
Preliminary Site Assessment Report

March 10, 2017

WBS Element: 48058.1.1

State Project: B-5864

Yancey County

at

Brown's Creek Baptist Church Property

Parcel #012

State Highway 80, Burnsville, NC

PIN #: 0758032125040000

Prepared For:

Mr. Gordon Box

NC DOT, Geotechnical Engineering Unit

GeoEnvironmental Section

1589 Mail Service Center

Raleigh, NC 27699-1589

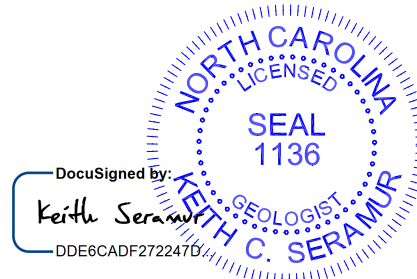
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This document is not considered final unless all signatures are completed.



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1.0 Introduction

1.1 General Site Background Information

Seramur & Associates, PC was contracted to complete a Preliminary Site Assessment (PSA) at:

Brown's Creek Baptist Church Property
Parcel #012
PIN #: 0758032125040000
State Highway 80, Burnsville, NC

This property is located on the east side of State Highway 80 approximately 200 feet north of the intersection with (Upper and Lower) Browns Creek Road (Figure 1). The property is vacant and local informant reported that it previously operated as a laundromat. The Right of Way extends along NC Highway 80 and the northern property line (Figure 2).

Our study focused on the previously developed northwest corner of the property. The southern portion of the property is an undeveloped agricultural field. There is a utility easement that extends from the former building location south to Lower Browns Creek Road. This utility easement was also included in our geophysical surveys.

2.0 Scope of Work

The PSA scope of work includes completing geophysical surveys at the property to investigate the potential for underground storage tanks within the Right of Way. This is followed by soil sampling and analysis to assess soil quality and estimate the volume of potentially contaminated soil if encountered (Figure 2).

2.1 Background Research

Seramur and Associates reviewed the Hazardous Materials Report prepared by Kleinfelder on July 15, 2013. They had been unable to determine the previous use of the property and considered the property as a potential petroleum UST facility. The NCDEQ UST database has no record of a UST system on the property.

The business owner at a computer shop across the street provided personal knowledge of Parcel #012. He stated that the former building had been used as a laundromat. The laundromat owner did not have a properly functioning septic system and was straight piping wastewater from the laundromat into the stream along the north side of the property. State environmental officials reportedly shut down the laundromat.

2.2 Plates 1, Photographs of Parcel #012

Plate 1. Photographs taken on February 6 & 7, 2017



View to the east showing empty lot and gravel drive at Parcel #012.



Magnetometer data collection in Grid 1 across the footprint of the former building.



GPR data collection in Grid 1 across the footprint of the former building.

2.3 Geophysical Surveys

Seramur & Associates set up one grid for geophysical surveys at Parcel #012. Grid 1 was located along the Right of Way parallel to Highway 80. The grid extended to the east across the footprint of the former building and to the Right of Way on the north side of the property. There is a utility easement that extends from the former building location south to lower Browns Creek Road. This utility easement was also surveyed with the magnetometer and GPR.

Geophysical data were collected along transects at a 2-foot spacing. Magnetometer surveys were completed with a MF-1 Fluxgate magnetometer. The MF-1 Fluxgate magnetometer is designed to measure changes in the Earth's magnetic field associated with larger ferrous objects. It does not respond to smaller objects such as nails or wire, but responds well to variations in the Earth's magnetic field produced by manholes, steel pipe, buried drums and tanks. The sensitivity level is well suited for detecting buried USTs at commercial and industrial facilities. Magnetometer data was compiled in an Excel spreadsheet and a contour map with hill shade was drafted using Golden Software's Surfer® modeling program (Figure 3).

A Ground Penetrating Radar (GPR) survey was completed across each grid using Geophysical Survey Systems, Inc. 400 MHz antenna and a SIR-3000 Single Channel Data Acquisition System with a calibrated survey wheel. The GPR data was downloaded and saved onto a computer. The GPR grid data has been processed and modeled using GPR-Slice® software. The GPR data processing included adjusting time zero, completing a background removal and adjusting the time variable gain to enhance deep reflections.

Three-dimensional models of the GPR grid data were produced with the GPR-Slice® software. These models can be sliced in vertical and horizontal planes in order to examine the three dimensional aspects of radar anomalies. Two time slices (or depth slices) were imaged for Grid 1 and placed on the site plan as shown on Figures 4 and 5. Each depth slice is a horizontal slice or plan view of the GPR grid data at a selected depth. The thickness of the horizontal slice can be adjusted to show reflections across a particular depth range.

