PROJECT SPECIAL PROVISIONS
GEOENVIRONMENTAL

CONTAMINATED SOIL (5/26/2022)

The Contractor's attention is directed to the fact that soil contaminated with petroleum hydrocarbon compounds exist within the project area. The known areas of contamination are indicated on corresponding plans sheets. Information relating to these contaminated areas, sample locations, and investigation reports will be available at the following web address by navigating to the correct letting year and month then selecting, "Plans and Proposals", "U-6003", "Individual Sheets/520 GeoEnvironmental":

http://dotw-xfer01.dot.state.nc.us/dsplan/

Petroleum contaminated soil may be encountered during any earthwork activities on the project. The Contractor shall only excavate those soils that the Engineer designates necessary to complete a particular task. The Engineer shall determine if soil is contaminated based on areas shown on the plans, petroleum odors, and unusual soil staining. Contaminated soil not required to be excavated is to remain in place and undisturbed. Undisturbed soil shall remain in place, whether contaminated or not. The Contractor shall transport all contaminated soil excavated from the project to a facility licensed to accept contaminated soil.

In the event that a stockpile is needed, the stockpile shall be created within the property boundaries of the source material and in accordance with the Diagram for Temporary Containment and Treatment of Petroleum-Contaminated Soil per North Carolina Department of Environmental Quality's (NCDEQ) Division of Waste Management UST Section GUIDELINES FOR EX SITU PETROLEUM CONTAMINATED SOIL REMEDIATION. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDEQ UST Section's Regional Office for off-site temporary storage. The Contractor shall provide copies of disposal manifests completed per the disposal facilities requirements and weigh tickets to the Engineer.

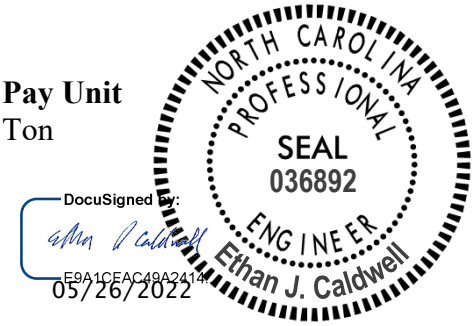
Measurement and Payment:

The quantity of contaminated soil hauled and disposed of shall be the actual number of tons of material, which has been acceptably transported and weighed with certified scales as documented by disposal manifests and weigh tickets. The quantity of contaminated soil, measured as provided above, shall be paid for at the contract unit price per ton for "Hauling and Disposal of Petroleum Contaminated Soil".

The above price and payment shall be full compensation for all work covered by this section, including, but not limited to stockpiling, loading, transportation, weighing, laboratory testing, disposal, equipment, decontamination of equipment, labor, and personal protective equipment.

Payment shall be made under:

Pay Item	**Pay Unit**
Hauling and Disposal of Petroleum Contaminated Soil	Ton



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GEOENVIRONMENTAL PHASE II INVESTIGATION

NCDOT PARCEL 002
QUALITY OIL COMPANY
KERNERSVILLE – KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE RD) TO NC 150 (N. MAIN ST)
743 PINEY GROVE RD
FORSYTH COUNTY, NORTH CAROLINA
WBS NUMBER 47138.1.1
TIP NUMBER U-6003
FORSYTH COUNTY PIN # 6887-40-2970.000

5/19/2022

PREPARED FOR

North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
Raleigh, North Carolina

Todd Plating, P.G.
Senior Peer Review

J. Harrison Carter, P.G.
NC# 2675
Project Geologist

DocuSigned by:
A4821DBC2816438...

06/02/2022

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1.0 INTRODUCTION

SynTerra Corporation (SynTerra) conducted a Phase II investigation of the referenced site located on the Western side of Piney Grove Road north of Kernersville in Forsyth County, North Carolina (**Figures 1** and **2**). The North Carolina Department of Transportation (NCDOT) plans to widen Piney Grove Road and extend Linville Springs Road through the adjacent intersection. SynTerra's work is consistent with the NCDOT's *Request for Technical and Cost Proposal* dated January 31, 2022, and our *Revised Technical and Cost Proposal* dated February 15, 2022. The objective of this work was to assist the NCDOT – Geotechnical Engineering Unit with identifying potential environmental concerns regarding effects on soil from underground storage tanks (USTs) within the rights-of-way and/or easements of the above-referenced site. This investigation included a geophysical survey to identify subsurface metallic features such as UST systems, and the advancement of five soil borings to test for the presence of constituents in the areas of the site that are in construction rights of way.

2.0 HISTORY

Based on historical documents obtained from the North Carolina of Environmental Quality (NCDEQ), one 1,000-gallon UST and three 3,000-gallon USTs were removed from the site in 1994. These USTs were located adjacent and to the north of the structure onsite, outside the investigation area of this investigation. A Limited Site Assessment report (LSA) prepared by Shield Engineering, Inc. dated March 12, 2004, indicated that petroleum constituents in soil and groundwater were not detected at concentrations greater than regulatory standards.

3.0 METHODS

SynTerra called NC811 on March 24, 2022, and requested utilities be marked in the areas of investigation. NC811 notified Centurylink, Winston Salem Sewer and Water, Duke Energy, North State Communications, Piedmont Natural Gas, and Charter Communications. The clearance was valid through April 14, 2022. SynTerra also contracted with Probe Utility, a private utility locator, to identify subsurface utilities at the site.

3.1 Geophysics

Geo Solutions Limited, Inc. (Geo Solutions), under contract to SynTerra, performed a geophysical survey of the site on March 15, 2022. Geo Solutions used a Geophex Model GEM-2 electromagnetic profiler connected to a GPS unit to create an electromagnetic profile of the site. Geo Solutions followed this with a ground penetrating radar (GPR) evaluation using a GSSI SIR 4000 with a 400 megahertz (MHz) antenna.

3.2 Soil Borings

Regional Probing Services (Regional Probing), under contract to SynTerra, used a Geoprobe® 5410 equipped with direct-push technology to advance five soil borings (P2SB-1 through P2SB-

5) on April 1, 2022. The locations of those borings are shown on **Figure 2**. The driller advanced these borings in the right of way along the east and north perimeters of the site in the areas of the proposed drainage installation.

Regional Probing advanced the borings to a depth of 10 feet, as requested by NCDOT. The water table was not encountered while performing the soil borings. SynTerra used a Trimble Geo 7x® handheld data collector to determine the locations of each boring. A GPS unit error caused a displacement in the recorded coordinates; however, locations were correct relative to each other, and coordinates were corrected based on locations of select borings relative to landmarks. Approximate Northings, Eastings, and elevations above sea level for the borings are shown in **Table 1**.

The driller collected soil samples in clear acetate sleeves. SynTerra collected samples of material at 2-foot intervals and placed the samples in zip-top plastic bags. After allowing the bags to sit untouched for approximately 15 minutes, a photoionization detector (PID) was used to screen the headspace in each bag for volatile organic compounds (VOCs).

Synterra collected one soil sample for analysis from each boring from the interval with the greatest concentration of VOCs based on the PID screening. The deepest interval was selected if PID screening results were consistent throughout the recovered core. To better vertically delineate potential petroleum constituents based on PID field screening in P2SB-3, two soil samples were collected from different intervals at this boring. Due to the presence of overhead power lines and encroachment restrictions to the north, and the UST to the south, additional soil borings in these directions could not be performed. Therefore, petroleum constituents in soil could not be delineated in these directions.

SynTerra placed samples in laboratory-supplied bottle ware, placed the samples on ice in a cooler, and shipped them under chain-of-custody to RED Lab, LLC (RED Lab) in Wilmington North Carolina. RED Lab analyzed the samples for benzene-toluene-ethylbenzene-xylene (BTEX), gasoline range organics (TPH-GRO), diesel range organics (TPH-DRO), total petroleum hydrocarbons (TPH), total aromatics, and benzo[a]pyrene (BaP).

4.0 RESULTS

4.1 Geophysics

The Geo Solutions *Geophysical Survey* report, dated March 29, 2022, is in **Appendix A**. Geo Solutions identified an existing non-metallic UST in the northeastern portion of the parking lot of the site. Location of this tank is shown on **Figure 2**.

4.2 Soil Borings

Table 2 summarizes the laboratory results and PID screening values for soil samples. Boring logs are in **Appendix B**. The soil samples were not stained and did not exhibit hydrocarbon odor, with the exception of P2SB-3, which exhibited a weathered hydrocarbon odor.

RED Lab detected several analytes, with greatest concentrations detected in the two samples from P2SB-3. Analytical results from the 8-10 foot interval indicated TPH-GRO and TPH-DRO concentrations greater than NCDEQ TPH action levels. In samples where hydrocarbons were detected, RED Lab identified the fingerprints as residual hydrocarbon, road tar, or did not identify a fingerprint match. The Laboratory Report is included in **Appendix C.**

5.0 CONCLUSIONS

5.1 Geophysics

Geo Solutions identified one existing UST in the investigation area of this parcel, located in the north-east corner of the parking lot.

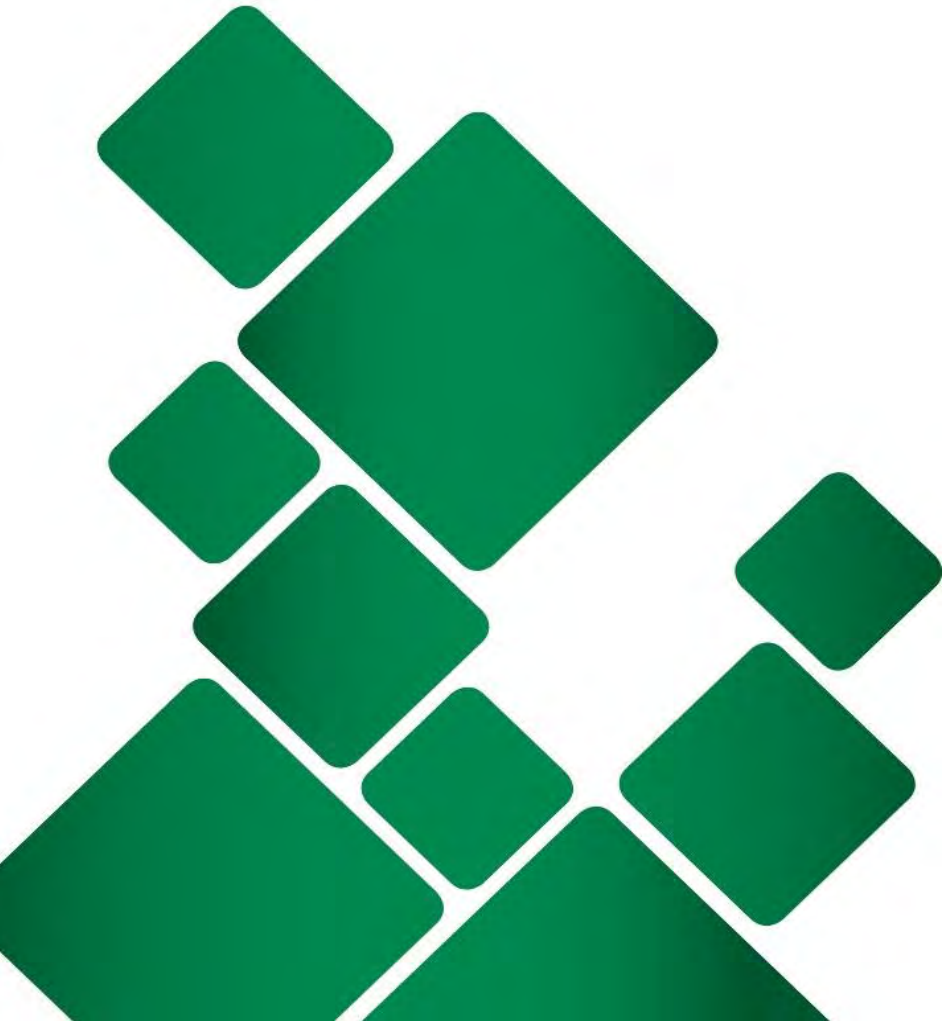
5.2 Soil

Based on analytical results and field screenings, soil at the location of P2SB-3 exhibited elevated petroleum constituent concentrations, with TPH concentrations greater than NCDEQ action levels. The adjacent borings P2SB-2 and P2SB-4, however, did not exhibit elevated constituent concentrations, indicating that the petroleum constituents in soil are restricted to a relatively small area of the site. SynTerra estimates that approximately 9,000 cubic feet of soil is present.

6.0 RECOMMENDATIONS

Based on elevated petroleum constituent concentrations at P2SB-3, SynTerra recommends that worker precautions, including but not limited to breathing zone air monitoring and PPE to limit soil contact be implemented if excavation is performed at that location. Based on proximity to the existing UST, further investigation may be warranted to confirm the integrity of this tank.

FIGURES



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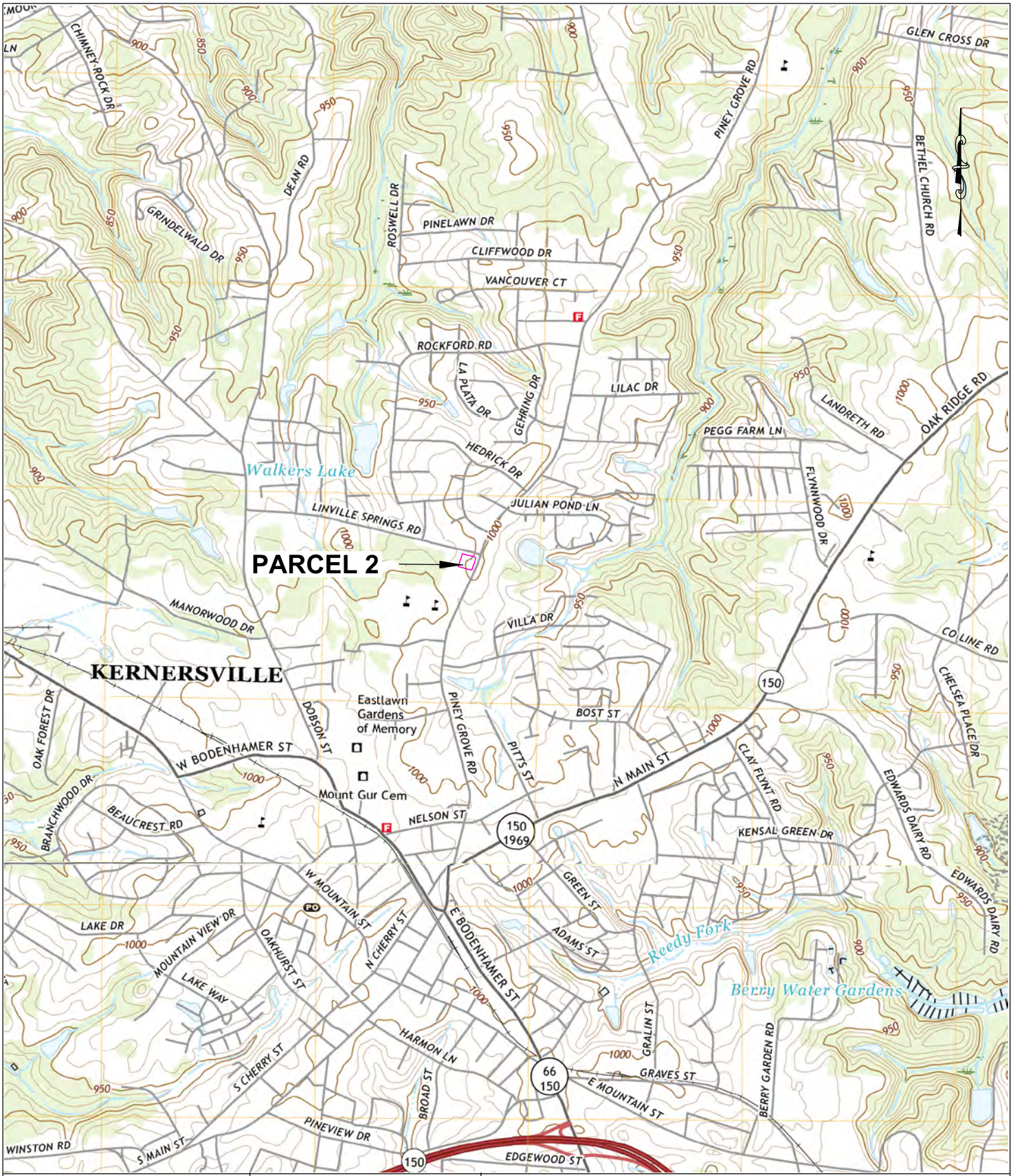

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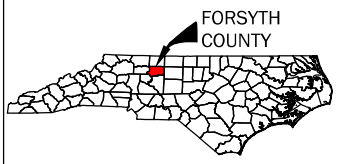

FIGURE 1
SITE LOCATION MAP
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

DRAWN BY: C. NEWELL
PROJECT MANAGER: H. CARTER
LAYOUT: USGS
DATE: 04/19/2022
CONTOUR INTERVAL: 10 FEET
MAP DATE: 2019

GRAPHIC SCALE
1000 0 1000 2000
IN FEET

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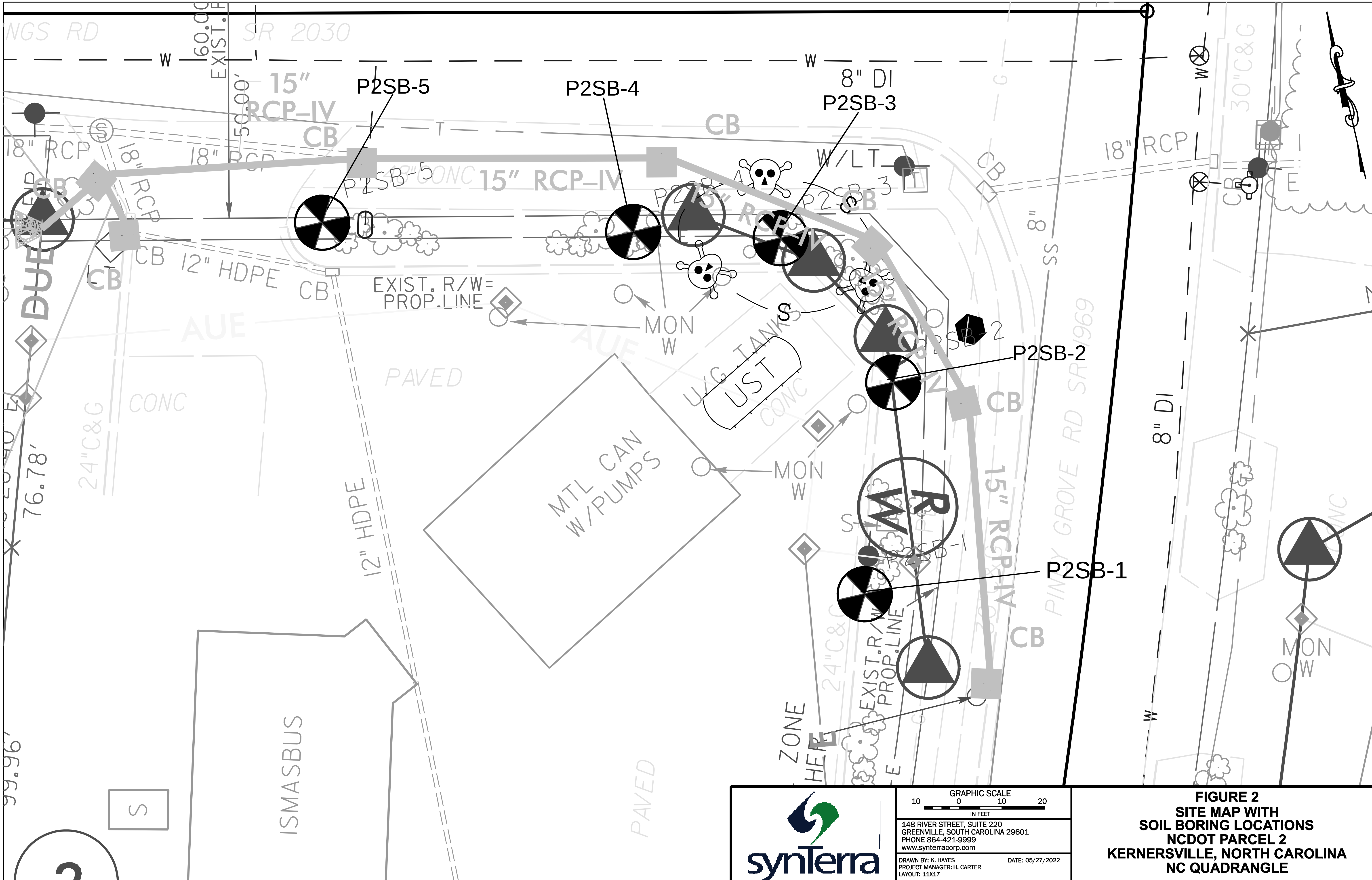

GRAPHIC SCALE
10 0 10 20
IN FEET

148 RIVER STREET, SUITE 220
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PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: K. HAYES DATE: 05/27/2022
PROJECT MANAGER: H. CARTER
LAYOUT: 11X17

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FIGURE 2
SITE MAP WITH
SOIL BORING LOCATIONS
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

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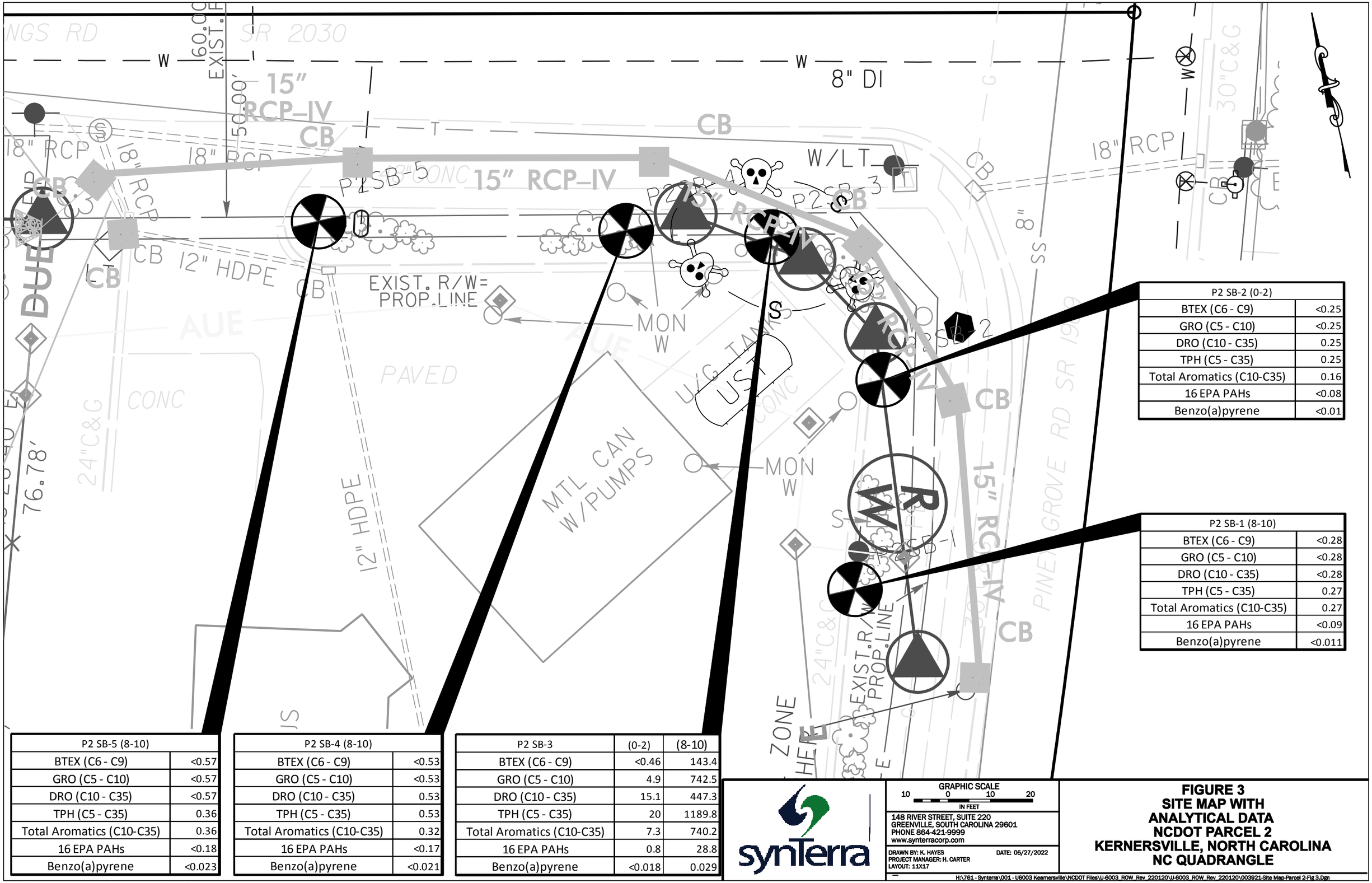

