PRELIMINARY SITE ASSESSMENT

SR 1997 (FAYETTEVILLE ROAD) WIDENING
TIP NO. U-5797, WBS NO. 44367.1.1

NCDOT PARCEL NO. 29
OWNER: NATIONAL RETAIL PROPERTIES LP
2100 ROBERTS ROAD
LUMBERTON, ROBESON COUNTY, NORTH CAROLINA

PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
C/O STV ENGINEERS, INC.
1600 PERIMETER PARK DRIVE, SUITE 225
MORRISVILLE, NC 2756002

PREPARED BY:
FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513

PROJECT NUMBER: G19011.00
JUNE 9, 2020

FALCON ENGINEERING

June 9, 2020

Mr. Patrick Livingston, PE
STV Engineers, Inc.
900 W. Trade St, Suite 715
Charlotte, NC 28202

Re: **Preliminary Site Assessment**
SR 1997 (Fayetteville Road) Widening
TIP No. U-5797, WBS No. 44367.1.1
Parcel No. 29
Owner: National Retail Properties LP
2100 Roberts Road
Lumberton, Robeson County, North Carolina

Dear: Mr. Livingston:

Falcon is pleased to present the following Preliminary Site Assessment in support of the above-mentioned Project. Specifically, Falcon sampled soil in proximity to the project limits on this parcel in general accordance with the approved scope of work. Soils requiring remediation or special handling during construction were not identified.

Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

Please review this report and advise us if you have any questions or concerns. We appreciate this opportunity to provide services to you and look forward to partnering with you on future projects. If you have any questions, please give Falcon a call at (919) 871-0800.

Sincerely,
FALCON ENGINEERING, INC.

Christopher J. Burkhardt
Environmental Services Manager

Jeremy R. Hamm, PE
Geotechnical Services Manager

TABLE OF CONTENTS

LIST OF FIGURES AND ATTACHMENTS

SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 29. Parcel No. 29 is addressed as 2100 Roberts Road, Lumberton Robeson County, North Carolina. NCDOT is proposing to widen Fayetteville Road (SR 1997) from Farringdom Street to 22nd Street. The limits of the assessment are between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). Boring locations were placed in the vicinity of proposed excavations for drainage features, utilities, and roadway/ditch cuts to determine if soils requiring remediation or special handling were present where excavation was planned to take place.

1.2 SCOPE OF WORK

Falcon's scope of work included coordination of; public and private utility location near the proposed borings, geophysical surveys, collecting soil samples using direct push methods, and laboratory analysis. Samples were analyzed for petroleum hydro carbons via UVF technology.

SECTION 2: HISTORY

2.1 PARCEL USAGE

Falcon performed a Phase I Environmental Site Assessment (ESA) for U-5797 under Project No. G17057 dated April 2018. The ESA identified this parcel as a Recognized Environmental Condition (REC) based on the history of the parcel and adjoining parcels. Falcon contacted Mr. Joe Oliver the County Fire Marshal during the ESA to inquire about known USTs along Fayetteville Road in the general area of Parcel No. 29. Mr. Oliver sent documents pertaining to USTs that had been installed and/or removed from Nichols addressed as 3100 Fayetteville Road, Baxley's addressed as Highway 211 East, and Taco Bell addressed as Fayetteville Road and Roberts Ave. This parcel is currently a Taco Bell.

Falcon also contacted Mr. Brandon Love, City of Lumberton Director of Planning & Neighborhood Services, to request information on permits for USTs, wells, or septic systems. Mr. Love remembered the former Nichols Grocery Store being in the general area of Parcel No. 29. Historic air photographs dated 1976 through 2000 show the majority of Parcel No. 29 as a cleared lot surrounded by small and large commercial buildings. The exact location of USTs associated with the above listed facilities is unknown. UST closure documentation including soil sampling results were not available for review.

2.2 FACILITY IDENTIFICATION NUMBER

A Facility Identification Number was not identified for this parcel.

2.3 GROUNDWATER INCIDENT NUMBER

A Groundwater Incident Number was not identified for this parcel.

SECTION 3: SITE OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Groundwater monitoring wells (MWs) were not observed on this parcel.

3.2 ACTIVE USTS

Active USTs were not observed within the project limits or registered at this parcel.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

USTs, monitoring wells, remediation systems, or hydraulic lifts were not observed.

SECTION 4: METHODOLOGY

4.1 GEOPHYSICS

Pyramid Geophysical Services (Pyramid) was subcontracted to perform a geophysical survey of the assessment area. The assessment area is between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). The survey was used to locate private utility lines, as well as possible indications of USTs, and/or their pits.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings.