2.4 Soil Sampling and Analyses

On February 20, 2017, Carolina Soil Investigations, LLC mobilized to the site to drill Geoprobe borings and collect soil samples. Our project design called for collecting shallow and deep soil samples from each boring (Figure 2). The purpose of collecting a shallow sample (~3 feet) is to test for petroleum releases related to surface spills and releases from product lines and dispensers. The purpose of collecting a deep soil sample is to test for petroleum releases related to underground storage tanks. Soil samples can also be collected at other depths within the Geoprobe cores where soil staining or petroleum odors indicate the possible presence of petroleum constituents.

We had planned to drill soil borings in the mapped Right of Way along NC Highway 80 and the north end of the property as shown on the original CAD files received for this project. However, when we got into the field we observed that the surveyor had marked the updated location of the proposed Right of Way. We kept our soil boring locations within the surveyed Right of Way markers (Figure 2).

A track-mounted Geoprobe rig was used to drill a total of seven soil borings. Drilling tools were decontaminated between each soil boring. A new pair of Nitrile gloves was worn while collecting each soil sample. A representative portion of each soil sample was placed in a zip lock bag and allowed to sit for a period of time to allow volatile vapors to accumulate in the headspace of the bag. A calibrated Photoionization detector (PID) was used to screen the

headspace in each bag and the concentration of volatile petroleum vapors was measured and recorded (Table 1). The texture and type of soil material (fill material) in the Geoprobe cores was described and recorded. Table 1 lists the boring data including sample number, depth, PID reading, lithology and type of soil material.

Samples were collected in laboratory supplied jars, labeled and packed in ice. A chain of custody was initiated and the samples were shipped on ice to REDLab, LLC in Wilmington, NC for Total Petroleum as Hydrocarbons (TPH) analysis. REDLab analyzed the soil samples for petroleum constituents by Ultra-Violet Fluorescence using a QED HC-1 analyzer. The analytical results are reported as Gasoline Range Organics (GRO) and Diesel Range Organics (DRO) and Total Petroleum as Hydrocarbons (TPH). REDLab provides a hydrocarbon spectrum with each of the sample results. This spectrum is used for a tentative identification of the type of hydrocarbon detected by the analytical method. REDLab interprets the hydrocarbon fingerprint for each sample using a library search of spectra for known hydrocarbon types and concentrations. The laboratory reports and fingerprint spectra are included in Appendix B.

3.0 Results of Investigation

Parcel #012 is a vacant property that previously operated as a laundromat. The building footprint was visible as a rectangular change in vegetation. The gravel driveway in front of the former building remains along the west side of the parcel. The Right of Way is relatively narrow along Highway 80 and then steps out to the east along the northern property boundary. There is a utility easement that extends from the former building location south to Lower Browns Creek Road.

3.1 Geophysical Surveys

Only one magnetic anomaly was detected in Grid 1 (Figure 3). The GPR was used to image this anomaly and the profile showed a narrow area of disturbed soil and a point reflector that are not characteristic of a UST (Figure 3). This magnetic anomaly is located along the updated Right of Way line.

The GPR data shows a high amplitude reflector along the east side of the gravel driveway, directly in front of the former building (Figure 4). The GPR profiles show this reflector to be a very shallow, continuous, high amplitude reflector. The initial CAD files we reviewed showed this area to be just outside of the proposed Right of Way. The updated CAD files move the Right of Way line west about 10 feet.

A second set of GPR anomalies are present within the Right of Way in the northwest corner of the property. The GPR profiles show these anomalies as a continuous, horizontal, high amplitude reflectors (Figure 5).

3.2 Soil Borings, Sampling and Laboratory Results

Soil material at Parcel #012 is described as silty sand with some gravel (Table 1). This soil is fill material. Groundwater was not encountered in any of the soil borings drilled on Parcel #012.

Three soil borings were drilled in the narrow Right of Way along Highway 80. Shallow and deep soil samples were collected and analyzed from Borings B-1 and B-2. Refusal to the Geoprobe core was encounter at boring B-3 at a depth of about 6 feet. This boring was offset and a second attempt also encountered auger refusal at a depth of 5 feet.

Four borings were drilled in the Right of Way along the northern property boundary and two soil samples were collected from each boring.

The soil recovered in the Geoprobe cores collected at Parcel #012 did not show any evidence of soil staining or petroleum odors. Laboratory analysis did not detect petroleum constituents in most soil samples. Very low concentrations (<1.3 ppm) of petroleum constituents were detected in three soil samples, S-20, S-25 and S-28 (Table B-2). The petroleum constituents detected are likely the result of surface spills or residual petroleum in fill material placed on the property.

3.4 Conclusions

The geophysical surveys did not find evidence of USTs on Parcel #012. Soil sampling and analysis within the Right of Way did not find evidence of petroleum constituents in soil above a concentration of 1.3 ppm.

3.5 Recommendations

Seramur & Associates does not recommend any additional assessment work at the Brown's Creek Baptist Church Property (Parcel #012).