P2 SB-2 (0-2)	
BTEX (C6 - C9)	<0.25
GRO (C5 - C10)	<0.25
DRO (C10 - C35)	0.25
TPH (C5 - C35)	0.25
Total Aromatics (C10-C35)	0.16
16 EPA PAHs	<0.08
Benzo(a)pyrene	<0.01

P2 SB-1 (8-10)	
BTEX (C6 - C9)	<0.28
GRO (C5 - C10)	<0.28
DRO (C10 - C35)	<0.28
TPH (C5 - C35)	0.27
Total Aromatics (C10-C35)	0.27
16 EPA PAHs	<0.09
Benzo(a)pyrene	<0.011

P2 SB-5 (8-10)	
BTEX (C6 - C9)	<0.57
GRO (C5 - C10)	<0.57
DRO (C10 - C35)	<0.57
TPH (C5 - C35)	0.36
Total Aromatics (C10-C35)	0.36
16 EPA PAHs	<0.18
Benzo(a)pyrene	<0.023

P2 SB-4 (8-10)	
BTEX (C6 - C9)	<0.53
GRO (C5 - C10)	<0.53
DRO (C10 - C35)	0.53
TPH (C5 - C35)	0.53
Total Aromatics (C10-C35)	0.32
16 EPA PAHs	<0.17
Benzo(a)pyrene	<0.021

P2 SB-3	(0-2)	(8-10)
BTEX (C6 - C9)	<0.46	143.4
GRO (C5 - C10)	4.9	742.5
DRO (C10 - C35)	15.1	447.3
TPH (C5 - C35)	20	1189.8
Total Aromatics (C10-C35)	7.3	740.2
16 EPA PAHs	0.8	28.8
Benzo(a)pyrene	<0.018	0.029

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GRAPHIC SCALE
10 0 10 20
IN FEET

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DRAWN BY: K. HAYES
PROJECT MANAGER: H. CARTER
LAYOUT: 11X17
DATE: 05/27/2022

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FIGURE 3
SITE MAP WITH ANALYTICAL DATA
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

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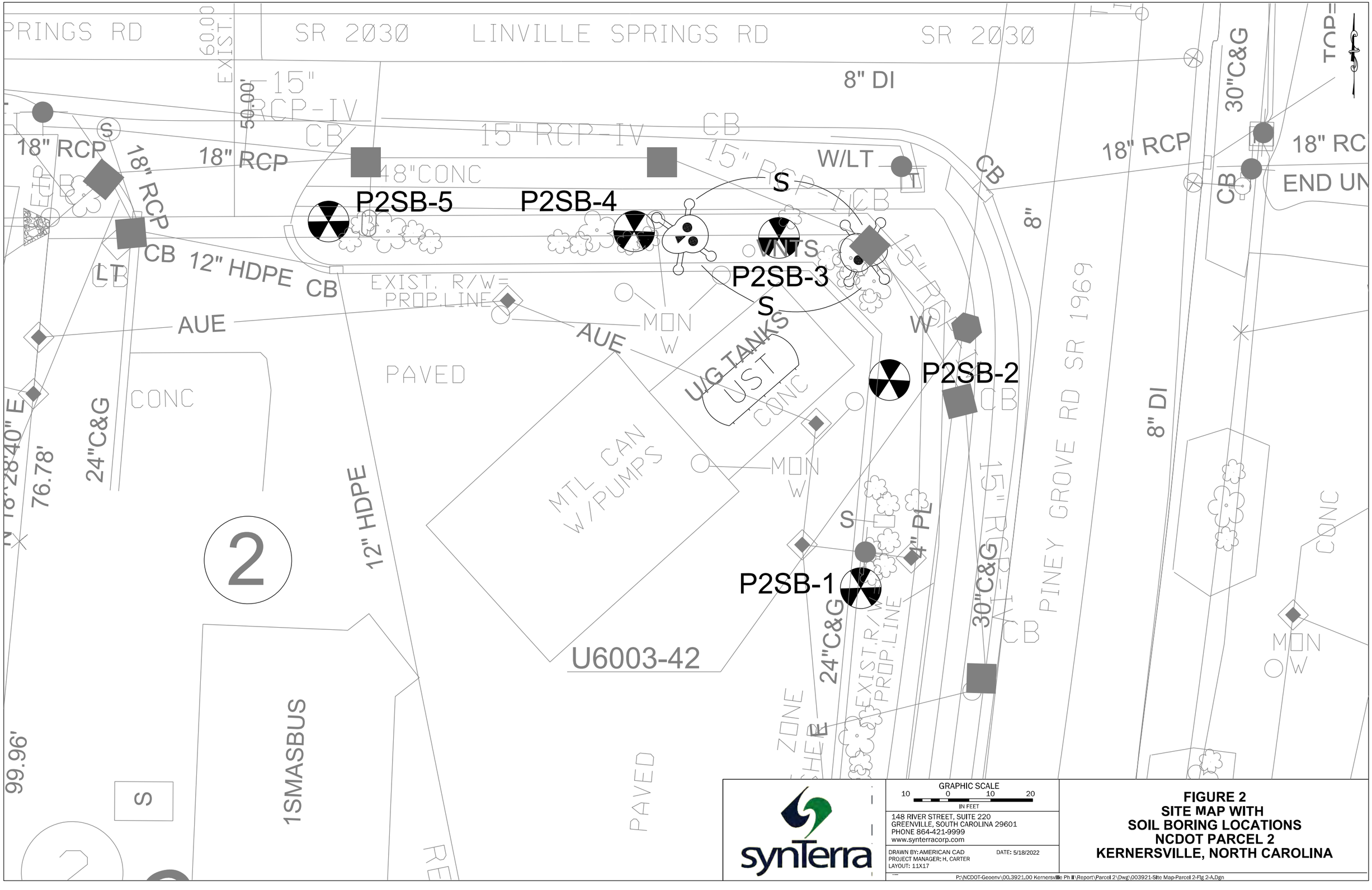

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GRAPHIC SCALE
10 0 10 20
IN FEET

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PROJECT MANAGER: H. CARTER
LAYOUT: 11X17
DATE: 5/18/2022

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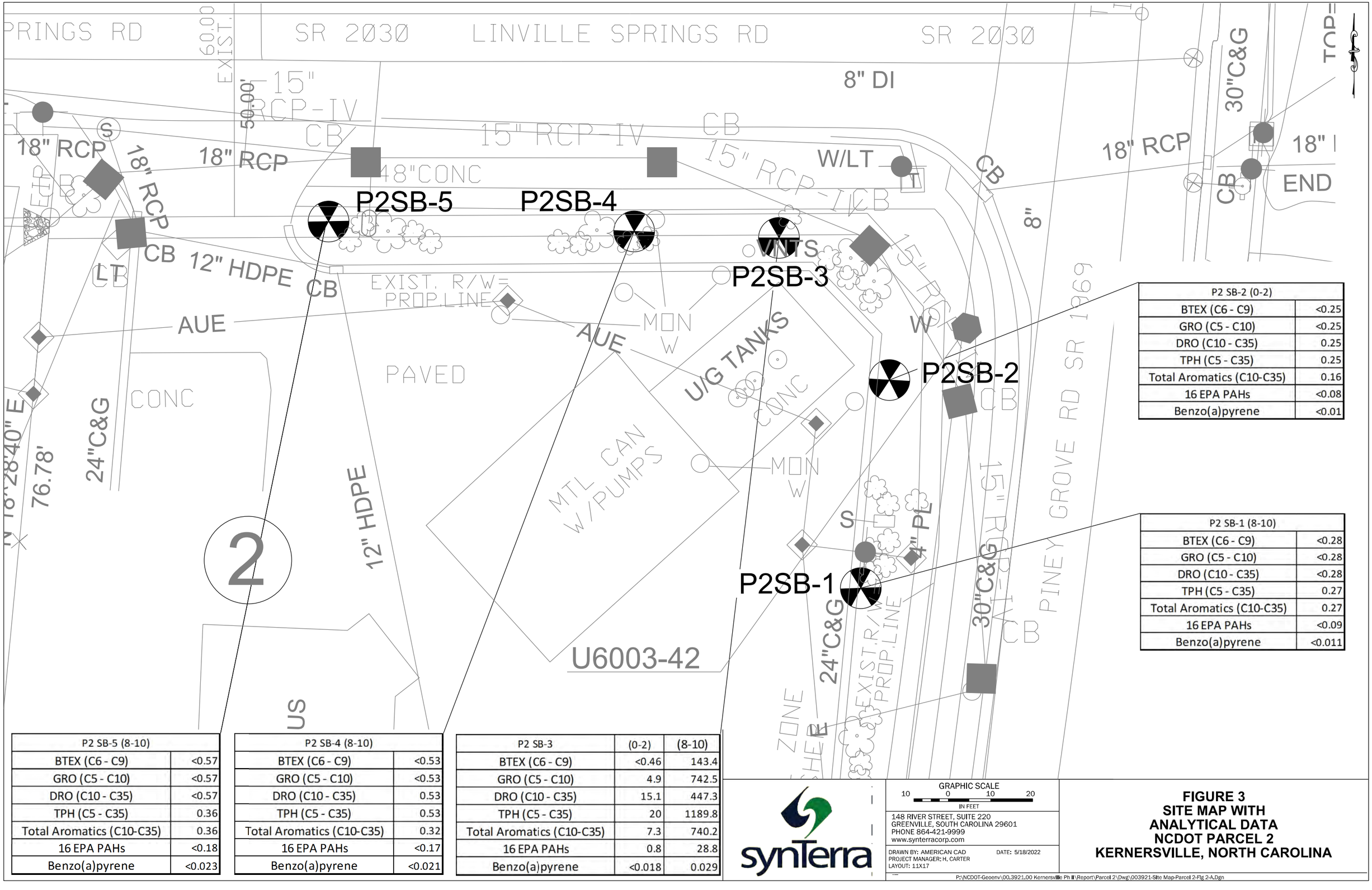
FIGURE 2
SITE MAP WITH
SOIL BORING LOCATIONS
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA



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GRAPHIC SCALE
10 0 10 20
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DATE: 5/18/2022

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FIGURE 3
SITE MAP WITH ANALYTICAL DATA
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream (JS)
- Buffer Zone 1 (BZ 1)
- Buffer Zone 2 (BZ 2)
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch (FLOW)
- False Sump

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line
- New Right of Way Line with Pin and Cap
- New Right of Way Line with Concrete or Granite R/W Marker
- New Control of Access Line with Concrete C/A Marker
- Existing Control of Access
- New Control of Access
- Existing Easement Line (E)
- New Temporary Construction Easement (E)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub

- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer (S)

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (T)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) (W)
- U/G Water Line LOS C (S.U.E*) (W)
- U/G Water Line LOS D (S.U.E*) (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (TV)
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (S.U.E.*) (G)
- Above Ground Gas Line (A/G Gas)

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (UNL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records (AATUR)
- End of Information (E.O.I.)

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NO SCALE

148 RIVER STREET, SUITE 220
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PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: C. NEWELL
DATE: 04/22/2022
PROJECT MANAGER: H. CARTER
LAYOUT: FIGURE 3

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FIGURE 4
LEGEND SHEET
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA

TABLES

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Science & Engineering Consultants

Table 1
Approximate Soil Boring Locations
Phase II Investigation Report Parcel 2
Kernersville, North Carolina

Boring Identification	Northing (feet)	Easting (feet)
P2SB-1	870926.21	1684122.12
P2SB-2	870972.78	1684139.86
P2SB-3	871011.54	1684121.96
P2SB-4	871020.80	1684088.84
P2SB-5	871039.44	1684018.71

Notes: Created by: JHC Checked by: EMJ

Coordinate system NAD83 NC State Plane - Survey Feet
GPS data collected using a Trimble Geo 7x handheld data collector.
A GPS device error caused a displacement in coordinate output, displacement was corrected based on select boring locations relative to known landmarks.
GPS data are approximate.

Table 2
Summary of Analytical Results
Phase II Investigation Report Parcel 2
Kernersville, North Carolina

Sample ID (feet depth)	PID Screening (PPM)	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	Benzo(a)pyrene	HC Fingerprint Match
P2 SB-1 (8-10)	0.0	<0.28	<0.28	<0.28	0.27	0.27	<0.09	<0.011	Residual HC
P2 SB-2 (0-2)	9.3	<0.25	<0.25	0.25	0.25	0.16	<0.08	<0.01	,(FCM),(BO),(P)
P2 SB-3 (0-2)	61.7	<0.46	4.9	15.1	20	7.3	0.8	<0.018	Road Tar 77%,(FCM)
P2 SB-3 (8-10)	1412	143.4	742.5	447.3	1189.8	740.2	28.8	0.029	No Match found
P2 SB-4 (8-10)	4.8	<0.53	<0.53	0.53	0.53	0.32	<0.17	<0.021	74.2%,(FCM)
P2 SB-5 (8-10)	1.4	<0.57	<0.57	<0.57	0.36	0.36	<0.18	<0.023	Residual HC,(P)

Notes:

Created by: EMJ Checked by: JHC

Results generated by a QED HC-1 analyser.

Concentration values in mg/kg.

Values are not corrected for moisture or stone content.

Fingerprints provide a tentative hydrocarbon identification.

BO -Background Organics

BTEX - Benzene, Toluene, Ethylbenzene, Xylene

PAH - Polycyclic aromatic hydrocarbons

TPH-GRO - Total Petroleum Hydrocarbons-Gasoline Range Organics

TPH-DRO - Total Petroleum Hydrocarbons-Diesel Range Organics

NCDEQ Action Level for TPH-GRO - 50 mg/kg

NCDEQ Action Level for TPH-DRO - 100 mg/kg

FCM - Results calculated using Fundamental Calibration Mode.

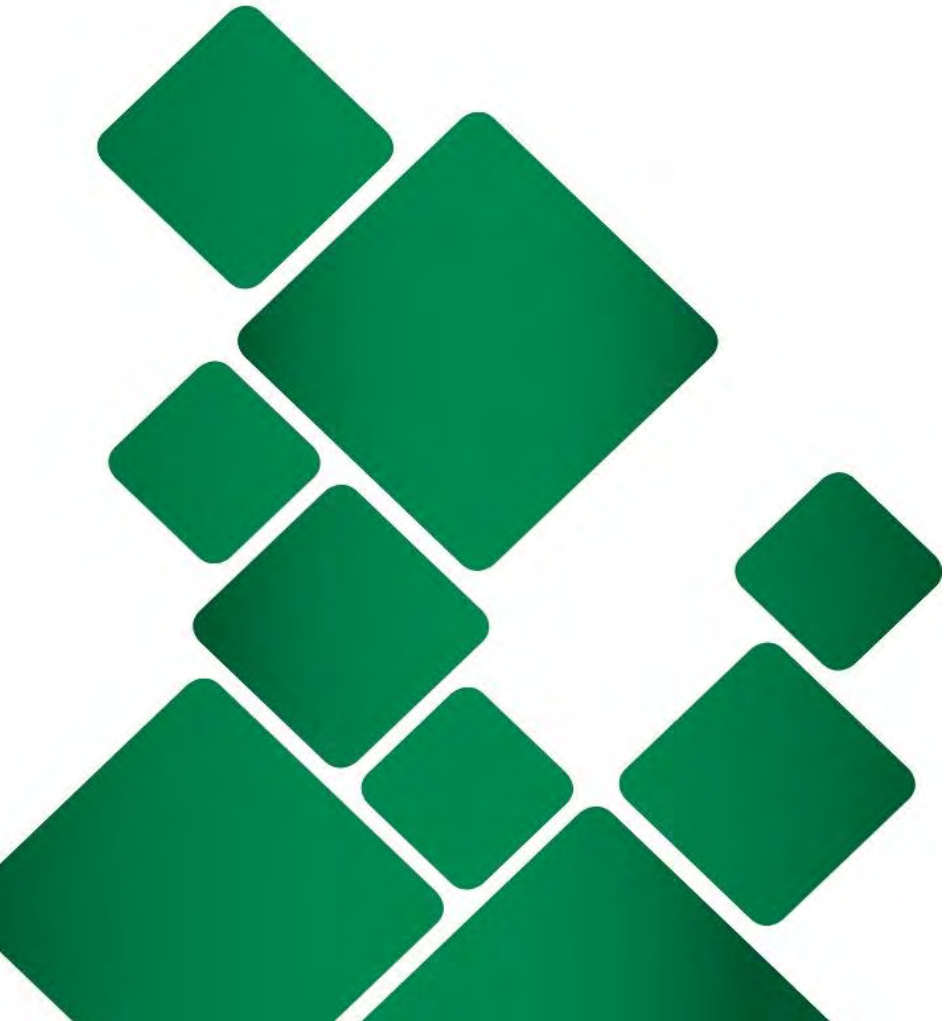
PPM - parts per million

P - Particulate present.

% - Confidence for sample fingerprint match to library.

APPENDIX A

GEOPHYSICAL SURVEY REPORT



synTerra

Science & Engineering Consultants

Technical Report

Geophysical Evaluation

NCDOT – U-6003

Piney Grove Road Kernersville, North Carolina

Prepared For:

SynTerra Corporation, Inc

Prepared By:

Geo Solutions Limited, Inc.

March 29, 2022

Geo Solutions Ltd.
P.O. Box 293
Conway, NC 27820
(252) 578-3233

March 29, 2022

Harrison Carter, PG
SynTerra Corporation
511 Keisler Drive, Suite 102
Cary, North Carolina 27518

Re: **Geophysical Evaluation – NCDOT U-6003 – Kernersville, NC**

File: Report

Dear Mr. Carter:

Geo Solutions Limited, Inc. (Geo Solutions) is pleased to submit this report to SynTerra Corporation, Inc (SynTerra) of a geophysical evaluation in support of an environmental site assessment of a North Carolina Department of Transportation (NCDOT) site located at 743 and 744 Piney Grove Road, Kernersville, North Carolina.

Background

SynTerra is completing an environmental site assessment of the NCDOT planned right of way (ROW) for a new roadway construction project know as the Kernersville Loop that will connect Piney Grove Road to NC-150 in Kernersville, NC. Two of the properties within the planned NCDOT ROW (Parcel #002 and Parcel #014) are the sites of either active or former fuel stations. As such, SynTerra contracted Geo Solutions to complete a geophysical evaluation of these properties within the proposed ROW. The objective of the geophysical evaluation was to detect and map any UST or other buried structures on these sites. Figure 1 below and at the rear of this report is a site map with the geophysical evaluation boundaries delineated.

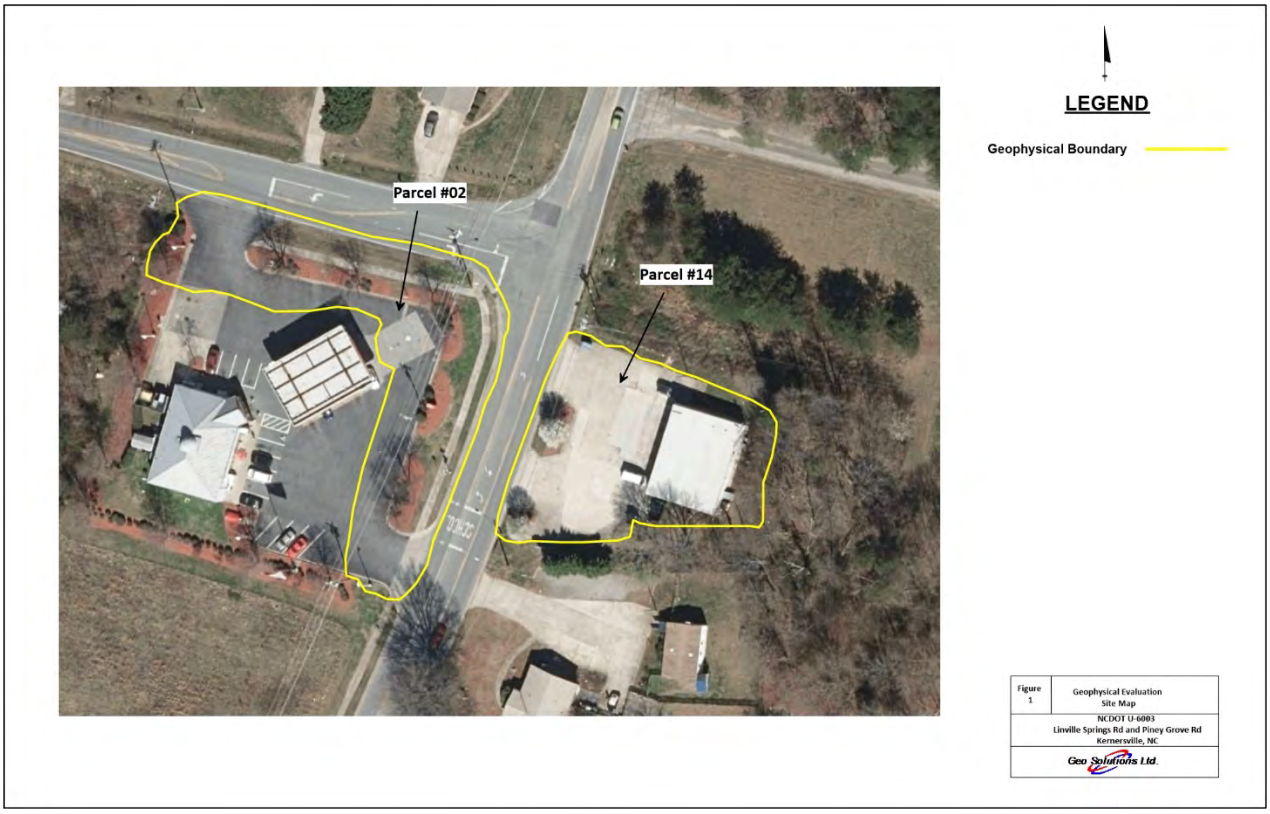


Figure 1. Site map of the area of the geophysical boundary of Parcels #002 and #014 delineated in yellow.

Technical Approach

Geo Solutions completed the evaluation utilizing two geophysical methods to investigate the two adjacent properties along Piney Grove Road in Kernersville, North Carolina. The field work for this project was completed on March 15, 2022.

Multifrequency Electromagnetic (EM) Evaluation

A high resolution electromagnetic (EM) evaluation was completed over the two sites using a Geophex Model GEM-2 multifrequency electromagnetic profiler which collects at a rate of 30 times per second. The EM data was collected on a hand-held data logger that communicated with the GEM-2 unit via Bluetooth. The GEM-2 was connected to a Hemisphere Model A-325 GPS unit which is augmented by the Wide Area Augmentation System (WAAS) and is capable of submeter accuracy. The EM profile spacing was

approximately 3 feet or less. The EM method is useful at evaluating the shallow subsurface for both metallic and non-metallic conductive materials such as steel USTs and variations in soil conductivity which may be related to former land use.

