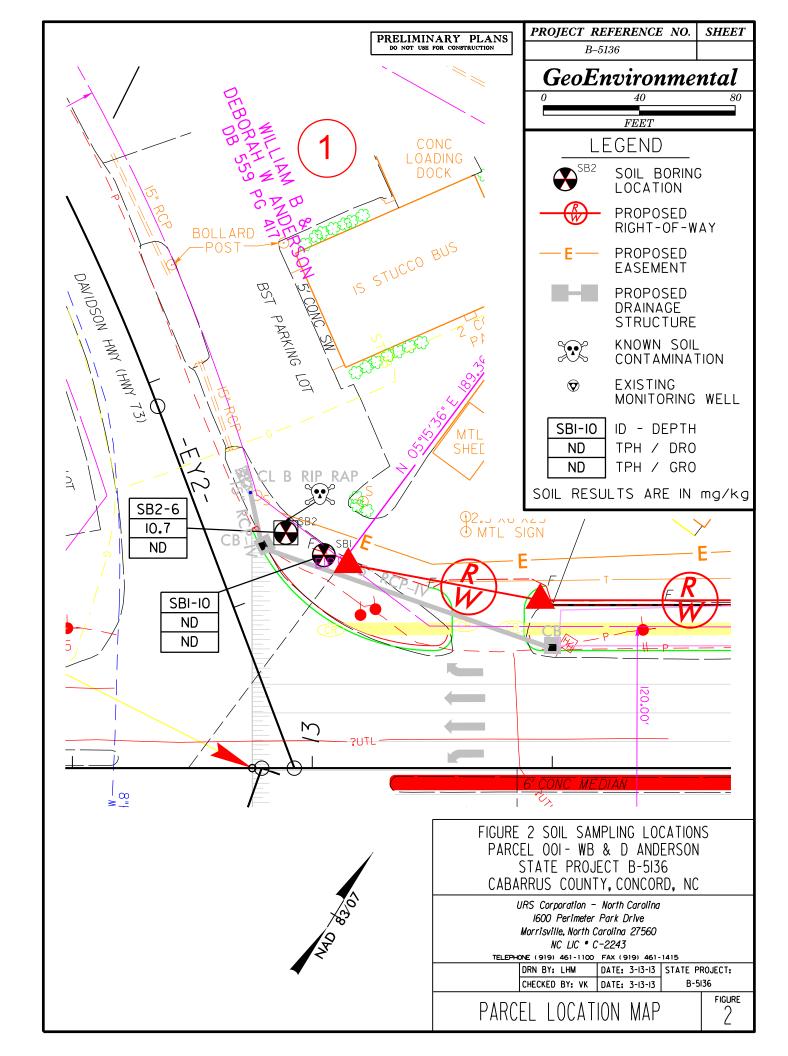
ft. BGS = feet below ground surface

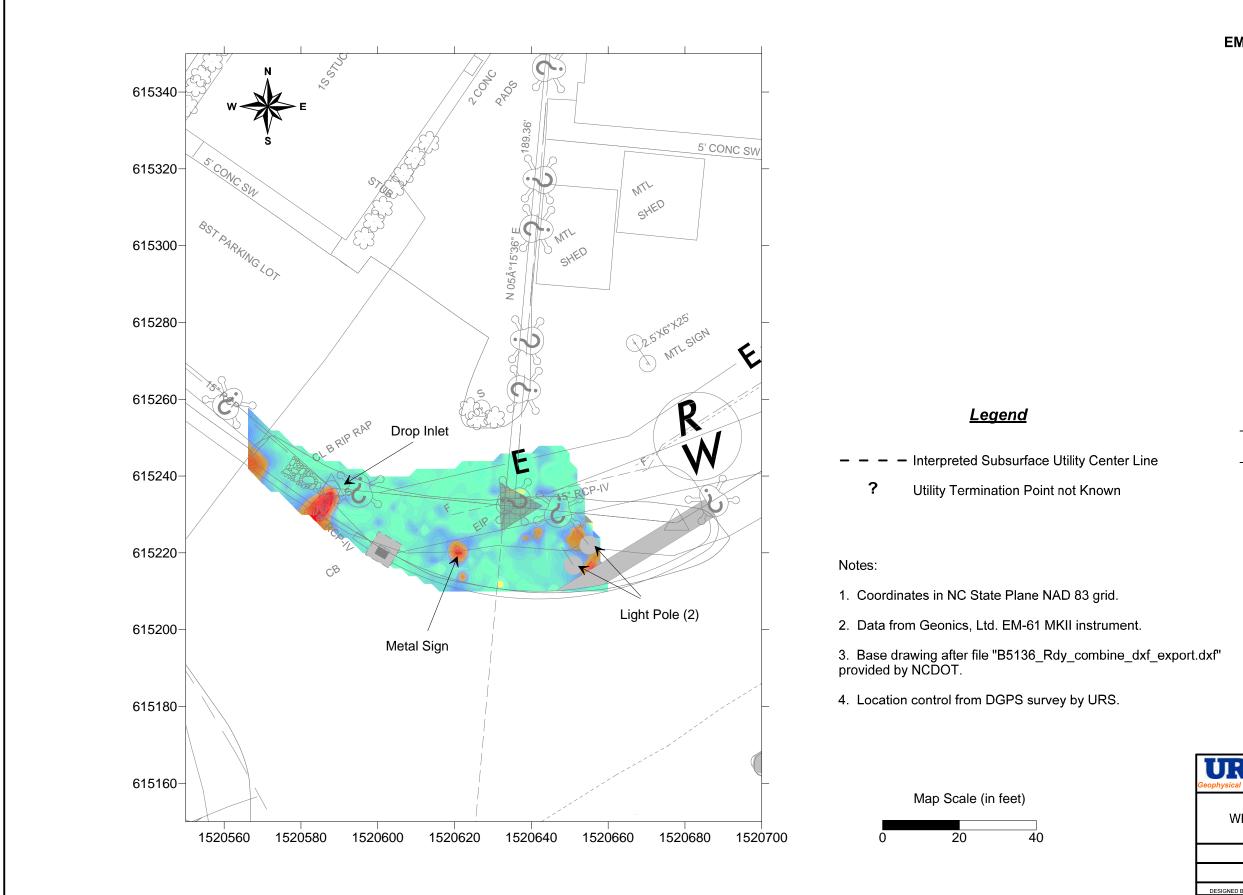
mg/kg = milligrams per kilogram

Bold data above the NCDENR Action Levels

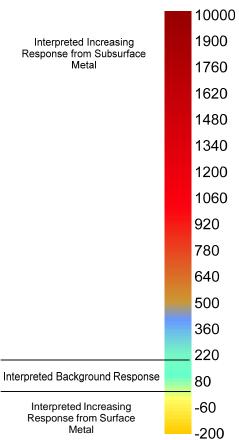


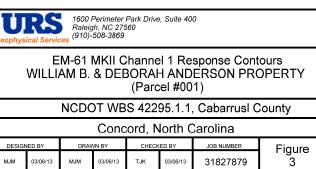


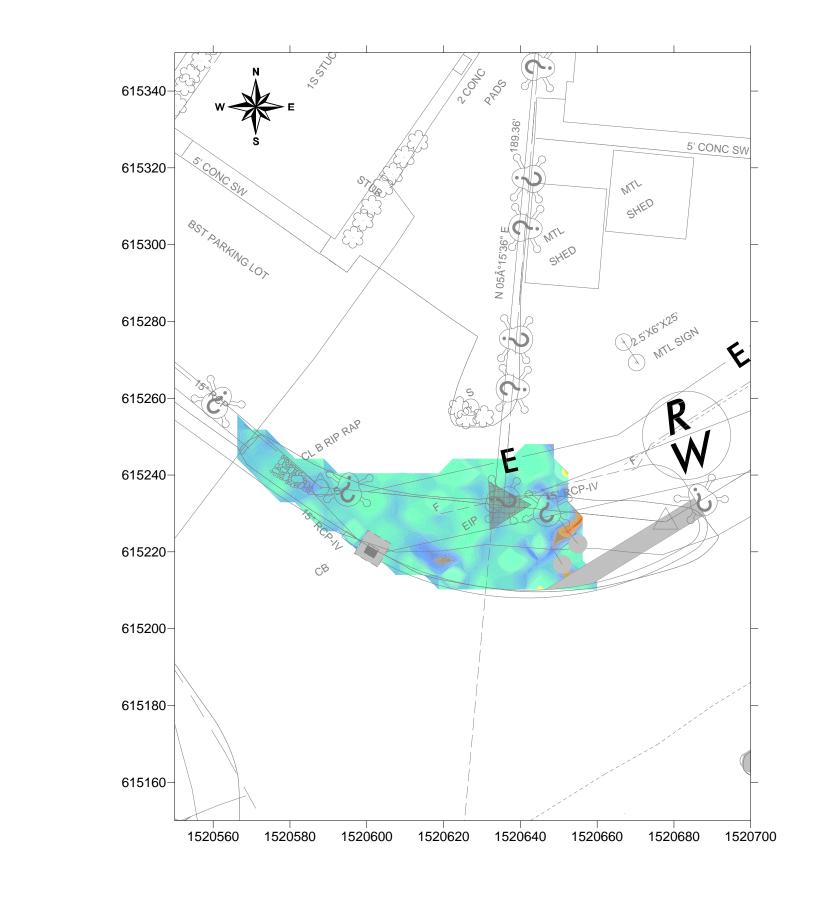