Appendix A

Tables and Figures

Table 1. Soil Boring Data - Parcel #012, Brown's Creek Baptist Church Property

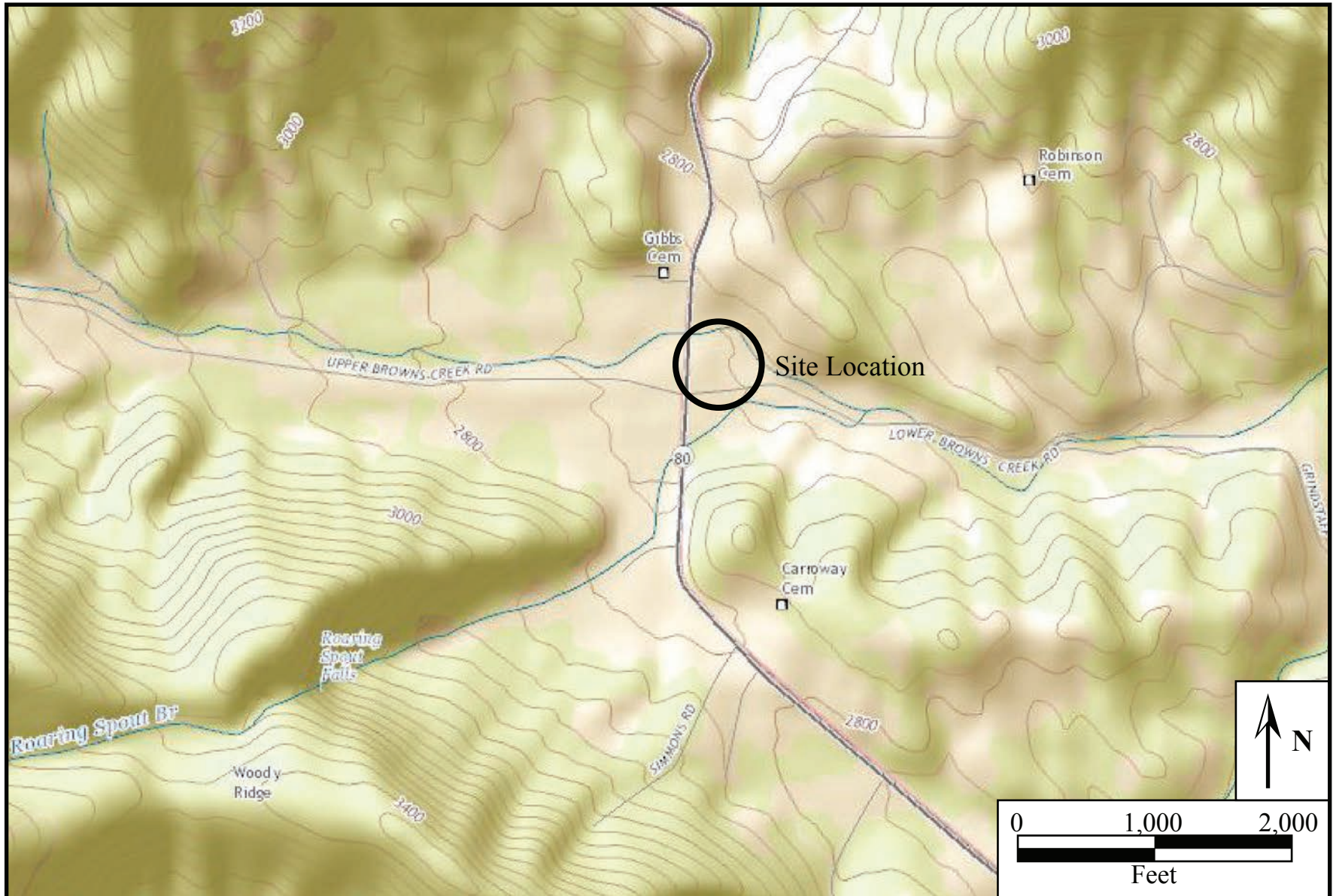
Boring No.	Depth (ft)	Lithology	Soil type	Soil Sample	PID ppm	Comments
B-1	0.0 to 5.0	Silty Sand	Fill	S-20	0.0	Sample at 3.0 ft.
B-1	5.0 to 10.0	Silty Sand	Fill	S-21	0.0	Sample at 8.2 ft. Saturated below 8.2 ft.
B-2	0.0 to 5.0	Silty Sand w/ Gravel	Fill	S-22	0.0	Sample at 3.0 ft.
B-2	5.0 to 7.0	Silty Sand w/ Gravel	Fill	S-23	0.0	Refusal at 7.0 ft. Sample at 7.0 ft.
B-3	0.0 to 5.0	Sand	Fill	S-24	0.0	Refusal at 5.0 ft. Sample at 5.0 ft.
B-4	0.0 to 5.0	Silty Sand	Fill	S-25	0.0	Sample at 3.0 ft.
B-4	5.0 to 6.0	Silty Sand	Fill	S-26	0.0	Refusal at 6.0 ft. Sample at 6.0 ft.
B-5	0.0 to 5.0	Silty Sand	Fill	S-27	0.0	Sample at 5.0 ft.
B-5	5.0 to 8.0	Silty Sand	Fill	S-28	0.0	Refusal at 8.0 ft. Sample at 7.5 ft.
B-6	0.0 to 5.0	Silty Sand	Fill	S-29	0.0	Sample at 3.0 ft.
B-6	5.0 to 8.0	Silty Sand	Fill	S-30	0.0	Refusal at 8.0 ft. Sample at 8.0 ft.
B-7	0.0 to 5.0	Silty Sand	Fill	S-31	0.0	Sample at 3.0 ft.
B-7	5.0 to 8.0	Silty Sand	Fill	S-32	0.0	Refusal at 8.0 ft. Sample at 8.0 ft.

