
Preliminary Site Assessment Report

March 8, 2017

WBS Element: 48058.1.1

State Project: B-5864

Yancey County

at

Celo Investment Partners Property

Parcel #004

4188 State Highway 80, Burnsville, NC

PIN #: 075803118688000

Facility ID No.: Not Registered

Prepared For:

Mr. Gordon Box

NC DOT, Geotechnical Engineering Unit

GeoEnvironmental Section

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



Keith C. Seramur, P.G.

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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:

Celo Investment Partners Property
Parcel #004
PIN #: 075803118688000
4188 State Highway 80, Burnsville, NC
Facility ID No.: Not Registered

This property is located on the west side of State Highway 80 approximately 200 feet north of the intersection with (Upper and Lower) Browns Creek Road (Figure 1). The property contains two buildings. One building is the former general store along Highway 80 and the second building is a long U-shaped building containing shops and studios. The main building near the highway operates as a computer repair store.

Our fieldwork was initially delayed as a result of the land owner requesting us to leave the property until he was contacted by the NCDOT Right of Way agent. The Right of Way and easements extend along State Highway 80 on the eastern portion of the property (Figure 2). The Right of Way and easement boundaries changed during the course of our work. Seramur & Associates received updated CAD drawings after the fieldwork was completed.

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 and easements. This is followed by soil sampling and analysis to assess soil quality and estimate the volume of potentially contaminated soil at the site (Figure 2).

2.1 Background Research

Seramur and Associates reviewed the Hazardous Materials Report prepared by Kleinfelder on July 15, 2013. They had located a suspicious concrete pad that appeared to have been a former gasoline dispenser. The NCDEQ UST database has no record of a UST system on the property.

The property owner stated that new siding had been placed on the building, but that there had been no additions to the original store building. The property owner stated that they had no knowledge of USTs on the parcel.

2.2 Plates 1 and 2, Photographs of Parcel #004

Plate 1. Photographs taken on February 6, 2017



View to the west showing front of former general store. Dispenser pad is to the right of the door.



Concrete pad showing outline of former gasoline dispenser and product line (in hole).



Magnetometer data collection in Grid 2 along front of former general store.

Plate 2. Photographs taken on February 6 and 20, 2017

	
<p>GPR data collection in Grid 2 along front of former general store.</p>	<p>GPR data collection at southeast corner of former general store where magnetic anomaly was recorded.</p>
	
<p>Geoprobe drilling to delineate southern extent of contaminated soil detected at former dispenser island.</p>	<p>Preparing Geoprobe core barrel for soil sample collection.</p>

2.3 Geophysical Surveys

Seramur & Associates set up three grids for geophysical surveys at Parcel #004. Grid 1 was placed across a construction easement on the north side of the building and this grid extended towards Highway 80 (Figures 3, 4 and 5). Grid 2 was placed within the Right of Way along the east side of the building. Grid 3 is located in the Right of Way on the south side of the building.

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 each grid and placed on site plans 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 a shallow and deep soil sample 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. Soil borings were drilled in the mapped Right of Way and easements along NC Highway 80 as shown on the original CAD files received for this project. The updated CAD files show that some of these boring locations are now outside of the proposed Right of Way (Figure 2).

A track-mounted Geoprobe rig was used to drill a total of ten 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, alluvium or residuum) 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 and 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.

Ground water was encountered in soil boring B-2. A one-inch PVC screen was set in the boring and a Polyethylene disposable bailer was used to purge the boring and collect a groundwater sample. REDLab, LLC also analyzed this groundwater sample for petroleum constituents (Table B-4).

3.0 Results of Investigation

Parcel #004 is a former general store that used to sell fuel, most likely gasoline. A concrete pad or dispenser island remains adjacent to the building. The property is presently being used for shops and studios.

3.1 Geophysical Surveys

Two magnetic anomalies were detected in Grid 1 (Figure 3). The first anomaly was recorded in the northeast corner of the property. The GPR was used to image this anomaly and it showed a shallow, high amplitude reflector that was not characteristic of a UST (Figure 4). Soil boring B-5 was drilled into this anomaly and the Geoprobe encountered refusal on concrete at a depth of one foot in the first two drilling attempts.

The second anomaly was recorded along the north side of the building. This anomaly was very limited in size, which is not characteristic of a UST. The GPR profiles show a point reflector at this location.

The shallow GPR slice shows a linear reflection in Grids 1 and 2 extending from the former dispenser pad out to an area north of the building (Figure 4). A second linear anomaly extends from this area to the side of the building. The deeper GPR depth slice shows a transparent area or reflection free area north of the linear anomalies (Figure 5). Reflection free areas can represent homogenous fill material.

Magnetic anomalies were not recorded in Grid 2. One larger magnetic anomaly was recorded in Grid 3 adjacent to the southeast corner of the building (Figure 3). The highest magnetometer readings were recorded immediately adjacent to the building foundation. The GPR data shows a high amplitude reflector adjacent to this corner of the building (Figures 4 and 5). The radar reflections indicate some type of subsurface structure at this location.

3.2 Soil Borings, Sampling and Laboratory Results

The soil at Parcel #004 is silty sand and sandy silt with gravel (Table 1). The soil types described include fill material, alluvium and residuum (saprolite).

Soil boring B-1 was drilled on the east side of the former fuel dispenser. A shallow sample (4-5 feet) was recovered from this boring, but our attempt to recover soil from a depth of 10 feet was unsuccessful as the drillers lost the core barrel in the bottom of the boring. A second Geoprobe boring (B-1a) was drilled immediately adjacent to Boring B-1 (6 inches to the NE) and a deep (9.5 foot) soil sample was recovered. Diesel range petroleum constituents were detected in soil sample S-1 at a concentration of 40.4 ppm. Gasoline and diesel range petroleum constituents were detected in soil sample S-2 collected from boring B-1a at concentrations above 100 ppm (Table B-3).

Soil boring B-2 was drilled north of boring B-1 in an effort to assess soil quality in the vicinity of the former tank pit. Soil samples S-3 and S-4 were collected from this boring. The deep sample was collected at a depth of 7.5 feet, as this was where the soil became wet. This sample depth was selected in an attempt to obtain soil from the capillary fringe (smear zone).

Groundwater was encountered in contact with contaminated soil in boring B-2 and a 1-inch PVC screen was set in the boring. Groundwater sample TW-1 was collected after purging the boring with a disposable bailer. Groundwater was measured at a depth of 5.71 feet below ground surface in soil boring B-2 (Figure 2).

Soil boring B-3 was drilled within the construction easement in an attempt to delineate the western extent of soil contamination. Soil samples S-5 and S-6 were collected from this boring. The deep sample (S-6) was collected at a depth of 8.0 feet where the soil became wet. Gasoline range petroleum constituents were detected in soil sample S-6 at a concentration of 69.7 ppm.

Soil boring B-4 was drilled in an attempt to delineate the extent of soil contamination north of the former UST excavation. Soil samples S-7 and S-8 were collected from this boring. Gasoline range petroleum constituents were detected in the shallow (3 foot) soil sample S-7 at a concentration of 61.1 ppm.

Soil boring B-5 was drilled in the northeast corner of the property to assess soil quality around magnetic and radar anomalies recorded at this location. The Geoprobe encountered refusal on concrete during the first two attempts to drill boring B-5. A shallow (4.5 foot) soil sample S-9 was collected from the second offset location of boring B-5. A deep soil sample was not collected because of refusal in the third boring at a depth of 6.5 feet. DRO were detected at a concentration of 1.3 ppm in soil sample S-9.

Soil boring B-6 was drilled east of boring B-1 in an effort to assess soil quality adjacent to the highway. Soil samples S-10 and S-11 were collected from this boring. Elevated concentrations of gasoline and diesel range petroleum constituents were detected in both of these soil samples.

Soil boring B-7 was drilled south of borings B-1 and B-6 in an effort to delineate the southern extent of soil contamination. Petroleum constituents were not detected at concentrations above minimum detection limits in soil samples S-12 and S-13 collected from this boring.

Soil borings B-8 and B-9 were drilled adjacent to the southeast corner of the building in an effort to assess soil quality adjacent to magnetic and radar anomalies at this location. Petroleum

constituents were not detected at concentrations above 10 ppm in soil samples (S-14 through S-17) collected from these borings.

Soil boring B-10 was drilled at the southern end of the right of way to assess soil quality in this area. Petroleum constituents were not detected at/or above 10 ppm in soil samples S-18 and S-19 collected from this boring.

3.3 Volume and Extent of Soil Contamination

Contaminated soil, defined as GRO concentrations above 50 ppm and DRO concentrations above 100 ppm, was detected in soil samples S-2, S-4, S-6, S-7, S-10 and S-11 (Table B-3 and Figure 8). Contaminated soil was detected at depths between 7.5 feet and 9.5 feet in borings B-1, B-2 and B-3. Contaminated soil was detected at a depth of 3 feet in Boring B-4. Both the shallow and deep soil samples in B-6 contained elevated concentrations of petroleum constituents.