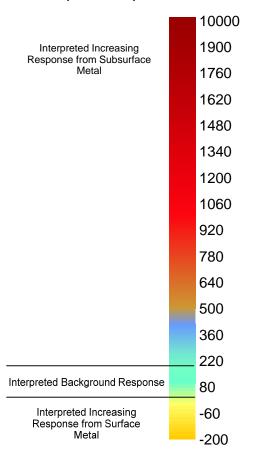
EM-61 MKII Channel 1 Response (milliVolts)







EM-61 MKII Differential Response (milliVolts)



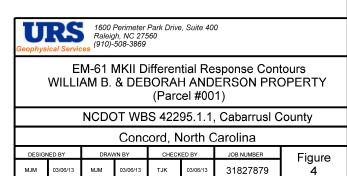
<u>Legend</u>

- - Interpreted Subsurface Utility Center Line
- ? Utility Termination Point not Known

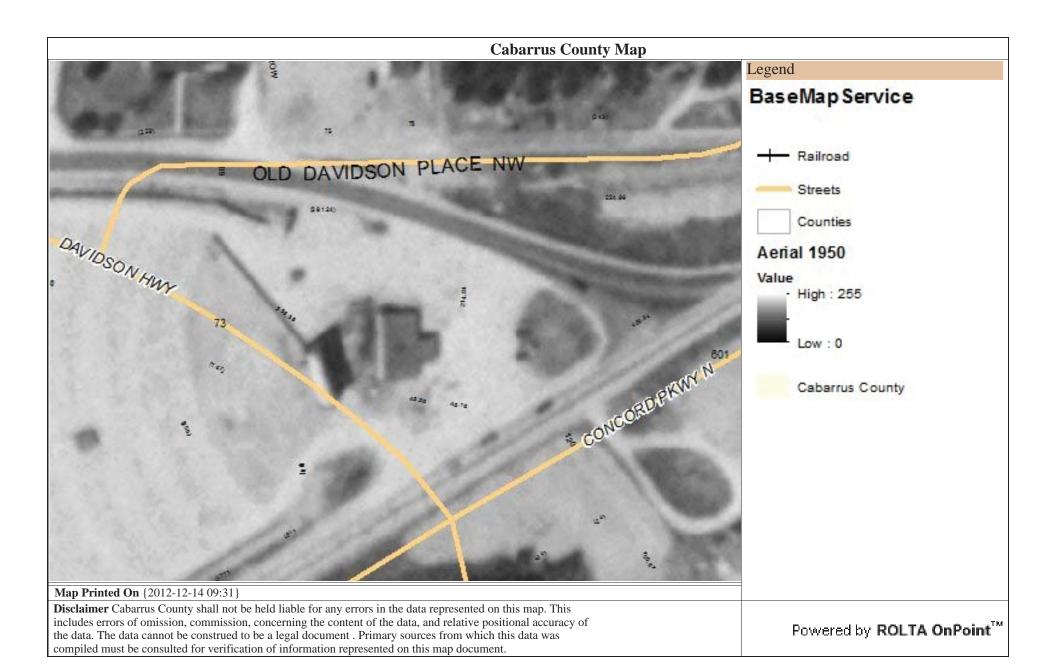
Notes:

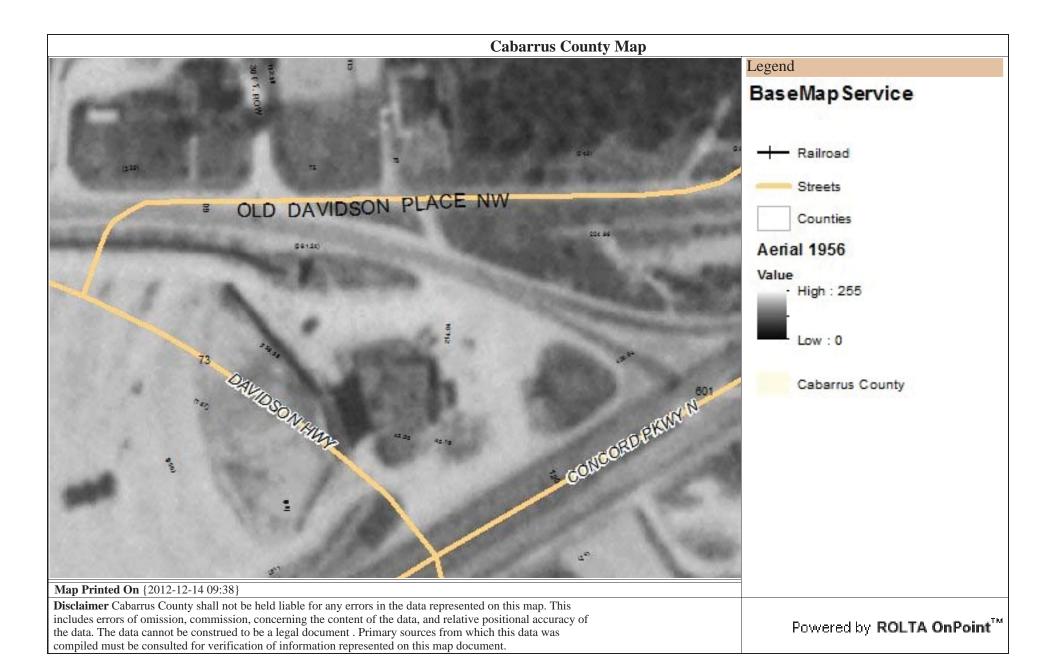
- 1. Coordinates in NC State Plane NAD 83 grid.
- 2. Data from Geonics, Ltd. EM-61 MKII instrument.
- 3. Base drawing after file "B5136_Rdy_combine_dxf_export.dxf" provided by NCDOT.
- 4. Location control from DGPS survey by URS.

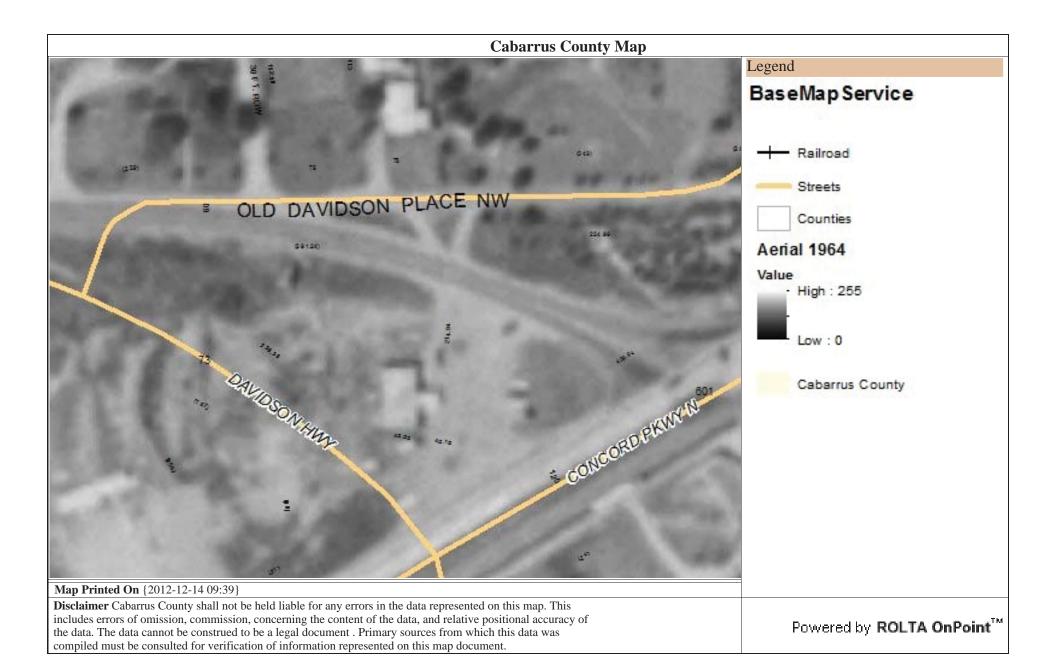
Map Scale (in feet)