Table B-3: Summary of Analytical Sampling

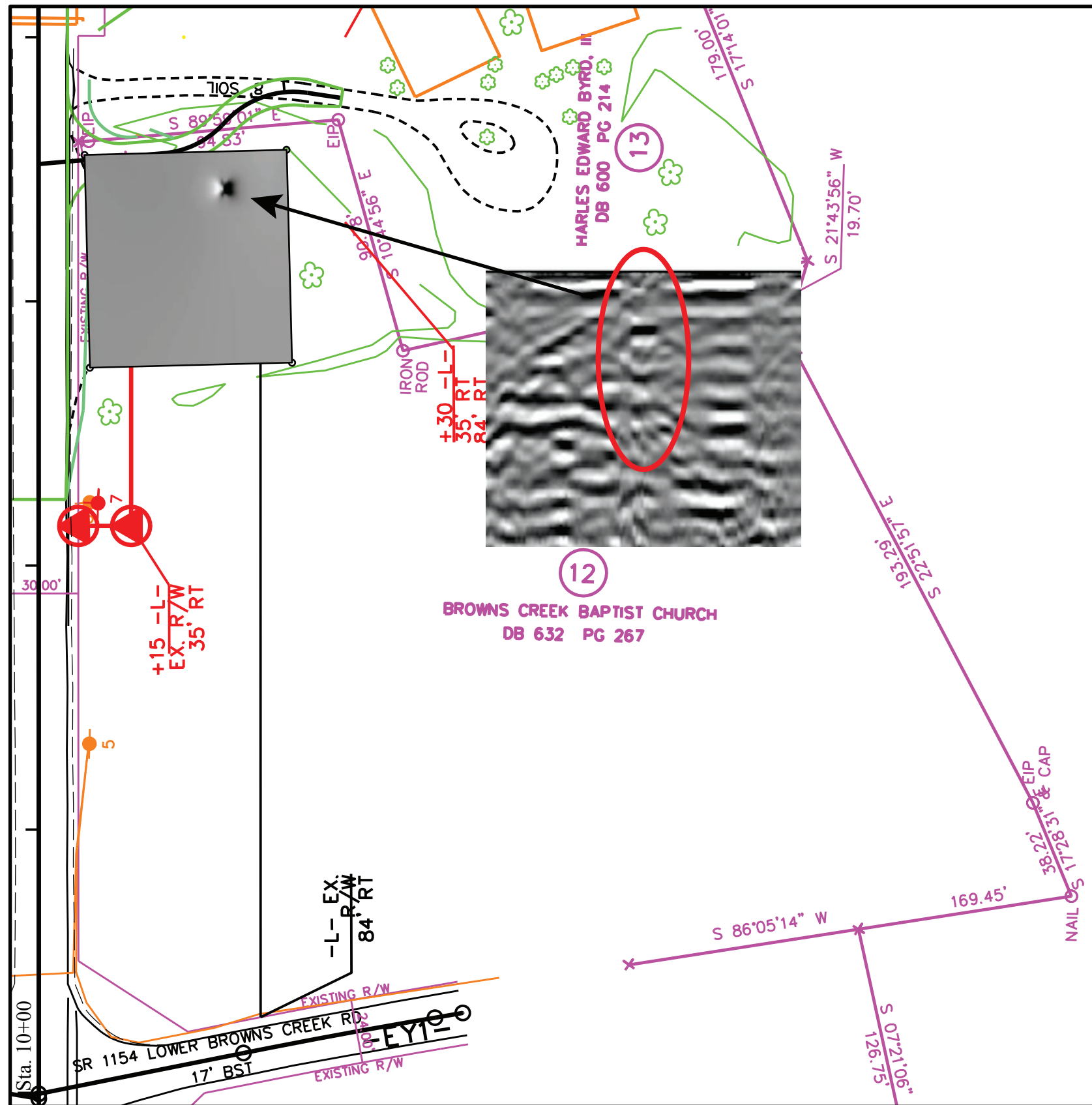
Revision Date: 02/22/17 Name: Brown's Creek Baptist Church, Parcel 012 Facility I.D. #: N/A