The right of way and construction easement boundaries changed after completion of our fieldwork. Contaminated soil in the vicinity of borings B-1, B-2 and B-6 is within the newly drawn right of way. An estimate of the volume of contaminated soil within this right of way is calculated using an area with a width of 12 feet (east-west) and a length of 50 feet (north-south) (Figure 9). The thickness of contaminated soil within the capillary fringe around borings B-1, B-2 and B-6 is estimated to be three feet. The volume of contaminated soil within the right of way and in the vicinity of the former dispenser and UST excavation is shown below:

$$\begin{aligned} 3 \text{ ft.} \times 600 \text{ ft}^2 &= 1800 \text{ ft}^3 \\ 1800 \text{ ft}^3 / 27 \text{ ft}^3/\text{yd}^3 &= 66.7 \text{ yd}^3 \\ 66.7 \text{ yd}^3 \times 1.5 \text{ tons}/\text{yd}^3 &= 100 \text{ tons} \end{aligned}$$

Soil contamination was also detected in the 3-foot soil sample at boring B-4. The volume of contaminated soil in the vicinity of boring B-4 can be estimated using an area with a width of 10 feet and a length of 25 feet. A thickness of 3 feet will be used for this estimate as is calculated below:

$$\begin{aligned} 3 \text{ ft.} \times 250 \text{ ft}^2 &= 750 \text{ ft}^3 \\ 750 \text{ ft}^3 / 27 \text{ ft}^3/\text{yd}^3 &= 27.8 \text{ yd}^3 \\ 27.8 \text{ yd}^3 \times 1.5 \text{ tons}/\text{yd}^3 &= 41.7 \text{ tons} \end{aligned}$$

The total volume of contaminated soil detected within the right of way at Parcel #004 is estimated to be 94.5 yd³ or 141.7 tons.

3.4 Conclusions

The concrete pad for a fuel dispenser remains in front of the former general store. The geophysical surveys imaged the product line extending from the dispenser, north into an area of homogenous fill material. This area is interpreted to be the former tank pit for the UST system. A second linear anomaly that extends from the tank pit back to the building could be a vent pipe. Seramur & Associates did not find any evidence of petroleum USTs remaining within the right of way or construction easements.

The magnetic and GPR anomalies at the northeast corner of the property likely represent the footing for a signpost. The Geoprobe encountered shallow (1 foot) auger refusal on a buried object at this location.

The subsurface structure that produced the magnetic and GPR anomalies at the southeast corner of the building has not been identified. Soil borings B-8 and B-9 were drilled at this location. Petroleum constituents were not detected at concentrations above 10 ppm in soil samples (S-14 through S-17) collected from these borings. This unknown subsurface structure does not appear to be related to a petroleum UST system. Perhaps it is a septic tank for the former general store.

Soil sampling and analysis detected petroleum constituent concentrations above NCDEQ Action Limits in the vicinity of the former UST system operated at the general store. The total volume of contaminated soil detected within the right of way at Parcel #004 is estimated to be 94.5 yd³ or 141.7 tons.

3.5 Recommendations

Contaminated soil is present within the proposed Right of Way for the bridge replacement. The CAD files did not show cut areas indicating that the grade of the ground surface will be changed during the bridge replacement. A driveway entrance is shown across the vicinity of soil borings B-2 and B-4.

An 18-inch RCP storm drain and drop inlet are shown in the vicinity of boring B-4. Contaminated soil was detected in this boring at a depth of 3.0 feet. Installation of this storm drain could encounter contaminated soil.

Soil boring B-5 was drilled closest to the bridge. Soil sample S-9 collected from boring B-5 at a depth of 4.5 feet did not contain petroleum constituents above 10 ppm.

If it is determined that unsuitable soil material needs to be removed from Parcel 004 it may be necessary to excavate and remove the contaminated soil from the right of way.

Seramur & Associates recommends that a licensed geologist or engineer supervise the removal of any soil associated with excavation work in the vicinity of borings B-1, B-2, B-4, and B-6. Contaminated soil removed from Parcel #004 should be sent to a remediation facility.

Appendix A

Tables and Figures

Table B-3: Summary of Analytical Sampling

Revision Date: 02/22/17 Name: Celo Investment Partners, Parcel 004 Facility I.D. #:Not Registered

Analytical Method (e.g., VOC by EPA 8260) →					UVF	UVF	Hydrocarbon Fingerprint
Contaminant of Concern →					TPH GRO (ppm)	TPH DRO (ppm)	
Sample ID	Date Collected (mm/dd/yy)	Source Area	Sample Depth (ft. BGS)	Incident Phase			
S-1	02/20/17	B-1	4-5 ft.	PSA	<0.53	40.4	Deg Fuel (FCM) 66.7%
S-2	02/20/17	B-1a	9.5 ft.	PSA	263.6	107.4	Deg Gas (FCM) 81%
S-3	02/20/17	B-2	4.5 ft.	PSA	31.2	39.6	V.Deg.PHC (FCM) 62.6%
S-4	02/20/17	B-2	7.5 ft.	PSA	151.8	178.8	Deg Fuel (FCM) 89.4%
S-5	02/20/17	B-3	5 ft.	PSA	<0.21	0.21	Residual.PHC (FCM) (P) (BO) 39.3% B
S-6	02/20/17	B-3	8 ft.	PSA	69.7	18.1	Deg Gas (FCM) 68.4%
S-7	02/20/17	B-4	3 ft.	PSA	61.1	16.8	Deg Gas (FCM) 68.4%
S-8	02/20/17	B-4	6.2 ft.	PSA	2.9	1.3	Deg Gas (FCM) 73.4%
S-9	02/20/17	B-5	4.5 ft.	PSA	<0.32	1.3	Deg.Fuel (FCM) 88.5%
S-10	02/20/17	B-6	4 ft.	PSA	569.4	501.3	Deg Gas (FCM) 89%
S-11	02/20/17	B-6	6.7 ft.	PSA	797.2	1112	Deg.PHC (FCM) 83.4%
S-12	02/20/17	B-7	4 ft.	PSA	<0.22	<0.22	PHC not detected (BO)
S-13	02/20/17	B-7	7.3 ft.	PSA	<0.29	<0.29	PHC not detected (OCR) (BO)
S-14	02/20/17	B-8	3 ft.	PSA	<0.58	7.1	V.Deg.PHC (FCM) 78.5%
S-15	02/20/17	B-8	7.5 ft.	PSA	<0.71	1.5	Residual.PHC (FCM) 59.3%
S-16	02/20/17	B-9	3 ft.	PSA	<0.58	1.1	Residual.PHC (FCM) 64.6%
S-17	02/20/17	B-9	7.5 ft.	PSA	<0.24	<0.24	PHC not detected
S-18	02/20/17	B-10	3 ft.	PSA	<0.68	1.3	Deg Fuel (OCR) (FCM) 86.3%
S-19	02/20/17	B-10	8.2 ft.	PSA	<0.23	0.23	Residual.PHC (FCM) (P) (BO) 34.1% B
NCDENR Action Level					50	100	