GPR data was acquired across select EM anomalies (where identified), using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Pyramid marked their findings on the surface with paint. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and to obtain adequate coverage. A copy of the full Geophysical Report is included in the Attachments.

4.2 BORINGS

Regional Probing was subcontracted to advance soil borings using direct push technology. Regional Probing used a truck-mounted Geoprobe® 5410 unit mounted on an off-road modified Ford F350 Diesel 4x4. The unit has auger-capabilities and is equipped with a GH-42 soil-probing hammer, with 21,700 pounds of down force and 28,900 pounds of retraction force. The unit has an on-board tank for decontaminating the geoprobe rods before advancing the probe at each sample location.

4.3 SAMPLE PROTOCOL

Prior to initiating sample collection Falcon contacted NC One Call and requested public utility locations be marked around the proposed sample locations. Sampling was in general accordance with the NC Department of Environmental Quality (DEQ) Division of Waste Management's (DWM) "Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases" (March 1, 2007 Version Change 9 – February 1, 2019) guidance document. Sampling strategy was derived based upon the project scope and objectives as outlined above. Red Lab, LLC was selected to perform the UVF laboratory analytical analysis. Appropriate sterile containers were received by Falcon from Red Lab prior to beginning the fieldwork. The containers were labeled appropriately.

A Minirae 3000 photoionization detector (PID) was used to field screen samples for volatile organics to determine if a release had occurred. The instrument was calibrated per manufacturer instructions prior to use. Falcon staff bagged composite soil samples of each boring in approximately two-foot sections. Representative samples were placed in a sealed plastic bag for approximately 10 minutes to allow soil hydrocarbons to reach equilibrium within the headspace prior to scanning with the PID. One sample per boring was collected from the depth of the proposed cut or from the section above the depth of cut with the highest PID reading.

To avoid cross contamination, a new unused pair of non-powdered nitrile gloves was worn while extracting each sample. Samples were placed in the appropriate laboratory provided containers. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used and sampling location identification. Samples were placed in an ice filled cooler and transported to the lab. Appropriate chain-of-custody procedures, including the completion of necessary forms, were followed.

SECTION 5: RESULTS

5.1 GEOPHYSICS

The geophysical investigation was performed between March 19 and March 28, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area. A total of seventeen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several EM anomalies were associated with interference from vehicles, suspected buried metallic debris, and suspected reinforced concrete and were further investigated with GPR. GPR verified the presence of metal reinforcement in the concrete on the southeastern portion of the survey area and evidence of possible utilities. No evidence of any larger structures such as USTs was observed.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced three borings (B-50, B-51, and B-53) to the proposed excavation depth of the drainage features, utilities, or roadway/ditch cut being assessed. Groundwater was not observed. Please see the Boring Location Map in the attachments for a visual depiction of the sample locations. The coordinates (latitude and longitude) that correspond to the sample locations are shown below in Table No. 1 Boring Coordinates.

TABLE NO. 1 BORING COORDINATES

Boring	Latitude	Longitude
B-50	34.6393126	-78.9994851
B-51	34.6387499	-78.9997117
B-53	34.6386503	-79.0001314

Borings were field screened with a PID in sections for evidence of volatile organics. The PID screening results are presented in Table No. 2 PID Readings. Falcon selected soil samples based on the field screening results and the needs of the project. Red Lab analyzed the selected samples and their full analytical report is attached. The results of the laboratory analysis are shown in Table No. 3 Summary of UVF Soil Sampling Results.

Petroleum hydrocarbons above State Action Levels were not detected in the samples.

TABLE NO. 2 PID READINGS

Boring	Depth BGS*	PID**
B-50	0-2.0	0.5
	2.0-4.0	**0.5**
B-51	0-2.5	0.5
	2.5-5.0	**0.4**
B-53	0-2.0	0.3
	2.0-4.0	0.1
	4-6.5	**0.8**

*BGS = Depth below ground surface in feet
**PID readings are in parts per million
Samples shown in **bold** were selected for analysis

TABLE NO. 3 SUMMARY OF UVF SOIL SAMPLING RESULTS

Sample ID	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	
B-50	<0.52	<0.52	1.6	1.6	0.91	<0.17	<0.021	0	81	19	Deg.PHC 74.4%,(FCM)
B-51	<0.25	<0.25	<0.25	<0.25	<0.05	<0.08	<0.01	0	0	100	,(FCM),(BO)
B-53	<0.26	<0.26	23.6	23.6	10.5	0.51	<0.01	0	82.2	17.8	V.Deg.PHC 96.4%,(FCM),(BO)

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious visual indications of a release (stained soils, odors, or oily sheen) were not observed. Table No. 4 Soil Observations lists visual soil observations of color and texture.

