Preliminary Site Assessment
Boone Gospel Tabernacle Property Parcel #33
Boone, Watauga County, NC

State Project U-4020
WBS Element # 35015.1.1
H&H Job No. ROW-148
May 29, 2008

Hart & Hickman

2923 South Tryon Street
Suite 100
Charlotte, NC 28203
704-586-0007

3334 Hillsborough Street
Raleigh, NC 27607
919-847-4241

Preliminary Site Assessment
Boone Gospel Tabernacle Property, Parcel #33
Boone, Watauga County, North Carolina
H&H Project ROW-148

Table of Contents

List of Tables

List of Figures

List of Appendices

Preliminary Site Assessment
Boone Gospel Tabernacle Property, Parcel #33
Boone, Watauga County, North Carolina
H&H Project ROW-148

1.0 Introduction

Hart & Hickman, PC (H&H) has prepared this Preliminary Site Assessment (PSA) report documenting assessment activities performed at the Boone Gospel Tabernacle property (Parcel #33) located at 372 East King Street (US Highway 421) in Boone, Watauga County, North Carolina. This assessment was conducted on behalf of the North Carolina Department of Transportation (NC DOT) in accordance with the scope of work outlined in our February 29, 2008 proposal.

The purpose of this assessment was to determine the presence or absence of impacted soil at the subject property in the proposed construction areas related to the widening of US Highway 421 (State Project U-4020). This property is expected to be a total take by NC DOT. A site location map is included as Figure 1 and a site map is presented as Figure 2. The NC DOT preliminary plan of the US Highway 421 widening area near the Boone Gospel Tabernacle property is included in Appendix A.

Based on information provided by NC DOT and property neighbors, the Boone Gospel Tabernacle property may have operated as a gas station at some unspecified time in the past. According to an Environmental Data Resources (EDR) report for the site vicinity, the property does not appear on the North Carolina Underground Storage Tank (UST) database, and H&H did not observe surface evidence of current USTs or evidence of UST removal.

2.0 Site Assessment

Soil Assessment Field Activities

H&H mobilized to the Boone Gospel Tabernacle property on April 1, 2008 to advance four soil borings (33-1 through 33-4) by direct push technology (DPT). Prior to advancing the soil borings, H&H reviewed a geophysical survey performed by URS Corporation (URS) between March 18 and March 22, 2008. URS utilized ground penetrating radar (GPR) and time domain electromagnetic (TDEM) technology to identify potential geophysical anomalies and potential USTs at the site. The

URS results indicated a magnetic anomaly on the eastern portion of the property as a potential UST; however, follow-up with GPR did not indicate a UST in this area. URS's report including a site map depicting the results of the GPR and TDEM is included in Appendix B.

Prior to conducting soil borings, utilities were marked by NC One Call and by DOT's contractor Vaughn and Melton. Borings were also cleared to a five foot depth by hand auger. H&H utilized Geologic Exploration, Inc. of Statesville, North Carolina to advance the soil borings (Figure 2). To facilitate the selection of soil samples for laboratory analysis, soil from each boring was screened continuously for the presence of volatile organic compounds (VOCs) with an organic vapor analyzer (OVA). Additionally, H&H observed the soil for visual and olfactory indications of petroleum impacts. In general, soil samples that exhibited the highest reading on the OVA were selected for laboratory analysis. Soil boring logs are included in Appendix C.

H&H submitted four samples (33-1 @ 3-5 ft; 33-2 @ 4-6 ft; 33-3 @ 6-8 ft; and 33-4 @ 4-6 ft) for laboratory analysis. Soil samples are identified by the NC DOT Parcel number, soil boring, and the depth interval in ft. Samples were sent to Prism Laboratories Inc. under standard chain-of-custody for analysis of total petroleum hydrocarbons (TPH) gasoline-range organics (GRO) and diesel-range organics (DRO) by EPA Method 8015B. Sample depths and analytical results are summarized in Table 1. Laboratory analytical data sheets for Parcel 33 soil samples and chain-of-custody documentation are provided in Appendix D. The chain-of-custody form includes samples collected from other nearby parcels. The analytical results are discussed below.

3.0 Analytical Results

No target analytes were detected in the soil samples collected from Parcel 33. Based on laboratory analytical results and OVA readings, it appears that no impacted soil is present at the site in the vicinity of the soil boring locations. DOT plans indicate a proposed cut of 2 to 3 ft in this area. Based on the results of soil sampling activities, impacted soil should not be encountered at this site during NC DOT road work.

4.0 Summary and Regulatory Considerations

H&H has reviewed Geophysical survey results and collected soil samples at Parcel 33. No USTs appear to be present within the NC DOT target area. TPH GRO and DRO were not detected in the four soil samples analyzed by the laboratory. DOT plans indicate a proposed cut of 2 ft to 3 ft in this area. Based on results of soil sampling activities, impacted soil should not be encountered at this site during NC DOT road work.