BGS = feet below ground surface

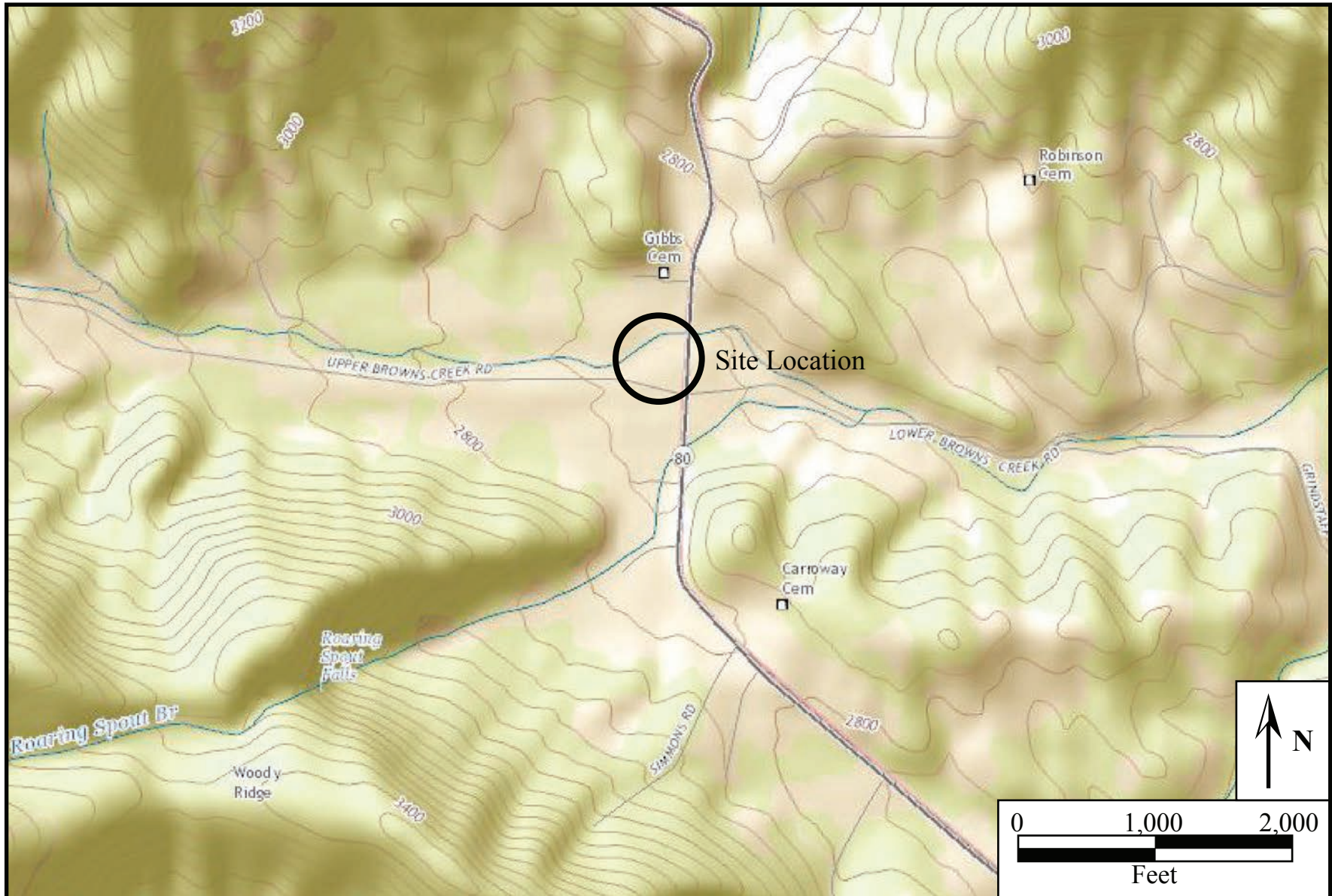
NR = No reading

Results reported in mg/kg = milligrams per kilogram

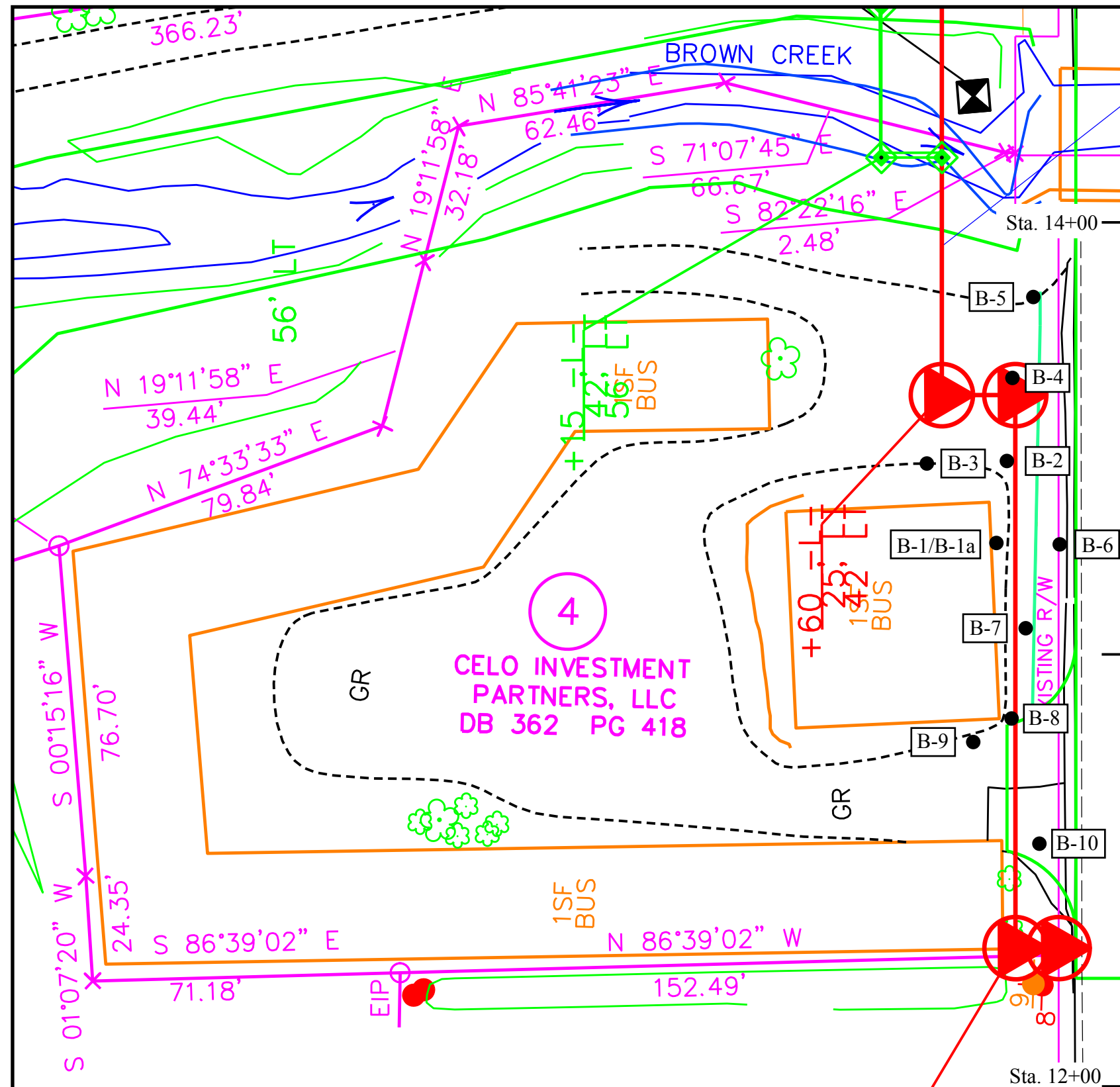
Table B-4: Summary of Groundwater Sampling Results

Revision Date: 02/22/17 Name: Celo Investment Partners, Parcel 004 Facility ID#: N/A

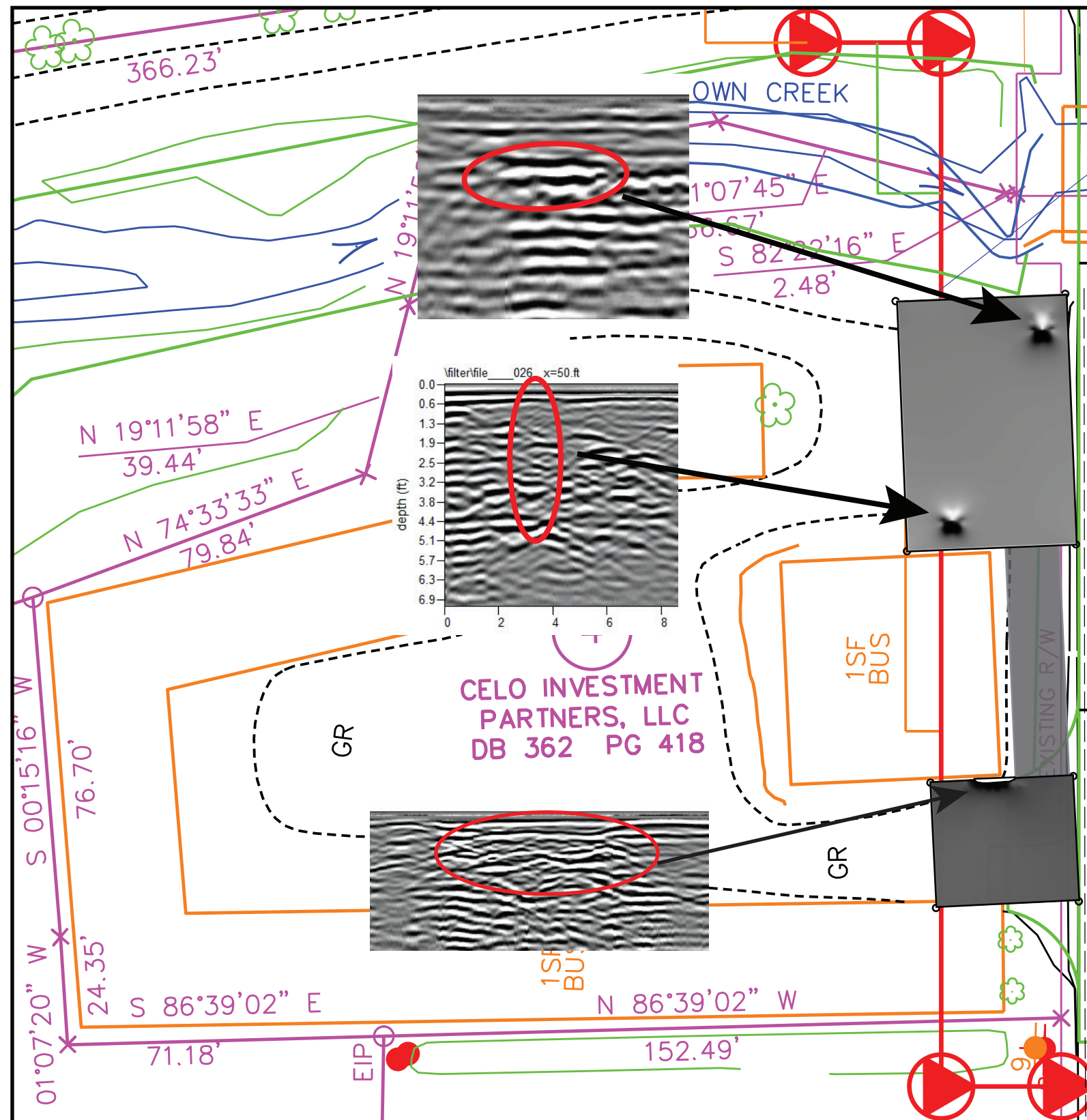
Analytical Method (e.g., VOC by EPA 601) →				UVF	UVF	Hydrocarbon Fingerprint
Contaminant of Concern →				TPH GRO (ppm)	TPH DRO (ppm)	
Well or SW ID	Date Collected (mm/dd/yy)	Sample ID	Depth to Water	TPH GRO (ppm)	TPH DRO (ppm)	Hydrocarbon Fingerprint
TW-1	02/20/17	TW-1	5.79 ft.	2.9	1.4	Deg Gas (FCM) (P) (BO) 57.6%