Ground-penetrating Radar (GPR) Evaluation

Geo Solutions completed a ground penetrating radar (GPR) evaluation over the two sites. Here, a GSSI SIR 4000 connected to a 400 MHz antenna mounted on a three-wheel cart was utilized. Parallel profiles spaced 3 feet or less were collected. The GPR records were post processed with GSSI Radan 7 software.

Results

Multifrequency Electromagnetic Evaluation

Geo Solutions completed an EM evaluation of the site with parallel profiles spaced approximately 3 feet apart over both sites (Figure 2). Once adequate survey coverage was achieved, the EM field data were post-processed to produce a comma separated variable (CSV) file that was then transferred to a laptop computer. These data were then processed using software developed by Geophex to calculate the apparent conductivity and in-phase values for each EM frequency collected (1470Hz, 4110 Hz, 9810 Hz, 32,190 Hz, 60000 Hz, and 90030 Hz). Typically, the in-phase data (sometimes referred to as the metal detection mode) is more representative of buried metallic materials whereas the apparent conductivity is more representative of non-metallic conductive buried materials. The apparent conductivity response can also be elevated in the presence of large metal features. By evaluating both the in-phase and apparent conductivity responses, the horizontal extents of conductive and metallic materials can be characterized. All the frequencies were evaluated and the 9,810 Hz data was chosen to create figures for this report as it provided the best contrast to background site conditions. Shown on Figure 3 and Figure 4 are the EM in-phase and apparent conductivity maps respectively with explanations for the anomalous conditions observed in the EM data. Here, anomalous conditions are shown as

orange to red and blue hues where the background site conditions are shown as light yellow and green hues. At the location of Parcel #014 the presence of reinforced concrete across the parking lot of the site caused a strong in-phase EM response. These areas of both strong negative and positive responses are typical of EM data collected over reinforced concrete. A known abandoned UST basin is present on site. The dispensers have been abandoned as well. In these areas where the excavation occurred, the area was covered over with non-reinforced concrete. At Parcel #002 a known active UST is present within the geophysical boundary. Here, the EM response was very weak in both the in-phase and apparent conductivity data. This would indicate that the UST is not constructed of steel. The UST is likely composed of fiberglass. A strong EM response was detected at the location of a metal sign and alarm system for the UST. There is another UST at the southwest side of Parcel #002 but it is located outside of the geophysical boundary and planned ROW.

Ground-penetrating Radar (GPR) Evaluation

Figure 5 is a map documenting the results of the GPR evaluation. At Parcel #014 the known abandoned UST basin, fuel line trench, and abandoned dispenser basin was delineated with pink ground-marking paint. A small anomaly was detected near the west side of the building. There were no subsurface structures detected at Parcel #014. At Parcel #002 the known active UST was detected with GPR. This appears to be a single tank with multiple fuel cells. The approximate dimensions of the UST are 14 ft x 35 ft. The footprint of the UST and vent lines were marked with pink ground paint. Appendix A. is photographic log of these site features. Shown on Figure 6 are cross sectional images of the UST basin and dispenser basin at Parcel #014. Figure 7 is a cross sectional image of the known active UST at Parcel #002.

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Conclusions

- Geo Solutions completed a detailed EM and GPR evaluation over two parcels along Piney Grove Road in Kernersville, North Carolina where the NCDOT plans to construct a new roadway.

- A known abandoned UST and dispenser basin along with the former trench for the product lines were detected at Parcel #014.

- A known active UST was detected at Parcel #002. This UST is not constructed of steel. It is likely constructed of fiberglass.

Limitations

The detection of subsurface objects is dependent upon parameters that include size, physical composition, and depth of burial. The combination of these parameters may produce a response that is below the detection threshold for a given geophysical method. The presence of reinforced concrete limits GPR and EM detections of subsurface structures below the slabs.

Please don't hesitate to call if you have any questions concerning this report. We appreciate the opportunity to have worked with you on this project.

Very truly yours,

GEO SOLUTIONS LIMITED, INC.

John DeLoatch, PG
Project Manager

LEGEND

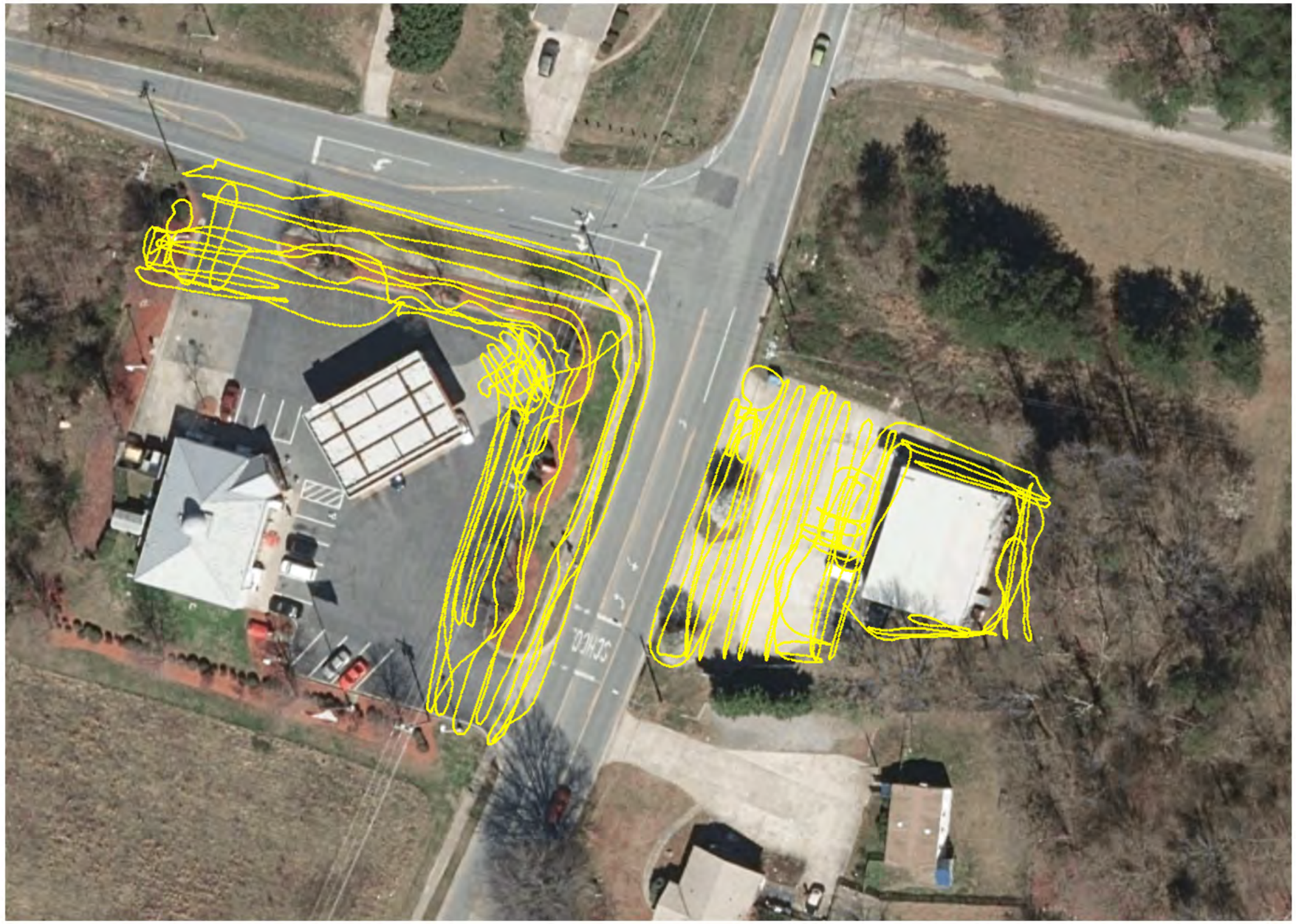
Geophysical Boundary

Map Scale (ft)

0 50 100

1" = 50'

Figure 1	Geophysical Evaluation Site Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

Indicates Location of EM Data Point

Map Scale (ft)

0 50 100

1" = 50'

Figure 2	Geophysical Evaluation EM Profile Location Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

LEGEND

9810 Hz In-phase (PPM)

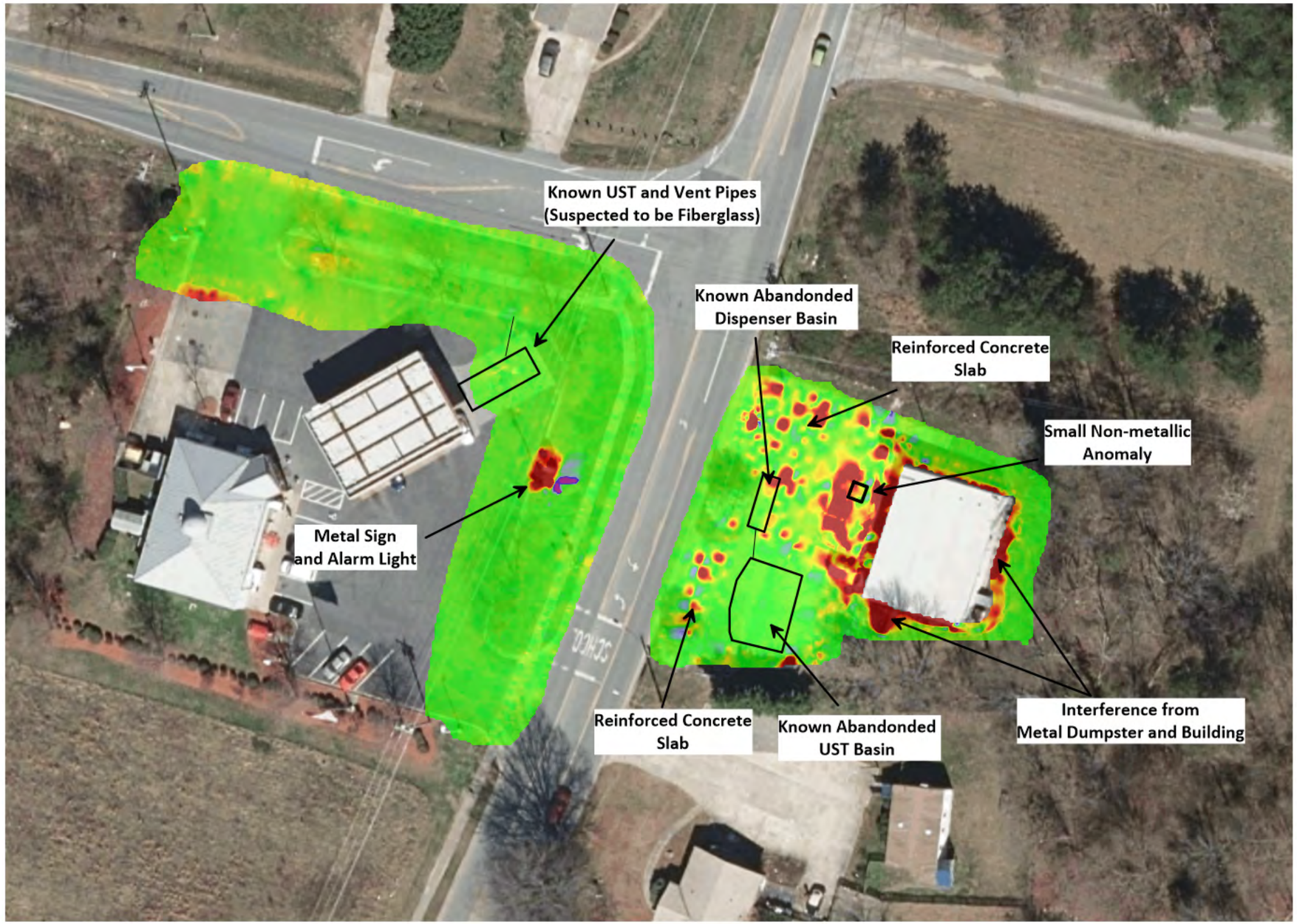
16000
14400
12800
11200
9600
8000
6400
4800
3200
1600
0
-1600
-3200
-4800
-6400
-8000
-9600
-11200
-12800
-14400
-16000

Map Scale (ft)

0 50 100

1" = 50'

Figure 3	Geophysical Evaluation EM In-phase (Metal Detection) Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

9810 Hz In-phase (PPM)

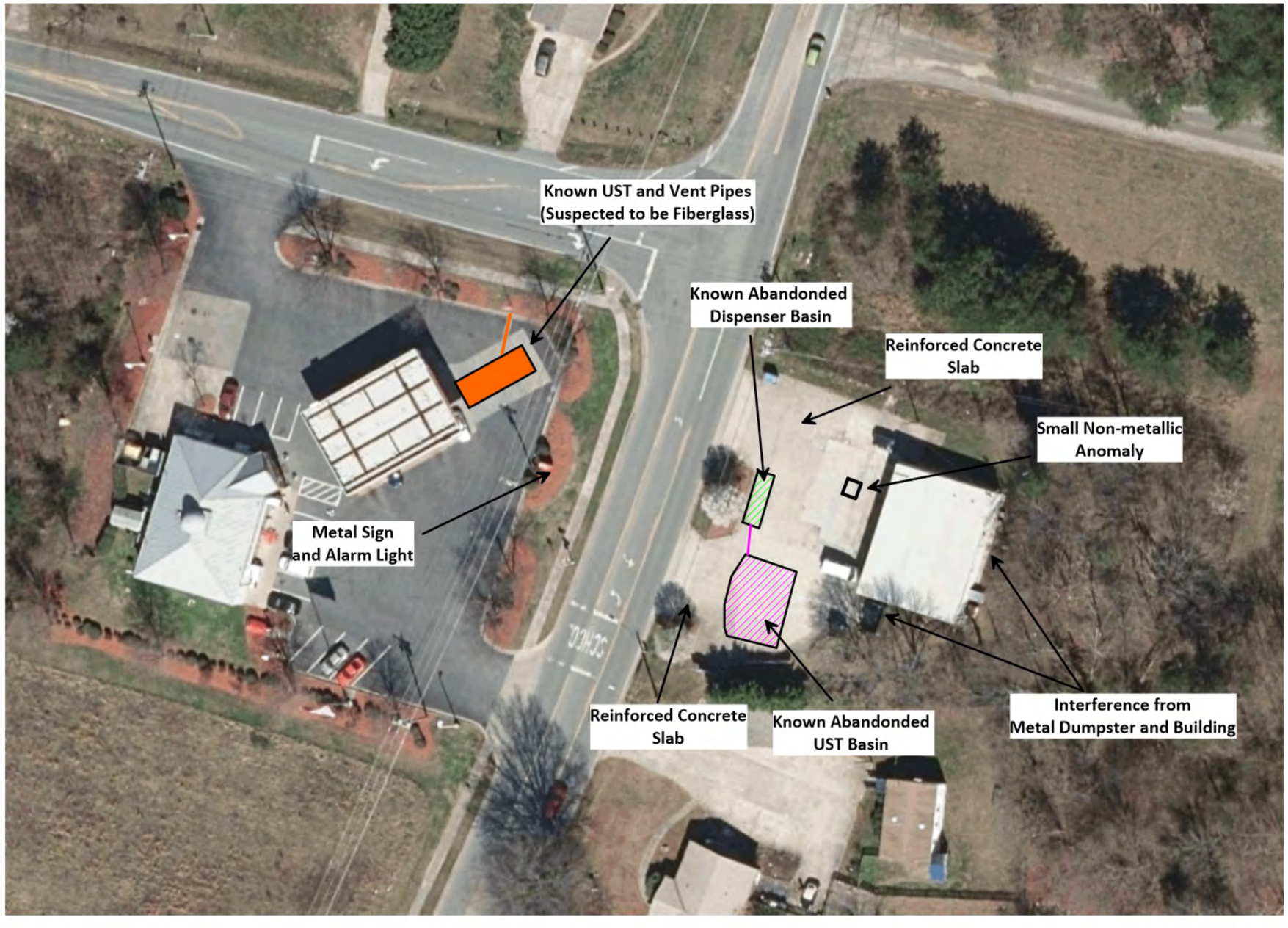
16000
14400
12800
11200
9600
8000
6400
4800
3200
1600
0
-1600
-3200
-4800
-6400
-8000
-9600
-11200
-12800
-14400
-16000

Map Scale (ft)

0 50 100

1" = 50'

Figure 4	Geophysical Evaluation EM In-phase (Metal Detection) Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

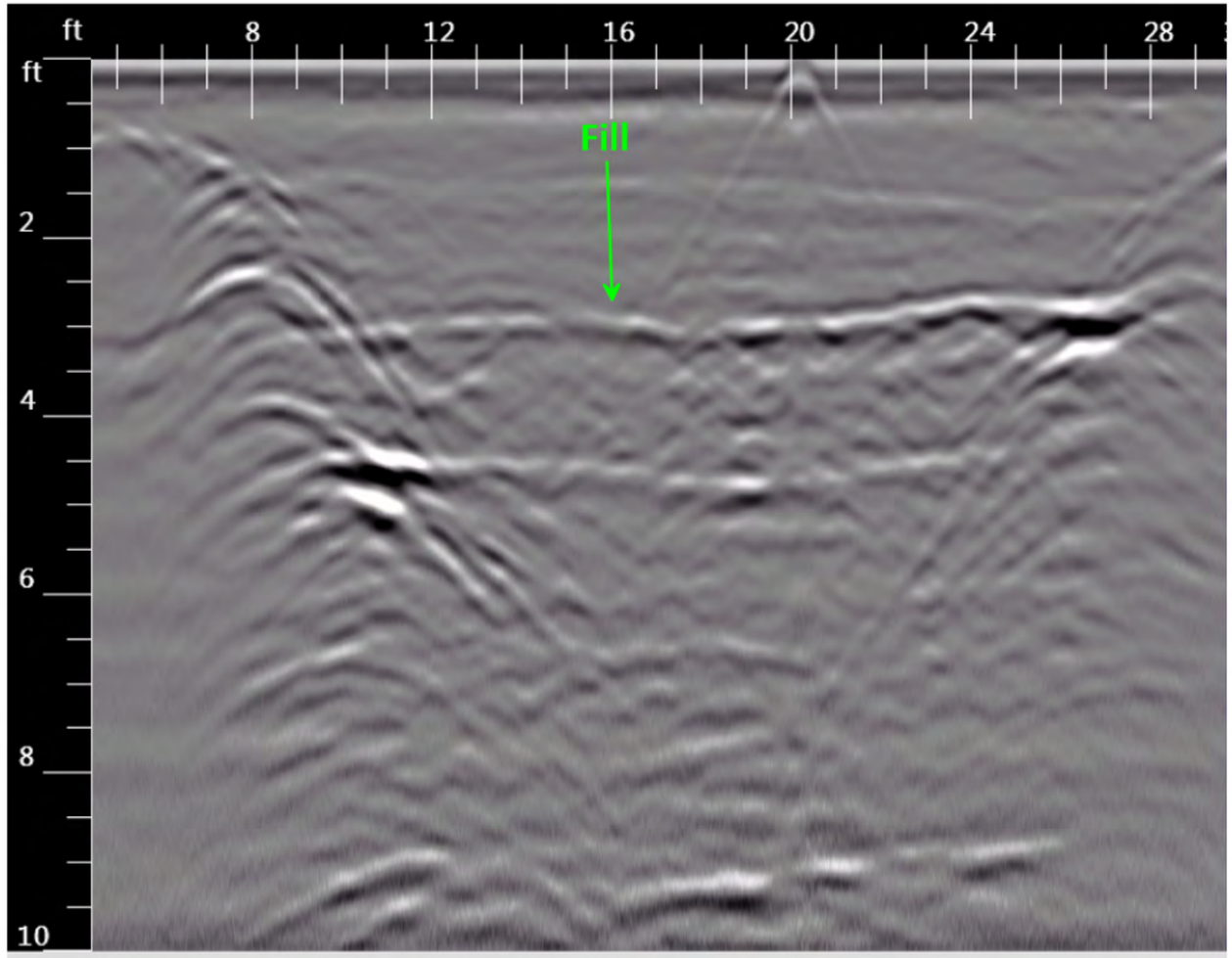
- Known UST
- Known Abandoned UST Basin
- Known Abandoned Fuel Dispenser Area
- UST Vent Lines
- Abandoned Product Lines Basin (No Lines in Place)
- Small GPR Anomaly

Map Scale (ft)

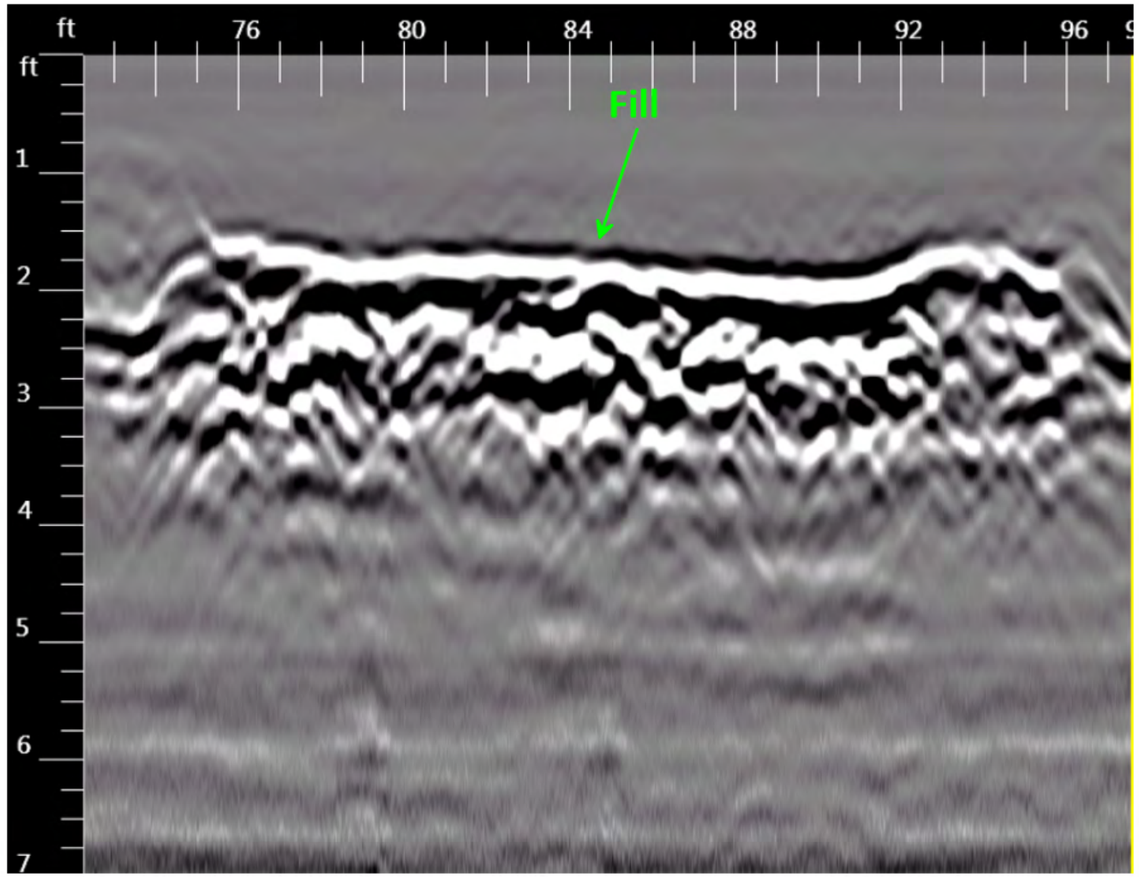
0 50 100

1" = 50'

Figure 5	Geophysical Evaluation Ground-penetrating Radar Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

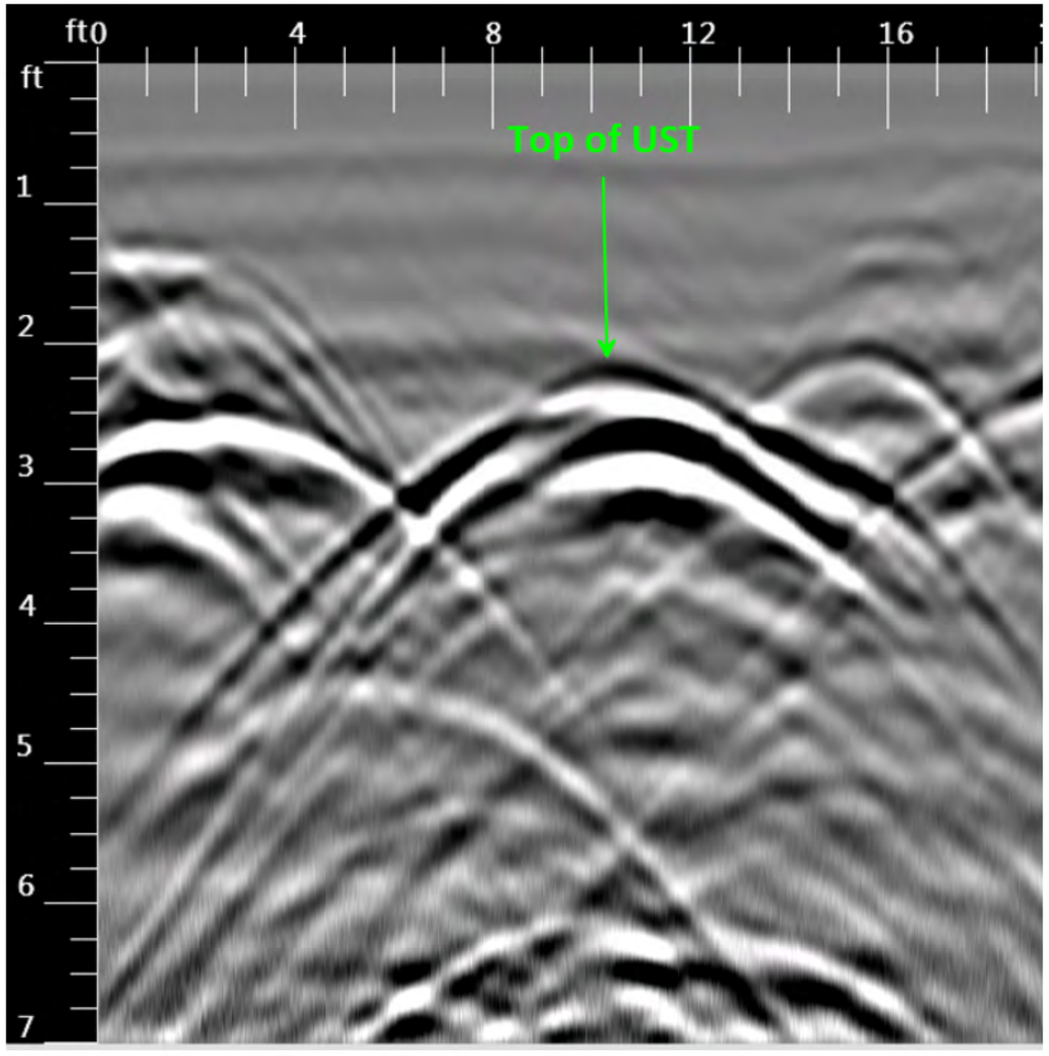


Transect collected across known abandonded UST Basin at Parcel # 014



Transect collected across known abandonded dispensers at Parcel # 014

Figure 6	Geophysical Evaluation Ground-penetrating Radar Cross Section of Known UST at Parcel # 02
	NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC
	Geo Solutions Ltd.