Analytical Method (e.g., VOC by EPA 8260) →					UVF	UVF	Hydrocarbon Fingerprint
Contaminant of Concern →					TPH GRO	TPH DRO	
Sample ID	Date Collected (mm/dd/yy)	Source Area	Sample Depth (ft. BGS)	Incident Phase			
S-20	02/20/17	B-1	3 ft.	PSA	<0.62	1.3	Degraded Fuel
S-21	02/20/17	B-1	8.2 ft.	PSA	<0.22	<0.22	Residual PHC
S-22	02/20/17	B-2	3 ft.	PSA	<0.24	<0.24	Residual.PHC
S-23	02/20/17	B-2	7 ft.	PSA	<0.3	<0.3	PHC not detected
S-24	02/20/17	B-3	5 ft.	PSA	<1.3	<1.3	PHC not detected
S-25	02/20/17	B-4	3 ft.	PSA	<0.24	0.3	Residual.PHC
S-26	02/20/17	B-4	6 ft.	PSA	<0.25	<0.25	PHC not detected
S-27	02/20/17	B-5	5 ft.	PSA	<0.29	<0.29	Residual.PHC
S-28	02/20/17	B-5	7.5 ft.	PSA	0.36	<0.36	Residual.PHC
S-29	02/20/17	B-6	3 ft.	PSA	<1.3	<1.3	PHC not detected
S-30	02/20/17	B-6	8 ft.	PSA	<0.38	<0.38	PHC not detected
S-31	02/20/17	B-7	3 ft.	PSA	<0.23	<0.23	PHC not detected
S-32	02/20/17	B-7	8 ft.	PSA	<0.3	<0.3	Residual.PHC
NCDENR Action Level					50	100	

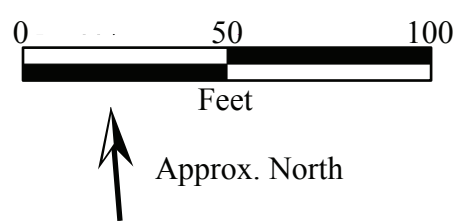
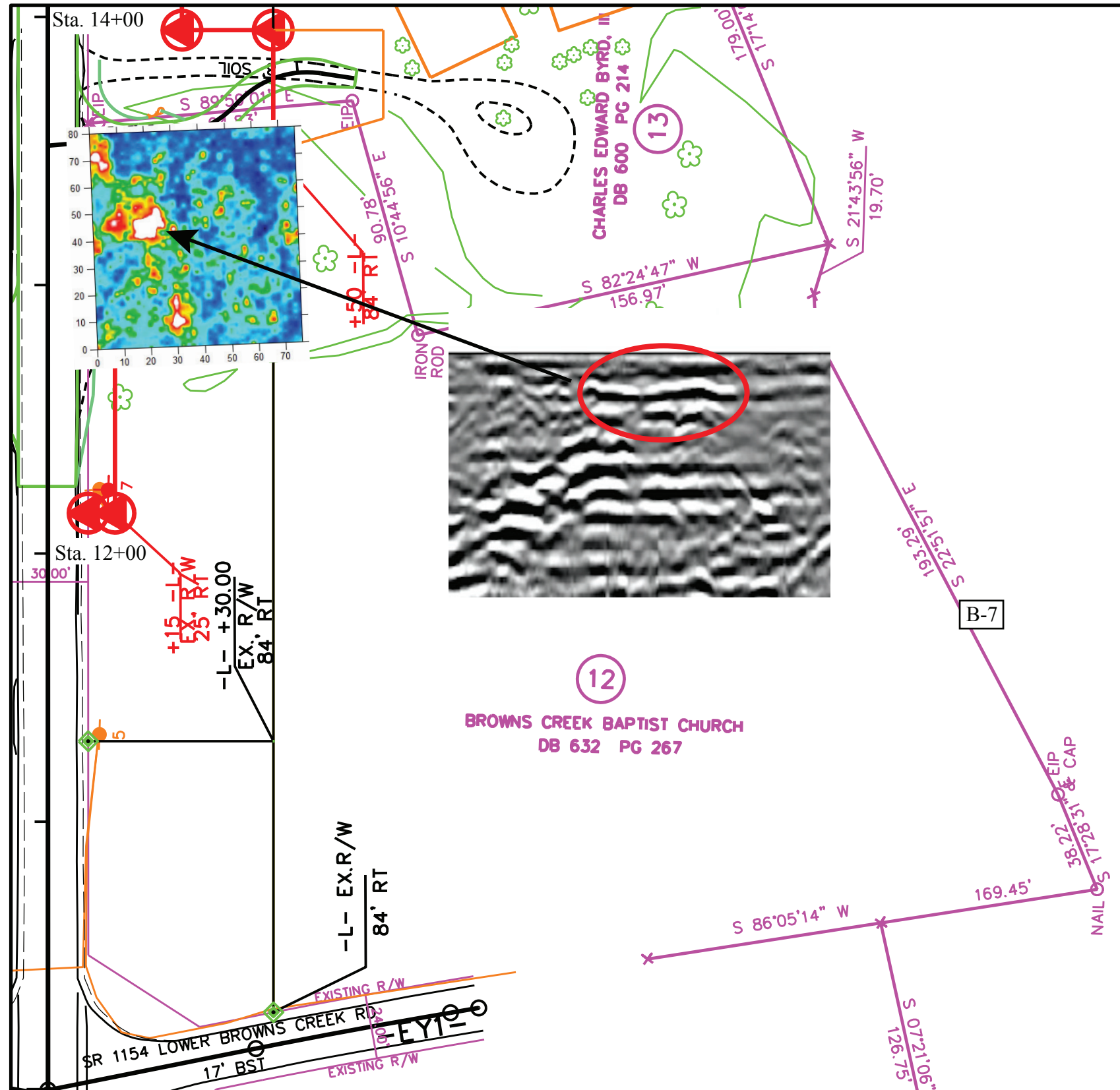
BGS = feet below ground surface
 Results reported in mg/kg = milligrams per kilogram