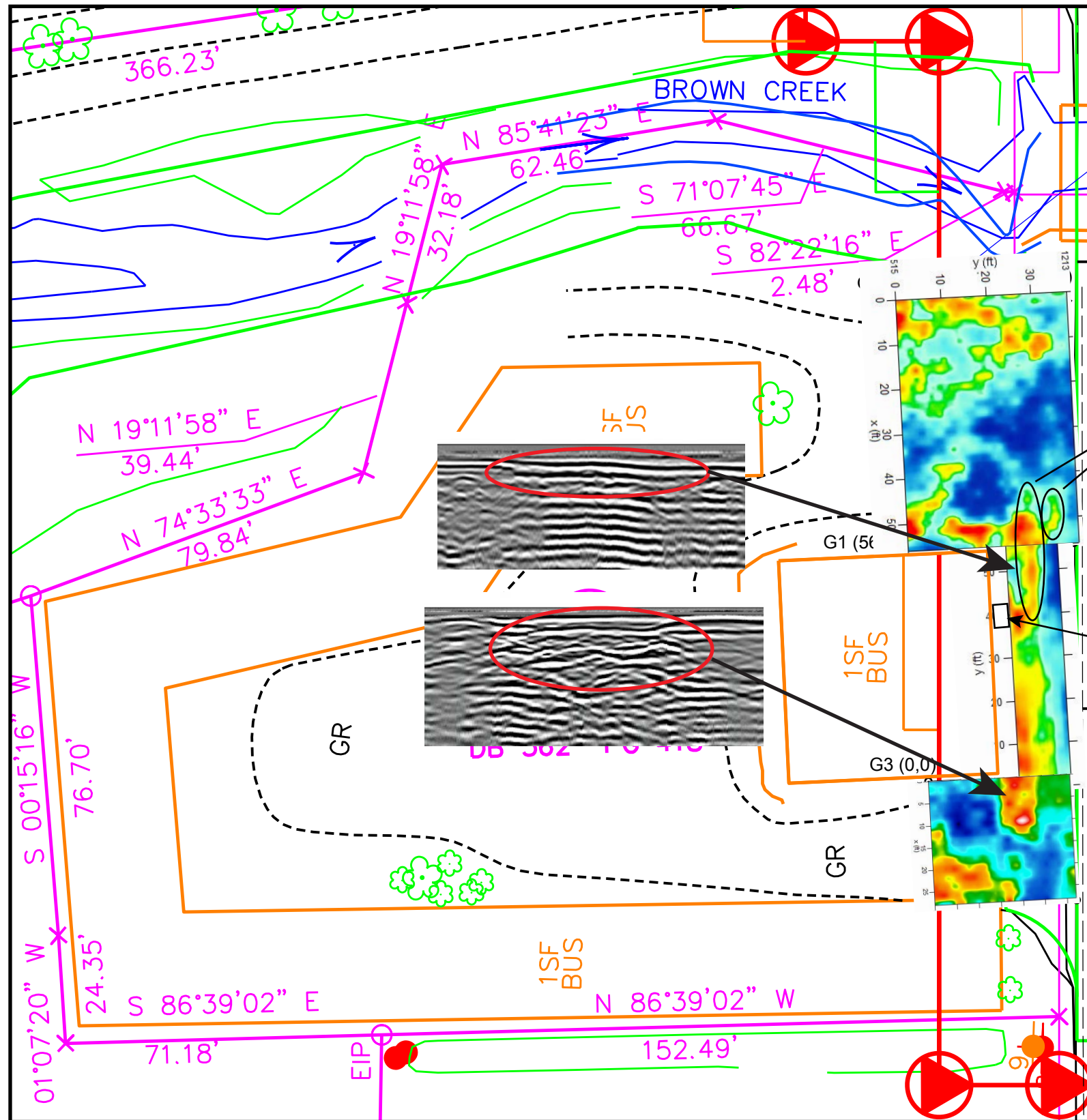
<p>Figure 2 Site Location Map Source: U.S.G.S The National Map</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Celo Investment Partners Property 4188 State Hwy 80 Burnsville, NC</p>	<p>Parcel #004 Facility I.D.: N/A</p>	<p>Seramur & Associates, PC Boone, NC</p>
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<p>0 25 50 Feet</p>	<p>Figure 2 Soil Boring Locations</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #004 Facility I.D.: N/A</p>
<p>Approx. North</p>	<p>- Approximate Location of Soil Boring</p>	<p>Celo Investment Partners Property 4188 State Hwy 80 Burnsville, NC</p>	<p>Seramur & Associates, PC Boone, NC</p>

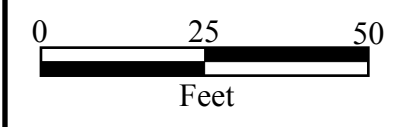


<p>0 25 50 Feet</p>	<p>Figure 3 Magnetometer Survey Data</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #004 Facility I.D.: N/A</p>
<p>↑ Approx. North</p>		<p>Celo Investment Partners Property 4188 State Hwy 80 Burnsville, NC</p>	<p>Seramur & Associates, PC Boone, NC</p>