Transect collected across known UST at Parcel # 2.
Suspected to be composed of Fiberglass

Figure 7	Geophysical Evaluation Ground-penetrating Radar Cross Section of Known UST at Parcel # 02
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

Appendix A. Draft Photograph Log – NCDOT– Kernersville, NC

Photograph 1. Known active UST at Shell Station property.

Photograph 2. Known abandoned UST Basin at the Quick Mart property.

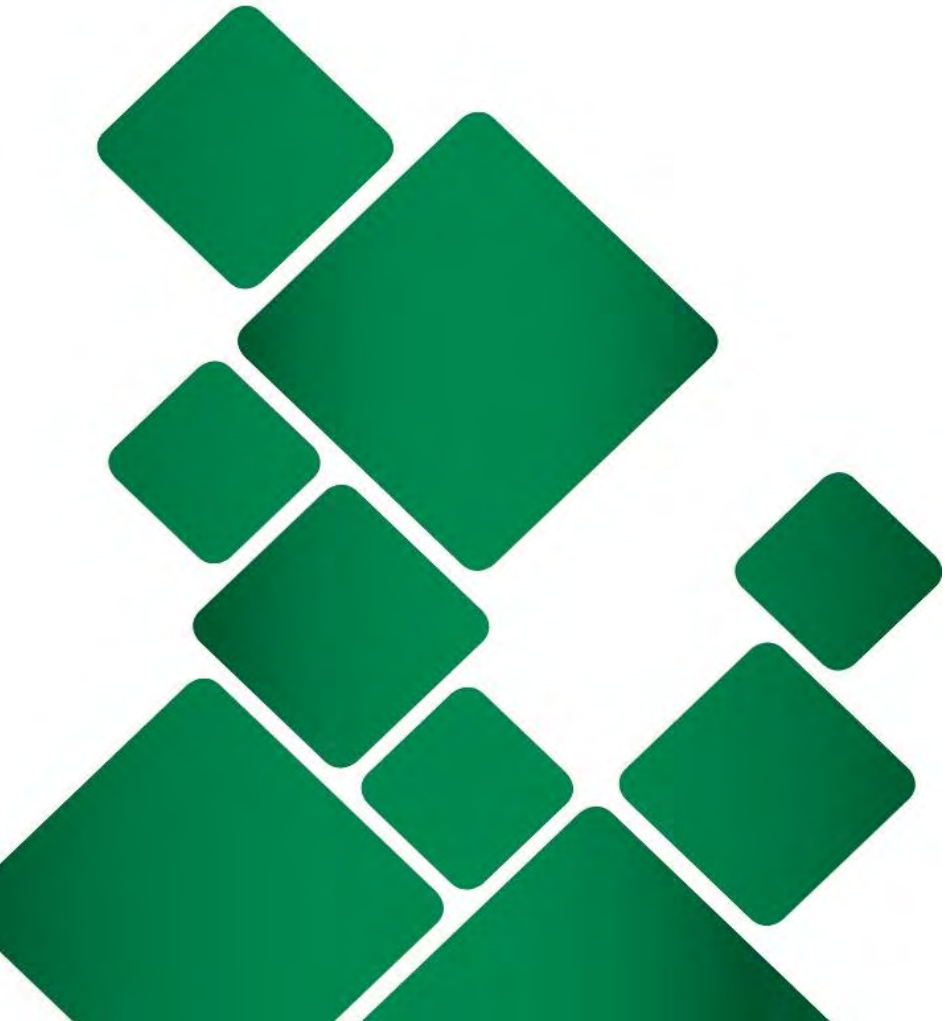
Photograph 3. Known abandoned UST Basin look toward former fuel dispensers at the Quick Mart property.

Photograph 4. Small Anomaly at Quick Mart property.

Photograph 5. Vent line at Shell Station property.

APPENDIX B

BORING LOGS



synTerra

Science & Engineering Consultants

Project: DOT Kernersville	Boring Number DZ SB 1
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			0.0		Red silty clay, micaceous moist, No odor		
			0.0				
4			0.0				
6			0.0		light Brown to light red to white sandy clayey silt, moist SAP. texture		
8			0.0				Sampled 8-10 0820
10							

synTerra

P2

Project: DOT Kennersville

Project Location: _____

Project Number: _____

Boring Number SB-2

Sheet ___ of ___

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
0			9.3		Red silty Clay, moist No odor		Sampled 0-2 0840
2							
			4.8				
4							
			1.1		Some saprolitic texture and white mottling		
6							
			0.3				
8							
			0.2				
10							

synTerra

Project: _____
Project Location: _____
Project Number: _____

Boring Number P2 SB3
Sheet ___ of ___

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
0			61.7		Red silty Clay, micaceous, moist		Sampled 0-2 0855
2			3.2				
4			604.6		Hydrocarbon odor, weathered gasoline? Throughout		
6			728.2				
8			1412		~~White/Brown~~ light Brown to grey, sandy clayey silt,		Sampled 8-10 0900
10							

synTerra

Project:	Boring Number P2SB4
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID PPM	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			1.3		Same as P2SB3 (JHC) No hydrocarbon odor		
4			1.6				
6			1.8				
8			2.4				Sampled 8-10 0930
10			4.8				

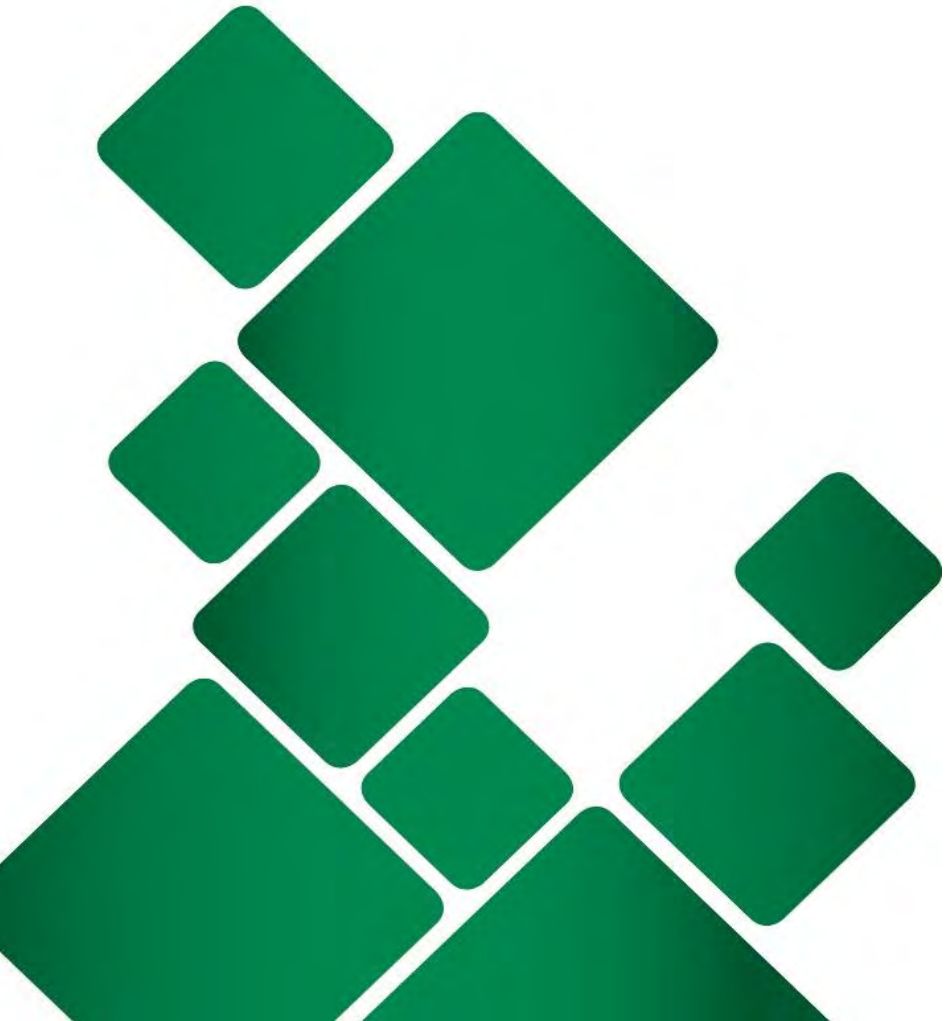
Project:	Boring Number P2SB5
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			0.8		Same as P2SB4 No hydrocarbon odor		
4			1.1				
6			1.0				
8			1.4				
10			1.4				Sample 8-10 0950

APPENDIX C

LABORATORY REPORT



synTerra

Science & Engineering Consultants

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: SYNTERRA
Address:

Samples taken 3/31/22-4/1/22
Samples extracted 3/31/22-4/1/22
Samples analysed Wednesday, April 6, 2022

Contact: HARRISON CARTER

Operator TORI KELLY

Project: DOT KERNERSVILLE

U04049

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	P14 SB-1 (8-10)	22.6	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	0	0	PHC not detected,(P)
s	P14 SB-2 (8-10)	11.2	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	0	0	Residual HC
s	P14 SB-3 (4-6)	21.8	<0.55	<0.55	0.55	0.55	0.46	<0.17	<0.022	0	84.6	15.4	Deg Fuel 82.3%,(FCM)
s	P14 SB-4 (6-8)	20.6	<0.52	0.81	<0.52	0.81	<0.1	<0.17	<0.021	100	0	0	Residual HC
s	P14 SB--5 (6-8)	21.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	0	0	0	PHC not detected
s	P14 SB-6 (8-10)	25.0	<0.63	<0.63	<0.63	<0.63	<0.13	<0.2	<0.025	0	0	0	PHC not detected
s	P14 SB-7 (6-8)	21.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	97.6	2.4	0	Residual HC
s	P14 SB-8 (6-8)	9.5	<0.24	0.48	0.24	0.72	0.23	<0.08	<0.01	75.7	20.4	3.8	Deg.PHC 56%,(FCM)
s	P2 SB-1 (8-10)	11.2	<0.28	<0.28	<0.28	0.27	0.27	<0.09	<0.011	0	66.2	33.8	Residual HC
s	P2 SB-2 (0-2)	9.9	<0.25	<0.25	0.25	0.25	0.16	<0.08	<0.01	0	39.8	60.2	,(FCM),(BO),(P)

Initial Calibrator QC check OK Final FCM QC Check OK 97.5 %

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

SynTerra Note - P14 Samples are from NCDOT Parcel 014
P2 Samples are from NCDOT Parcel 002

QED

REDLAB
RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: SYNTERRA
Address:

Samples taken 3/31/22-4/1/22
Samples extracted 3/31/22-4/1/22
Samples analysed Wednesday, April 6, 2022

Contact: HARRISON CARTER

Operator TORI KELLY

Project: DOT KERNERSVILLE

U04049

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	P2 SB-3 (0-2)	18.4	<0.46	4.9	15.1	20	7.3	0.8	<0.018	44.5	47.2	8.3	Road Tar 77%,(FCM)
s	P2 SB-3 (8-10)	23.0	143.4	742.5	447.3	1189.8	740.2	28.8	0.029	98	1.8	0.2	No Match found
s	P2 SB-4 (8-10)	21.1	<0.53	<0.53	0.53	0.53	0.32	<0.17	<0.021	74.8	18.7	6.5	74.2%,(FCM)
s	P2 SB-5 (8-10)	22.8	<0.57	<0.57	<0.57	0.36	0.36	<0.18	<0.023	0	100	0	Residual HC,(P)

Initial Calibrator QC check OK Final FCM QC Check OK 98.8 %

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

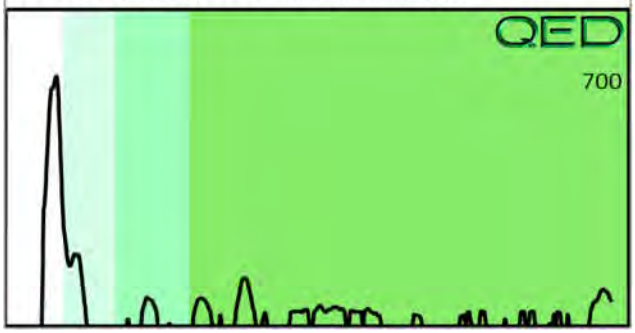
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

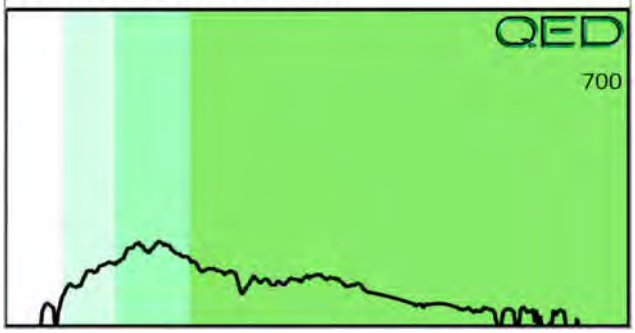
QED Hydrocarbon Fingerprints

Project: DOT KERNERSVILLE ##################

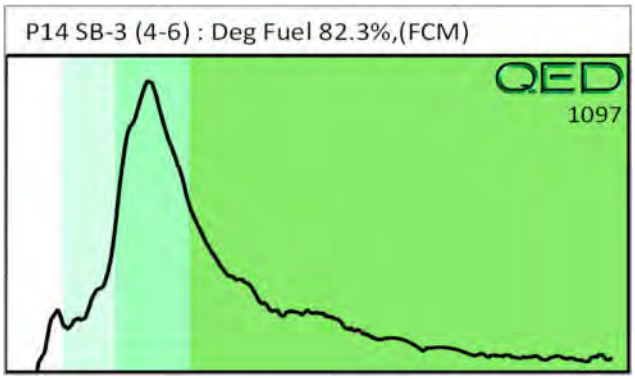
P14 SB-1 (8-10) : PHC not detected,(P)



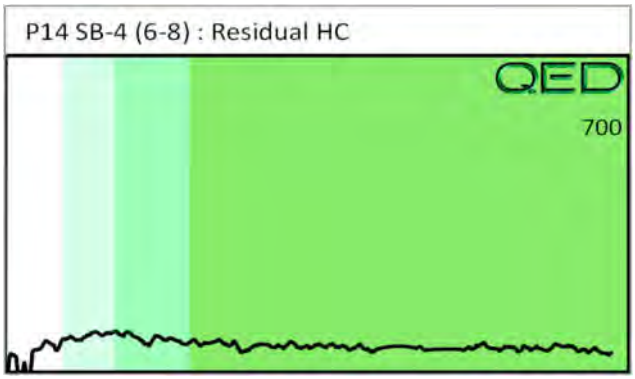
P14 SB-2 (8-10) : Residual HC



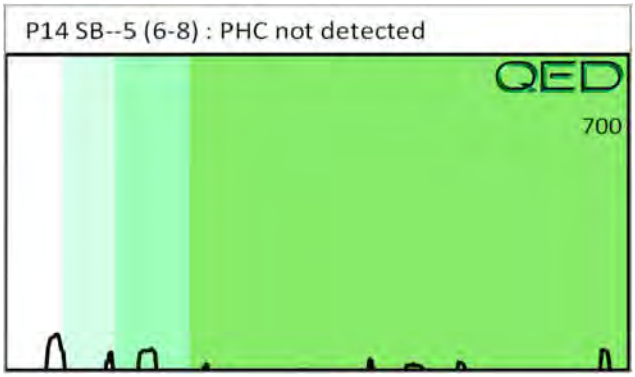
P14 SB-3 (4-6) : Deg Fuel 82.3%,(FCM)



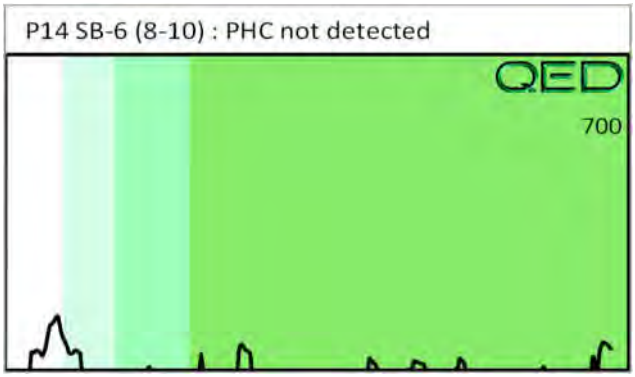
P14 SB-4 (6-8) : Residual HC



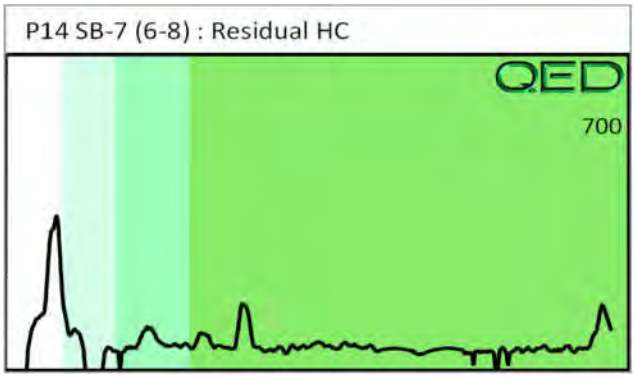
P14 SB--5 (6-8) : PHC not detected



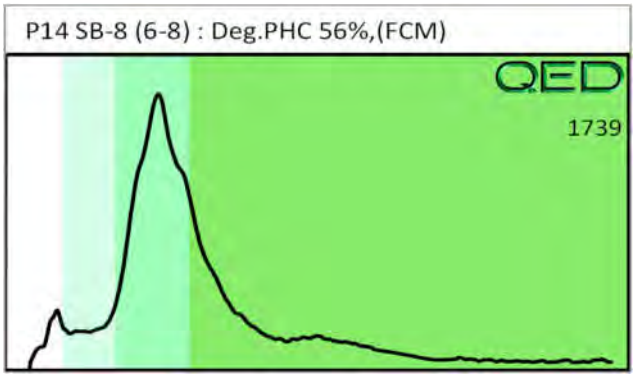
P14 SB-6 (8-10) : PHC not detected



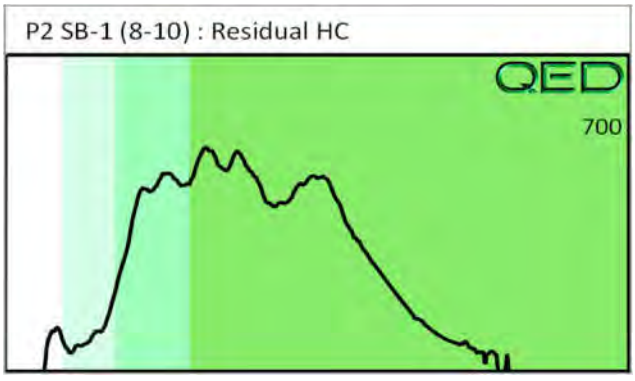
P14 SB-7 (6-8) : Residual HC



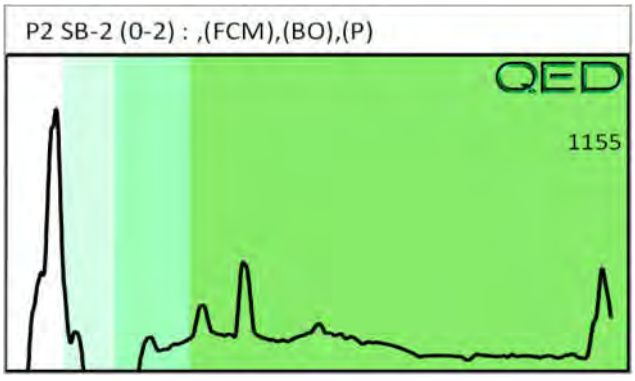
P14 SB-8 (6-8) : Deg.PHC 56%,(FCM)



P2 SB-1 (8-10) : Residual HC



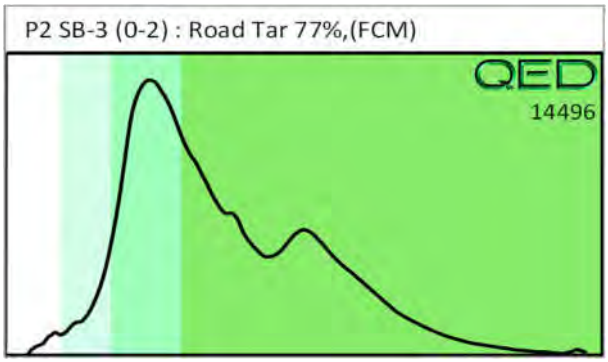
P2 SB-2 (0-2) : ,(FCM),(BO),(P)

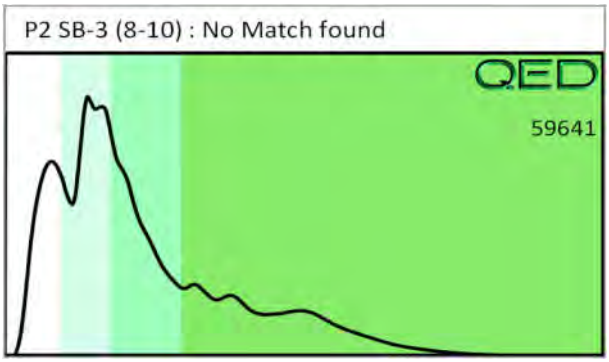


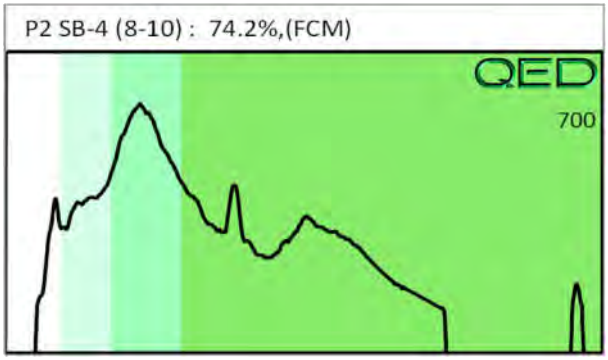
QED Hydrocarbon Fingerprints

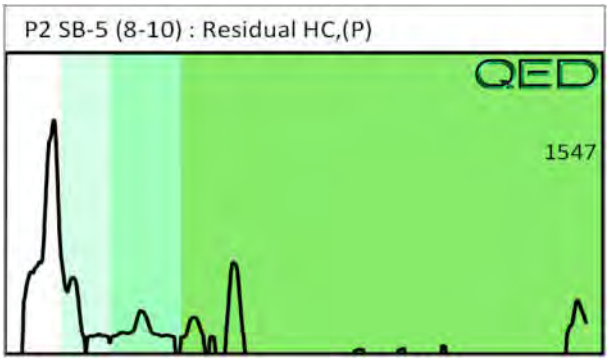
Project: DOT KERNERSVILLE

Wednesday, April 6, 2022









Client Name:	Synterra
Address:	
Contact:	Harrison Carter
Project Ref.:	DOT Kernersville
Email:	HCarter@Synterracorp.com
Phone #:	704-661-0634
Collected by:	H. Carter

REDLAB™
RAPID ENVIRONMENTAL DIAGNOSTICS

CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

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

Each UVF sample will be analyzed for total BTEX, GRO, DRO, TPH, PAH total aromatics and BaP. Standard GC Analyses are for BTEX and Chlorinated Solvents: VC, 1,1 DCE, 1,2 cis DCE, 1,2 trans DCE, TCE, and PCE. Specify target analytes in the space provided below.