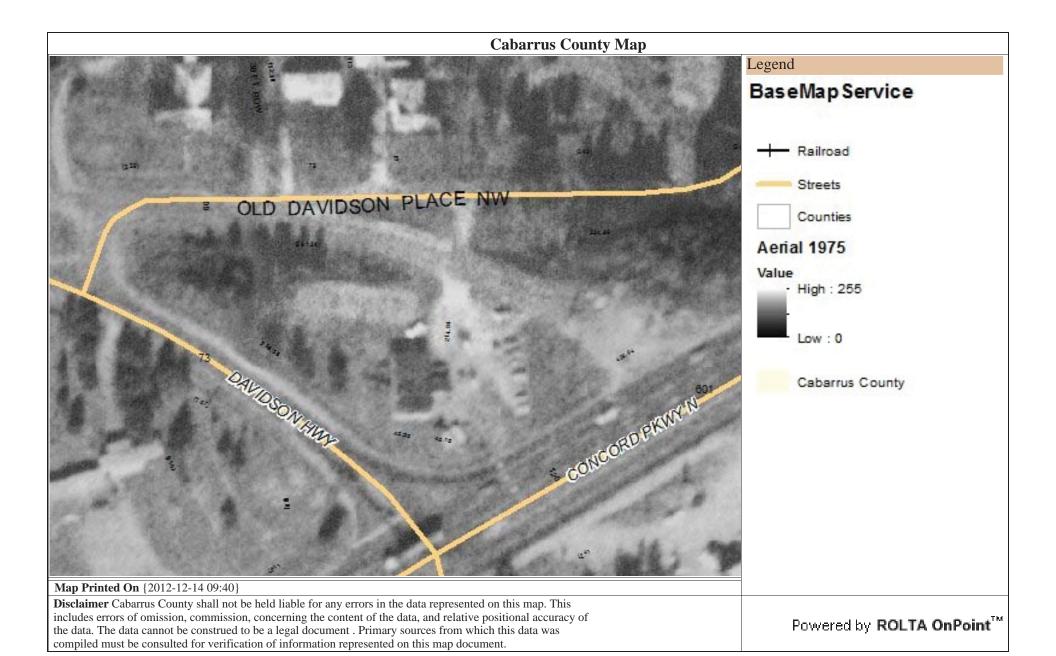
Appendix A
Historical Information







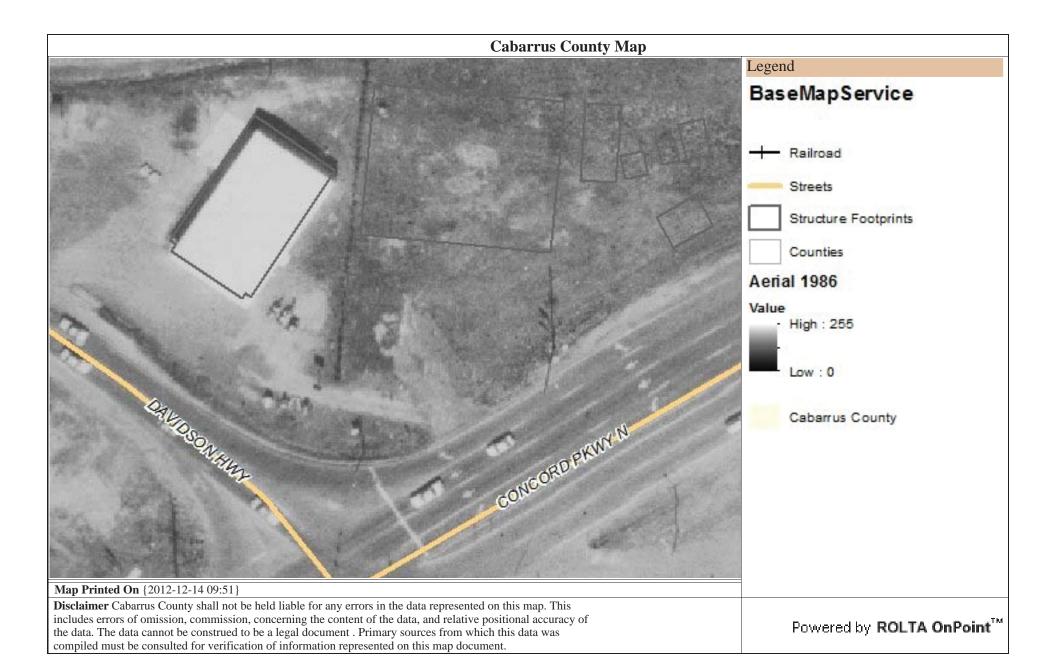


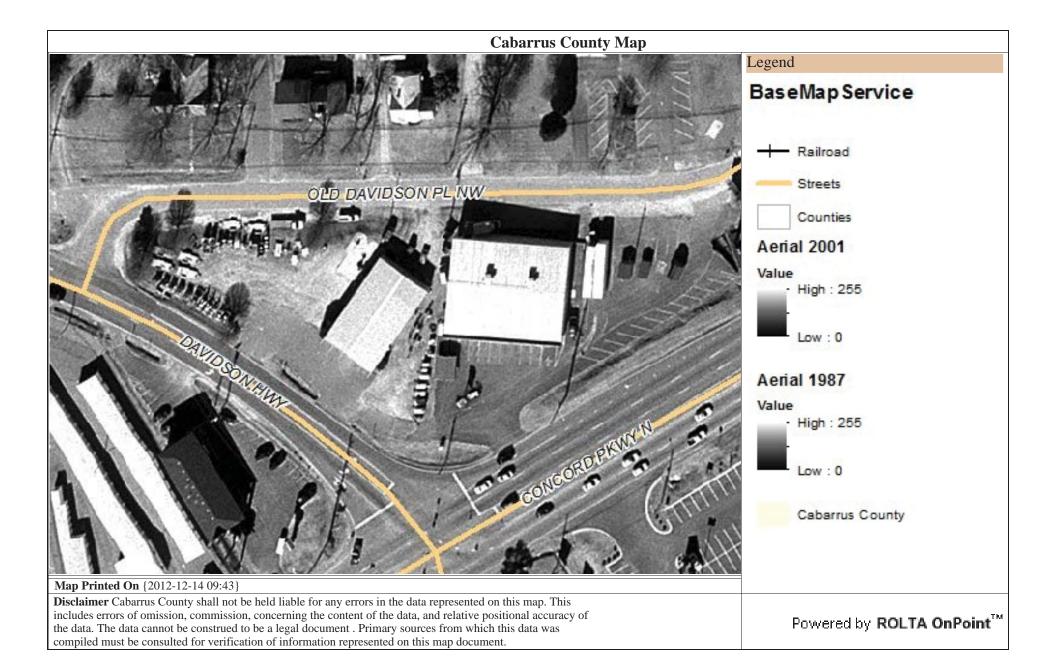




Cabarrus County Map Legend BaseMap Service Railroad Streets OLD DAVIDSON PL NW Counties Aerial 1986 Value · High: 255 DAVIDSONHIN Low: 0 Cabarrus County CONCORD PKWY N Map Printed On {2012-12-14 09:42} **Disclaimer** Cabarrus County shall not be held liable for any errors in the data represented on this map. This includes errors of omission, commission, concerning the content of the data, and relative positional accuracy of Powered by ROLTA OnPoint™ the data. The data cannot be construed to be a legal document . Primary sources from which this data was

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Cabarrus County Map Legend BaseMapService OLD DAVIDSON PL NW - Railroad Streets Structure Footprints Counties Aerial 2001 Value High: 255 Low: 0 Cabarrus County CONEORD PKWY N Map Printed On {2012-12-14 09:53} **Disclaimer** Cabarrus County shall not be held liable for any errors in the data represented on this map. This includes errors of omission, commission, concerning the content of the data, and relative positional accuracy of

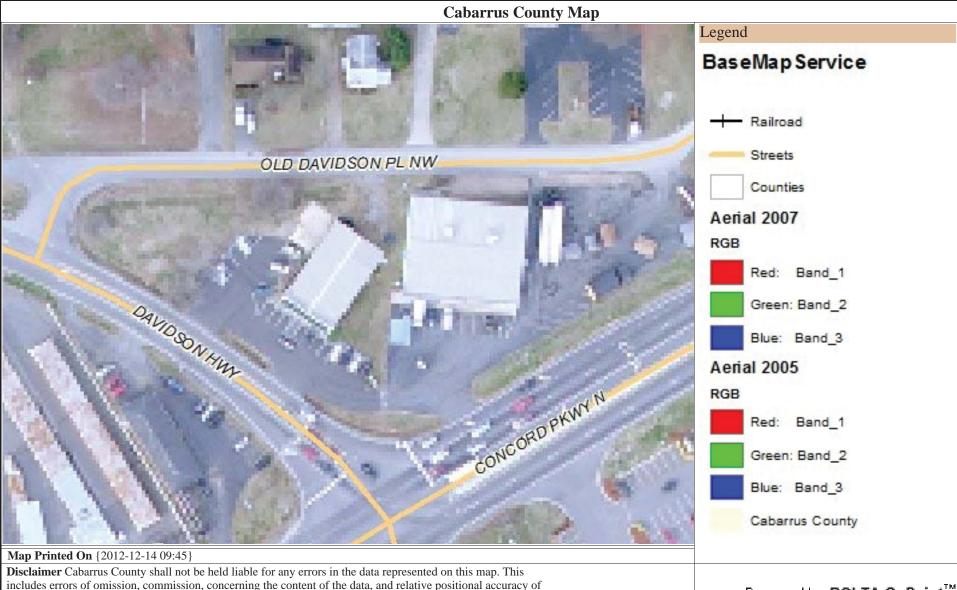
the data. The data cannot be construed to be a legal document . Primary sources from which this data was