TABLE NO. 4 SOIL OBSERVATIONS

Sample ID	Depth	Color	Soil Type
B-50	0-2.0	Gray Brown	Silty Clayey Sand (A-2-6)
	2.0-4.0	Gray	Slightly Clayey Silty Sand (A-2-4)
B-51	0-2.5	Gray Brown	Silty Sandy Clay (A-6)
	2.5-5.0	Brown Tan	Sandy Clay (A-6)
B-52	0-2.0	Brown Orange	Slightly Clayey Silty Sand (A-2-4)
	2.0-4.0	Gray Brown	Silty Clayey Sand (A-2-6)
	4.0-6.0	Gray	Slightly Clayey Silty Sand (A-2-4)
	6.0-8.0	Gray Brown	Sandy Clay (A-6)
B-53	0-2.0	Gray	Slightly Clayey Silty Sand (A-2-4)
	2.0-4.0	Gray	Silty Sand (A-2-4)
	4.0-6.5	Gray	Slightly Clayey Silty Sand (A-2-4)

Depth is in feet below ground surface

5.4 QUANTITIES CALCULATIONS

Soils requiring quantity calculations were not identified.

SECTION 6: CONCLUSIONS

6.1 INTERPRETATION OF RESULTS

This Preliminary Site Assessment was performed to evaluate the soils in proximity to the project limits on this parcel for the presence of petroleum hydrocarbons. The findings are as follows:

- Soil sampling completed on the parcel did not identify contaminants in the soil at levels requiring remediation.

6.2 GEOPHYSICS

Collectively, the geophysical data did not record any evidence of unknown metallic UST's within the geophysical survey area at Parcel No. 29. Falcon does not anticipate UST's will be encountered within the project limits on this parcel during construction.

6.3 SAMPLING

Sampling results did not identify contaminates in the soil which require remediation in the areas sampled. Based on past project experience, Falcon does not anticipate soil remediation or special handling and disposal will be required during construction on this parcel.

6.4 QUANTITIES

Soils requiring quantities calculations were not identified.