5.0 Signature Page

This report was prepared by:

David Graham (DNB)
Project Geologist for
Hart and Hickman, PC

This report was reviewed by:

Matt Bramblett, PE
Principal and Project Manager for
Hart and Hickman, PC

Table 1
Soil Analytical Results
Boone Gospel Tabernacle, Parcel #33
Boone, North Carolina
H&H Job No. ROW-148

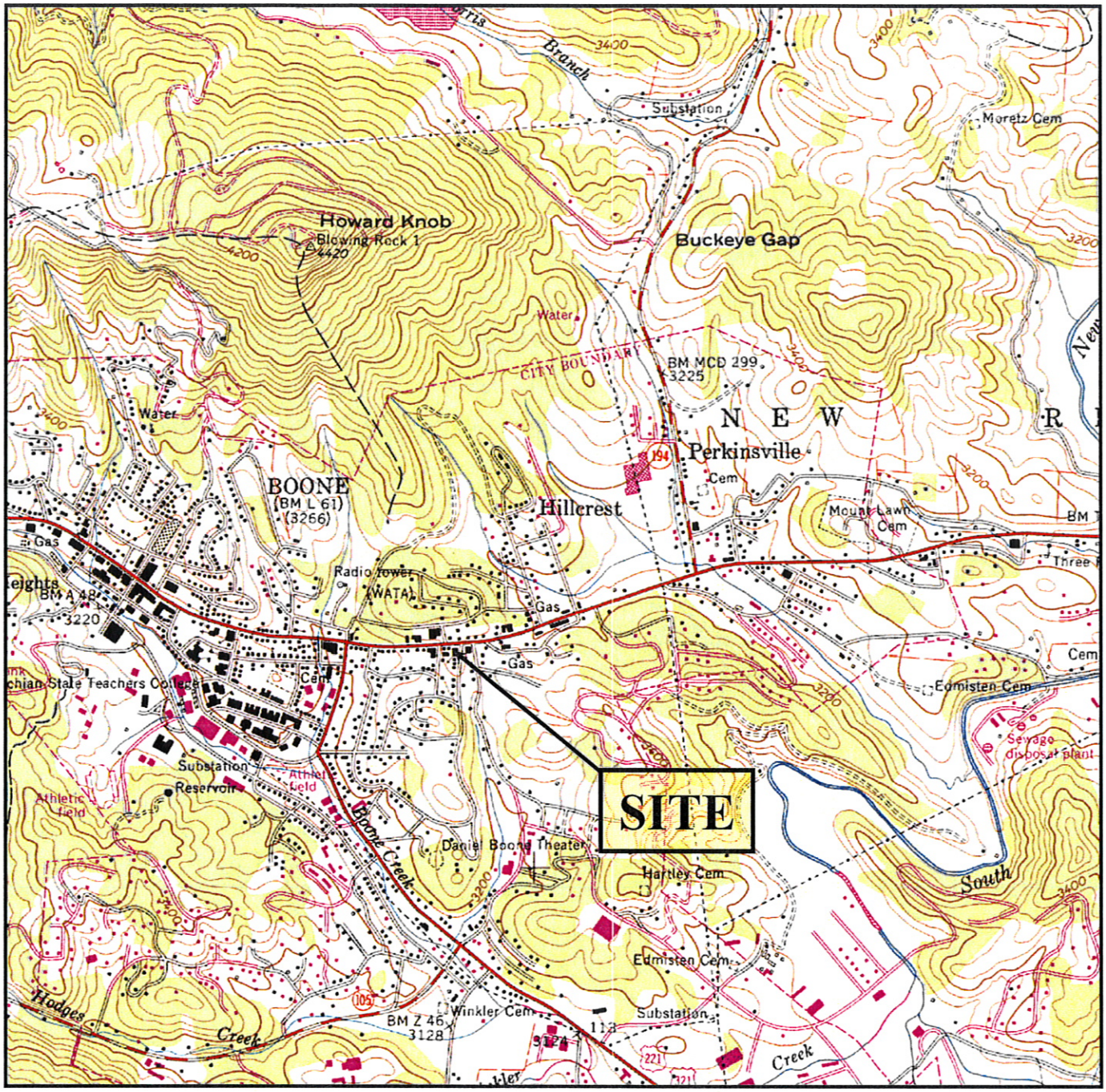
Sample ID	33-1	33-2	33-3	33-4	NC DENR
Sample Depth (ft)	3-5	4-6	6-8	4-6	Action
Sample Date	4/1/2008	4/1/2008	4/1/2008	4/1/2008	Level
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
TPH-DRO/GRO (8015B)					
Diesel-Range Organics (DRO)	<7.5	<7.8	<9.2	<8.7	10
Gasoline-Range Organics (GRO)	<5.4	<5.6	<6.6	<6.3	10

Notes:

EPA Method follows parameter in parentheses

NA= Not analyzed; VOCs=volatile organic compounds

TPH=total petroleum hydrocarbons



N

APPROXIMATE

0 2000 4000

SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

BOONE, NC 1959
PHOTOREVISED 1978

QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE	SITE LOCATION MAP
PROJECT	BOONE GOSPEL TABERNACLE PROPERTY PARCEL #33 BOONE, NORTH CAROLINA

Hart & Hickman
A Professional Corporation
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0370 (f)

DATE:	4-28-08	REVISION NO:	0
JOB NO:	ROW-148	FIGURE NO:	1

EAST KING STREET

-L-STA-35+00

MTL CANOPY

29

30

31

32

33

34

35

36

95

100

101

1SFBK BUS

1SFBK BUS

1SBK BUS

BLK WALL

2SFBUS

DECK

1SBKBLK CHURCH

1SBKD

1SBKD

1SFD

2SFBUS

1SFBUS

DRYERS

UST

THE WEST DRIVE

HORN IN

33-1 3-5'
[<5.4] (<7.5)

33-2 4-6'
[<5.6] (<7.8)

33-3 6-8'
[<6.6] (<9.2)

33-4 4-6'
[<6.3] (<8.7)