<p>Figure 3 Site Location Map Source: U.S.G.S The National Map</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Browns Creek Baptist Church Property Burnsville, NC</p>	<p>Parcel #012 Facility I.D.: N/A</p>	<p>Seramur & Associates, PC Boone, NC</p>
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<p>0 50 100 Feet</p>	<p>Figure 3 Magnetometer Survey Results</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #012 Facility I.D.: N/A</p>
<p>↑ Approx. North</p>		<p>Browns Creek Baptist Church Property Burnsville, NC</p>	<p>Seramur & Associates, PC Boone, NC</p>



<p>Figure 4 1.0 to 1.5 foot GPR Depth Slice</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #012 Facility I.D.: N/A</p>
	<p>Browns Creek Baptist Church Property Burnsville, NC</p>	<p>Seramur & Associates, PC Boone, NC</p>

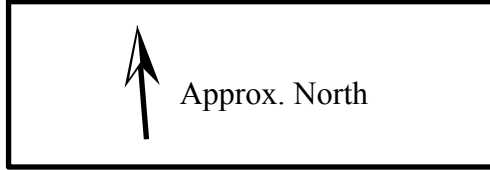
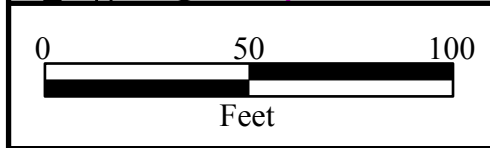
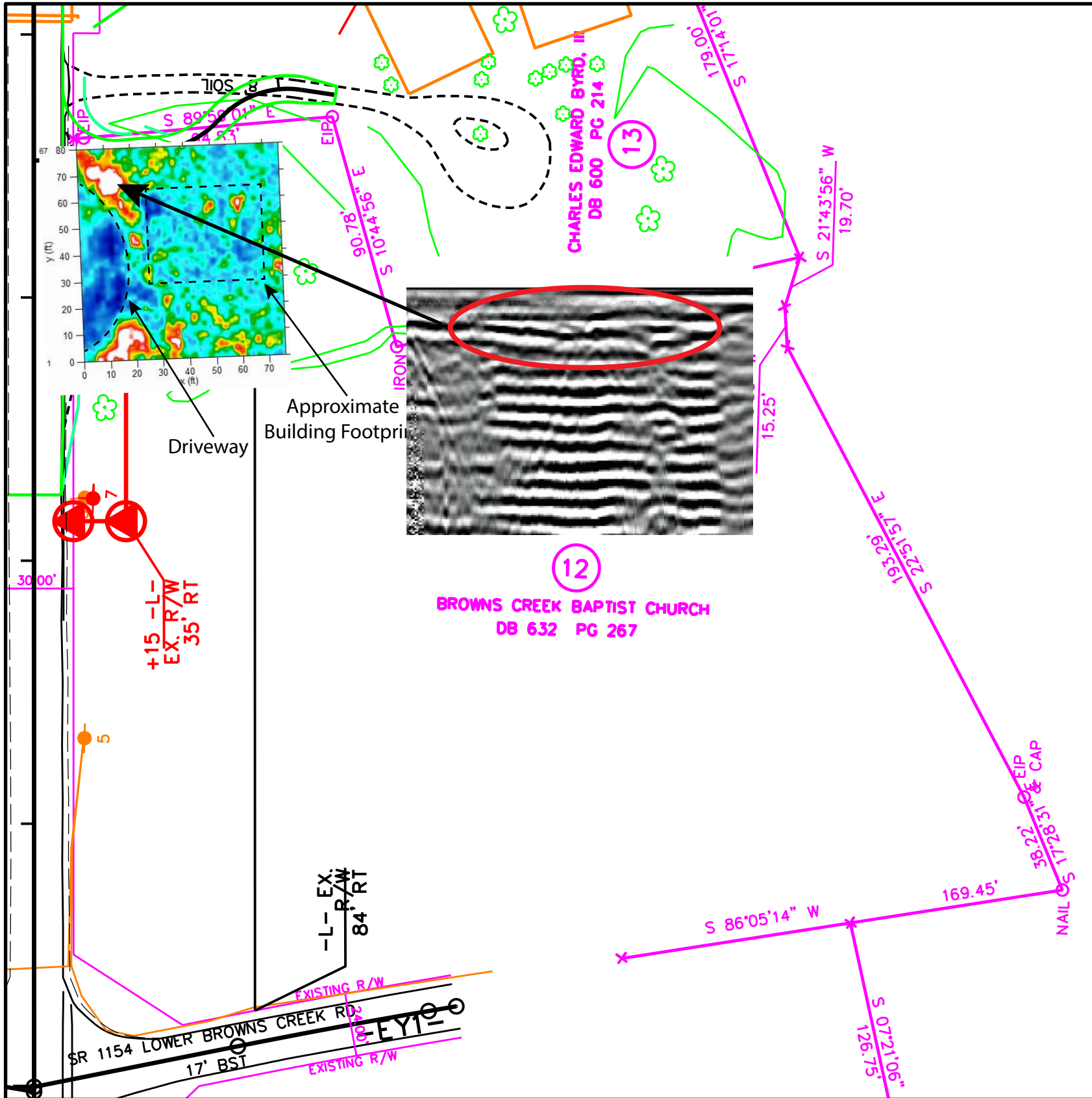
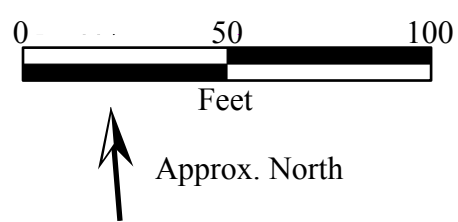
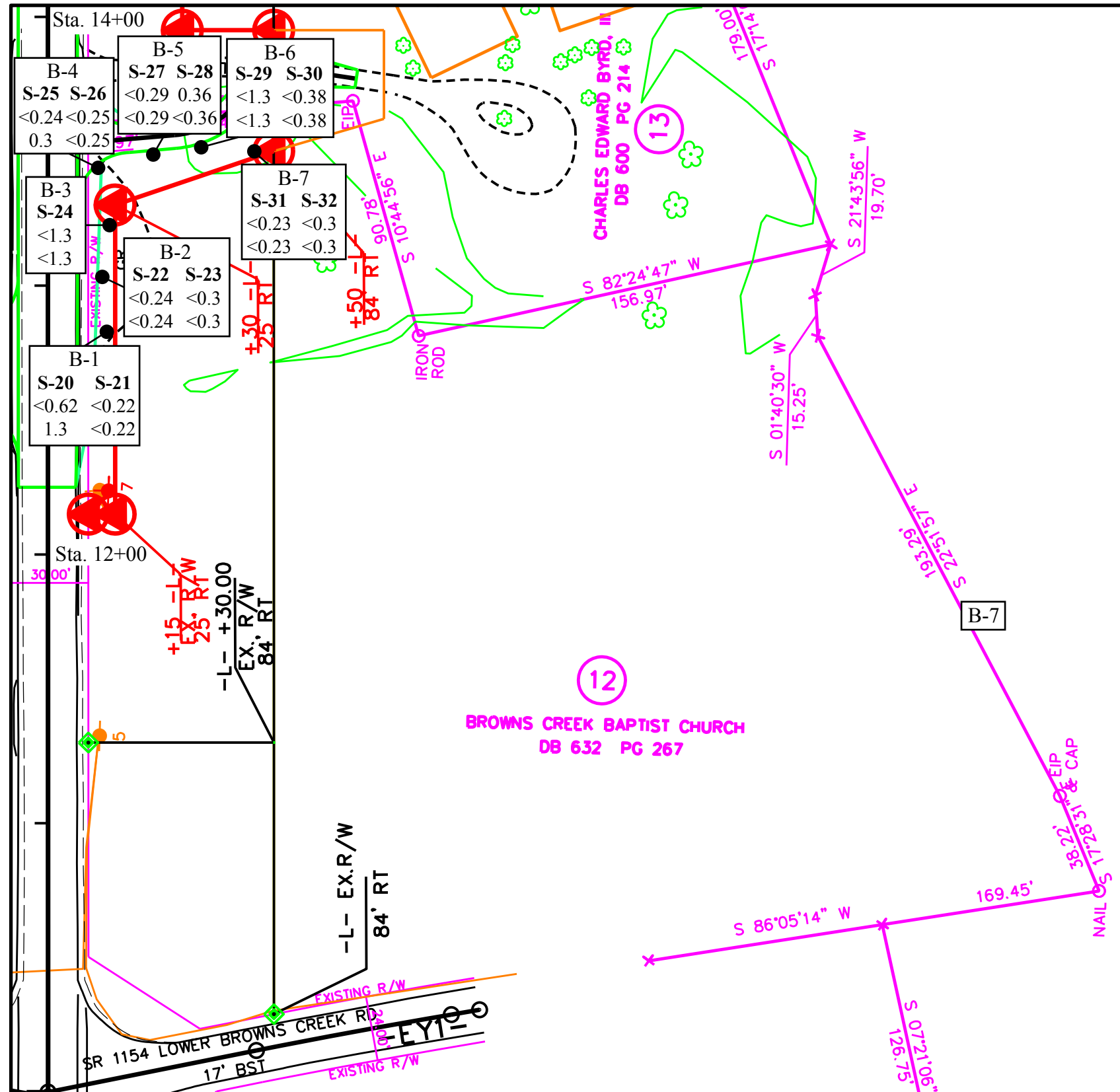