SECTION 7: RECOMMENDATIONS

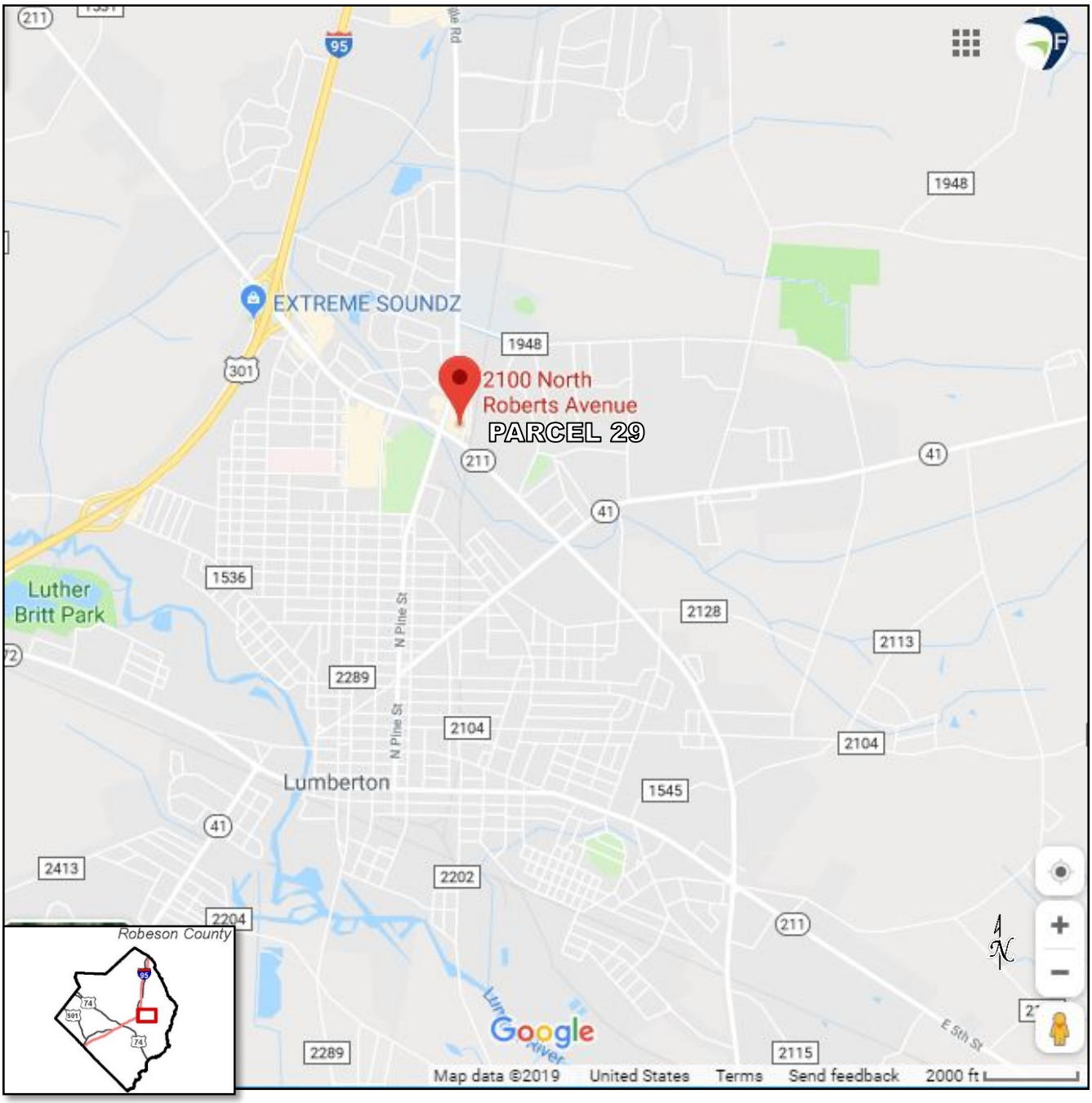
7.1 ADDITIONAL SAMPLING

Contaminants above the Industrial / Commercial Soil Cleanup Levels were not identified; therefore, additional assessment is not warranted at this time. Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

7.2 SPECIAL HANDLING OF IMPACTED SOIL

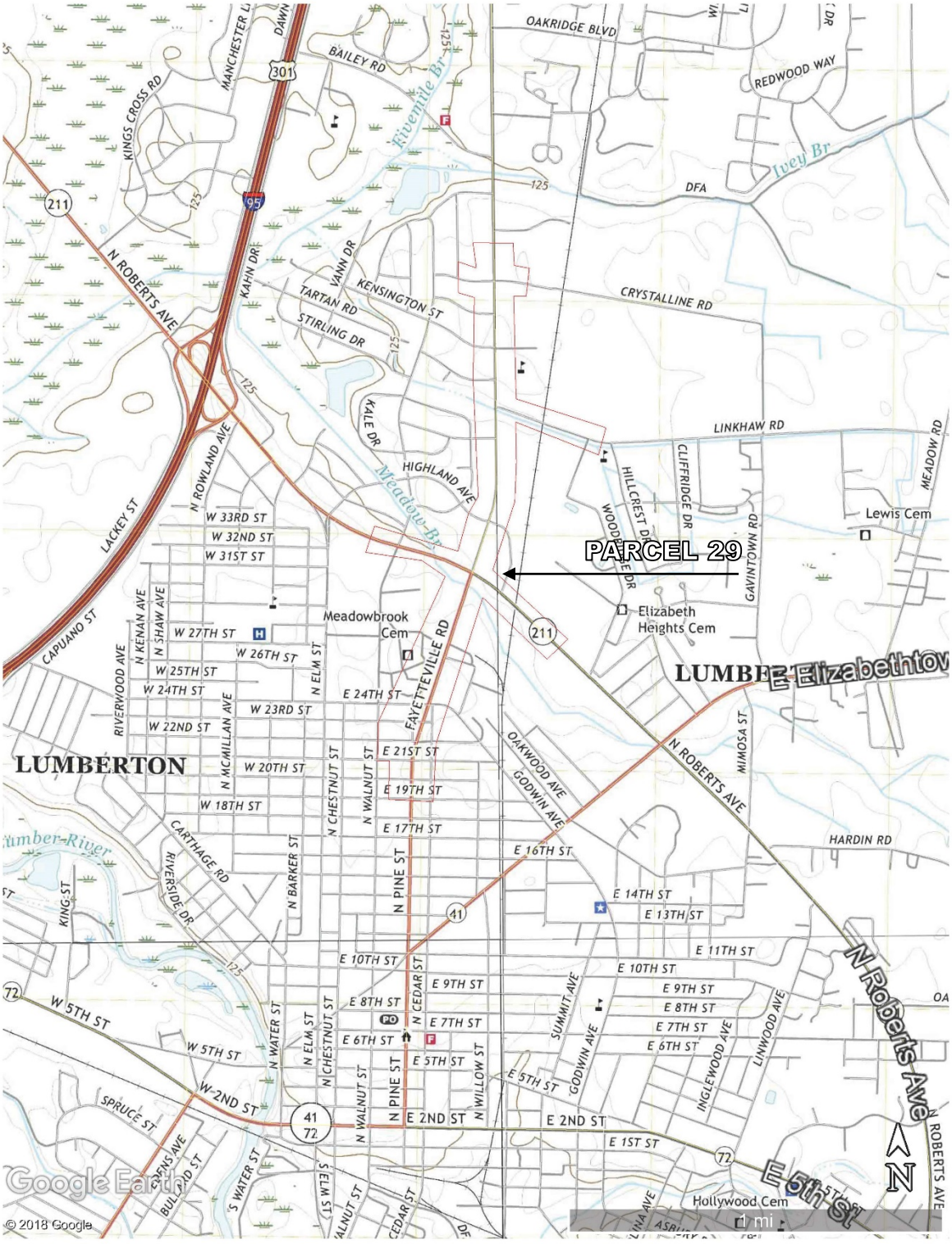
Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
Vicinity Map