F U T C D S

LEGEND

PROPERTY LINE

EXISTING RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY

-C- PROPOSED CUT LINE

-F- PROPOSED FILL LINE

T PROPOSED TRANSITION LINE

-D- PROPOSED DRAINAGE EASEMENT

-U- PROPOSED UTILITY EASEMENT

PROPOSED DRAINAGE PIPE

PROPOSED CATCH BASIN

SOIL BORING

33 PARCEL NUMBER

AST ABOVE GROUND STORAGE TANK

[] = TPH GRO IN mg/kg

() = TPH DRO IN mg/kg

LEGEND

N

APPROXIMATE

0 30 60

SCALE IN FEET

TITLE

SITE MAP AND SOIL ANALYTICAL RESULTS

PROJECT

BOONE GOSPEL TABERNACLE PROPERTY
PARCEL #33
BOONE, NORTH CAROLINA

Hart & Hickman
A PROFESSIONAL CORPORATION
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

DATE: 4-24-08

REVISION NO. 0

JOB NO: ROW-148

FIGURE: 2

Appendix A

NC DOT Preliminary Plan

U–4020 | 5

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

S:\AAA-Master Projects\NC DOT Right-of-Way -ROW\ROW-148 Boone PSAs\Files from DOT\Proj\FIGURES\bind.dwg, Model, 5/28/2008 12:07:22 PM, 1:80

-Y6-
PI Sta 10+95.52
D = 2° 05' 54.4" (RT)
D = 10° 00' 00.0"
L = 20.98'
T = 10.49'
R = 572.96'
e = SEE PLANS

PI Sta 13+08.10
D = 2° 13' 48.1" (RT)
D = 10° 00' 00.0"
L = 22.30'
T = 11.15'
R = 572.96'
e = SEE PLANS

-Y8-
PI Sta 11+06.80
D = 6° 10' 06.8" (RT)
D = 10° 00' 00.0"
L = 61.69'
T = 30.87'
R = 572.96'
e = SEE PLANS

Appendix B

URS Geophysical Report

URS

March 31, 2008

Mr. Matt Bramblett, P.E.
Hart & Hickman
2923 South Tryon Street
Suite 100
Charlotte, North Carolina 28203

Subject: **Geophysical Investigation Report and UST Delineation**
NCDOT State Project U-4020, Watauga County
Parcels #30, 31, 33, 35, 37, 38
Boone, North Carolina
URS Project No. 31825704

Dear Mr. Bramblett:

In accordance with our technical and cost proposal (TCP) submitted to North Carolina Department of Transportation (NCDOT) on March 7, 2008, URS Corporation (URS) is pleased to present the findings of the geophysical investigation conducted as part of NCDOT State Project U-4020, Watagua County, WBS Element 35015.1.1. The objective of the investigation was to locate underground storage tanks (USTs) within the NCDOT right-of-way and construction easements along US 421/King Street in Boone, North Carolina. The geophysical investigation was conducted in advance of proposed widening of US 421/King Street and will be used to assist with the Preliminary Site Assessment (PSA) of individual parcels within the right-of-way and easement.

Site Description

The geophysical investigation was conducted for Hart & Hickman at Parcels #30, 31, 33, 35, 37, and 38. According to the Request for Proposal (RFP) issued by NCDOT, dated February 20, 2008, Parcels #30, 33, and 35 are expected to be total takes. Therefore, all accessible portions of these parcels were surveyed for this investigation. For Parcels #31, 37, and 38, the right-of-way and construction easements were surveyed for this investigation. These limits had been physically marked in the field by others prior to conducting the geophysical investigation. None of these parcels were abandoned at the time of the geophysical investigation. The majority of the survey areas consisted of asphalt driveways or parking lots.

Survey Methods

The geophysical investigation was conducted using primarily the electromagnetic (EM) method. The Geonics, Ltd. EM-61 MKII (EM-61) instrument was used to perform the investigation. Ground-penetrating radar (GPR) was used as a follow-up technique to the

URS Corporation – North Carolina
6135 Park South Drive, Suite 300
Charlotte, NC 28210
Tel: 704.522.0330
Fax: 704.522.0063
www.urscorp.com

EM-61 survey. The GPR survey was completed using a Sensors & Software, Inc. Noggin PLUS Smart Cart System with a 250 MHz scanning antenna.

Electromagnetic Surveying with the EM-61 MKII (EM-61)

The EM-61 is a time domain EM instrument specifically designed to detect buried metal objects. The EM-61 generates rapid EM pulses through a transmitter coil. These pulses induce secondary EM fields in the near subsurface. The secondary EM fields induced from moderately conductive subsurface materials (i.e. soil and rock) are of relatively short duration. However, the secondary EM fields induced from metallic objects, such as reinforced concrete or steel drums, are of relatively long duration. The EM-61 measures this prolonged response from metallic objects after the EM response from conductive earth materials dissipates. This design provides high resolution of metallic targets. The depth of investigation of the instrument is relatively unaffected by site specific subsurface conditions.

The EM-61 measures the EM response in milliVolts (mV). The variations in EM response readings from some background level are more diagnostic than the absolute values. EM response values can be plotted and contoured to evaluate the variations across the site. Variations in the EM response resulting from buried metallic objects such as cast iron pipes are generally manifested by relatively large amplitude (greater than about 50 mV) anomalies.