Product & Vent Lines

Former Dispenser Location



Approx. North

Figure 4
0-1 Foot
GPR Fgrvj Slice

State Project: B-5864
Yancey County, NC

Celo Investment
Partners Property
4188 State Hwy 80
Burnsville, NC

Parcel #004
Facility I.D.: N/A

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Boone, NC

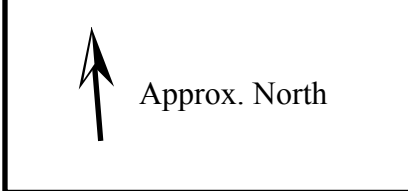
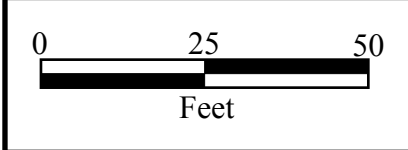
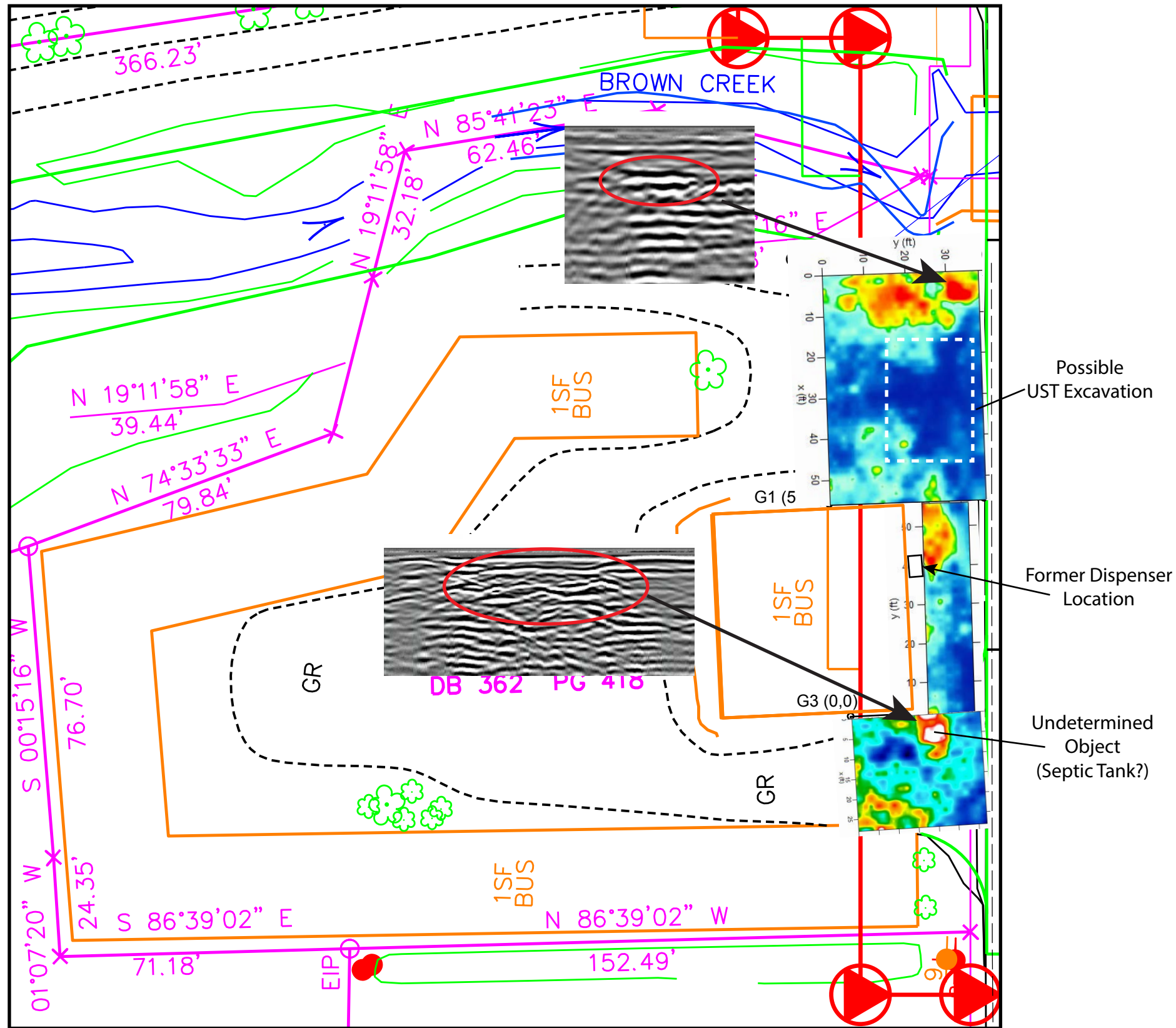


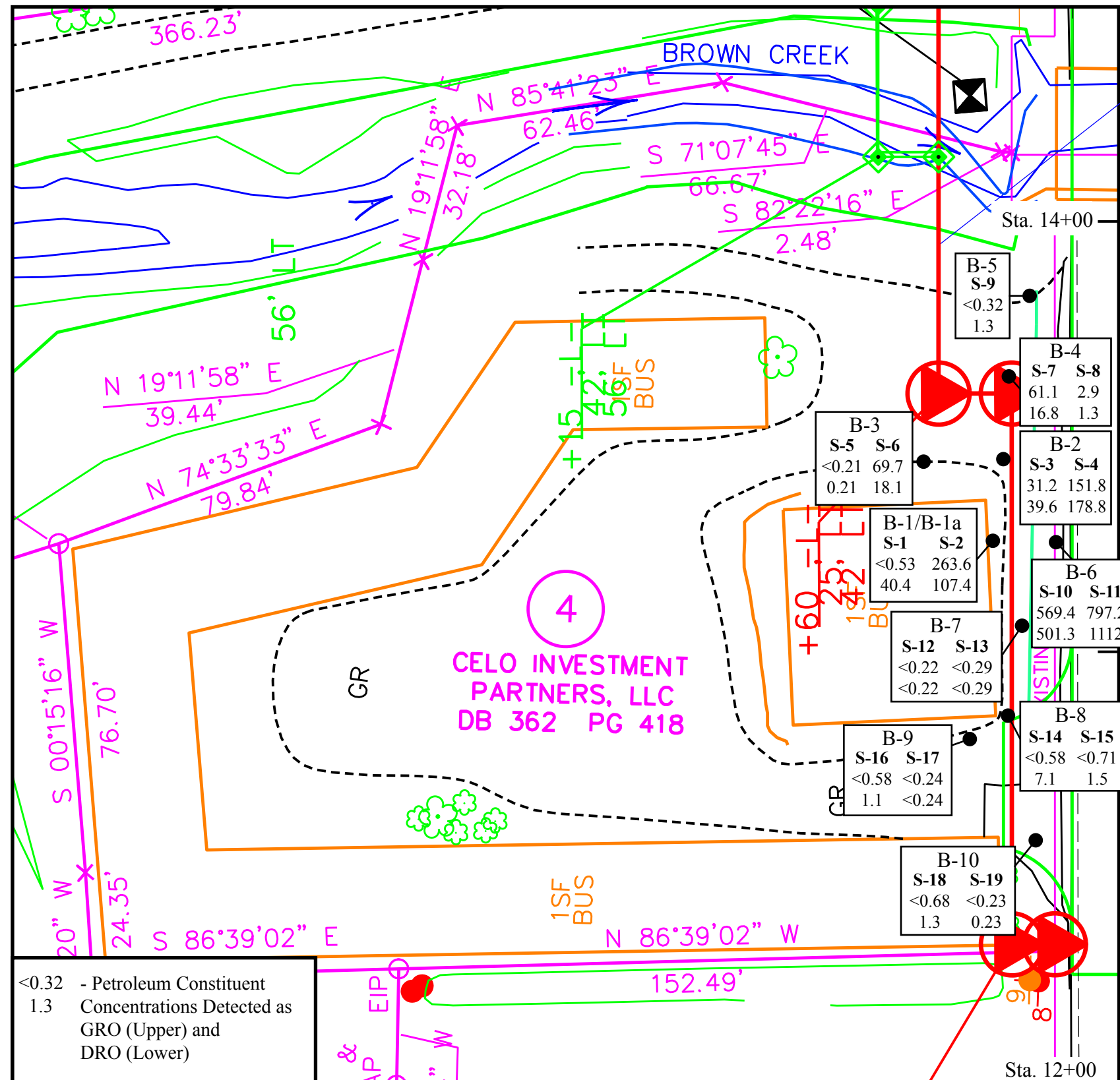
Figure 4
2-3 Foot
GPR Fgr yj Slice

State Project: B-5864
Yancey County, NC

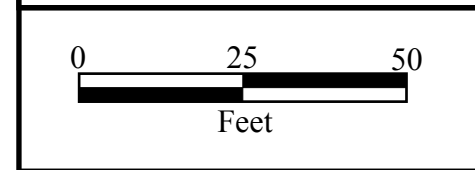
Celo Investment
Partners Property
4188 State Hwy 80
Burnsville, NC

Parcel #004
Facility I.D.: N/A

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Boone, NC



<0.32 - Petroleum Constituent
 1.3 Concentrations Detected as
 GRO (Upper) and
 DRO (Lower)