Figure 5 3 to 4 Foot GPR Time Slice	State Project: B-5864 Yancey County, NC	Parcel #012 Facility I.D.: N/A
	Browns Creek Baptist Church Property Burnsville, NC	Seramur & Associates, PC Boone, NC



<p>Figure 8 Soil Sampling Analytical Results</p> <p>- Approximate ● Location of Soil Boring</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #012 Facility I.D.: N/A</p>
	<p>Browns Creek Baptist Church Property Burnsville, NC</p>	<p>Seramur & Associates, PC Boone, NC</p>

Appendix B

Laboratory Reports and Chain of Custody Records



Hydrocarbon Analysis Results

Client: SERAMUR & ASSOCIATES
Address: 165 KNOLL DRIVE
 BOONE, NC 28607

Samples taken
Samples extracted
Samples analysed

Monday, February 20, 17
 Monday, February 20, 17
 Wednesday, February 22, 2017

Contact: KEITH SERAMUR

Operator

PANTESCO

Project: NCDOT B-5864

											H09382		
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	S-20	24.8	<0.62	<0.62	1.3	1.3	<0.12	<0.02	<0.002	0	100	0	Deg Fuel (OCR) (FCM) 75.4%
s	S-21	8.8	<0.44	<0.22	<0.22	<0.22	<0.04	<0.007	<0.001	0	0	100	Residual.PHC (P) (BO) 38.6% B
s	S-22	9.7	<0.24	<0.24	<0.24	<0.24	<0.05	<0.008	<0.001	0	0	100	Residual.PHC (P) (BO)
s	S-23	12.0	<0.3	<0.3	<0.3	<0.3	<0.06	<0.01	<0.001	0	0	0	(P) (BO)
s	S-24	51.0	<1.3	<1.3	<1.3	<1.3	<0.25	<0.04	<0.005	100	0	0	(P) 22.4%
s	S-25	9.5	<0.24	<0.24	0.3	0.3	<0.05	<0.008	0.001	0	0	100	Residual.PHC (FCM) (P) (BO) 43.7%
s	S-26	10.2	<0.25	<0.25	<0.25	<0.25	<0.05	<0.008	<0.001	0	0	0	PHC not detected (P) (BO)
s	S-27	11.5	<0.29	<0.29	<0.29	<0.29	<0.1	<0.01	0.002	0	63.1	36.9	Residual.PHC (P) (BO)
s	S-28	14.3	<0.71	0.36	<0.36	0.36	<0.07	<0.01	<0.001	100	0	0	Residual.PHC (FCM) (P) (BO) 26%
s	S-29	53.1	<2.7	<1.3	<1.3	<1.3	<0.27	<0.04	<0.005	0	0	0	(P) (BO) 36.7%
Initial Calibrator QC check			OK			Final FCM QC Check			OK			99.7 %	

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present



Hydrocarbon Analysis Results

Client: SERAMUR & ASSOCIATES
Address: 165 KNOLL DRIVE
 BOONE, NC 28607

Samples taken
Samples extracted
Samples analysed

Monday, February 20, 17
 Monday, February 20, 17
 Wednesday, February 22, 2017

Contact: KEITH SERAMUR

Operator

PANTESCO

Project: NCDOT B-5864

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	S-30	15.1	<0.38	<0.38	<0.38	<0.38	<0.08	<0.01	<0.002	0	0	0	PHC not detected (P)
s	S-31	9.2	<0.23	<0.23	<0.23	<0.23	<0.05	<0.007	<0.001	0	0	0	PHC not detected (P)
s	S-32	12.0	<0.3	<0.3	<0.3	<0.3	<0.06	<0.01	0.003	0	0	100	Residual.PHC (P) (BO)
Initial Calibrator QC check			OK			Final FCM QC Check			OK			107.3 %	

Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content
 Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library
 (SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