The response amplitude for a given buried metallic object is primarily a function of burial depth and size of the object. It is thus useful to have some means of interpreting the depth of a given object. The EM-61 uses a two receiver coil system consisting of a top coil and a bottom coil. This design facilitates the recognition of near-surface objects from deeper targets. The EM-61 record includes the response from the top coil, the bottom coil and the differential response between the two coils. Near surface objects, such as small pieces of scrap metal, can mask the response from larger objects, such as utility lines, drums or underground storage tanks, at deeper depths. The two-coil design of the EM-61, and differential processing, allows for this masking effect to be significantly reduced. Although the EM-61 is designed to mitigate interference from surface features, large metallic objects at the surface, such as cars, buildings, and fences can effectively saturate the EM response and mask potential buried metal objects below.

Ground Penetrating Radar (GPR)

The GPR method involves transmitting relatively high-frequency electromagnetic pulses into the subsurface using a transducer antenna, and recording the subsequent signal from reflected and refracted electromagnetic energy using a receiving antenna. The electromagnetic pulses, or radar waves are influenced by many factors in the subsurface, the most important being the dielectric constant of the soil. The dielectric constant is the ratio of the speed of light in a vacuum (0.3m/ns) to the velocity of the GPR wave, quantity squared. Therefore, changes in dielectric constant correspond to changes in electromagnetic wave propagation velocity. When the wavelength is short compared to the thickness of soil layers, which is generally

true, electromagnetic waves are reflected at the interfaces of dielectric contrast in accordance with the principles of optics.

GPR is useful in mapping and locating subsurface features and stratigraphy under a variety of conditions. The method is useful in many types of geologic, environmental, and engineering applications including: locating and mapping buried waste materials; locating and delineating metallic and nonmetallic utilities, pipes, underground storage tanks and drums; mapping geological strata, fractures, and voids; and delineating and mapping previously excavated and backfilled areas.

The effectiveness of GPR surveying at a given site is directly related to the dielectric properties of the subsurface materials. The effective depth of exploration provided by the method can be limited by subsurface materials characterized with high conductivity and dielectric constants, including clay, metal and metallic minerals, or reinforced pavement, all of which absorb radar energy instead of reflecting waves back to the surface receiver. In general, the depth of investigation at a given site is inversely proportional to frequency and the degree of feature resolution is proportional to frequency. Irregular and/or rough terrain can negatively impact the quality of GPR data.

Field Investigation

The field investigation was conducted between March 18 and 22, 2008. EM-61 data were collected along parallel profiles spaced approximately 3 feet apart across the portions of the survey areas that were accessible with the EM-61. Inaccessible areas included portions of the parcels containing parked cars, dumpsters, and landscaping features. EM-61 data were recorded at a rate of 5 readings per second, which equates to an along-profile data point spacing of less than 1 foot.

A Trimble ProXRS global positioning system (GPS) was used to record simultaneous positional data coincident with the EM-61 data. The ProXRS system provides real-time differential corrections via an Omnistar subscription service. The acquired differential GPS (DGPS) have a horizontal accuracy of approximately 3 feet. URS also used the GPS system to record the locations of relevant site features.

Prior to conducting the GPR investigation, URS performed preliminary in-field analysis of the EM-61 data to identify anomalies potentially indicative of USTs. GPR follow-up was conducted at individual point target locations identified in the EM-61 data or within the sections of the parcels that could not be accessed using the EM-61. Because GPR was used as a follow-up technique, no data sets were post-processed for purposes of this investigation.

Data Processing

The EM-61 data were pre-processed using the program DAT61 MK2, issued by Geonics Ltd. The program was used primarily to prepare the data for contouring in Surfer, issued by Golden Software. Contoured data represent EM-61 Channel 3 response data. Channel 3 data include milliVolt readings recorded at a relatively later time interval during the measured response from the secondary EM field. Thus, this channel generally records secondary field responses from depths consistent with USTs. Interference from surface or near-surface features (e.g. reinforced concrete, buried catch basin, etc.) will also be recorded by this channel, which is why the GPR follow-up survey was conducted over EM-61 anomalies that could not be readily attributed to existing site features.

Investigation Results

The results of the geophysical investigation for Parcels #30, 31, and 33 are presented as **Figure 1**. The results for Parcel #35 are presented as **Figures 2 and 3**. The results for Parcels #37 and 38 are presented as **Figures 4 and 5,** respectively.

Responses from metallic objects are represented by color-shaded contours outside the interpreted background response range. Relatively strong responses (i.e. yellow to dark red contours) generally indicate buried objects of significant metal mass or surface or near-surface features (e.g. reinforced concrete pad). Relatively muted responses (i.e. dark blue contours) generally indicate decreased metal mass or metallic objects potentially buried to greater depths. Sources of known or suspected metallic interference are identified accordingly in **Figures 1 through 5**. Anomalies consistent with EM-61 response patterns for USTs are identified in **Figures 1 through 5** with either green or magenta ellipses. These anomalies were subsequently targeted for GPR follow-up surveying.

The EM-61 anomaly annotated with the green ellipse in **Figure 1** indicates a potential UST as indicated by both the EM-61 and GPR surveys. GPR surveying across this anomaly revealed parabolic-shaped reflection patterns that are consistent with USTs. The EM-61 anomalies annotated with magenta ellipses in **Figures 1, 4, and 5** indicate that the GPR follow-up survey did not reveal the characteristic parabolic-shaped reflection patterns typically associated with USTs. However, it should be noted that USTs that may no longer be intact may not exhibit characteristic GPR reflection patterns. Therefore, intrusive investigations of the EM-61 anomalies annotated with magenta ellipses in **Figures 1, 4, and 5** may be warranted if it is necessary for completion of the PSA to have confirmation of the identity of these anomalies.