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Cabarrus County Map Legend BaseMap Service Railroad Streets OLD DAVIDSON PL NW Counties Aerial 2005 RGB Red: Band_1 Green: Band_2 Blue: Band_3 Cabarrus County ONE ORD PHYNY Map Printed On {2012-12-14 09:44} Disclaimer Cabarrus County shall not be held liable for any errors in the data represented on this map. This includes errors of omission, commission, concerning the content of the data, and relative positional accuracy of

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Cabarrus County Map Legend BaseMap Service Railroad Streets OLD DAVIDSON PL NW Counties Aerial 2009 RGB Red: Band_1 DAVIDSONHW Green: Band_2 Blue: Band_3 Cabarrus County Map Printed On {2012-12-14 09:46} Disclaimer Cabarrus County shall not be held liable for any errors in the data represented on this map. This includes errors of omission, commission, concerning the content of the data, and relative positional accuracy of

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Cabarrus County Map Legend BaseMap Service Railroad Streets OLD DAVIDSONFLNW Counties Cabarrus County JONG ORD PRINTIN Map Printed On {2012-12-14 09:47} **Disclaimer** Cabarrus County shall not be held liable for any errors in the data represented on this map. This includes errors of omission, commission, concerning the content of the data, and relative positional accuracy of the data. The data cannot be construed to be a legal document . Primary sources from which this data was

compiled must be consulted for verification of information represented on this map document.