Sample Collection Date/Time	TAT Requested 24 Hour	TAT Requested 48 Hour	Analysis Type UVF	Analysis Type GC	Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
3/31 1310						P14SB-1 (8-10)	51.5	40.0	11.5
1320						P14SB-2 (8-10)	52.6	40.1	12.5
1330						P14SB-3 (4-6)	51.9	40.0	11.9
1340						P14SB-4 (6-8)	52.5	39.9	12.6
1350						P14SB-5 (6-8)	51.9	40.0	11.9
1440						P14SB-6 (8-10)	50.5	40.1	10.4
1506						P14SB-7 (6-8)	51.9	40.0	11.9
1530						P14SB-8 (6-8)	54.8	40.1	14.7
4/1 0820						P2SB-1 (8-10)	52.6	40.1	12.5
0840						P2SB-2 (0-2)	54.0	39.9	14.1
0855						P2SB-3 (0-2)	48.5	39.9	18.6
0900						P2SB-3 (8-10)	51.3	40.0	11.3
0930						P2SB-4 (8-10)	52.4	40.1	12.3
0950						P2SB-5 (8-10)	51.6	40.2	11.4

COMMENTS/REQUESTS:

TARGET GC/UVF ANALYTES:

Relinquished by		Accepted by	Date/Time
[signature]	1550	FedEx	1550 4/4
Relinquished by		Accepted by	Date/Time
		MM 4/5/22	1500

RED Lab USE ONLY
3-2022-2 14
Ref. No

Science & Engineering Consultants
synterracorp.com

GEOENVIRONMENTAL PHASE II INVESTIGATION

NCDOT PARCEL 014
MALIK AND NYLA ASLAM
KERNERSVILLE – KERNERSVILLE LOOP FROM SR 1969 (PINEY GROVE RD) TO NC 150 (N. MAIN ST)
744 PINEY GROVE RD
FORSYTH COUNTY, NORTH CAROLINA
WBS NUMBER 47138.1.1
TIP NUMBER U-6003
FORSYTH COUNTY PIN # 6887-40-2970.000

5/19/2022

PREPARED FOR

North Carolina Department of Transportation
Geotechnical Engineering Unit
Geoenvironmental Section
Raleigh, North Carolina

Todd Plating, P.G.
Senior Peer Review

J. Harrison Carter, P.G.
NC# 2675
Project Geologist

DocuSigned by:
A4821DBC2816438...

06/02/2022

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1.0 INTRODUCTION

SynTerra Corporation (SynTerra) conducted a Phase II investigation of the parcel located at 744 Piney Grove Road (Site) located on the eastern side of Piney Grove Road north of Kernersville in Forsyth County, North Carolina (**Figures 1** and **2**). The North Carolina Department of Transportation (NCDOT) plans to widen Piney Grove Road and extend Linville Springs Road through the adjacent intersection. SynTerra's work is consistent with the NCDOT's *Request for Technical and Cost Proposal* dated January 31, 2022, and our *Revised Technical and Cost Proposal* dated February 15, 2022. The objective of this work was to assist the NCDOT – Geotechnical Engineering Unit with identifying potential environmental concerns regarding effects on soil from underground storage tanks (USTs) within the rights-of-way and/or easements of the above-referenced site. This investigation included a geophysical survey to identify subsurface metallic features such as UST systems, and the advancement of eight soil borings to test for the presence of constituents in the accessible areas of the site.

2.0 HISTORY

Based on historical documents obtained from the North Carolina Department of Environmental Quality (NCDEQ), the Site previously contained two 10,000-gallon USTs that were removed from the site in 2004. A Limited Site Assessment report (LSA) prepared by SEI Environmental dated October 22, 2004, indicates total petroleum hydrocarbon (TPH) concentrations in soil at concentrations greater than action levels at multiple locations near the former USTs and associated equipment. This LSA also identified petroleum constituents in groundwater. The continued presence of those petroleum constituents in groundwater was identified in subsequent investigations or monitoring events.

3.0 METHODS

SynTerra called NC811 on March 24, 2022 and requested utilities be marked in the areas of investigation. NC811 notified Centurylink, Winston Salem Sewer and Water, Duke Energy, North State Communications, Piedmont Natural Gas, and Charter Communications. The clearance was valid through April 14, 2022. SynTerra also contracted with Probe Utility, a private utility locator, to identify subsurface utilities at the site.

3.1 Geophysics

Geo Solutions Limited, Inc. (Geo Solutions), under contract to SynTerra, performed a geophysical survey of the site on March 15, 2022. Geo Solutions used a Geophex Model GEM-2 electromagnetic profiler connected to a GPS unit to create an electromagnetic profile of the site. Geo Solutions followed this with a ground penetrating radar (GPR) evaluation using a GSSI SIR 4000 with a 400 megahertz (MHz) antenna. The Geo Solutions report is included in **Appendix A**.

3.2 Soil Borings

Regional Probing Services (Regional Probing), under contract to SynTerra, used a Geoprobe® 5410 equipped with direct-push technology to advance eight soil borings (P14SB-1 through P14SB-8) on March 31, 2022. The locations of those borings are shown on **Figure 2**. The driller advanced P14SB-2 in the location of the former USTs, SB-4 in the location of the former pump island, P14SB-5 at the location of a subsurface anomaly in the parking lot near the building, and the remainder of the soil borings were distributed throughout the accessible areas of the site.

Regional Probing advanced the borings to a depth of 10 feet, as requested by NCDOT. The water table was not encountered while performing the soil borings. SynTerra used a Trimble Geo 7x® handheld data collector to determine the locations of each boring. A GPS unit error caused a displacement in the recorded coordinates; however, locations were correct relative to each other, and coordinates were corrected based on locations of select borings relative to landmarks. Approximate Northings, Eastings, and elevations above sea level for the borings are shown in **Table 1**.

The driller collected soil samples in clear acetate sleeves. Boring logs are provided in **Appendix B**. SynTerra collected samples of material at 2-foot intervals and placed the samples in zip-top plastic bags. After allowing the bags to sit untouched for approximately 15 minutes, a photoionization detector (PID) was used to screen the headspace in each bag for volatile organic compounds (VOCs).

Synterra collected one soil sample for analysis from each boring from the interval with the greatest concentration of VOCs based on the PID screening. The deepest interval was selected if PID screening results were consistent throughout the recovered core.

SynTerra placed samples in laboratory-supplied bottle ware, placed the samples on ice in a cooler, and shipped them under chain-of-custody to RED Lab, LLC (RED Lab) in Wilmington North Carolina. RED Lab analyzed the samples for benzene-toluene-ethylbenzene-xylene (BTEX), gasoline range organics (TPH-GRO), diesel range organics (TPH-DRO), total petroleum hydrocarbons (TPH), total aromatics, and benzo[a]pyrene (BaP).

4.0 RESULTS

4.1 Geophysics

The Geo Solutions *Geophysical Survey* report, dated March 29, 2022, is in **Appendix A**. Geo Solutions identified pits of fill material where the former USTs, pump island, and piping were located. One small anomaly was identified near the west side of the building, beneath the parking lot.

4.2 Soil Borings

Table 2 summarizes the laboratory results and PID screening values for soil samples. Boring logs are in **Appendix B**. The soil samples were not stained and did not exhibit hydrocarbon odor, except for P14SB-3; however, this boring did not exhibit elevated PID screening values.

RED Lab detected several analytes, but at relatively low concentrations that were not greater than NCDEQ action levels where applicable. In samples where hydrocarbons were detected, RED Lab identified the fingerprints predominantly as residual hydrocarbons, degraded petroleum hydrocarbons, or degraded fuel.

5.0 CONCLUSIONS

5.1 Geophysics

Geo Solutions did not identify existing USTs at this parcel. Based on record review and results from the geophysical survey, USTs, pump islands, and associated piping have been removed from this parcel.

5.2 Soil

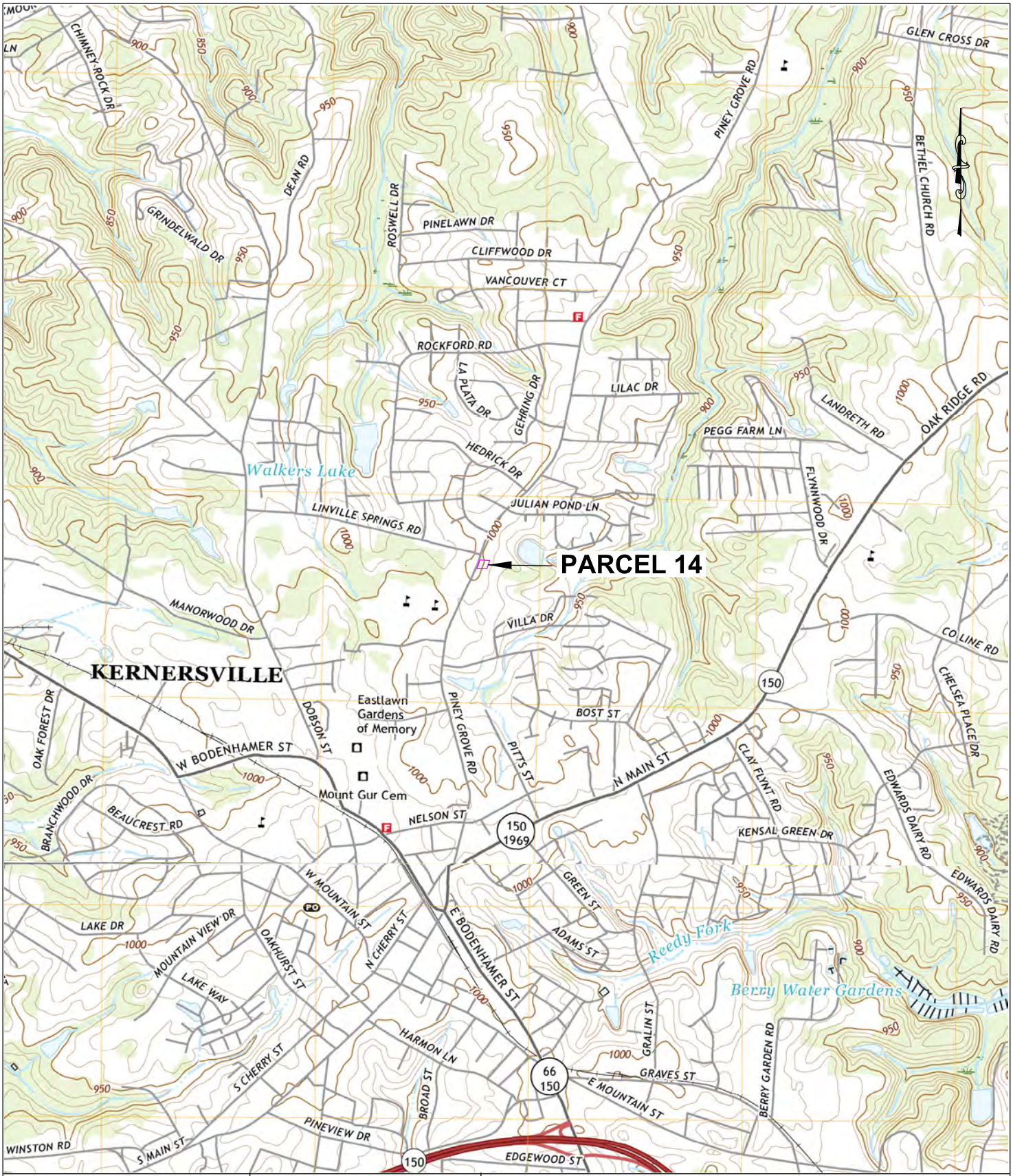
Phase II assessment activities indicate soil located in the area of investigation are less than previous investigations conducted in 2004. While petroleum related constituents were detected in three borings, no analytical results were greater than action levels. RED Lab's hydrocarbon fingerprints were, indicative of petroleum that has had a substantial amount of time to degrade.

6.0 RECOMMENDATIONS

SynTerra does not have technical evidence to support the need for further soil assessment at the site.

FIGURES

Science & Engineering Consultants



synTerra
148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA
PHONE 864-421-9999
www.synterracorp.com

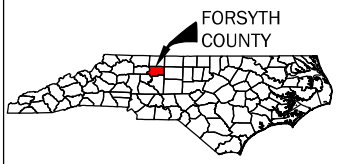
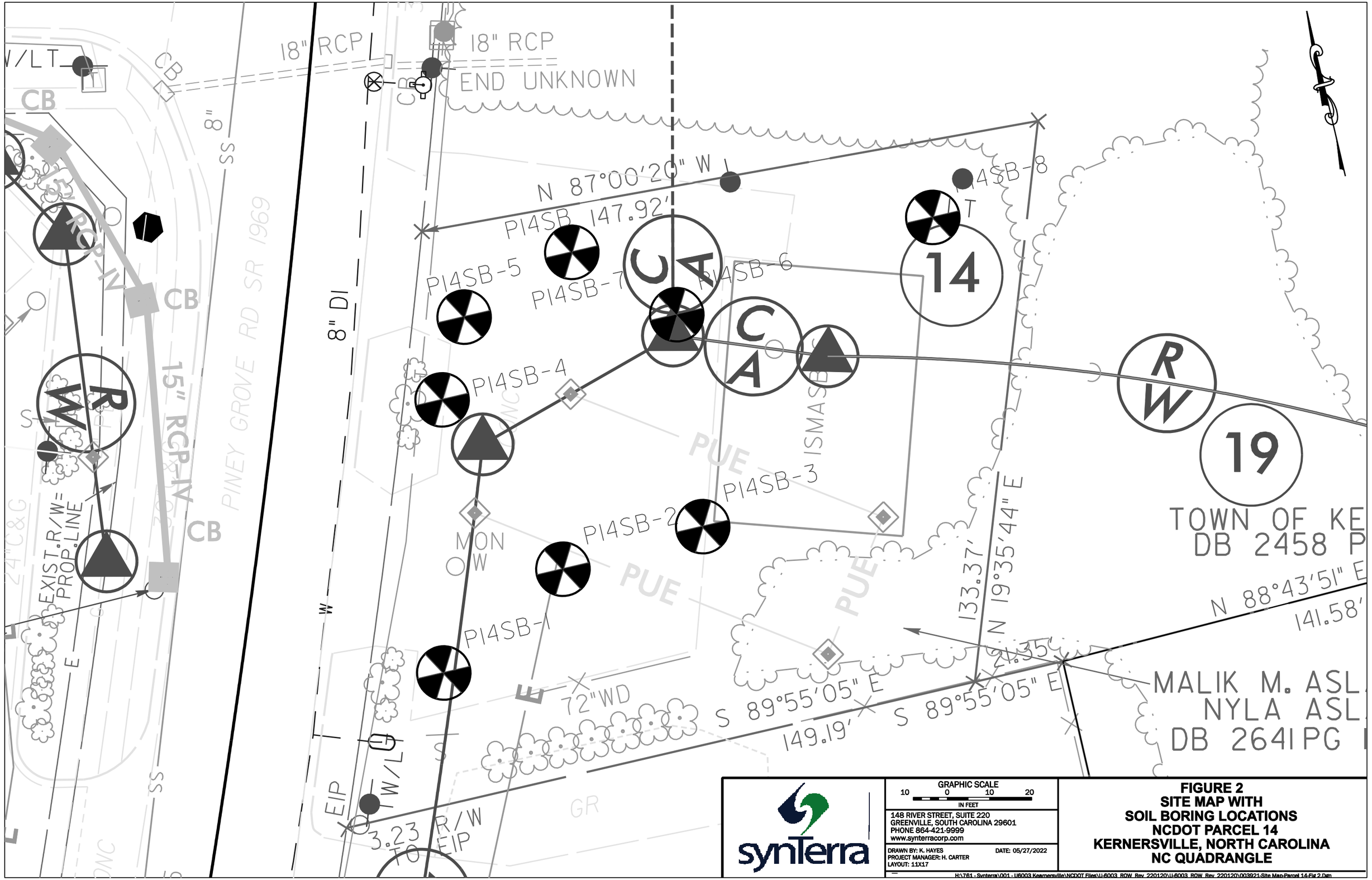


FIGURE 1
SITE LOCATION MAP
NCDOT PARCEL 14
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

DRAWN BY: C. NEWELL
PROJECT MANAGER: H. CARTER
LAYOUT: USGS
DATE: 04/19/2022
CONTOUR INTERVAL: 10 FEET
MAP DATE: 2019

GRAPHIC SCALE
1000 0 1000 2000
IN FEET

P:\NCDOT-Geoenv\00.3921.00 Kernersville Ph II\Report\Parcel 14\Dwg\003921-Site Loc-Parcel 14-Fig 1.Dgn



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GRAPHIC SCALE
10 0 10 20
IN FEET

148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA 29601
PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: K. HAYES
PROJECT MANAGER: H. CARTER
LAYOUT: 11X17
DATE: 05/27/2022

H:\761 - Synterra\001 - U6003 Kernersville\NCDOT Files\U-6003_ROW_Rev_220120\U-6003_ROW_Rev_220120\003921-Site Map-Parcel 14-Fig 2.Dgn

FIGURE 2
SITE MAP WITH
SOIL BORING LOCATIONS
NCDOT PARCEL 14
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

...\003921-Site Map-Parcel 14-Fig 5/27/2022 11:28:51 AM

SITE MAP WITH

P14 SB-4 (6-8)	
BTEX (C6 - C9)	<0.52
GRO (C5 - C10)	0.81
DRO (C10 - C35)	<0.52
TPH (C5 - C35)	0.81
Total Aromatics (C10-C35)	<0.1
17 EPA PAHs	<0.17
Benzo(a)pyrene	<0.021

P14 SB--5 (6-8)	
BTEX (C6 - C9)	<0.55
GRO (C5 - C10)	<0.55
DRO (C10 - C35)	<0.55
TPH (C5 - C35)	<0.55
Total Aromatics (C10-C35)	<0.11
18 EPA PAHs	<0.17
Benzo(a)pyrene	<0.022

P14 SB-7 (6-8)	
BTEX (C6 - C9)	<0.55
GRO (C5 - C10)	<0.55
DRO (C10 - C35)	<0.55
TPH (C5 - C35)	<0.55
Total Aromatics (C10-C35)	<0.11
19 EPA PAHs	<0.17
Benzo(a)pyrene	<0.022

P14 SB-6 (8-10)	
BTEX (C6 - C9)	<0.63
GRO (C5 - C10)	<0.63
DRO (C10 - C35)	<0.63
TPH (C5 - C35)	<0.63
Total Aromatics (C10-C35)	<0.13
18 EPA PAHs	<0.2
Benzo(a)pyrene	<0.025

P14 SB-8 (6-8)	
BTEX (C6 - C9)	<0.24
GRO (C5 - C10)	0.48
DRO (C10 - C35)	0.24
TPH (C5 - C35)	0.72
Total Aromatics (C10-C35)	0.23
19 EPA PAHs	<0.08
Benzo(a)pyrene	<0.01

P14 SB-2 (8-10)	
BTEX (C6 - C9)	<0.28
GRO (C5 - C10)	<0.28
DRO (C10 - C35)	<0.28
TPH (C5 - C35)	<0.28
Total Aromatics (C10-C35)	<0.06
16 EPA PAHs	<0.09
Benzo(a)pyrene	<0.011

P14 SB-1 (8-10)	
BTEX (C6 - C9)	<0.57
GRO (C5 - C10)	<0.57
DRO (C10 - C35)	<0.57
TPH (C5 - C35)	<0.57
Total Aromatics (C10-C35)	<0.11
16 EPA PAHs	<0.18
Benzo(a)pyrene	<0.023

P14 SB-3 (4-6)	
BTEX (C6 - C9)	<0.55
GRO (C5 - C10)	<0.55
DRO (C10 - C35)	0.55
TPH (C5 - C35)	0.55
Total Aromatics (C10-C35)	0.46
17 EPA PAHs	<0.17
Benzo(a)pyrene	<0.022

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GRAPHIC SCALE
10 0 10 20
IN FEET

148 RIVER STREET, SUITE 220
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PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: K. HAYES
PROJECT MANAGER: H. CARTER
LAYOUT: 11X17
DATE: 05/27/2022

FIGURE 3
SITE MAP WITH ANALYTICAL DATA
NCDOT PARCEL 14
KERNERSVILLE, NORTH CAROLINA
NC QUADRANGLE

H:\761 - Synterra\001 - U6003 Kearnersville\NCDOT Files\U-6003_ROW_Rev_220120\U-6003_ROW_Rev_220120\003921-Site Map-Parcel 14-Fig 3.Dgn

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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (IP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign
- Well
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream (JS)
- Buffer Zone 1 (BZ 1)
- Buffer Zone 2 (BZ 2)
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch (FLOW)
- False Sump

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line
- New Right of Way Line with Pin and Cap
- New Right of Way Line with Concrete or Granite R/W Marker
- New Control of Access Line with Concrete C/A Marker
- Existing Control of Access
- New Control of Access
- Existing Easement Line (E)
- New Temporary Construction Easement (E)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub

- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer (S)

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (T)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) (W)
- U/G Water Line LOS C (S.U.E*) (W)
- U/G Water Line LOS D (S.U.E*) (W)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (TV)
- TV Tower
- U/G TV Cable Hand Hole
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (S.U.E.*) (G)
- Above Ground Gas Line (A/G Gas)

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (UNL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

synTerra

NO SCALE

148 RIVER STREET, SUITE 220
GREENVILLE, SOUTH CAROLINA 29601
PHONE 864-421-9999
www.synterracorp.com

DRAWN BY: C. NEWELL
DATE: 04/22/2022
PROJECT MANAGER: H. CARTER
LAYOUT: FIGURE 3

08/17/2021 4:57 PM P:\NCDOT-Geoenv\00.3921.00 Kernersville Ph II\Report\Parcel 14\Dwg\003921-LEGEND-Parcel 14-Fig 3.Dgn

FIGURE 4
LEGEND SHEET
NCDOT PARCEL 2
KERNERSVILLE, NORTH CAROLINA

TABLES

synTerra

Science & Engineering Consultants

Table 1
Approximate Soil Boring Locations
Phase II Investigation Report Parcel 14
Kernersville, North Carolina

Boring Identification	Northing (feet)	Easting (feet)
P14SB-1	870862.32	1684204.23
P14SB-2	870879.78	1684237.24
P14SB-3	870882.04	1684271.69
P14SB-4	870925.24	1684218.56
P14SB-5	870943.10	1684228.09
P14SB-6	870932.02	1684277.15
P14SB-7	870952.20	1684256.35
P14SB-8	870940.78	1684341.29

Notes: Created by: JHC Checked by: EMJ

Coordinate system NAD83 NC State Plane - Survey Feet
GPS data collected using a Trimble Geo 7x handheld data collector.
A GPS device error caused a displacement in coordinate output, displacement was corrected based on select boring locations relative to known landmarks.
GPS data are approximate.