↑
Approx. North

Figure 6
 Soil Sampling
 Analytical Results

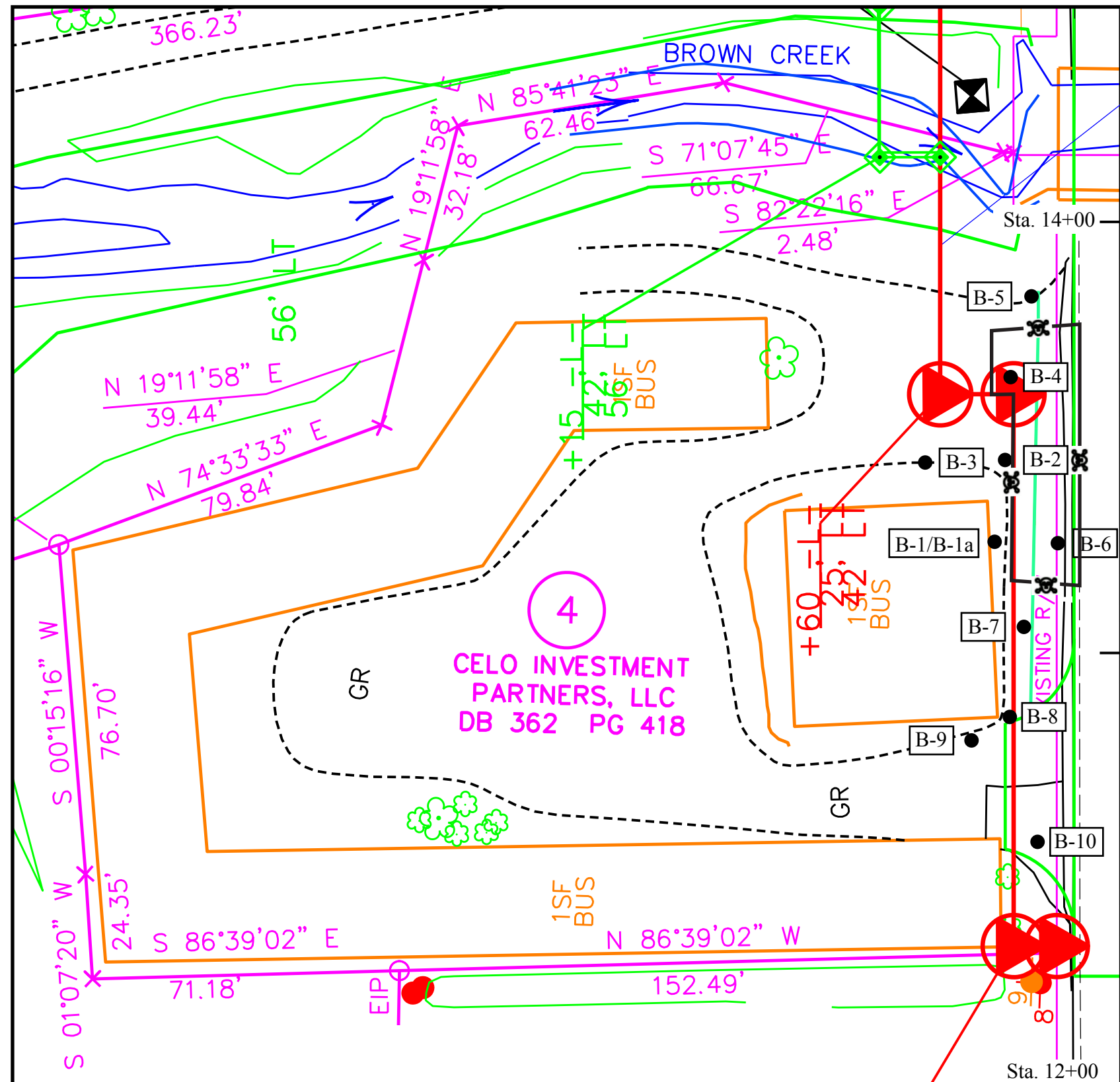
● - Approximate
 Location of
 Soil Boring

State Project: B-5864
 Yancey County, NC

Celo Investment
 Partners Property
 4188 State Hwy 80
 Burnsville, NC

Parcel #004
 Facility I.D.: N/A

Seramur & Associates, PC
 Boone, NC



<p>0 25 50 Feet</p>	<p>Figure 7 Approximate Area of Soil Contamination</p>	<p>State Project: B-5864 Yancey County, NC</p>	<p>Parcel #004 Facility I.D.: N/A</p>
<p>↑ Approx. North</p>	<p>● - Approximate Location of Soil Boring</p>	<p>Celo Investment Partners Property 4188 State Hwy 80 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
 WED FEB 22, 2017

Contact: KEITH SERAMUR

Operator

NICK HENDRIX

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-1	21.1	<0.53	<0.53	40.4	40.4	40.1	1.8	0.02	0	88	12	Deg Fuel (FCM) 66.7%
s	S-2	26.3	<0.66	263.6	107.4	371	100.1	3.9	0.021	72.5	26.7	0.8	Deg Gas (FCM) 81%
s	S-3	23.4	<0.59	31.2	39.6	70.8	25.8	1.1	0.011	54.7	38.4	6.9	V.Deg.PHC (FCM) 62.6%
s	S-4	1076.8	<26.9	151.8	178.8	330.6	111	5.5	0.11	57.7	37	5.3	Deg Fuel (FCM) 89.4%
s	S-5	8.3	<0.21	<0.21	0.21	0.21	<0.04	<0.007	<0.001	0	0	100	Residual.PHC (FCM) (P) (BO) 39.3% B
s	S-6	40.0	<1	69.7	18.1	87.8	11.7	0.41	<0.004	85.6	14.3	0.1	Deg Gas (FCM) 68.4%
s	S-7	37.1	<0.93	61.1	16.8	77.9	10.9	0.38	<0.004	84.9	15	0.1	Deg Gas (FCM) 68.4%
s	S-8	10.9	<0.27	2.9	1.3	4.2	0.99	0.04	<0.001	74.3	24.3	1.3	Deg Gas (FCM) 73.4%
s	S-9	12.9	<0.32	<0.32	1.3	1.3	1.2	0.05	<0.001	0	88.6	11.4	Deg.Fuel (FCM) 88.5%
s	S-10	489.9	88.4	569.4	501.3	1070.7	88.8	3.5	<0.049	86.5	13.5	0	Deg Gas (FCM) 89%
Initial Calibrator QC check			OK			Final FCM QC Check			OK			96.8 %	