Appendix B Boring Logs



BORING LOG: P1-SB1

Dormit #			Drill Data	02/06/4	<u> </u>	Cito	Por	2001 0001	
Permit #			Drill Date Use	02/06/1)	Site	rar	cel 001	
Client NCDO Address		vidoo		poord NC		URS Corporation		10	
•			Boring Depth (ft)	10	Total Depth (ft)		2.25		
Drilling Method Geoprobe direct push Backfill Material bentonite		NA	10	Boring Diam. (in) Static Water Level		known			
Rmrks <i>Groun</i>			arod	TOC Elevation				ate liner	
n boring	uwater not en	counte	i eu	100 Lievation		Sample Method	ACE	ate iiilei	
Depth (ft.)	Sample Depth (ft)	Blows/ 6"	OVA (ppm)	Geol	ogic Des			Typical Diagram	
0			0.7 ppm						
2 —			1.0 ppm						
			1.3 ppm	Red, fine- to medium-gr	ained sand micaceou	ly clay, dry to slightly moist, us			
4 —			1.5 ppm	-					
			2.1 ppm						
6 —			2.6 ppm	Red, clay, dry, micaceous			<u></u>		
			3.2 ppm				backfilled with bentonite		
3			3.1 ppm	Dod ozones first	medi	aroined earthy slevy de-		ckfilled wit	
			3.6 ppm	Red-orange, fine- to	ınealum-(grained sandy clay, dry		ba	
10 P1-S	31-10 10'		4.0 ppm			um-grained sand, dry			
				Boring t	erminated a	at 10 ft bgs			
12							Not to S	Scale	
lotes:	_			I					
eologist:	Brand	y Cost	ner	Driller: Probe Te	ech				



Permit #			Drill Date	02/06/13	Site	Parcel 001	
Client NCDOT	•		Use		URS Corporation		
Address 100 Davidson Hwy, Con			n Hwy, Cor	ncord, NC	Total Depth (ft)	10	
Drilling Method Geoprobe direct push			ect push	Boring Depth (ft) 10	Boring Diam. (in)	2.25	
Backfill Material	bento	nite		NA	Static Water Level	unknown	
Rmrks Ground	lwater not en	counte	red	TOC Elevation	Sample Method	Acetate liner	
n boring							
Depth (ft.)	Sample Depth (ft)	Blows/ 6"	OVA (ppm)	Geologic Des	scription	Typical Diagram	
0			2.5 ppm				
2 —		2.6 ppm		-			
			2.4 ppm				
4 —			3.3 ppm	Red to red-orange, clay	ry, micaceous		
			3.4 ppm				
6 — P1-SE	32-6 6'		4.1 ppm			< 1	
			3.5 ppm			h bentonite	
8 —			1.2 ppm			backfilled with	
			1.1 ppm	Red-orange silty clay,	dry, micaceous	pa	
10			0.9 ppm		140 (1)		
				Boring terminated	at 10 ft bgs		
12						Not to Scale	
			•	•			

Appendix C
Laboratory Report



Pace Analytical Services, Inc. 2225 Riverside Dr. Asheville, NC 28804 (828)254-7176 Pace Analytical Services, Inc. 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

February 13, 2013

Chemical Testing Engineer NCDOT Materials & Tests Unit 1801 Blue Ridge Road Raleigh, NC 27607

RE: Project: TIP #B-516 42295.1.1 Pace Project No.: 92147225

Dear Chemical Engineer:

Enclosed are the analytical results for sample(s) received by the laboratory on February 06, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jon D Bradley for

for Brudley

Kevin Herring

kevin.herring@pacelabs.com

Project Manager

Enclosures





Pace Analytical Services, Inc. 205 East Meadow Road - Suite A

> Eden, NC 27288 (336)623-8921

Pace Analytical Services, Inc. 2225 Riverside Dr. Asheville, NC 28804 (828)254-7176 Pace Analytical Services, Inc. 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

CERTIFICATIONS

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078 North Carolina Drinking Water Certification #: 37706 North Carolina Field Services Certification #: 5342 North Carolina Wastewater Certification #: 12 South Carolina Certification #: 99006001

Florida/NELAP Certification #: E87627 Kentucky UST Certification #: 84 West Virginia Certification #: 357 Virginia/VELAP Certification #: 460221



Pace Analytical Services, Inc. 2225 Riverside Dr. Asheville, NC 28804 (828)254-7176 Pace Analytical Services, Inc. 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

SAMPLE SUMMARY

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92147225001	P1-SB1-10	Solid	02/06/13 14:35	02/06/13 17:35
92147225002	P1-SB2-6	Solid	02/06/13 14:40	02/06/13 17:35



Pace Analytical Services, Inc. 2225 Riverside Dr. Asheville, NC 28804 (828)254-7176 Pace Analytical Services, Inc. 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

SAMPLE ANALYTE COUNT

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92147225001	P1-SB1-10	EPA 8015 Modified	MEJ	2	PASI-C
		EPA 8015 Modified	RGF	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C
92147225002	P1-SB2-6	EPA 8015 Modified	MEJ	2	PASI-C
		EPA 8015 Modified	RGF	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C



Pace Analytical Services, Inc. 2225 Riverside Dr. Asheville, NC 28804 (828)254-7176 Pace Analytical Services, Inc. 9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

HITS ONLY

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92147225001	P1-SB1-10					
ASTM D2974-87	Percent Moisture	18.8 %		0.10	02/07/13 12:37	
92147225002	P1-SB2-6					
EPA 8015 Modified ASTM D2974-87	Diesel Components Percent Moisture	10.7 mg 16.8 %	/kg	6.0 0.10	02/08/13 21:25 02/07/13 12:37	



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PROJECT NARRATIVE

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Method: EPA 8015 Modified
Description: 8015 GCS THC-Diesel
Client: NCDOT West Central
Date: February 13, 2013

General Information:

2 samples were analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



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PROJECT NARRATIVE

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Method: EPA 8015 Modified
Description: Gasoline Range Organics
Client: NCDOT West Central
Date: February 13, 2013

General Information:

2 samples were analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

QC Batch: GCV/6627

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

- MS (Lab ID: 919701)
 - 4-Bromofluorobenzene (S)
- MSD (Lab ID: 919702)
 - 4-Bromofluorobenzene (S)

Method Blank:

All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.