A single UST appears to be buried along the southern edge of the building situated at Parcel #35. The EM-61 results in **Figure 2** indicate high-amplitude responses consistent with the presence of a UST. Follow-up GPR surveying also revealed the presence of parabolic-shaped reflection patterns associated with USTs. A fill port is situated within the center of the geophysical anomaly. The GPR antenna was used to identify the perimeter of the UST.

Figure 3 presents a photo of the field markings that indicate the interpreted UST perimeter at Parcel #35.

In general, sections of the parcels that are represented by the interpreted background range of colors in the EM-61 results appear to be free of buried metal to depths within the survey capabilities of the instrument. The results presented in **Figures 1 through 5** do not constitute an underground utility avoidance survey and therefore should be used in conjunction with proper utility marking protocol prior to beginning any intrusive work at these parcels.

Limitations

This 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.

We greatly appreciate the opportunity to work with you on this project. We will transmit AutoCAD files (.DXF type) of the geophysical results in a separate submittal. Please contact Matt Barner at (704) 716-0737 if you have any questions regarding this report.

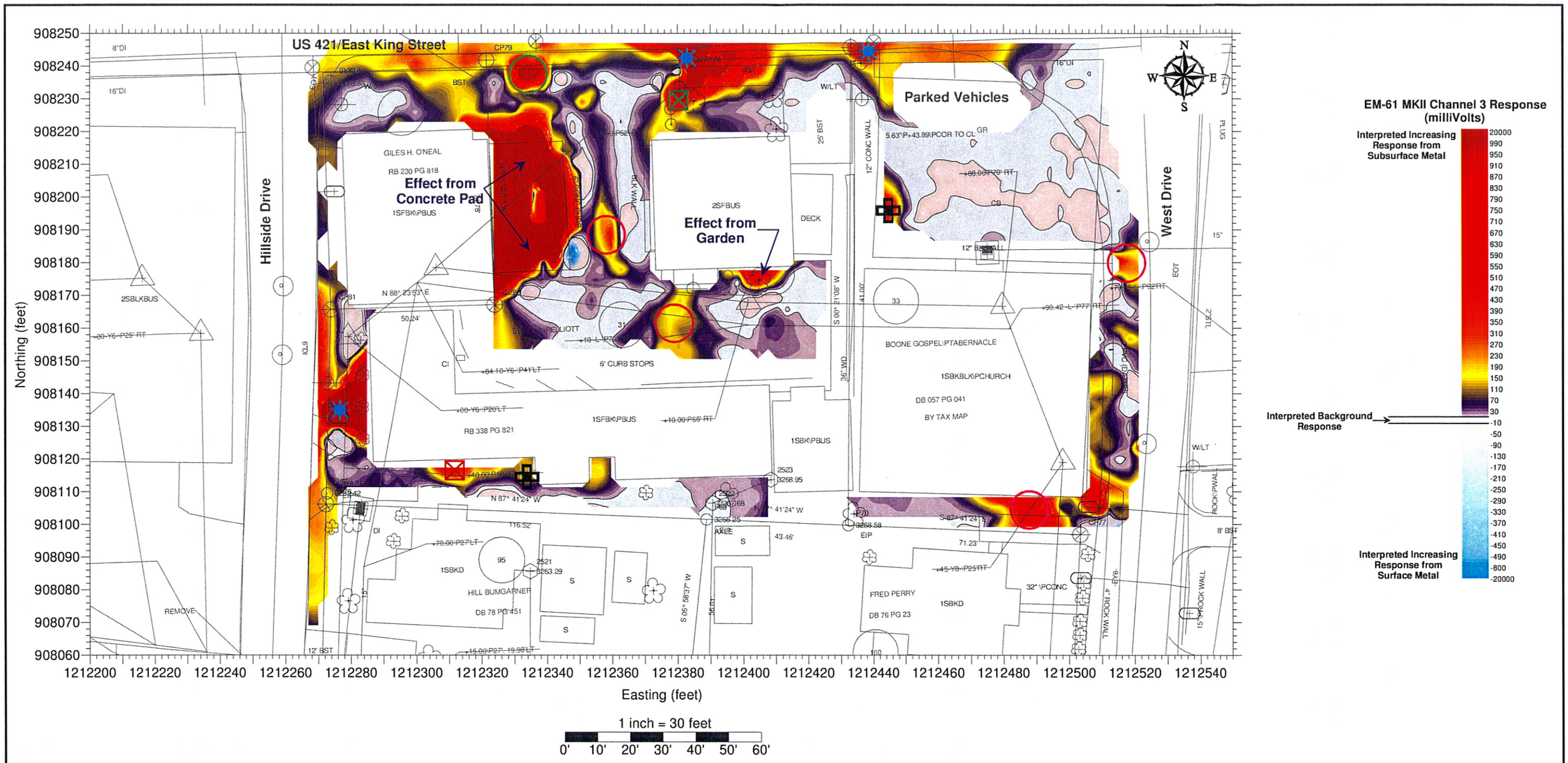
Very truly yours,

URS Corporation – North Carolina

Matthew A. Barner	Timothy J. King	Walt Plekan, L.G.
Senior Geophysicist	Principal Geophysicist	Project Manager

Enc.: Figure 1 – Geophysical Investigation Results, Parcels #30, 31, 33
Figure 2 – Geophysical Investigation Results, Parcel #35
Figure 3 – Site Photograph, Parcel #35
Figure 4 – Geophysical Investigation Results, Parcel #37
Figure 5 – Geophysical Investigation Results, Parcel #38