Table 2
Summary of Analytical Results
Phase II Investigation Report Parcel 14
Kernersville, North Carolina

Sample ID	PID Screening (PPM)	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	Benzo(a)pyrene	HC Fingerprint Match
P14 SB-1 (8-10)	0.0	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	PHC not detected,(P)
P14 SB-2 (8-10)	0.0	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	Residual HC
P14 SB-3 (4-6)	0.1	<0.55	<0.55	0.55	0.55	0.46	<0.17	<0.022	Deg Fuel 82.3%,(FCM)
P14 SB-4 (6-8)	0.8	<0.52	0.81	<0.52	0.81	<0.1	<0.17	<0.021	Residual HC
P14 SB--5 (6-8)	1.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	PHC not detected
P14 SB-6 (8-10)	0.5	<0.63	<0.63	<0.63	<0.63	<0.13	<0.2	<0.025	PHC not detected
P14 SB-7 (6-8)	1.2	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	Residual HC
P14 SB-8 (6-8)	3.5	<0.24	0.48	0.24	0.72	0.23	<0.08	<0.01	Deg.PHC 56%,(FCM)

Notes:

Created by: EMJ Checked by: JHC

Results generated by a QED HC-1 analyser.

Concentration values in mg/kg.

Values are not corrected for moisture or stone content.

Fingerprints provide a tentative hydrocarbon identification.

BTEX - Benzene, Toluene, Ethylbenzene, Xylene

PAH - Polycyclic aromatic hydrocarbons

TPH-GRO - Total Petroleum Hydrocarbons-Gasoline Range Organics

TPH-DRO - Total Petroleum Hydrocarbons-Diesel Range Organics

NCDEQ Action Level for TPH-GRO - 50 mg/kg

NCDEQ Action Level for TPH-DRO - 100 mg/kg

FCM - Results calculated using Fundamental Calibration Mode.

PPM - parts per million

P - Particulate present.

% - Confidence for sample fingerprint match to library.

APPENDIX A

GEOPHYSICAL SURVEY REPORT

synTerra

Science & Engineering Consultants

Technical Report

Geophysical Evaluation

NCDOT – U-6003

Piney Grove Road Kernersville, North Carolina

Prepared For:

SynTerra Corporation, Inc

Prepared By:

Geo Solutions Limited, Inc.

March 29, 2022

Geo Solutions Ltd.
P.O. Box 293
Conway, NC 27820
(252) 578-3233

March 29, 2022

Harrison Carter, PG
SynTerra Corporation
511 Keisler Drive, Suite 102
Cary, North Carolina 27518

Re: **Geophysical Evaluation – NCDOT U-6003 – Kernersville, NC**

File: Report

Dear Mr. Carter:

Geo Solutions Limited, Inc. (Geo Solutions) is pleased to submit this report to SynTerra Corporation, Inc (SynTerra) of a geophysical evaluation in support of an environmental site assessment of a North Carolina Department of Transportation (NCDOT) site located at 743 and 744 Piney Grove Road, Kernersville, North Carolina.

Background

SynTerra is completing an environmental site assessment of the NCDOT planned right of way (ROW) for a new roadway construction project know as the Kernersville Loop that will connect Piney Grove Road to NC-150 in Kernersville, NC. Two of the properties within the planned NCDOT ROW (Parcel #002 and Parcel #014) are the sites of either active or former fuel stations. As such, SynTerra contracted Geo Solutions to complete a geophysical evaluation of these properties within the proposed ROW. The objective of the geophysical evaluation was to detect and map any UST or other buried structures on these sites. Figure 1 below and at the rear of this report is a site map with the geophysical evaluation boundaries delineated.

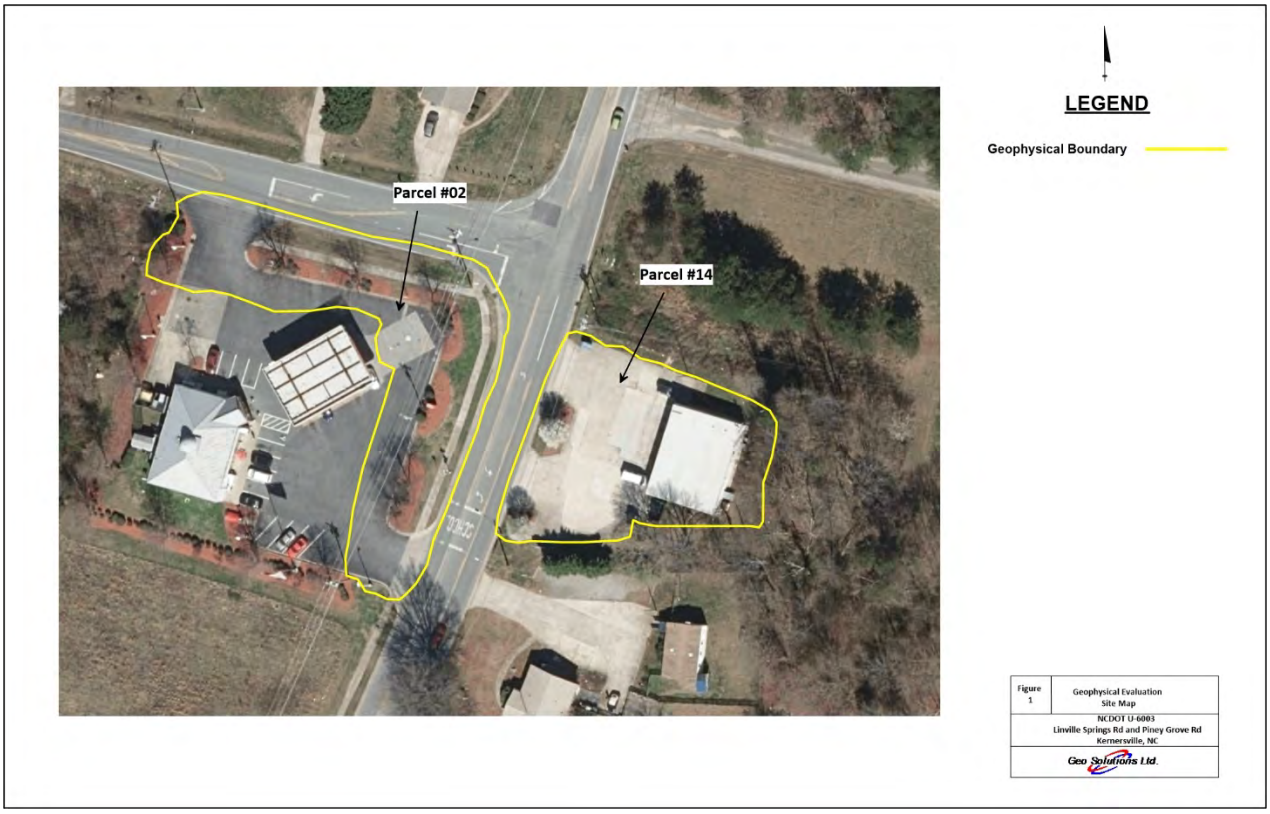


Figure 1. Site map of the area of the geophysical boundary of Parcels #002 and #014 delineated in yellow.

Technical Approach

Geo Solutions completed the evaluation utilizing two geophysical methods to investigate the two adjacent properties along Piney Grove Road in Kernersville, North Carolina. The field work for this project was completed on March 15, 2022.

Multifrequency Electromagnetic (EM) Evaluation

A high resolution electromagnetic (EM) evaluation was completed over the two sites using a Geophex Model GEM-2 multifrequency electromagnetic profiler which collects at a rate of 30 times per second. The EM data was collected on a hand-held data logger that communicated with the GEM-2 unit via Bluetooth. The GEM-2 was connected to a Hemisphere Model A-325 GPS unit which is augmented by the Wide Area Augmentation System (WAAS) and is capable of submeter accuracy. The EM profile spacing was

approximately 3 feet or less. The EM method is useful at evaluating the shallow subsurface for both metallic and non-metallic conductive materials such as steel USTs and variations in soil conductivity which may be related to former land use.

Ground-penetrating Radar (GPR) Evaluation

Geo Solutions completed a ground penetrating radar (GPR) evaluation over the two sites. Here, a GSSI SIR 4000 connected to a 400 MHz antenna mounted on a three-wheel cart was utilized. Parallel profiles spaced 3 feet or less were collected. The GPR records were post processed with GSSI Radan 7 software.

Results

Multifrequency Electromagnetic Evaluation

Geo Solutions completed an EM evaluation of the site with parallel profiles spaced approximately 3 feet apart over both sites (Figure 2). Once adequate survey coverage was achieved, the EM field data were post-processed to produce a comma separated variable (CSV) file that was then transferred to a laptop computer. These data were then processed using software developed by Geophex to calculate the apparent conductivity and in-phase values for each EM frequency collected (1470Hz, 4110 Hz, 9810 Hz, 32,190 Hz, 60000 Hz, and 90030 Hz). Typically, the in-phase data (sometimes referred to as the metal detection mode) is more representative of buried metallic materials whereas the apparent conductivity is more representative of non-metallic conductive buried materials. The apparent conductivity response can also be elevated in the presence of large metal features. By evaluating both the in-phase and apparent conductivity responses, the horizontal extents of conductive and metallic materials can be characterized. All the frequencies were evaluated and the 9,810 Hz data was chosen to create figures for this report as it provided the best contrast to background site conditions. Shown on Figure 3 and Figure 4 are the EM in-phase and apparent conductivity maps respectively with explanations for the anomalous conditions observed in the EM data. Here, anomalous conditions are shown as

orange to red and blue hues where the background site conditions are shown as light yellow and green hues. At the location of Parcel #014 the presence of reinforced concrete across the parking lot of the site caused a strong in-phase EM response. These areas of both strong negative and positive responses are typical of EM data collected over reinforced concrete. A known abandoned UST basin is present on site. The dispensers have been abandoned as well. In these areas where the excavation occurred, the area was covered over with non-reinforced concrete. At Parcel #002 a known active UST is present within the geophysical boundary. Here, the EM response was very weak in both the in-phase and apparent conductivity data. This would indicate that the UST is not constructed of steel. The UST is likely composed of fiberglass. A strong EM response was detected at the location of a metal sign and alarm system for the UST. There is another UST at the southwest side of Parcel #002 but it is located outside of the geophysical boundary and planned ROW.

Ground-penetrating Radar (GPR) Evaluation

Figure 5 is a map documenting the results of the GPR evaluation. At Parcel #014 the known abandoned UST basin, fuel line trench, and abandoned dispenser basin was delineated with pink ground-marking paint. A small anomaly was detected near the west side of the building. There were no subsurface structures detected at Parcel #014. At Parcel #002 the known active UST was detected with GPR. This appears to be a single tank with multiple fuel cells. The approximate dimensions of the UST are 14 ft x 35 ft. The footprint of the UST and vent lines were marked with pink ground paint. Appendix A. is photographic log of these site features. Shown on Figure 6 are cross sectional images of the UST basin and dispenser basin at Parcel #014. Figure 7 is a cross sectional image of the known active UST at Parcel #002.

.

Conclusions

- Geo Solutions completed a detailed EM and GPR evaluation over two parcels along Piney Grove Road in Kernersville, North Carolina where the NCDOT plans to construct a new roadway.

- A known abandoned UST and dispenser basin along with the former trench for the product lines were detected at Parcel #014.

- A known active UST was detected at Parcel #002. This UST is not constructed of steel. It is likely constructed of fiberglass.

Limitations

The detection of subsurface objects is dependent upon parameters that include size, physical composition, and depth of burial. The combination of these parameters may produce a response that is below the detection threshold for a given geophysical method. The presence of reinforced concrete limits GPR and EM detections of subsurface structures below the slabs.

Please don't hesitate to call if you have any questions concerning this report. We appreciate the opportunity to have worked with you on this project.

Very truly yours,

GEO SOLUTIONS LIMITED, INC.

John DeLoatch, PG
Project Manager

LEGEND

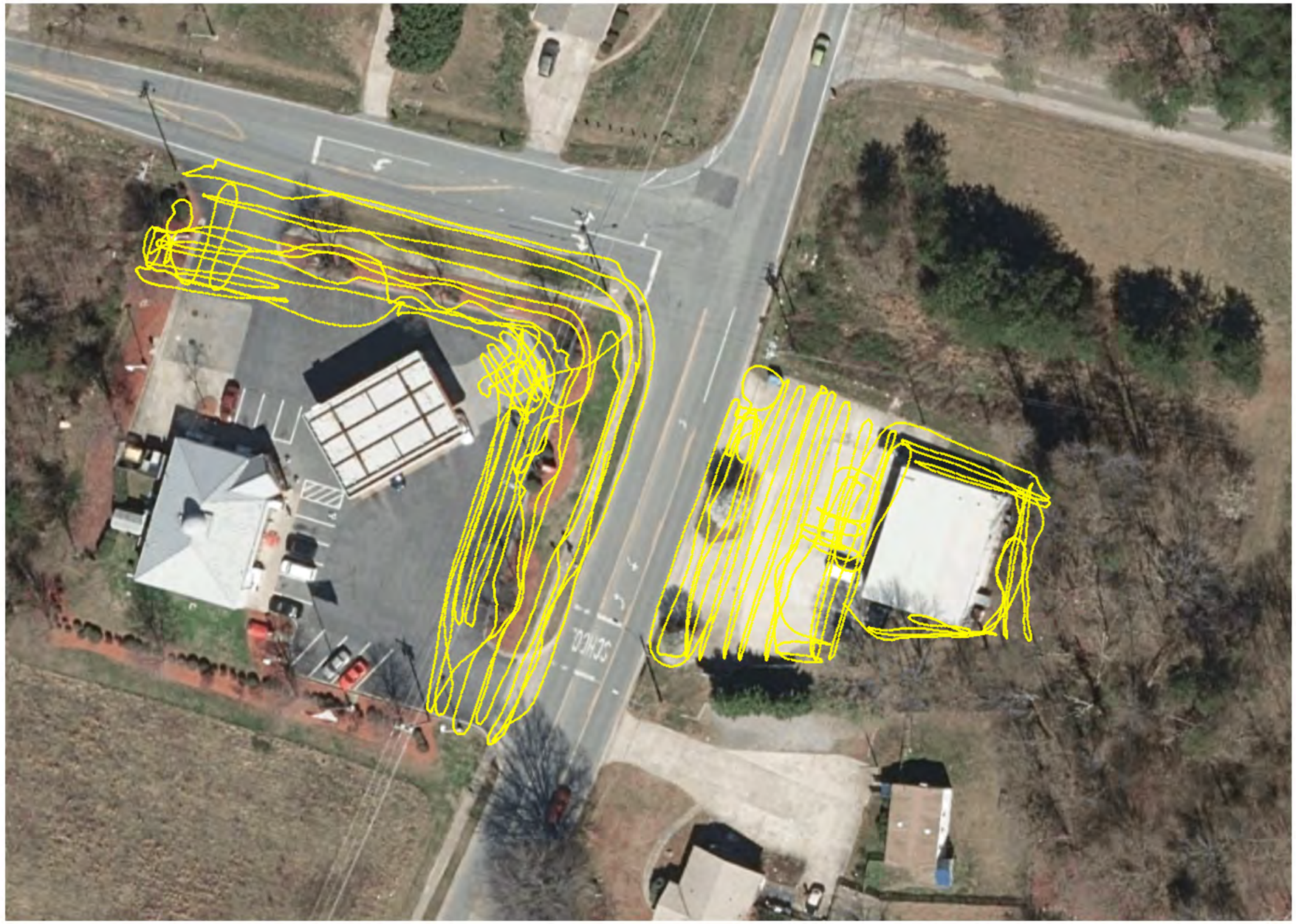
Geophysical Boundary

Map Scale (ft)

0 50 100

1" = 50'

Figure 1	Geophysical Evaluation Site Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

Indicates Location of EM Data Point

Map Scale (ft)

0 50 100

1" = 50'

Figure 2	Geophysical Evaluation EM Profile Location Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

LEGEND

9810 Hz In-phase (PPM)

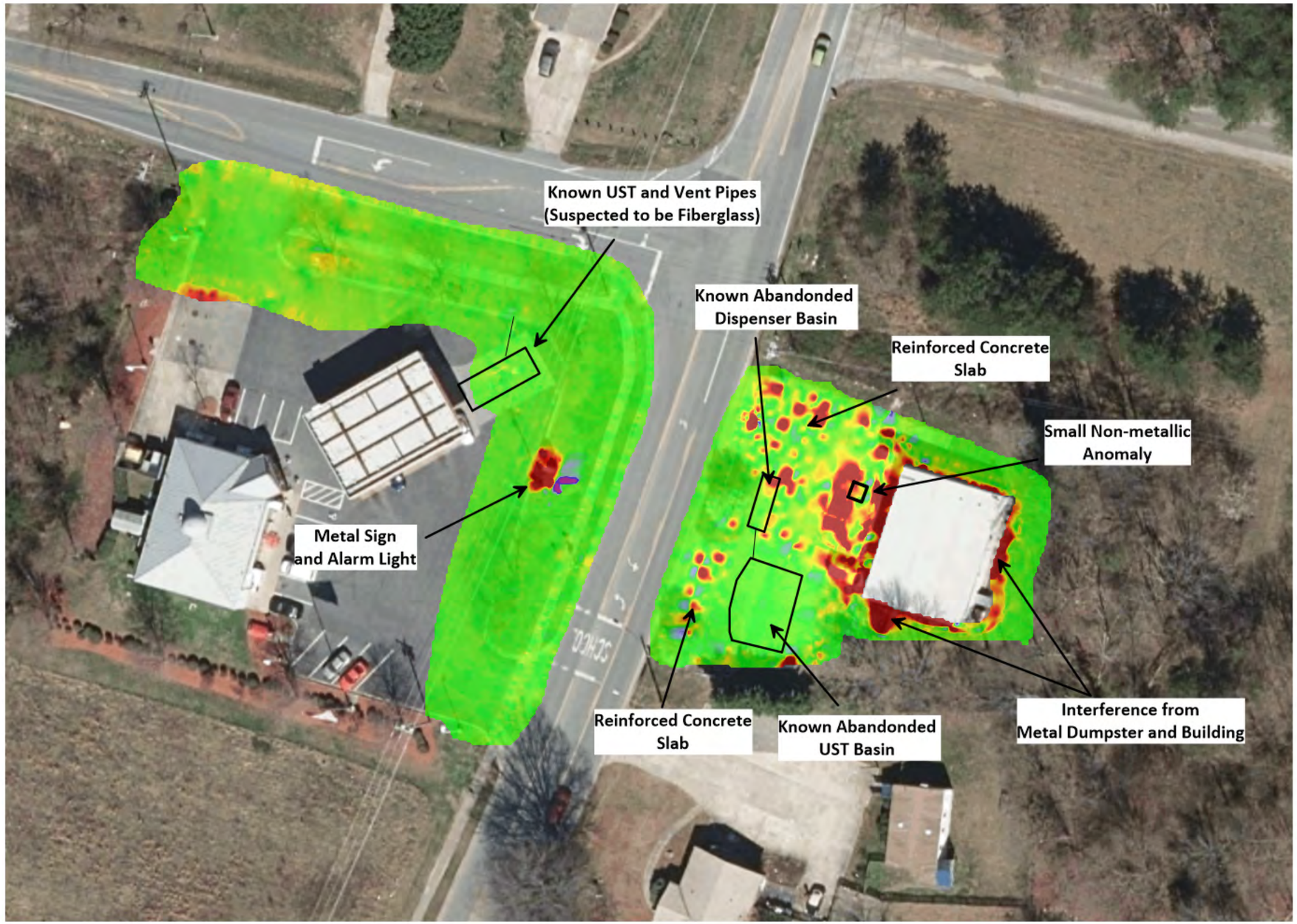
16000
14400
12800
11200
9600
8000
6400
4800
3200
1600
0
-1600
-3200
-4800
-6400
-8000
-9600
-11200
-12800
-14400
-16000

Map Scale (ft)

0 50 100

1" = 50'

Figure 3	Geophysical Evaluation EM In-phase (Metal Detection) Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

9810 Hz In-phase (PPM)

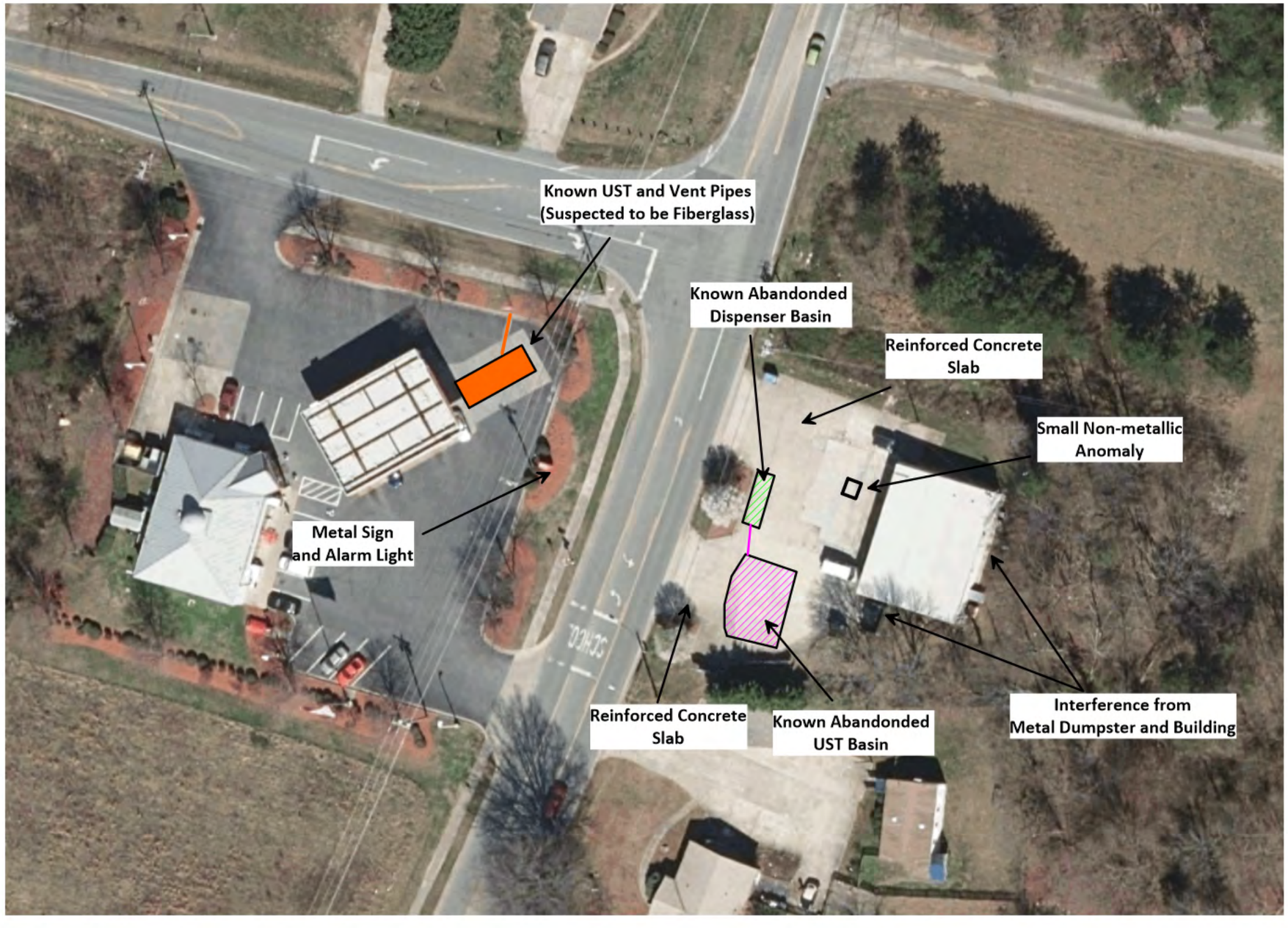
16000
14400
12800
11200
9600
8000
6400
4800
3200
1600
0
-1600
-3200
-4800
-6400
-8000
-9600
-11200
-12800
-14400
-16000