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ANALYTICAL RESULTS

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Date: 02/13/2013 02:25 PM

Sample: P1-SB1-10 Lab ID: 92147225001 Collected: 02/06/13 14:35 Received: 02/06/13 17:35 Matrix: Solid

Results reported on a "dry-weig	ght" basis								
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical	Method: EP/	A 8015 Modifie	d Preparat	ion Me	thod: EPA 3546			
Diesel Components Surrogates	ND m	ng/kg	6.2	5.5	1	02/07/13 07:58	02/08/13 21:02	68334-30-5	
n-Pentacosane (S)	80 %	, D	41-119		1	02/07/13 07:58	02/08/13 21:02	629-99-2	
Gasoline Range Organics	Analytical	Method: EPA	A 8015 Modifie	d Preparat	ion Me	thod: EPA 5035A	5030B		
Gasoline Range Organics Surrogates	ND m	ng/kg	5.7	5.7	1	02/11/13 09:48	02/11/13 17:25	8006-61-9	
4-Bromofluorobenzene (S)	88 %	, o	70-167		1	02/11/13 09:48	02/11/13 17:25	460-00-4	
Percent Moisture	Analytical	Method: AS	ΓM D2974-87						
Percent Moisture	18.8 %	, D	0.10	0.10	1		02/07/13 12:37		



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ANALYTICAL RESULTS

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Date: 02/13/2013 02:25 PM

Sample: P1-SB2-6 Lab ID: 92147225002 Collected: 02/06/13 14:40 Received: 02/06/13 17:35 Matrix: Solid

Results reported on a "dry-weig	ght" basis								
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel	Analytical	Method: EP	A 8015 Modifie	d Prepara	tion Me	thod: EPA 3546			
Diesel Components Surrogates	10.7 n	ng/kg	6.0	5.4	1	02/07/13 07:58	02/08/13 21:25	68334-30-5	
n-Pentacosane (S)	79 %	6	41-119		1	02/07/13 07:58	02/08/13 21:25	629-99-2	
Gasoline Range Organics	Analytical	Method: EPA	A 8015 Modifie	d Prepara	tion Me	thod: EPA 5035A	/5030B		
Gasoline Range Organics Surrogates	ND n	ng/kg	5.5	5.5	1	02/11/13 09:48	02/11/13 11:18	8006-61-9	
4-Bromofluorobenzene (S)	100 %	6	70-167		1	02/11/13 09:48	02/11/13 11:18	460-00-4	
Percent Moisture	Analytical	Method: AS	TM D2974-87						
Percent Moisture	16.8 %	6	0.10	0.10	1		02/07/13 12:37		



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QUALITY CONTROL DATA

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

QC Batch: GCV/6627 Analysis Method: EPA 8015 Modified

QC Batch Method: EPA 5035A/5030B Analysis Description: Gasoline Range Organics

Associated Lab Samples: 92147225001, 92147225002

METHOD BLANK: 919699 Matrix: Solid

Associated Lab Samples: 92147225001, 92147225002

ParameterUnitsBlank ResultReporting LimitAnalyzedQualifiersGasoline Range Organicsmg/kgND5.702/11/13 09:23

4-Bromofluorobenzene (S) % 110 70-167 02/11/13 09:23

LABORATORY CONTROL SAMPLE: 919700

Date: 02/13/2013 02:25 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Gasoline Range Organics mg/kg 23.9 20.9 87 70-165 4-Bromofluorobenzene (S) % 88 70-167

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 919701 919702 MSD MS 92146952001 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD RPD Qual Gasoline Range Organics mg/kg 124 26.5 26.5 139 150 56 97 47-187 30 4-Bromofluorobenzene (S) % 165 168 70-167 S5



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QUALITY CONTROL DATA

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

QC Batch: OEXT/20694 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 3546 Analysis Description: 8015 Solid GCSV

Associated Lab Samples: 92147225001, 92147225002

METHOD BLANK: 917703 Matrix: Solid

917704

Associated Lab Samples: 92147225001, 92147225002

Blank Reporting Limit Parameter Result Qualifiers Units Analyzed **Diesel Components** ND 5.0 02/08/13 12:47 mg/kg n-Pentacosane (S) % 76 41-119 02/08/13 12:47

LABORATORY CONTROL SAMPLE:

Date: 02/13/2013 02:25 PM

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers **Diesel Components** mg/kg 66.7 54.0 81 49-113 n-Pentacosane (S) % 88 41-119

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 917705 917706 MSD MS 92147228003 Spike Spike MS MSD MS MSD % Rec Max Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits **RPD** RPD Qual **Diesel Components** mg/kg ND 83.1 83.1 57.0 58.2 63 65 10-146 2 30 n-Pentacosane (S) % 72 72 41-119



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QUALITY CONTROL DATA

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

QC Batch: PMST/5293 Analysis Method: ASTM D2974-87

QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture

Associated Lab Samples: 92147225001, 92147225002

SAMPLE DUPLICATE: 917652

 Parameter
 Units
 92147144001 Result
 Dup Result
 Max RPD
 Max RPD
 Qualifiers

 Percent Moisture
 %
 17.2
 18.4
 7
 25

SAMPLE DUPLICATE: 917653

Date: 02/13/2013 02:25 PM

92147228004 Dup Max RPD RPD Parameter Units Result Result Qualifiers Percent Moisture % 26.9 26.3 2 25



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QUALIFIERS

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

Date: 02/13/2013 02:25 PM

S5 Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).



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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TIP #B-516 42295.1.1

Pace Project No.: 92147225

Date: 02/13/2013 02:25 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92147225001	P1-SB1-10	EPA 3546	OEXT/20694	EPA 8015 Modified	GCSV/13907
92147225002	P1-SB2-6	EPA 3546	OEXT/20694	EPA 8015 Modified	GCSV/13907
92147225001	P1-SB1-10	EPA 5035A/5030B	GCV/6627	EPA 8015 Modified	GCV/6628
92147225002	P1-SB2-6	EPA 5035A/5030B	GCV/6627	EPA 8015 Modified	GCV/6628
92147225001	P1-SB1-10	ASTM D2974-87	PMST/5293		
92147225002	P1-SB2-6	ASTM D2974-87	PMST/5293		



CHAIN-OF-CUSTODY / Analytical Request Document The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

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HCI NaOH	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S ₂ O ₃ No Methanol	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S ₂ O ₃ No Methanol	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S	HCI NaOH Na ₂ S ₂ O ₃ Na ₂ S ₂ O ₃ Nethanol Other LAnalysis Test K TH GCO DATE DATE DATE Residual Chlorine Residual Chlorine Residual Chlorine
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*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any inveliges not paid within 30 days.