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

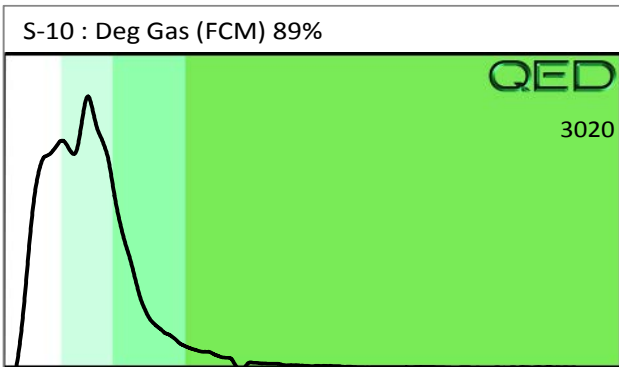
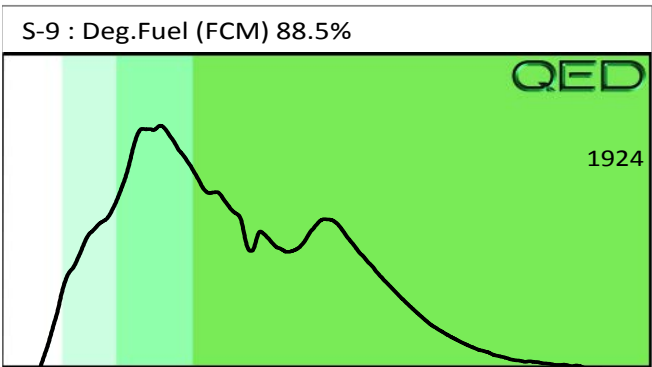
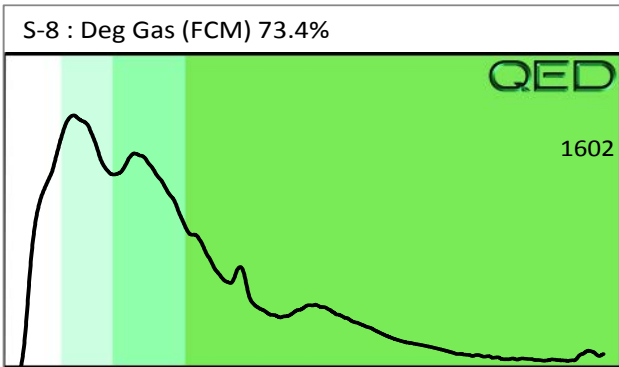
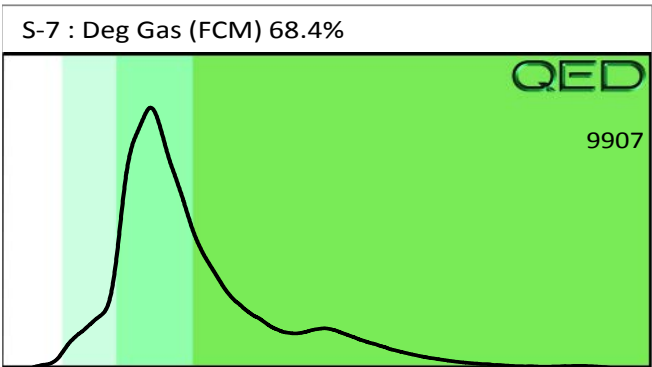
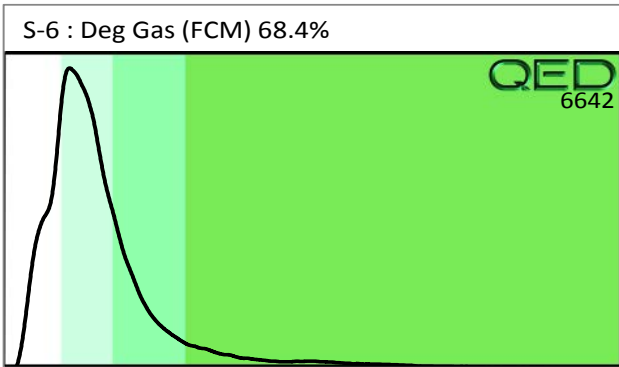
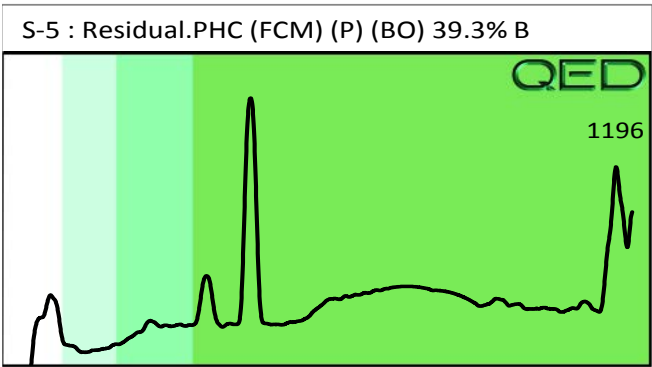
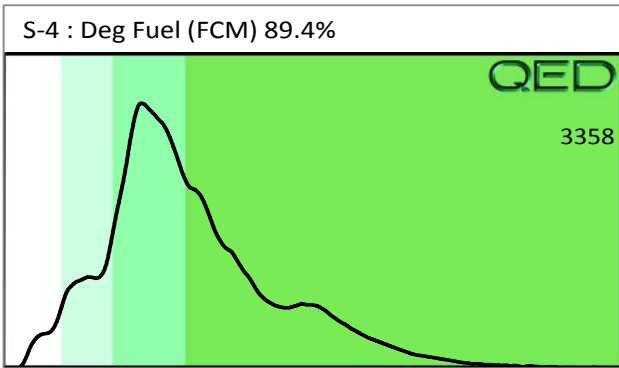
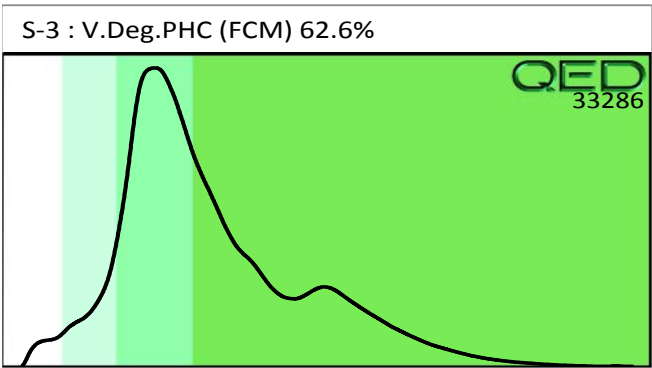
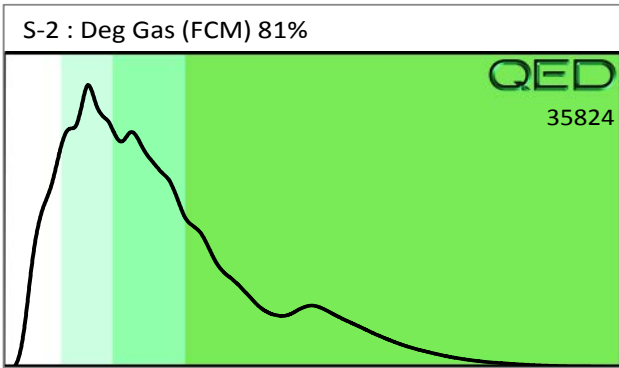
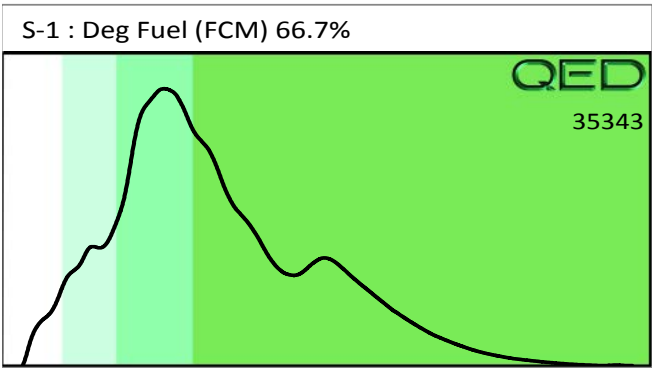
Project: NCDOT B-5864