1c: Vernon Keys, URS, Raleigh
File 3182 5704 – 4.2



1 inch = 30 feet

0' 10' 20' 30' 40' 50' 60'

EM-61 MKII Channel 3 Response (milliVolts)

Interpreted Increasing Response from Subsurface Metal

20000 990 950 910 870 830 790 750 710 670 630 590 550 510 470 430 390 350 310 270 230 190 150 110 70 30

Interpreted Background Response

-10 -50 -90 -130 -170 -210 -250 -290 -330 -370 -410 -450 -490 -800 -20000

Interpreted Increasing Response from Surface Metal

Legend

- EM-61 Anomaly Surveyed with GPR Follow-Up (Both Surveys Indicate Potential UST)
- EM-61 Anomaly Surveyed with GPR Follow-Up (GPR Does not Indicate Potential UST)
- AST
- Utility Feature
- Flower Bed
- Electrical Box

Notes:

1. Coordinates in NC State Plane, NAD-83 datum.
2. Data from Geonics, Ltd. EM-61 MKII instrument.
3. Base drawing from U-4020 contract drawings provided by NCDOT.
4. EM-61 location control and additional site features from DGPS survey by URS Corporation.

URS Geophysical Services
6135 Park South Dr., Ste. 300
Charlotte, NC 28210
(704) 522-0330

Geophysical Investigation Results
Parcels #30, 31, 33

NCDOT State Project U-4020, Watauga County

Boone, North Carolina

DESIGNED BY		DRAWN BY		CHECKED BY		JOB NUMBER	Figure
MAB	03/27/08	MAB	03/27/08	SJH	03/28/08	31825704	1

Appendix C

Soil Boring Logs

BORING NUMBER 33-1

Hart & Hickman
ENVIRONMENTAL CONSULTANTS

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: Boone PSAs
JOB NUMBER: ROW-148
LOCATION: Boone, NC

DEPTH (ft)	RECOVERY (%)	BLOW COUNT	OVA (ppm) BKG.	OVA (ppm) SAMP.	LITHOLOGY	MATERIAL DESCRIPTION	WELL DIAGRAM	DEPTH (ft)
0.0						GRAVEL		0.0
	100		2.7	3.3		Brown, Silty Medium SAND, Slightly Moist, Loose		
2.5								2.5
	50		3.1	3.4		Light Brown, Silty Medium SAND, some Partially Weathered Rock, Slightly Moist		
5.0						Refusal at 5.0 feet. Bottom of borehole at 5.0 feet.		5.0
7.5								7.5
10.0								10.0

DRILLING CONTRACTOR: GEOLOGIC EXPLORATION
DRILL RIG/ METHOD: Geoprobe 6620DT
SAMPLING METHOD: DPT Sleeves
LOGGED BY GAB
DRAWN BY:

BORING STARTED 4/1/08
BORING COMPLETED: 4/1/08
TOTAL DEPTH: 5
SURFACE ELEV:
DEPTH TO WATER:

Remarks:

Borehole hand-augered to 3 feet.
Soil sample collected from 3-5 feet for laboratory analysis.

LOG OF BORING - HART HICKMAN.GDT - 5/23/08 11:21 - S:\AAA-MASTER PROJECTS\NC DOT RIGHT-OF-WAY -ROW\ROW-148 BOONE PSAS\BORING LOGS\ROW-148 (33).GPJ

BORING NUMBER 33-2

Hart & Hickman
ENVIRONMENTAL CONSULTANTS

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

PROJECT: Boone PSAs
JOB NUMBER: ROW-148
LOCATION: Boone, NC

DEPTH (ft)	RECOVERY (%)	BLOW COUNT	OVA (ppm) BKG.	OVA (ppm) SAMP.	LITHOLOGY	MATERIAL DESCRIPTION	WELL DIAGRAM
0						GRAVEL	
			2.3	2.6		Brown/Orange, Silty Medium SAND, Slightly Moist	
	100			3.7			
5				3		Brown, Fine Sandy SILT, Slightly Moist, Loose	
	100			2.9		Brown, Fine Sandy SILT, some Partially Weathered Rock from 6-8 feet, Slightly Moist, Loose	
				2.9			
10	60			3.1			
						Bottom of borehole at 12.0 feet.	
15							
20							

DRILLING CONTRACTOR: GEOLOGIC EXPLORATION
DRILL RIG/ METHOD: Geoprobe 6620DT
SAMPLING METHOD: DPT Sleeves
LOGGED BY GAB
DRAWN BY:

BORING STARTED 4/1/08
BORING COMPLETED: 4/1/08
TOTAL DEPTH: 12
SURFACE ELEV:
DEPTH TO WATER:

Remarks:

Borehole hand-augered to 5 feet.
Soil sample collected from 4-6 feet for laboratory analysis.