Project No.: G19011.00
Date: September 2019
Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
USGS Topographic Maps



Project No.: G19011.00
Date: September 2019
Source: "NW, NE, SW, and SE Lumberton, NC" 2019

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
Parcel Location Map

September 5, 2019

County Line

City Limits

Streets

Parcels

1:2,138

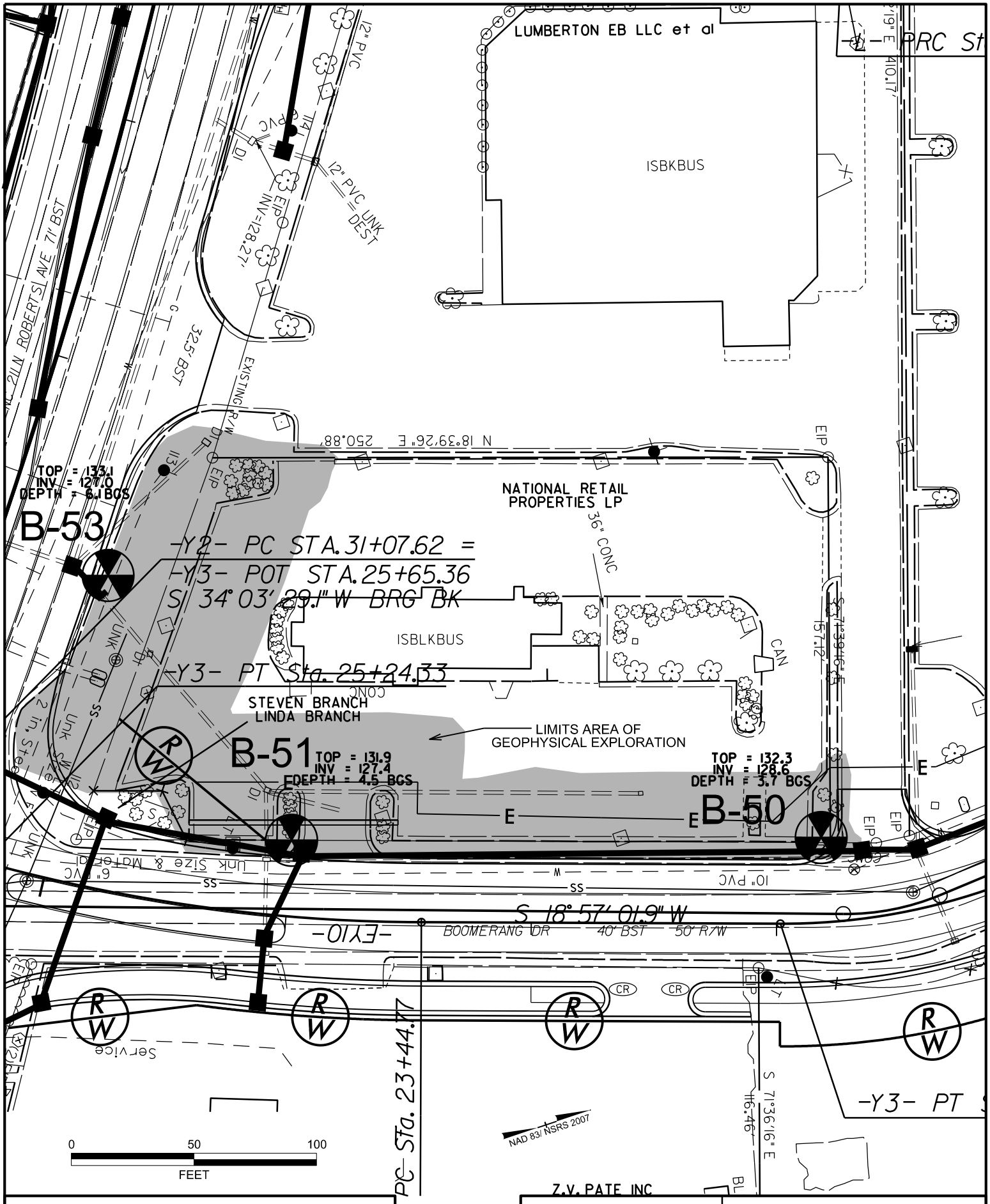
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2019