SIGNATURE OF SAMPLE TO LONG LES

(MM/DD/YY): 2/10/13

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical

Document Name: Sample Condition Upon Receipt (SCUR)

Document Number: F-CHR-CS-03-rev.08

Page 1 of 2

Issuing Authority:

Pace Huntersville Quality Office

Courier: Fed Ex	Client Nam	e:\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Project # <u>92/47225</u>			
Custody Seal on Cooler/Box Present: yes	Where Received: Huntersville	Asheville	Eden 🔲	Raleigh			
Sample Arrived within Hold Time Substitute Substitu	Courier: Fed Ex UPS USPS Clien	ıt□ Commercial☑	Pace Other	@ptilogal			
Packing Material:	Custody Seal on Cooler/Box Present: yes	no Seals i	intact: 🔲 yes				
Thermometer Used: IR Gun T1101 1 (1)02 Type of Ice: (Ve) Blue None	Packing Material: Subble Wrap Bubble	Bags □ None □	Other				
Temp Correction Factor T1101: No Correction T1102:	~	· ~	<u></u>	Samples on ice, cooling process has begun			
Cornect Containers Used:		tion T1102 : N	lo Correction				
Chain of Custody Filled Out:	Corrected Cooler Temp.: 0 C Temp should be above freezing to 6°C	_					
Chain of Custody Relinquished: Stampler Name & Signature on COC: Stamples Arrived within Hold Time: Stamples Stamples Arrived within Hold Time: Stamples Stamp	Chain of Custody Present:	□Yes □No □N/A	1.				
Sampler Name & Signature on COC:	Chain of Custody Filled Out:	□Yes □No □N/A	2.				
Samples Arrived within Hold Time:	Chain of Custody Relinquished:	ØYes □No □N/A	3.				
Short Hold Time Analysis (<7zhr):	Sampler Name & Signature on COC:	ÜYes □No □N/A	4.				
Rush Turn Around Time Requested:	Samples Arrived within Hold Time:	□yés □No □N/A	5	·			
Sufficient Volume:	Short Hold Time Analysis (<72hr):	□Yes ☑N6 □N/A	6.				
Correct Containers Used:	Rush Turn Around Time Requested:		7.				
Pace Containers Used: Yes No NA	Sufficient Volume:	☑Yes □No □N/A	8.				
Containers Intact:	Correct Containers Used:	ØYes □No □N/A	9.				
Filtered volume received for Dissolved tests	-Pace Containers Used:	ŽÍYes □No □N/A					
Sample Labels match COC:	Containers Intact:	ÚYes □No □N/A	10.				
-Includes date/time/ID/Analysis Matrix: All containers needing preservation have been checked. All containers needing preservation are found to be in compliance with EPA recommendation.	Filtered volume received for Dissolved tests	□Yes □No ☑N/A	11.				
All containers needing preservation have been checked. All containers needing preservation are found to be in compliance with EPA recommendation. Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) Samples checked for dechlorination: Headspace in VOA Vials (>6mm): Trip Blank Present: Trip Blank Custody Seals Present Pace Trip Blank Lot # (if purchased): Client Notification/ Resolution: Person Contacted: Comments/ Resolution: Date/Time: Date/Time:	Sample Labels match COC:	☑Yes □No □N/A	12.	- 3			
All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) Examples checked for dechlorination: Eyes INo INW 14. Headspace in VOA Vials (>6mm): Eyes INO INW 15. Eyes INO INW 16. Eyes INO INW 15. Eyes INO INW 16. Eyes INO INW 15. Eyes INO INW 16. Eyes INO INW							
compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, WI-DRO (water) Samples checked for dechlorination: Yes No INM 14. Headspace in VOA Vials (>6mm): Yes No	All containers needing preservation have been checked.	□Yes □No □N/A	13.	1			
Samples checked for dechlorination: Yes No Div 14.	All containers needing preservation are found to be in compliance with EPA recommendation.	□Yes □No □NA					
Headspace in VOA Vials (>6mm):	exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	□Yes □No	Initial when completed				
Trip Blank Present:	Samples checked for dechlorination:	□Yes □No □N/A	14.				
Trip Blank Custody Seals Present	Headspace in VOA Vials (>6mm):	□Yes □No □N/A	15.				
Pace Trip Blank Lot # (if purchased): Client Notification/ Resolution: Person Contacted: Comments/ Resolution: Date/Time:	Trip Blank Present:	□Yes □No □NA	16.	÷			
Client Notification/ Resolution: Person Contacted: Comments/ Resolution: Date/Time:	Trip Blank Custody Seals Present	□Yes □No □N/A	•				
Person Contacted: Date/Time: Comments/ Resolution:	Pace Trip Blank Lot # (if purchased):		<u> </u>				
Comments/ Resolution:	Client Notification/ Resolution:			Field Data Required? Y / N			
	Person Contacted:	Date	/Time:				
SCURE Pavious: Att Date: 2/10/13 SRF Review: WH Date: 2/1/13	Comments/ Resolution:						
SCURE Pavious 1/H Date: 2/to 13 SRF Review: 1/H Date: 2/1/13							
SCURE Pavious 1/H Date: 2/0/13 SRF Review: 1/H Date: 2/1/B	(<u></u>			The state of the s			
	SCURE Reviews 1/ Att	2/0/13/9	SRF Review:	(CH Date: 2/7/13			

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)