Map Scale (ft)

0 50 100

1" = 50'

Figure 4	Geophysical Evaluation EM In-phase (Metal Detection) Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	



LEGEND

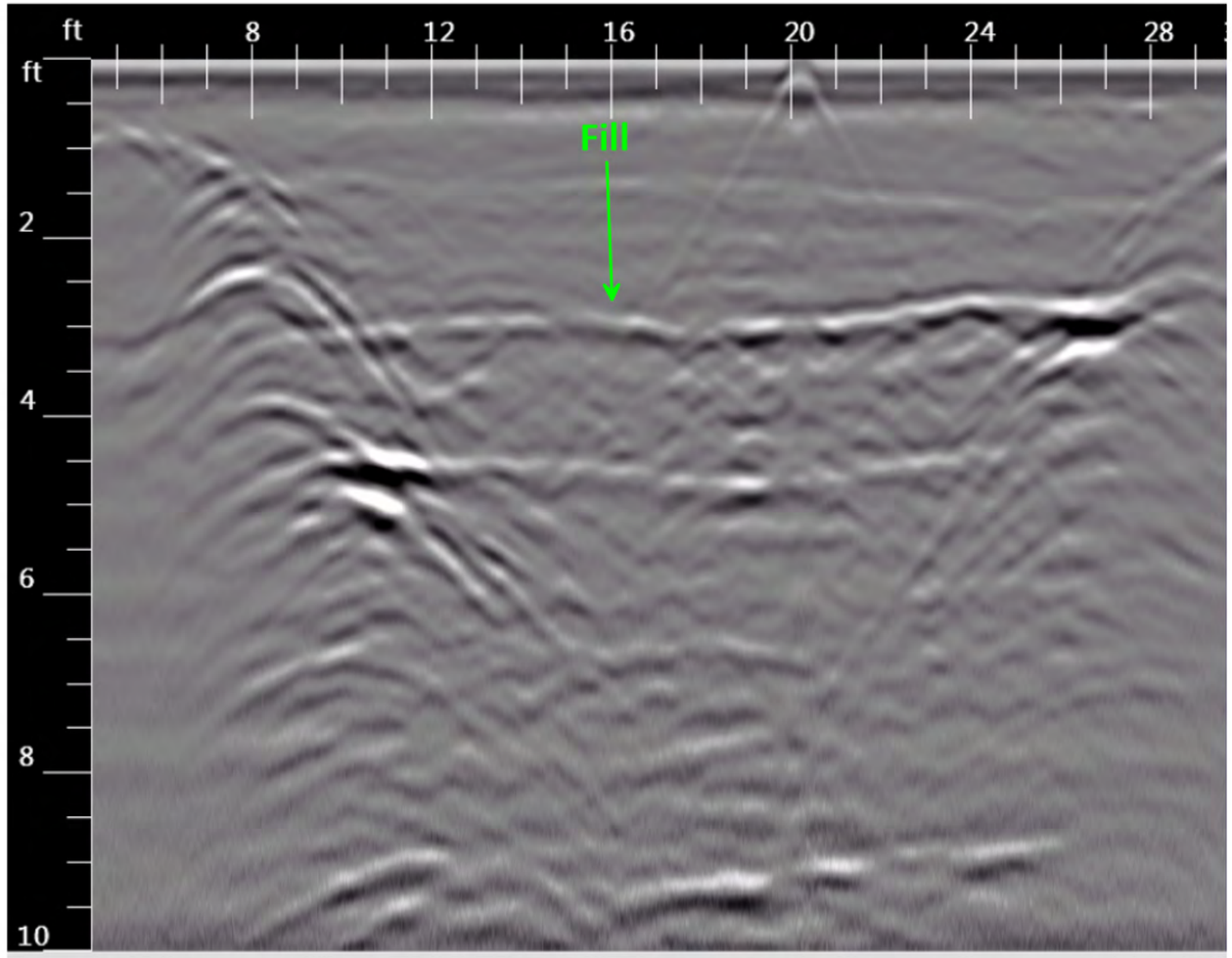
- Known UST
- Known Abandoned UST Basin
- Known Abandoned Fuel Dispenser Area
- UST Vent Lines
- Abandoned Product Lines Basin (No Lines in Place)
- Small GPR Anomaly

Map Scale (ft)

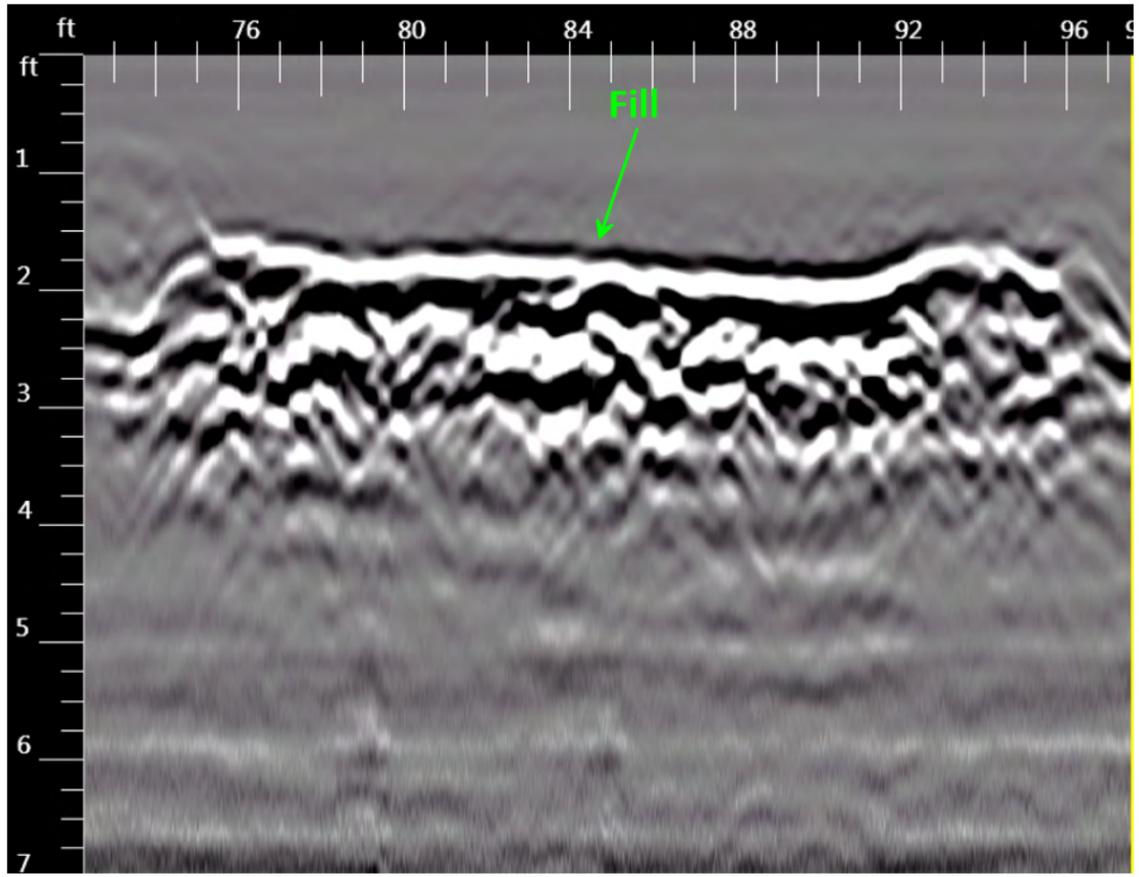
0 50 100

1" = 50'

Figure 5	Geophysical Evaluation Ground-penetrating Radar Results Map
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

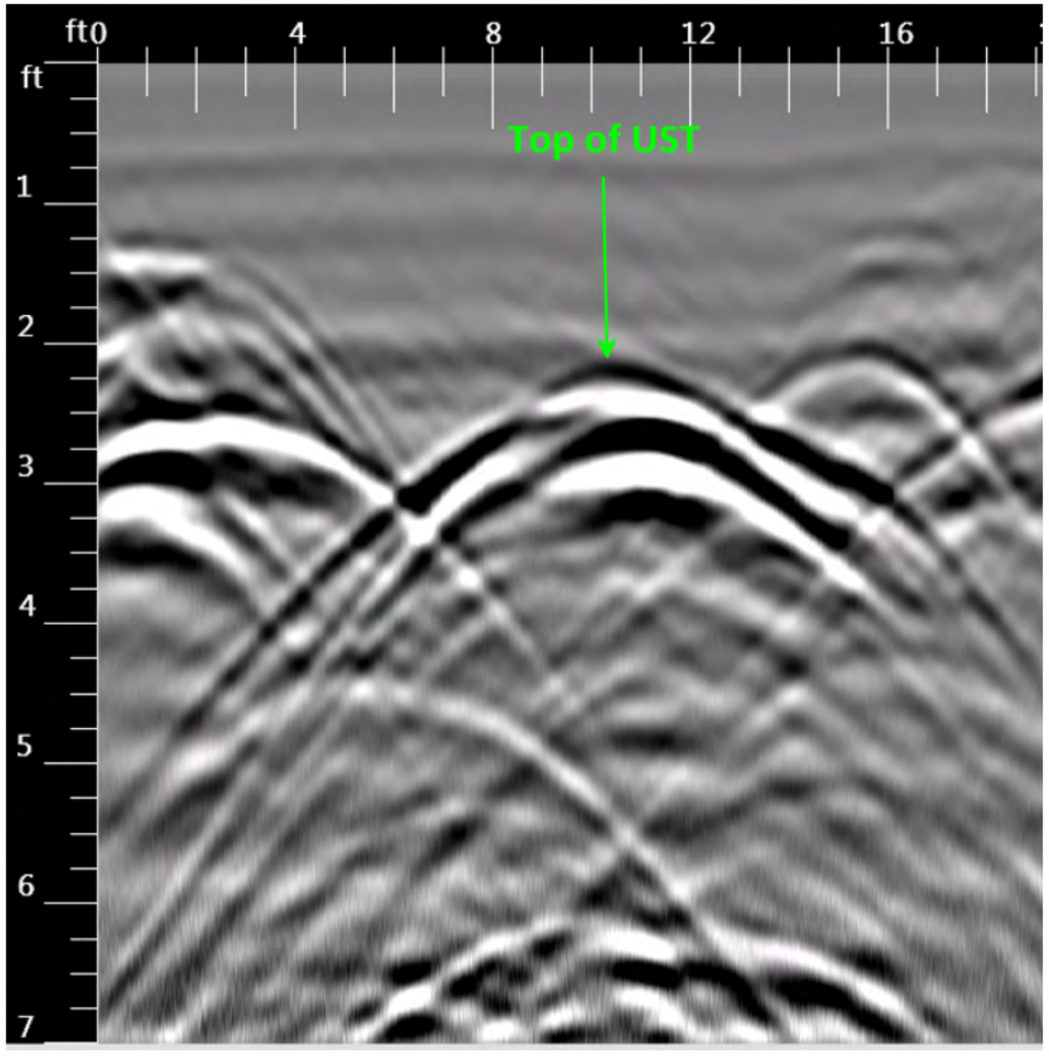


Transect collected across known abandonded UST Basin at Parcel # 014



Transect collected across known abandonded dispensers at Parcel # 014

Figure 6	Geophysical Evaluation Ground-penetrating Radar Cross Section of Known UST at Parcel # 02
	NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC
	Geo Solutions Ltd.



Transect collected across known UST at Parcel # 2.
Suspected to be composed of Fiberglass

Figure 7	Geophysical Evaluation Ground-penetrating Radar Cross Section of Known UST at Parcel # 02
NCDOT U-6003 Linville Springs Rd and Piney Grove Rd Kernersville, NC	
Geo Solutions Ltd.	

Appendix A. Draft Photograph Log – NCDOT– Kernersville, NC

Photograph 1. Known active UST at Shell Station property.

Photograph 2. Known abandoned UST Basin at the Quick Mart property.

Photograph 3. Known abandoned UST Basin look toward former fuel dispensers at the Quick Mart property.

Photograph 4. Small Anomaly at Quick Mart property.

Photograph 5. Vent line at Shell Station property.

APPENDIX B

BORING LOGS

synTerra

Science & Engineering Consultants

Project: DOT Kernersville
Project Location:
Project Number:

Boring Number P14 SB-1
Sheet 1 of 1

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
0			0.0		Clayey silt to silty clay Red & Brown mottling NO odor moist		
2			0.0				
4			0.0				
6			0.0		Sandy silt, white, moist some saprolitic texture		
8			0.0		Sampled @ - 10 1310		
10							

Project: DOT Kennerstine

Project Location:

Project Number:

Boring Number P14 SB-2

Sheet 1 of 1

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID PPM	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			0.0		Back filled Tank Pit - quarry fines - gray sand		
4			0.0		No odor		
6			0.0				
8			0.0				
10			0.0		Sampled 8-10 1320		

synTerra

Project: DOT Kernersville	Boring Number SB3
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			0.0		red silty clay, slightly moist, no odor, moist		
			0.1		↓		
4					SAA 4-5 ft gray color, slight possible Hydrocarbon odor, may be staining		Sampled 4-6 1330
			0.1				
6					light brown sandy clayey silt, saprolitic texture red + white mottling		
			0.1		↓		
8							
			0.0				
10							

synTerra

Project: DOT Kernersville	Boring Number SB-4
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
			0.3	(JHC)	Red-orange silty Clay		
			~~0.1~~				
2			—		No odor moist		
			0.0				
4			—				
			0.5				
6			—		sandy Clayey silt light Brown, saprolite ter.		Sampled 6-8 1340
			0.8				~~1350~~ (JHC)
8			—		Dk Brown, red, white mottling		
			0.6				
10							

Project: DOT Kernersville	Boring Number SB-5
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
			0.0		Same as SB-4		
2			0.1				
4			1.1				
			~~0.4~~ JHC				
6			1.8				SB-5 Sampled ~~0~~ JHC @ (6-8) 1350
8			0.3				
10							

PIH

Project: DOT Kernersville	Boring Number SB-6
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
			JHC				- this location @ anomaly
			~~0.5~~		0-3		
			0.0		Red clayey silt, most likely fill, micaceous		
2							
			0.1				
4					Gray sand - appears to be auger fines used to backfill during tank pull @ SB-2 PIH		
			0.1				
6							
			0.0		light Brown sandy clayey silt, appears to be native, saprolitic texture		
8							Sampler 6-10 1440
			0.5				
10							

P14

Project: DOT Kernersville

Project Location:

Project Number:

Boring Number SB-7

Sheet 1 of 1

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID ppm	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
2			0.1		Red silty clay, micaceous small pockets of gray sand - likely fill		
4			0.3				
6			0.7				
8			1.2		JHC Sandy ~~silt~~ Clayey silt Sap. tex, mottling, light Brown moist		Sampled 6-8 1500
10			0.2				

synTerra

P14

Project: "Dot Kennebunk"	Boring Number SB 8
Project Location:	Sheet 1 of ___
Project Number:	

Start Date	End Date	Logged By	Reviewed By
Drilling Method		Drilling Contractor	Total Depth of Borehole
Sampling Method		Groundwater Level(s)	Surface Casing Depth
Size and Type of Well Casing		Screen Interval	Ground Surface Elevation
TOC height		Location	Boring Diameter

Depth, feet	SAMPLES: Type and Number	SAMPLES: Recovery, %	SAMPLES: PID	USCS Code	MATERIAL DESCRIPTION	Well Completion Schematic	FIELD NOTES AND WELL DETAILS
			0.9		Silty Red Clay, moist No odor		Behind Bldg
2			0.9				
4			0.6				
6			~~0.~~				Sampled 6-8 1530
8			3.5				
			1.7		Darker Brown		
			~~3.~~				
10					~~Sandy~~		

synTerra

APPENDIX C

LABORATORY REPORT

synTerra

Science & Engineering Consultants

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: SYNTERRA
Address:

Samples taken 3/31/22-4/1/22
Samples extracted 3/31/22-4/1/22
Samples analysed Wednesday, April 6, 2022

Contact: HARRISON CARTER

Operator TORI KELLY

Project: DOT KERNERSVILLE

U04049

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	P14 SB-1 (8-10)	22.6	<0.57	<0.57	<0.57	<0.57	<0.11	<0.18	<0.023	0	0	0	PHC not detected,(P)
s	P14 SB-2 (8-10)	11.2	<0.28	<0.28	<0.28	<0.28	<0.06	<0.09	<0.011	0	0	0	Residual HC
s	P14 SB-3 (4-6)	21.8	<0.55	<0.55	0.55	0.55	0.46	<0.17	<0.022	0	84.6	15.4	Deg Fuel 82.3%,(FCM)
s	P14 SB-4 (6-8)	20.6	<0.52	0.81	<0.52	0.81	<0.1	<0.17	<0.021	100	0	0	Residual HC
s	P14 SB--5 (6-8)	21.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	0	0	0	PHC not detected
s	P14 SB-6 (8-10)	25.0	<0.63	<0.63	<0.63	<0.63	<0.13	<0.2	<0.025	0	0	0	PHC not detected
s	P14 SB-7 (6-8)	21.8	<0.55	<0.55	<0.55	<0.55	<0.11	<0.17	<0.022	97.6	2.4	0	Residual HC
s	P14 SB-8 (6-8)	9.5	<0.24	0.48	0.24	0.72	0.23	<0.08	<0.01	75.7	20.4	3.8	Deg.PHC 56%,(FCM)
s	P2 SB-1 (8-10)	11.2	<0.28	<0.28	<0.28	0.27	0.27	<0.09	<0.011	0	66.2	33.8	Residual HC
s	P2 SB-2 (0-2)	9.9	<0.25	<0.25	0.25	0.25	0.16	<0.08	<0.01	0	39.8	60.2	,(FCM),(BO),(P)

Initial Calibrator QC check OK Final FCM QC Check OK 97.5 %

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

SynTerra Note - P14 Samples are from NCDOT Parcel 014
P2 Samples are from NCDOT Parcel 002

QED

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QROS

Hydrocarbon Analysis Results

Client: SYNTERRA
Address:

Samples taken 3/31/22-4/1/22
Samples extracted 3/31/22-4/1/22
Samples analysed Wednesday, April 6, 2022

Contact: HARRISON CARTER

Operator TORI KELLY

Project: DOT KERNERSVILLE

U04049

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	P2 SB-3 (0-2)	18.4	<0.46	4.9	15.1	20	7.3	0.8	<0.018	44.5	47.2	8.3	Road Tar 77%,(FCM)
s	P2 SB-3 (8-10)	23.0	143.4	742.5	447.3	1189.8	740.2	28.8	0.029	98	1.8	0.2	No Match found
s	P2 SB-4 (8-10)	21.1	<0.53	<0.53	0.53	0.53	0.32	<0.17	<0.021	74.8	18.7	6.5	74.2%,(FCM)
s	P2 SB-5 (8-10)	22.8	<0.57	<0.57	<0.57	0.36	0.36	<0.18	<0.023	0	100	0	Residual HC,(P)

Initial Calibrator QC check OK Final FCM QC Check OK 98.8 %

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

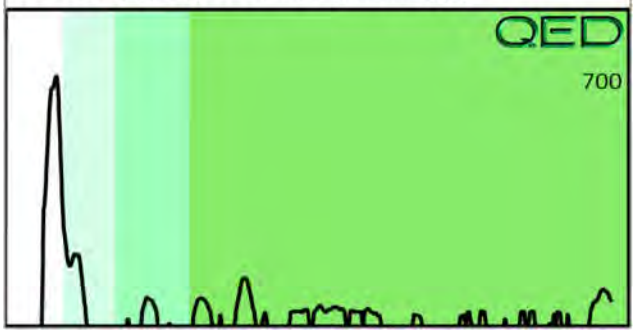
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

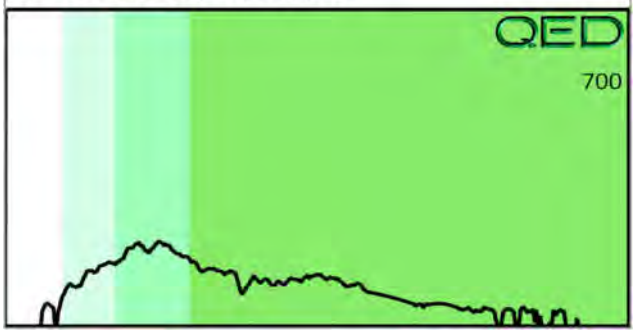
QED Hydrocarbon Fingerprints

Project: DOT KERNERSVILLE ##################

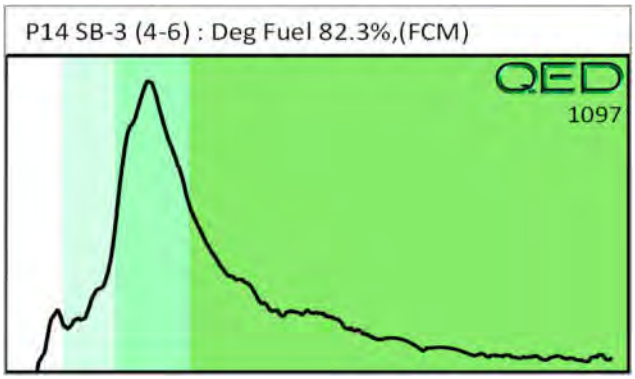
P14 SB-1 (8-10) : PHC not detected,(P)



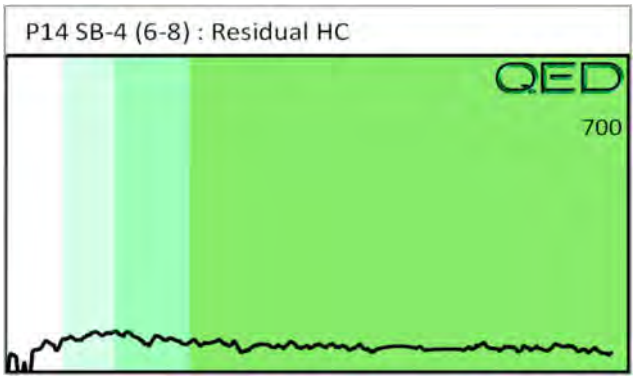
P14 SB-2 (8-10) : Residual HC



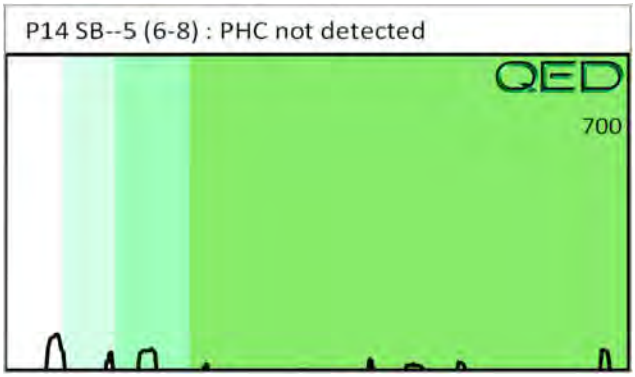
P14 SB-3 (4-6) : Deg Fuel 82.3%,(FCM)