Project No.: G19011.00
Date: September 2019
Source: Robeson County GIS



NOTES:

- BGS = BELOW GROUND SURFACE

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607
PHONE: 919.871.0800
FAX: 919.871.0803

BORING LOCATION PLAN

NCDOT U-5797 (SR 1997 WIDENING)
PARCEL 29 - NATIONAL RETAIL PROPERTIES
ROBESON / LUMBERTON, NC
WBS NO.: 44367.1.1 & TIP NO.: U-5797
FALCON PROJECT NO. G19011.00

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
1990 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

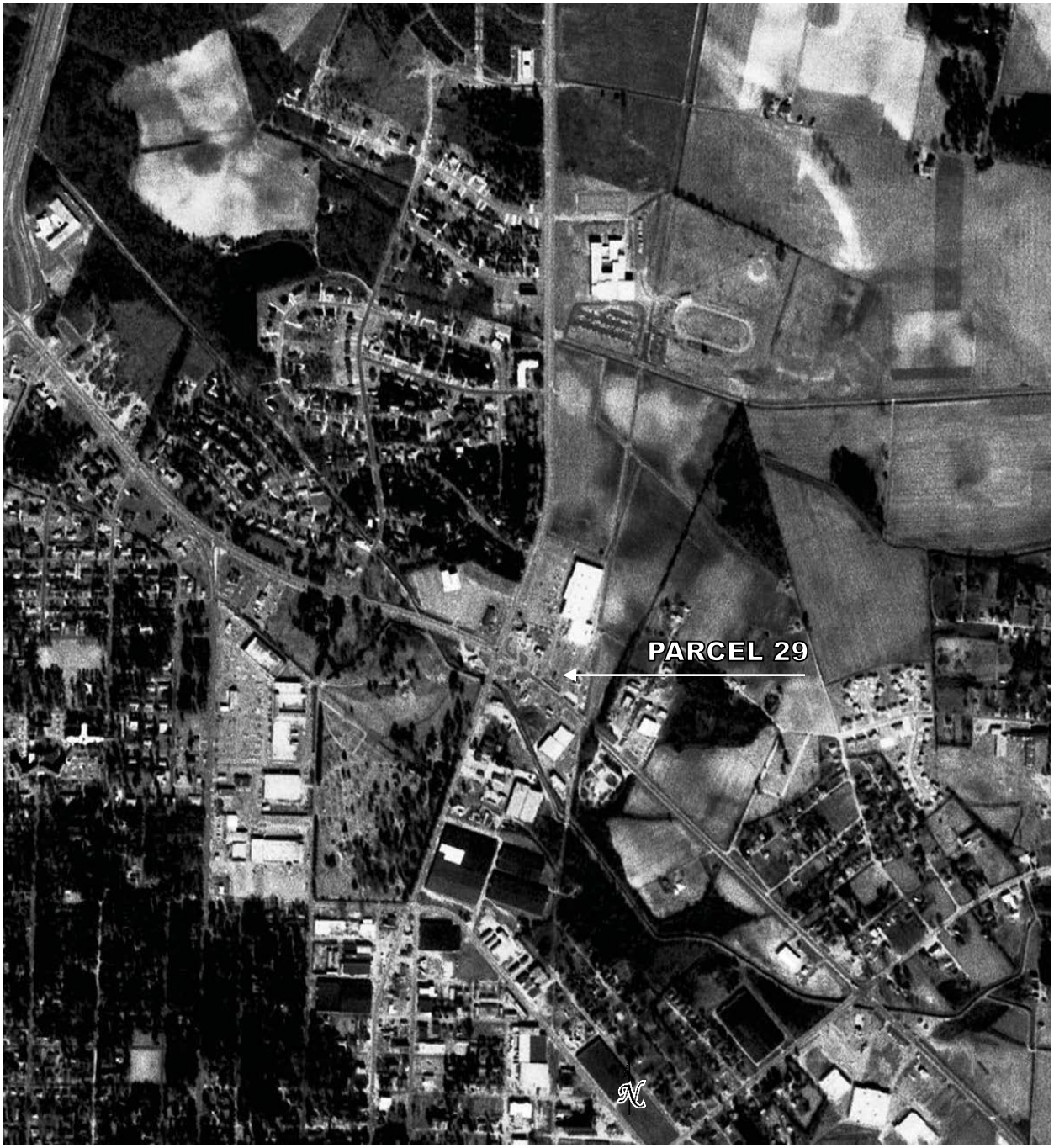
NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
1986 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
1985 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
1976 Aerial Photograph