LOG OF BORING - HART HICKMAN.GDT - 5/23/08 11:21 - S:\AAA-MASTER PROJECTS\NC DOT RIGHT-OF-WAY -ROW\ROW-148 BOONE PSAS\BORING LOGS\ROW-148 (33).GPJ

Hart & Hickman
ENVIRONMENTAL CONSULTANTS

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

BORING NUMBER 33-3

PROJECT: Boone PSAs
JOB NUMBER: ROW-148
LOCATION: Boone, NC

DEPTH (ft)	RECOVERY (%)	BLOW COUNT	OVA (ppm) BKG.	OVA (ppm) SAMP.	LITHOLOGY	MATERIAL DESCRIPTION	WELL DIAGRAM
0						GRAVEL	
			1.3	2.3		Light Brown, Silty Medium SAND, some Partially Weathered Rock, Sligtly Moist	
	100			3.3			
5				2.9		Brown, Silty Fine SAND, some Partially Weathered Rock, Slightly Moist, Loose	
	100			4.1			
						Brown/Orange, Silty Medium SAND, some Partially Weathered Rock, Slightly Moist, Loose	
				3.8			
10	70			3.6			
						Bottom of borehole at 12.0 feet.	
15							
20							

DRILLING CONTRACTOR: GEOLOGIC EXPLORATION
DRILL RIG/ METHOD: Geoprobe 6620DT
SAMPLING METHOD: DPT Sleeves
LOGGED BY GAB
DRAWN BY:

BORING STARTED 4/1/08
BORING COMPLETED: 4/1/08
TOTAL DEPTH: 12
SURFACE ELEV:
DEPTH TO WATER:

Remarks:

Borehole hand-augered to 5 feet.
Soil sample collected from 6-8 feet for laboratory analysis.

LOG OF BORING - HART HICKMAN.GDT - 5/23/08 11:21 - S:\AAA-MASTER PROJECTS\NC DOT RIGHT-OF-WAY -ROW\ROW-148 BOONE PSAS\BORING LOGS\ROW-148 (33).GPJ

Hart & Hickman
ENVIRONMENTAL CONSULTANTS

2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)

3334 Hillsborough Street
Raleigh, North Carolina 27607
919-847-4241(p) 919-847-4261(f)

BORING NUMBER 33-4

PROJECT: Boone PSAs
JOB NUMBER: ROW-148
LOCATION: Boone, NC

DEPTH (ft)	RECOVERY (%)	BLOW COUNT	OVA (ppm) BKG.	OVA (ppm) SAMP.	LITHOLOGY	MATERIAL DESCRIPTION	WELL DIAGRAM	DEPTH (ft)
0						GRAVEL		0
	100		0.9	2.3		Brown, Fine Sandy SILT, Slightly Moist		
				2.3				
5			1	1.9				5
				1.9		Brown/ Orange, Clayey SILT, Slightly Moist		
	100							
						Brown/ Orange, Silty Fine SAND, Slightly Moist		
			1.1	1.9				
10								10
	70			1.6				
						Bottom of borehole at 12.0 feet.		
15								15
20								20

DRILLING CONTRACTOR: GEOLOGIC EXPLORATION
DRILL RIG/ METHOD: Geoprobe 6620DT
SAMPLING METHOD: DPT Sleeves
LOGGED BY GAB
DRAWN BY:

BORING STARTED 4/1/08
BORING COMPLETED: 4/1/08
TOTAL DEPTH: 12
SURFACE ELEV:
DEPTH TO WATER:

Remarks:

Borehole hand-augered to 5 feet.
Soil sample collected from 4-6 feet for laboratory analysis.

LOG OF BORING - HART HICKMAN.GDT - 5/23/08 11:21 - S:\AAA-MASTER PROJECTS\NC DOT RIGHT-OF-WAY -ROW\ROW-148 BOONE PSAS\BORING LOGS\ROW-148 (33).GPJ

Appendix D

Laboratory Analytical Report

PRISM LABORATORIES, INC
Full Service Analytical & Environmental Solutions

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

Laboratory Report

04/18/08

North Carolina Department of Transportation
Attn: David Graham
c/o Hart and Hickman
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project Name: Boone PSAs
Project ID: ROW-148
Project No.: WBS# 35015.1.1
Sample Matrix: Soil

Client Sample ID: 33-1 (3-5')
Prism Sample ID: 210368
COC Group: G0408076
Time Collected: 04/01/08 9:10
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**92.6**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	7.5	1.2	1	8015B	04/08/08 22:09	jvogel	Q31590
Sample Preparation:			25.18 g	/	1 mL	3545	04/07/08 16:00	Wconder	P21277

Surrogate	% Recovery	Control Limits
o-Terphenyl	62	49 - 124

Sample Weight Determination									
Weight 1	**5.05**	g			1	GRO	04/14/08 0:00	lbrown	
Weight 2	**4.88**	g			1	GRO	04/14/08 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	5.4	3.4	50	8015B	04/09/08 20:32	wbradley	Q31604

Surrogate	% Recovery	Control Limits
aaa-TFT	74	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limit only. No J-Flags applied.

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

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

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

Laboratory Report

04/18/08

North Carolina Department of Transportation
Attn: David Graham
c/o Hart and Hickman
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project Name: Boone PSAs
Project ID: ROW-148
Project No.: WBS# 35015.1.1
Sample Matrix: Soil

Client Sample ID: 33-2 (4-6')
Prism Sample ID: 210369
COC Group: G0408076
Time Collected: 04/01/08 9:40
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**89.4**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	7.8	1.3	1	8015B	04/08/08 23:20	jvogel	Q31590
Sample Preparation:			25.19 g	/	1 mL	3545	04/07/08 16:00	Wconder	P21277

Surrogate	% Recovery	Control Limits
o-Terphenyl	82	49 - 124

Sample Weight Determination									
Weight 1	**4.27**	g			1	GRO	04/14/08 0:00	lbrown	
Weight 2	**4.45**	g			1	GRO	04/14/08 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	5.6	3.5	50	8015B	04/09/08 21:35	wbradley	Q31604

Surrogate	% Recovery	Control Limits
aaa-TFT	70	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limit only. No J-Flags applied.