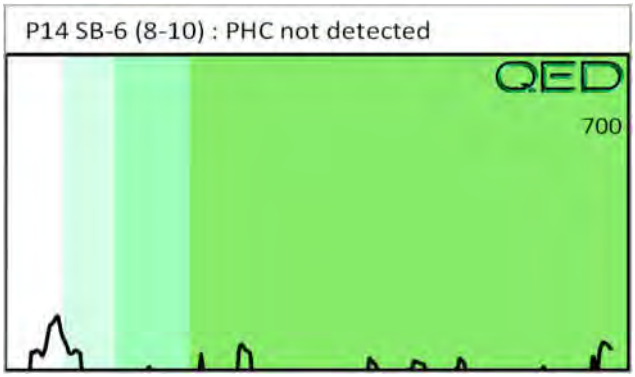
P14 SB-4 (6-8) : Residual HC



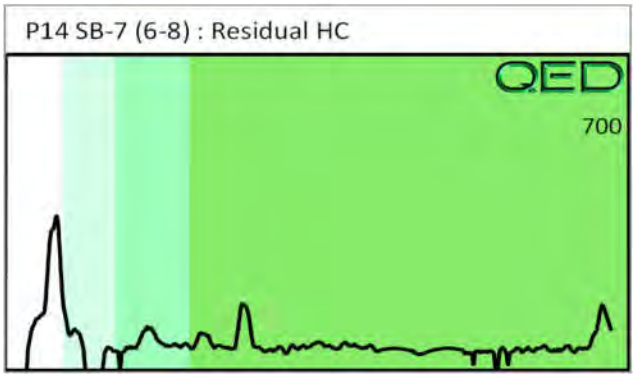
P14 SB--5 (6-8) : PHC not detected



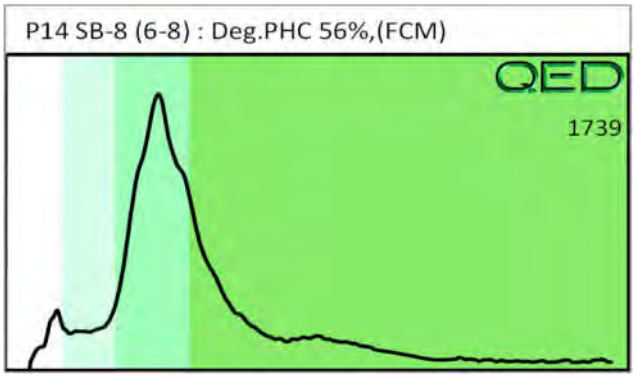
P14 SB-6 (8-10) : PHC not detected



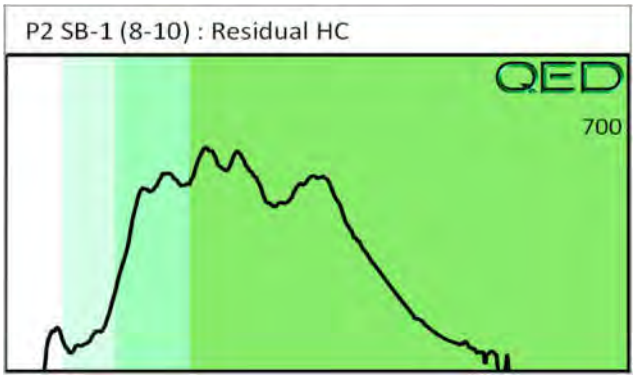
P14 SB-7 (6-8) : Residual HC



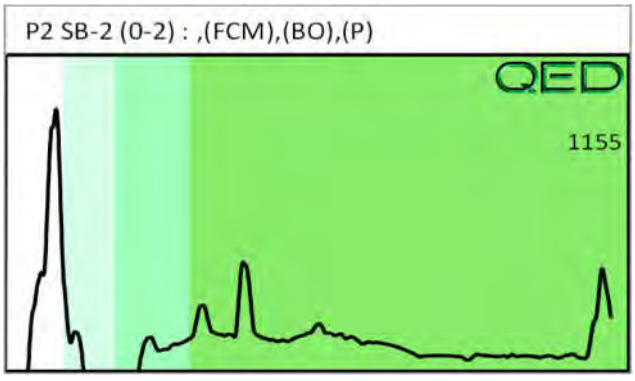
P14 SB-8 (6-8) : Deg.PHC 56%,(FCM)



P2 SB-1 (8-10) : Residual HC



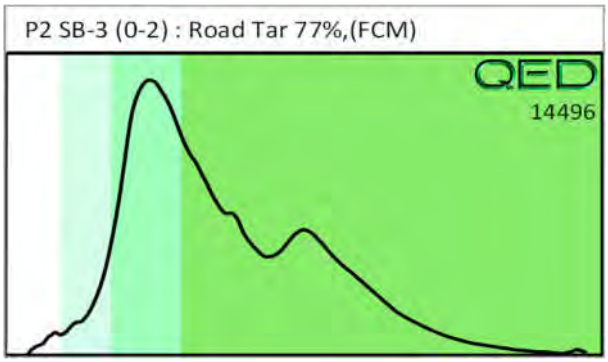
P2 SB-2 (0-2) : ,(FCM),(BO),(P)

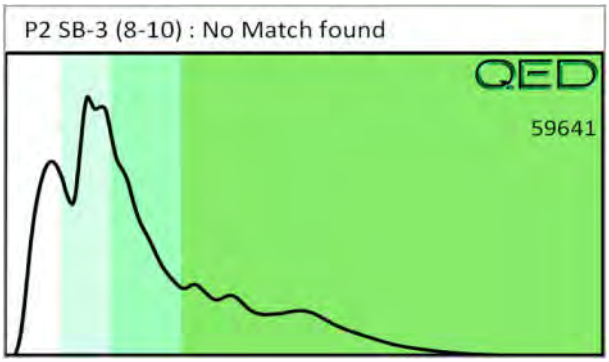


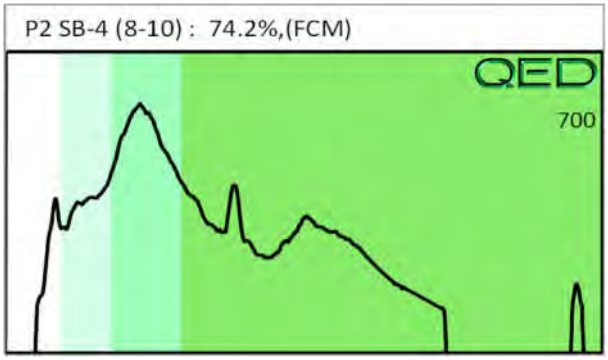
QED Hydrocarbon Fingerprints

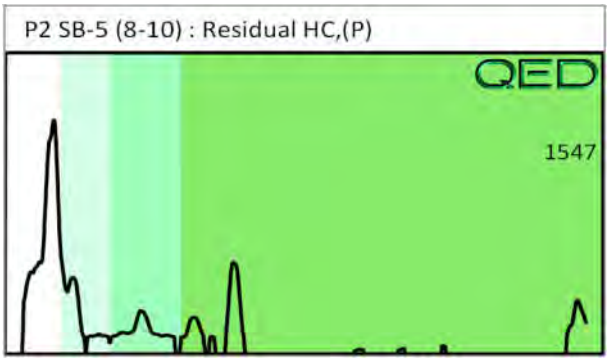
Project: DOT KERNERSVILLE

Wednesday, April 6, 2022









Client Name:	Synterra
Address:	
Contact:	Harrison Carter
Project Ref.:	DOT Kernersville
Email:	HCarter@Synterracorp.com
Phone #:	704-661-0634
Collected by:	H. Carter

REDLAB™
RAPID ENVIRONMENTAL DIAGNOSTICS

CHAIN OF CUSTODY AND ANALYTICAL REQUEST FORM

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

Each UVF sample will be analyzed for total BTEX, GRO, DRO, TPH, PAH total aromatics and BaP. Standard GC Analyses are for BTEX and Chlorinated Solvents: VC, 1,1 DCE, 1,2 cis DCE, 1,2 trans DCE, TCE, and PCE. Specify target analytes in the space provided below.

Sample Collection Date/Time	TAT Requested 24 Hour	TAT Requested 48 Hour	Analysis Type UVF	Analysis Type GC	Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
3/31 1310						P14SB-1 (8-10)	51.5	40.0	11.5
1320						P14SB-2 (8-10)	52.6	40.1	12.5
1330						P14SB-3 (4-6)	51.9	40.0	11.9
1340						P14SB-4 (6-8)	52.5	39.9	12.6
1350						P14SB-5 (6-8)	51.9	40.0	11.9
1440						P14SB-6 (8-10)	50.5	40.1	10.4
1506						P14SB-7 (6-8)	51.9	40.0	11.9
1530						P14SB-8 (6-8)	54.8	40.1	14.7
4/1 0820						P2SB-1 (8-10)	52.6	40.1	12.5
0840						P2SB-2 (0-2)	54.0	39.9	14.1
0855						P2SB-3 (0-2)	48.5	39.9	18.6
0900						P2SB-3 (8-10)	51.3	40.0	11.3
0930						P2SB-4 (8-10)	52.4	40.1	12.3
0950						P2SB-5 (8-10)	51.6	40.2	11.4

COMMENTS/REQUESTS:

TARGET GC/UVF ANALYTES:

Relinquished by		Accepted by	Date/Time
[signature]	1550	FedEx	1550 4/4
Relinquished by		Accepted by	Date/Time
		MM 4/5/22	1500

RED Lab USE ONLY
3-2022-2 14
Ref. No

TRANSMITTAL

To: W. Al Blanton, PE, PLS, Project Team Lead
NCDOT Division 9 – Project Development

From: Mark L. Reep, PE
Senior Project Engineer
HDR

Subject: Final GeoEnvironmental Report for Planning for U-6003
Kernersville Loop, Piney Grove Road (SR 1969) to NC 150 (North Main Street)
Kernersville, Forsyth County

Date: May 31, 2018

Attached is the Final GeoEnvironmental Report for the subject project.

For additional information, please contact me at mark.reep@hdrinc.com or 919-900-1635 or Phillip Rogers at phillip.rogers@hdrinc.com.

MR/

cc: Connie K. James, PE, Project Engineer

hdrinc.com

555 Fayetteville Street, Suite 900, Raleigh, NC 27601
T 919.232.6600 **F** 919.232.6642

Hazardous Materials Report

HDR's GeoEnvironmental staff have investigated the above referenced project to identify hazardous material sites for inclusion in the environmental document.

HAZARDOUS MATERIALS EVALUATION

Purpose

The main purpose of this investigation is to identify properties within the project study area that are or may be contaminated and therefore result in increased project costs and future liability if acquired by the Department. Hazardous material impacts may include, but are not limited to, active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dumpsites.

Techniques/Methodologies

Geographic Information System (GIS) was consulted to identify known sites of concern in relation to the project corridor. U-6003 consists of improving Piney Grove Road access to a two-lane facility with bicycle and pedestrian accommodations that would connect Piney Grove Road (SR 1969) and N. Main Street (NC 150) in Kernersville, Forsyth County, North Carolina. The purpose of the project is to relieve congestion and improve traffic operations.

HDR personnel also conducted a field reconnaissance along the above mentioned project limits on 1/22/2018. An Environmental Risk Information Services (ERIS) search of appropriate environmental agencies' databases, historic aerials, topographic maps, city directory as well as physical properties data assisted in evaluating sites identified during this study.

Findings

This section presents the results of an initial hazardous material evaluation conducted along the above referenced project corridor. The table below depicts sites with historic or current business practices of environmental concern. Those deemed as areas of concern have been further evaluated in the following pages.

Site No. (from west to east)	Site Address / Name	Potential Concern	Risk	Database Records / Additional Information
1	743 Piney Grove Road – Quality Mart/ Shell / Piney Grove Hardware	LUST(s) / Current Business	Moderate	UST Registry/Site Reconnaissance
2	744 Piney Grove Road – The Pantry 278 / AAA Quick Mart	LUST(s) / Current Business	Moderate	UST Registry/Site Reconnaissance
3	Villa Drive – Winston-Salem Collection	Spills / Current Business	Low	Site Reconnaissance
4	1025 N. Main Street – County Line Grocery/ K&L Grab-N-Go	UST(s) / Current Business	Low	UST Registry/Site Reconnaissance
5	933 N. Main Street – Hubbard Transmission & Auto Repair	Current Business	Low	Site Reconnaissance

UST Facilities
Based on the HDR study, three (3) sites may contain petroleum USTs and/or contamination concerns from past UST/AST's within the project limits.

Hazardous Waste Sites

Based on our study, none of the aforementioned sites were known as a Hazardous Waste Site as identified near the project corridor. Kernersville Rubber Dump is located close to the city center at 231 Green Street, but was not further evaluated due to gradient and distance from the project corridor.

Landfills

No apparent landfills were identified within the project limits.

Drycleaners

No apparent drycleaners were identified within the project limits.

Other GeoEnvironmental Concerns

Two (2) additional site with potential GeoEnvironmental concerns were further identified within the project corridor. These included an auto transmission auto repair business as well as the Winston-Salem Collection System near Villa Drive which experience numerous sanitary system overflows of varying volumes (i.e. 15-150 gallons).

These sites' presence/extent of contamination is unknown at this time, however.

Anticipated Impacts

In conclusion, five (5) potential GeoEnvironmental sites of concern were identified within the proposed project limits for further assessment and contained on the following pages for additional detail and evaluation.

HDR anticipates low to moderate monetary and potential scheduling impacts resulting from these GeoEnvironmental sites.

(See the table above, details below and the attached plan sheets)

Known and Potential Hazardous Material Sites

1) **Property Owner** **NCDOT PIN: 6887-40-0932.00**

Shell/Piney Grove Hardware/Quality Mart
743 Piney Grove Road
Kernersville, NC 27284
Facility ID: 00-2-0000016019

Quality Oil Company
Incident No. 14435

This current gas station and convenience store is located on the west side of Piney Grove Road. According to the UST Section Registry there are three (3) tanks currently onsite (1 – 12,000 gallon diesel, 1- 10,000 gallon gasoline, & 1 – 15,000 gallon gasoline tanks). The current gasoline tanks were all installed on or about March 2000 and the diesel tank on or about December 2006. A total of four (4) historic tanks (1-1,000 gallon kerosene & 3-3,000 gasoline tanks) were installed in 1967 and removed in 1994. This property appears in the Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST) and LUST TRUST database. According to the ERIS database search, groundwater has been impacted with dissolved-phase petroleum compounds which were from the former onsite UST system and extends in the upgradient, lateral and downgradient directions. Soil contamination goes to 17 feet deep, approximately 2,500 tons. Due historic and current business practice, LUST and registry database inclusion this site has been included in this report.

This site is anticipated to present moderate GeoEnvironmental impacts to the project.

2) **Property Owner**
The Pantry #278
744 Piney Grove Road
Kernersville, NC 27284
Facility ID: 00-0-000015059

NCDOT PIN: 6887-40-2970.00
Malik M & Nyla Aslam
Incident No. 30428

This current convenience store is located on the east side of Piney Grove Road. According to the UST Section Registry a total of two (2) historic tanks (2-10,000 gallon gasoline tanks) were installed in 1980 and removed in August of 2004. This property appears in the UST, LUST, LUST TRUST, and FUEL STATIONS database. According to the ERIS database search, the groundwater monitoring event conducted in May 2015 indicated a number of the 12 monitoring wells contained petroleum constituents exceeding NCDEQ 2L Standards. Groundwater data indicated a general decrease of contaminant concentration between February 2013 and January 2015, however with a "fairly small plume." The groundwater data indicated some migration of the source downgradient but the majority of the in-use water supply wells are located upgradient and side-gradient of the source area. Continued maintenance and change out of booms were recommended. Due historic business practice, LUST and registry database inclusion this site has been included in this report.

This site is anticipated to present moderate GeoEnvironmental impacts to the project.

3) **Property Owner**

Various
Between 469-489 Villa Drive
Kernersville, NC 27284

NCDOT PIN: Miscellaneous

Winston-Salem Collection System

The Winston-Salem Collection System in the proximity of the 400 block of Villa Drive in Kernersville has had multiple Sanitary Sewer Overflow (SSO) notice of violations. In September 2007, approximately 400 gallons overflowed, in April 2009 approximately 410 gallons overflowed, in November 2013 some 15 gallons overflowed, and May of 2017 approximately 150 gallons overflowed. Although, sanitary sewer based, runoff and unknown consistency has led to further inclusion and proximity to residents and the Torn of Kernersville pump station. These violations or spills have warranted registry database inclusion and due to numerous instances it has been included in this report.

This site is anticipated to present low GeoEnvironmental impacts to the project.

4) **Property Owner** **NCDOT PIN: 6886-88-3894.00**

County Line Grocery/K & L's Grab-N-Go
1025 N Main Street
Kernersville, NC 27284
Facility ID: 00-0-0000031423

Clinard Oil Company, Inc.

This current gas station and convenience store is located on the west side of North Main Street. According to the UST Section Registry there are three (3) tanks currently onsite (3 – 6,000 gallon gasoline tanks). The current gasoline tanks were all installed on or about October 1989. This property appears in the UST and FUEL STATIONS database. Due historic and current business practice, UST/FUEL STATIONS and registry database inclusion this site has been included in this report.

This site is anticipated to present low GeoEnvironmental impacts to the project.

5) **Property Owner** **NCDOT PIN: 6886-78-7548.00**

Hubbard Transmission & Auto Repair
933 N Main Street
Kernersville, NC 27284

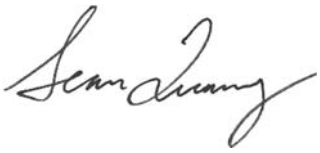
Same

This current auto service and repair business is located on the west side of North Main Street. There is no current UST Section Registry listing under this address or name, however it may be documented under different ownership or PO Box and further evaluation may be warranted. It was also not listed in any ERIS databases either. Although no spills nor registry database records were documented, this site has been included in this report based on site reconnaissance and business practice.

This site is anticipated to present low GeoEnvironmental impacts to the project.

Please note that discovery of additional sites not recorded by regulatory agencies and not reasonably discernible during the project corridor reconnaissance may occur. The GeoEnvironmental Section should be notified immediately after discovery of such sites so their potential impact(s) may be assessed.

If there are questions regarding these preliminary GeoEnvironmental concerns, please contact us at 704-338-6700.



Sean Quarry
Senior Environmental Scientist
HDR Engineering, Inc. of the Carolinas

Attachments:
Site Location
Plan Sheets

cc:
Cyrus Parker, LG, PE, CPM, GeoEnvironmental Supervisor
Mark Reep, PE – HDR – Project Manager
John Jamison – HDR – Environmental Scientist
row-notify@ncdot.gov
File

N

0 500 1,000
Feet

Surry
Stokes
Yadkin
Forsyth
Guilford
Project Location
Davie
Davidson

Project Study Area

Kernersville Town Limits

Parcel

Water Body

Macy Grove Road Extension (U-4734)

Stream/ Creek

STUDY AREA MAP
STIP U-6003
PROPOSED NEW ROUTE FROM SR 1969 (PINEY GROVE ROAD) TO NC 150 (NORTH MAIN STREET) KERNERSVILLE, FORSYTH COUNTY

MAY 2018

NC GRID
NAD 83 NA 2011

NORMAN FREEMAN

JAMES ROBERTS

KINGSTON AVE 30' PAVED

CYNTHIA LITTLE

CAROLYN OZMENT

CHARLES CARTER

CHARLES CARTER

CHARLES CARTER

CHARLES CARTER

CHARLES CARTER

DOCK

POND

VICTOR GALLARDO

MARIA BERNAL

BILLY LAWSON

CHRISTINA TILLOTSON

MICHAEL SMITH

8"VC (PROJ# 2341)

6"PL (PROJ# 20315)

S 77° 08' 31" E

S 76° 04' 08" E

S 76° 05' 16" E

N 17° 45' 50" E

N 24° 13' 08" E

BIKE LANE

L HORD

MTL CAN W/PUMPS

PAVED

QUALITY OIL COMPANY LLC QM 41

MALIK ASLAM

TOWN OF KERNERSVILLE

ANNA BROOKS

BROOKSIDE MONTESSORI SCH INC

WILLOWBROOK CARE CENTER INC

TOWN OF KERNERSVILLE

METER STATION

10"STL

GREU TL-3

JEANETTE SILVER

MADISON WILLIAMS

ROBERT MCGHAN

ROBERT MCGHAN

HOMEOWNERS ASSN IC

TOWN KERNERSVILLE

3

CARMEL CT 26' PAVED

REBECCA BREITENSTEIN

1SFD

2SFD

BRYANT KING

LARRY SANFORD

CITY OF WS

SEWER PUMP STATION

NANCY EDWARDS

TONY CAULK

AMH NC PROP LP

THOMAS VEALE

ANTHONY RAYMOND

AMH NC PROP LP

BRIAN HOSTRANDER

5'4" CMP

8" VC

12"DI (PROJ# 8231)

42" CMP

42" CMP

NC GRID
NAD 83 NA 2011

TOWN OF KERNERSVILLE

TOWN OF KERNERSVILLE

NANCY EDWARDS

8" (PROJ# 2004)

CAT-1

GREU TL-3

BIKE LANE

BIKE LANE

S 76° 05' 08.8" E

BIKE LANE

BIKE LANE

CAT-1

GREU TL-3

CAT-1

GREU TL-3

3@ 66" CMP

10"STL

8" (PROJ# 2017S)

MAMIE RIERSON

MAMIE RIERSON

10"STL

ROBERT SMITH

HTR

HTR

HTR

HTR

ISFD

E L E
NG CO INC

LN 20' PAVED

WILLIAM EDWARDS
SIMON S EDWARDS
DB 2418 PG 2778
DB 1612 PG 1113
NANCY T. EDWARDS
DB 3221 PG 3942
DB 1612 PG 1108
NC GRID
NAD 83 NA 2011
S 64°04'28.0" E
MITCHELL B EASTER
DB 1970 PG 183
N 27°53'53" E 170.75'
N 27°52'54" E 86.11'
DB 3029 PG 3824
MITCH EASTER
DB 1902 PG 1868
N 27°53'53" E
JAMES R RAGLAND SR
DB 1120 PG 1059
MITCHELL B EASTER
S 22°30'19" E 313.05'
S 45°16'58" E 150.00'
DONALD W & TIMOTHY D HUBBARD
DB 3052 PG 3793
KERNERSVILLE
FORSYTH COUNTY
DB 2078 PG 625
SILO
2SMD
EXISTING R/W
NC 150 OAK RIDGE RD 24' BST
BY-26
BY-27
MAG NAIL
12" RCP
15" RCP
TOWN OF KERNERSVILLE PERMANENT DRAINAGE EASEMENT DB 2663 PG 2830
DANNY L DILLON
DB 2663 PG 2830
DANNY L & WILLIAM B DILLON
DB 2989 PG 838
DB 684 PG 170
BACK REF:
S 24°23'19" W 208.65'
HAYWORTH-MILLER FUNERAL HOME
SIMON S & CASEY D EDWARDS
N 24°47'48" E 300.24'
S 10°28'57" E 300.00'
DANNY L DILLON
JEFF
PAULA
4
5