Project No.: G19011.00
Date: September 2019
Source: ERIS Aerial Photographs

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
Site Photographs

Photograph No. 1: General view of Boring B-50.

Photograph No. 2: General view of Boring B-51.

NCDOT U-5797 (SR 1997 Widening) Parcel 29
Preliminary Site Assessment
Site Photographs

Photograph No. 3: General view of Boring B-53.

PA-2787

DIVISION OF ENVIRONMENTAL MANAGEMENT

June 26, 1991

Mr. Sam Everett
1203 East 11th Street
Lumberton, NC 28358

SUBJECT: Review of Lab Results
UST Soil Assessment
Oscar Baxley Grocery
Highway 211 - East
Lumberton, Robeson County

Dear Mr. Everett:

This is to acknowledge receipt of the above mentioned soil assessment dated June 14, 1991.

Based on review of the lab results, no additional soil excavation and removal is required. Should new information become available concerning this matter, we reserve the right to reverse this finding.

Should you have any questions or need clarification, please contact Mrs. Cindy Hegg of this office at (919) 486-1541.

Sincerely,

original signed by
M. J. Noland

M. J. Noland, P.E.
Regional Supervisor

CH
MJN/CH/gc

Site Investigation Report For Permanent Closure of U.S.T.

FOR TANKS IN NC

Return Completed Form To:
The appropriate DEM Regional Office according to the county of the facility's location. [SEE MAP ON REVERSE SIDE OF OWNER'S COPY (BLUE) FOR REGIONAL OFFICE ADDRESS].

Sate Use Only
I.D. Number _____
Date Received _____

INSTRUCTIONS

Please complete and return within (30) days following completion of site investigation.

I. Ownership of Tank(s)

Owner Name (Corporation, Individual, Public Agency, or Other Entity): Pauline Barley Everett
Street Address: 1203 East 11th Street
County: Robeson
City: Lumberton State: NC Zip Code: 28358
Area Code: 919 Telephone Number: 738-5863

II. Location of Tank(s)

Facility Name or Company: Oscar Barley Grocery
Facility ID # (if available): None
Street Address or State Road: Highway 211 East
County: Robeson City: Lumberton Zip Code: 28358
Area Code: 919 Telephone Number: None

III. Contact Person

Name: Sam Everett Job Title: Husband of Owner Telephone Number: (919) 738-5863
Closure Contractor (Name): Floyd Grading Co (Address): PO Box 3107 Lumberton NC 28359
Lab (Name): Oxford Laboratories Inc (Address): 1316 South 5th Street Wilmington, NC 28401

IV. U.S.T. Information

Tank No.	Size in Gallons	Tank Dimensions	Last Contents
1	550	42" X 7'.6"	GAS
2	550	42" X 7'.6"	GAS

V. Excavation Condition

Tank No.	Water in Excavation Yes	Water in Excavation No	Free Product Yes	Free Product No	Notable Odor or Visible Soil Contamination Yes	Notable Odor or Visible Soil Contamination No
1		✓		✓		✓
2		✓		✓		✓

VI. Additional Information Required

See reverse side of blue copy (owner's copy) for additional information required by N.C. - DEM in the written report and sketch.

VII. Check List

Check the activities completed.

- ✓ Contact local fire marshall
- ✓ Notify DEM Regional Office before abandonment.
- ✓ Drain & flush piping into tank.
- ✓ Remove all product and residuals from tank
- ✓ Excavate down to tank.
- ✓ Clean and inspect tank.
- ✓ Remove drop tube, fill pipe, gauge pipe, vapor recovery tank connections, submersible pumps and other tank fixtures.
- ✓ Cap or plug all lines except the vent and fill lines.
- ✓ Purge tank of all product & flammable vapors.
- ✓ Cut one or more large holes in the tanks.
- ✓ Backfill the area.