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

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

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

Laboratory Report

04/18/08

North Carolina Department of Transportation
Attn: David Graham
c/o Hart and Hickman
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project Name: Boone PSAs
Project ID: ROW-148
Project No.: WBS# 35015.1.1
Sample Matrix: Soil

Client Sample ID: 33-3 (6-8')
Prism Sample ID: 210370
COC Group: G0408076
Time Collected: 04/01/08 10:00
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**75.6**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	9.2	1.5	1	8015B	04/08/08 23:56	jvogel	Q31590
Sample Preparation:			25.23 g	/	1 mL	3545	04/07/08 16:00	Wconder	P21277

Surrogate	% Recovery	Control Limits
o-Terphenyl	76	49 - 124

Sample Weight Determination									
Weight 1	**5.04**	g			1	GRO	04/14/08 0:00	lbrown	
Weight 2	**5.23**	g			1	GRO	04/14/08 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	6.6	4.1	50	8015B	04/09/08 22:06	wbradley	Q31604

Surrogate	% Recovery	Control Limits
aaa-TFT	80	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limit only. No J-Flags applied.

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

All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

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

Laboratory Report

04/18/08

North Carolina Department of Transportation
Attn: David Graham
c/o Hart and Hickman
2923 South Tryon St. Ste 100
Charlotte, NC 28203

Project Name: Boone PSAs
Project ID: ROW-148
Project No.: WBS# 35015.1.1
Sample Matrix: Soil

Client Sample ID: 33-4 (4-6')
Prism Sample ID: 210371
COC Group: G0408076
Time Collected: 04/01/08 10:15
Time Submitted: 04/03/08 8:30

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Percent Solids Determination									
Percent Solids	**80.0**	%			1	SM2540 G	04/07/08 13:45	mbarber	
Diesel Range Organics (DRO) by GC-FID									
Diesel Range Organics (DRO)	**BRL**	mg/kg	8.7	1.4	1	8015B	04/09/08 0:32	jvogel	Q31590
Sample Preparation:				25.1 g /	1 mL	3545	04/07/08 16:00	Wconder	P21277

Surrogate	% Recovery	Control Limits
o-Terphenyl	68	49 - 124

Sample Weight Determination									
Weight 1	**4.60**	g			1	GRO	04/14/08 0:00	lbrown	
Weight 2	**4.61**	g			1	GRO	04/14/08 0:00	lbrown	
Gasoline Range Organics (GRO) by GC-FID									
Gasoline Range Organics (GRO)	**BRL**	mg/kg	6.3	3.9	50	8015B	04/09/08 22:38	wbradley	Q31604

Surrogate	% Recovery	Control Limits
aaa-TFT	79	55 - 129

Sample Comment(s):

BRL = Below Reporting Limit
Values are reported down to the reporting limit only. No J-Flags applied.
The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.
All results are reported on a dry-weight basis

Angela D. Overcash, V.P. Laboratory Services

449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC.

Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 2 OF 3 QUOTE # TO ENSURE PROPER BILLING: _____

Client Company Name: HART & HICKMAN
Report To/Contact Name: DAVID GRAHAM
Reporting Address: _____

Phone: 887-4630 Fax (Yes) (No): _____
Email (Yes) (No) Email Address _____
EDD Type: PDF___ Excel___ Other_____
Site Location Name: BOONE PSAs
Site Location Physical Address: _____

Project Name: ROW-148 - BOONE PSAs
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: NCDOT
Address: _____

Purchase Order No./Billing Reference WBS 35015.1.1
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 2.9	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC___ USACE___ FL___ NC___
SC___ OTHER___ N/A___
Water Chlorinated: YES___ NO___
Sample Iced Upon Collection: YES ✓ NO___

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED: TPH: DRO/GRO	VOCs 5035/8260B	PAHs 8270C	DRY WT. BASIS	REMARKS	PRISM LAB ID NO.
31-6 (6-8')	040108	0845	Soil	C,G,VOA / C,G	2/1	40ml. / 4oz	methanol / —	✓					210368
33-1 (3-5')		0910			2/1			✓					210368
33-2 (4-6')		0940			2/1			✓					210369
33-3 (6-8')		1000			3/1			✓					210370
33-4 (4-6')		1015			2/1			✓					210371
35-1 (10-12')		1100		C,G	5				✓	✓			210372
35-2 (6-8')		1115			5				✓	✓			210373
35-3 (6-8')		1145			5				✓	✓			210374
35-4 (6-8')		1315			5				✓	✓			210375
42-1 (10-12')		1430		C,G,VOA / C,G	2/1	40ml / 4oz		✓					210376

Sampler's Signature C.V.D. Matthews Sampled By (Print Name) C. MATTHEWS / M. FALKNOR Affiliation H&H

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

		Date	Military/Hours
Relinquished By: (Signature) C.V.D. Matthews	Received By: (Signature) David Mann	4-2-08	1234
Relinquished By: (Signature) David Mann 4-3-08 0830	Received By: (Signature)	4/3/08	0830
Relinquished By: (Signature)	Received For Prism Laboratories By:	4/3/08	0830

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Fed Ex ☐ UPS ☐ Hand-delivered ☒ Prism Field Service ☐ Other _____

COC Group No. G048076

Additional Comments:

PRISM USE ONLY

Site Arrival Time:	
Site Departure Time:	
Field Tech Fee:	
Mileage:	

33

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____	☐ NC ☐ SC ☐ _____

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (~~Zero Head Space~~)