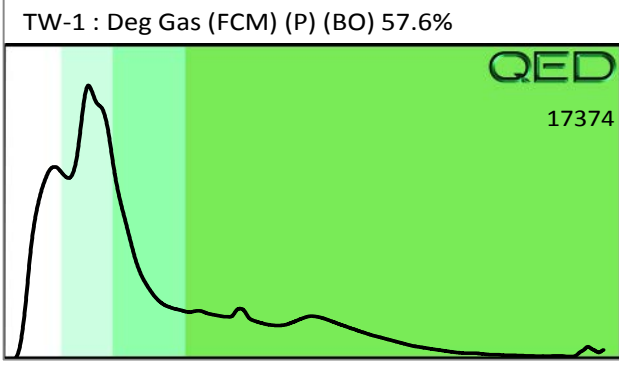
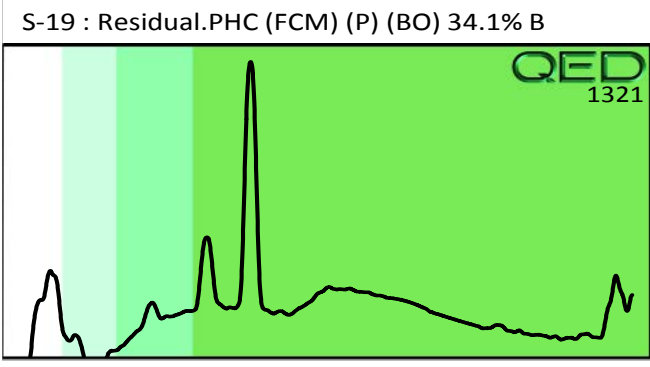
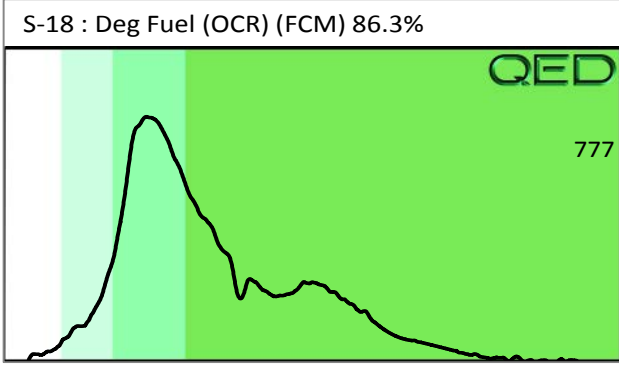
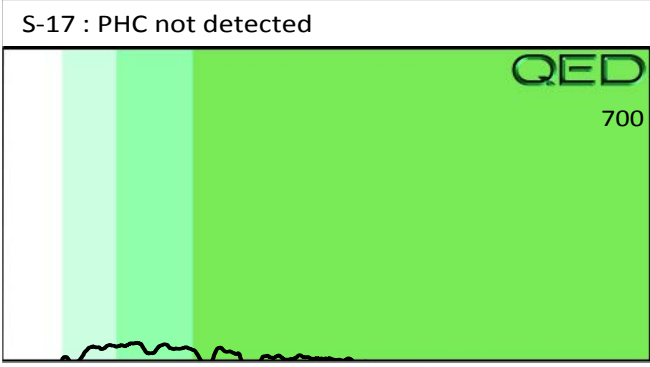
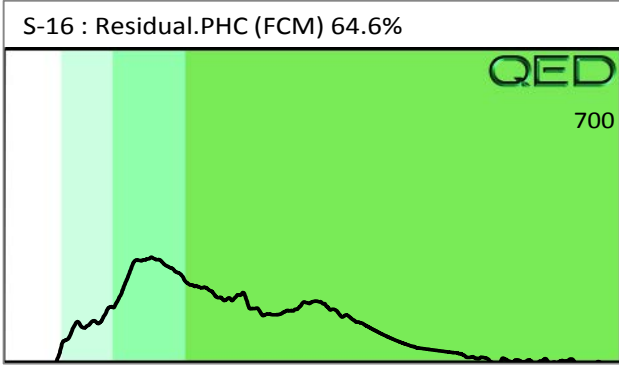
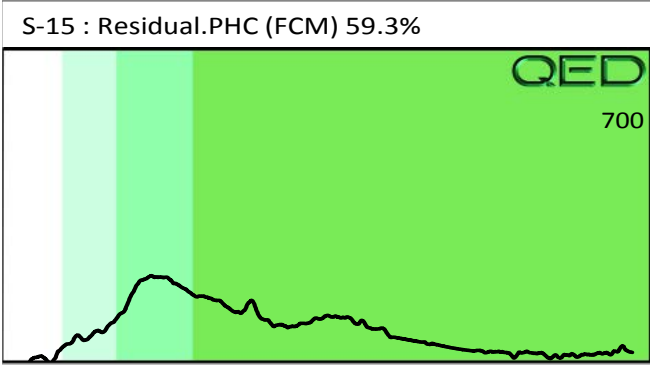
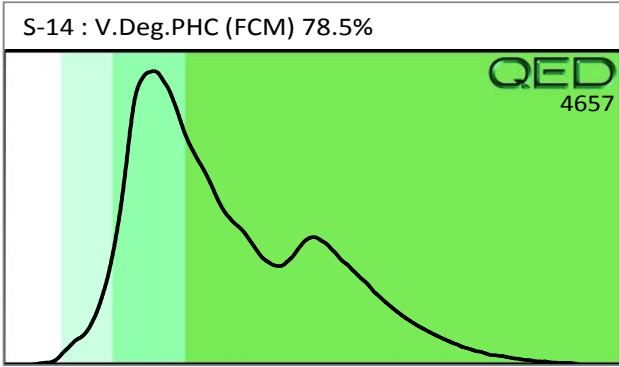
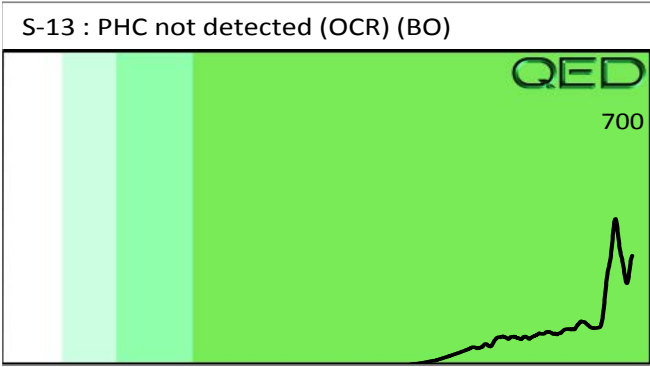
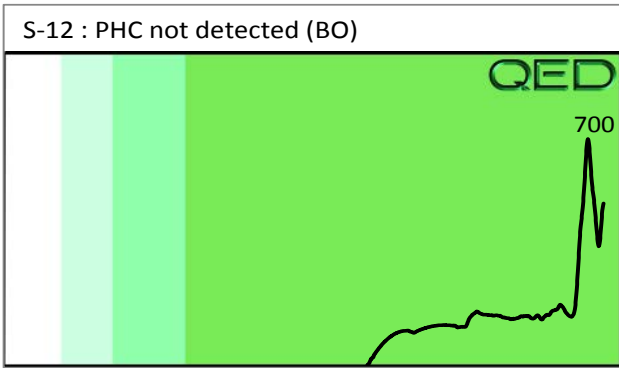
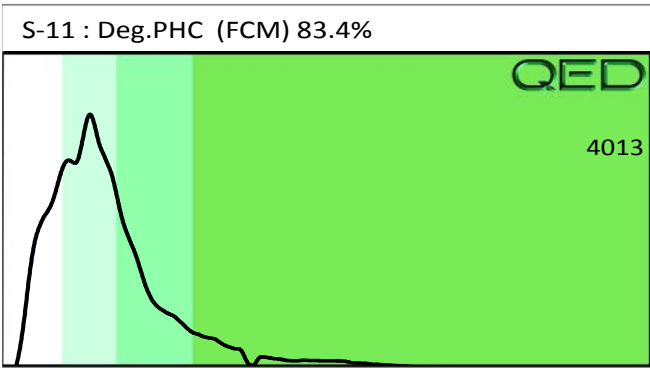
											H09382		
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	S-11	694.9	<34.7	797.2	1112	1909	169.8	6.9	<0.069	82.4	17.6	0	Deg.PHC (FCM) 83.4%
s	S-12	9.0	<0.22	<0.22	<0.22	<0.22	<0.04	<0.007	<0.001	0	0	0	PHC not detected (BO)
s	S-13	11.8	<0.29	<0.29	<0.29	<0.29	<0.06	<0.009	<0.001	0	0	0	PHC not detected (OCR) (BO)
s	S-14	23.0	<0.58	<0.58	7.1	7.1	2.5	0.11	0.002	0	77.3	22.7	V.Deg.PHC (FCM) 78.5%
s	S-15	28.3	<0.71	<0.71	1.5	1.5	<0.14	<0.02	<0.003	0	25.6	74.4	Residual.PHC (FCM) 59.3%
s	S-16	23.2	<0.58	<0.58	1.1	1.1	<0.12	<0.02	<0.002	0	64.8	35.2	Residual.PHC (FCM) 64.6%
s	S-17	9.5	<0.24	<0.24	<0.24	<0.24	<0.05	<0.008	<0.001	0	0	0	PHC not detected
s	S-18	27.1	<0.68	<0.68	1.3	1.3	<0.2	<0.02	<0.003	0	67	33	Deg Fuel (OCR) (FCM) 86.3%
s	S-19	9.3	<0.23	<0.23	0.23	0.23	<0.05	<0.007	<0.001	0	0	100	Residual.PHC (FCM) (P) (BO) 34.1% B
W	TW-1	1.0	1.3	2.9	1.4	4.3	1.3	0.05	0	69.1	30.3	0.6	Deg Gas (FCM) (P) (BO) 57.6%
Initial Calibrator QC check			OK			Final FCM QC Check			OK			100.1 %	

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

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RED Lab, LLC
 5598 Marvin K Moss Lane
 MARBIONC Bldg, Suite 2003
 Wilmington, NC 28409

Each sample will be analyzed for
 BTEX, GRO, DRO, TPH, PAH total
 aromatics and BaP

RED LAB™

RAPID ENVIRONMENTAL DIAGNOSTICS
CHAIN OF CUSTODY AND ANALYTICAL
REQUEST FORM

Client Name: Serammur & Assoc. Ints. PC
 Address: 165 Knoll Drive
Boone, NC 28607
 Contact: Keith Serammur
 Project Ref.: NCDOT B-5864
 Email: serammur@icland.com
 Phone #: (828) 264-0284
 Collected by: KCS

Sample Collection Date/Time	TAT Requested		Matrix (S/W)	Sample ID	UVF	GC BTEX	Total Wt.	Tare Wt.	Sample Wt.
	24 Hour	48 Hour							
02/20/17 10:40		X	S	S-1	X		57.9	45.6	12.3
02/20/17 11:03		X	S	S-2	X		55.2	45.3	9.9
02/20/17 11:10		X	S	S-3	X		57.0	45.9	11.1
02/20/17 11:10		X	S	S-4	X		54.9	45.0	9.9
02/20/17 11:30		X	S	S-5	X		51.7	45.4	6.3
02/20/17 11:30		X	S	S-6	X		52.1	45.6	6.5
02/20/17 11:42		X	S	S-7	X		52.3	45.3	7.0
02/20/17 11:48		X	S	S-8	X		50.6	45.1	5.5
02/20/17 12:14		X	S	S-9	X		51.7	45.5	6.2
02/20/17 13:14		X	S	S-10	X		52.1	45.2	6.9
02/20/17 13:22		X	S	S-11	X		51.3	45.4	5.9
02/20/17 13:35		X	S	S-12	X		50.6	45.4	5.2
02/20/17 13:34		X	S	S-13	X		50.3	45.2	5.1
02/20/17 13:52		X	S	S-14	X		56.4	45.1	11.3
02/20/17 13:54		X	S	S-15	X		54.0	44.8	9.2
02/20/17 13:57		X	S	S-16	X		55.7	44.5	11.2
02/20/17 14:02		X	S	S-17	X		56.0	45.5	10.5
02/20/17 14:05		X	S	S-18	X		54.3	44.7	9.6
02/20/17 14:08		X	S	S-19	X		56.1	45.3	10.8
02/20/17 12:15		X	W	TW-1	X				71.8

RED Lab USE ONLY

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Comments:

Relinquished by	Date/Time	Accepted by	Date/Time
SAPC	02/21/17 11:30	<i>[Signature]</i>	11/5 2:22 17
Relinquished by	Date/Time	Accepted by	Date/Time

① → → →