Date Tank Permanently closed: 5/23/91

ABANDONMENT IN PLACE
- ☐ Fill tank until material overflows tank opening;
- ☐ Plug or cap all openings;.
- ☐ Disconnect and cap or remove vent line
- ☐ Solid inert material used - please specify: _____

REMOVAL
- ✓ Create vent hole
- ✓ Label tank
- ✓ Dispose of tank in approved manner

Final tank destination: Floyd Grading Co

VIII. Certification (Read and Sign)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Print name and official title of owner or owner's authorized representative	Signature	Date Signed
Sam Everett	Sam Everett	5/23/91

GW/UST-2 White Copy - Regional Office Yellow Copy - Central Office Blue Copy - Owner

Notice of Intent: UST Permanent Closure or Change-In-Service

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DEM Regional Office according to the county of the facility's location. [SEE REVERSE SIDE OF OWNER'S COPY (BLUE) FOR REGIONAL OFFICE ADDRESS].

State Use Only
I. D. Number _____
Date Received _____

INSTRUCTIONS
Complete and return thirty (30) days prior to closure or change-in-service.

I. OWNERSHIP OF TANK(S)

Tank Owner Name: Pauline Barkley Everett
(Corporation, Individual, Public Agency, or Other Entity)
Street Address: 1203 East 11th Street
County: Robeson
City: Lumberton State: NC Zip Code 28358
Tele. No. (Area Code): 919-738-5863

II. LOCATION OF TANK(S)

Facility Name or Company Oscar Barkley Grocery
Facility ID # (if available) None
Street Address or State Road: Hwy 211 - East
County: Robeson City: Lumberton Zip Code 28358
Tele. No. (Area Code): None

III. CONTACT PERSON

Name: Sam Everett Job Title: Husband Telephone Number: 919) 738-5863

IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN-SERVICE

1. Contact Local Fire Marshall.
2. Plan the entire closure event.
3. Conduct Site Soil Assessments.
4. If Removing Tanks or Closing in Place refer to API Publications. 2015 "Cleaning Petroleum Storage Tanks" & 1604 "Removal & Disposal of Used Underground Petroleum Storage Tanks".
5. Provide a sketch locating piping, tanks and soil sampling locations.
6. Fill out form GW/UST-2 "Site Investigation Report for Permanent Closure" and return within 30 days following the site investigation.
7. Keep records for 3 years.

V. WORK TO BE PERFORMED BY:

(Contractor) Name: Floyd Grading Co.
Address: P.O Box 3197 Lumberton State: N.C. Zip Code: 28359
Contact: Calvin F. Floyd Phone: Office 671-1177

VI. TANK(S) SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE

TANK ID#	TANK CAPACITY	LAST CONTENTS	PROPOSED ACTIVITY: CLOSURE – Removal	CLOSURE – Abandonment In Place	CHANGE-IN-SERVICE – New Contents Stored
1	550	GAS	✓		
2	550	GAS	✓		

VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE

Print name and official title: Sam Everett - Owner
*Scheduled Removal Date: 5/23/91
Signature: Sam Everett
Date Submitted: 5/23/91

*If scheduled work date changes, notify your appropriate DEM Regional Office 48 hours prior to originally scheduled date.

GW/UST-3 White Copy - Regional Office Yellow Copy - Central Office Blue Copy - Owner

Fire Prevention Form 1.

APPLICATION TO USE, INSTALL, CONDUCT PROCESSES OR CARRY ON OPERATIONS INVOLVING OR CREATING CONDITIONS DEEMED HAZARDOUS TO LIFE OR PROPERTY

10-14-83
Date

To Chief of Fire Department, City of Lumberton, N. C.

Application is hereby made by the undersigned for a Permit to { Use / Install / Operate / Conduct }

in or on the premises known as TACO-BELL / FAYETTEVILLE ROAD ROBERTS ~~Street or~~ Avenue

the following materials, processes or operations.

(Describe briefly what is to be done and state what hazardous materials are to be used.)

FOR THE REMOVAL OF 4 - 4000 GALLON UNDERGROUND GASOLINE STORAGE TANKS.

#12-83

Conditions, surroundings and arrangements to be in accordance with the Fire Prevention Ordinance.

This application is / is not approved insofar as Zoning and Building Ordinances are concerned.

Inspector of Buildings

C. M. Lewis Jr.
Name of Applicant

P.O. Box 1887
Lumberton N.C.
Address of Applicant

Complete plans and construction details must be filed on all major projects and when requested by the chief of the fire department.

FREEMAN PRINTING CO., LUMBERTON, N. C., 500-2/68

550 gal.

Fire Prevention Form 1.

APPLICATION TO USE, INSTALL, CONDUCT PROCESSES OR CARRY ON OPERATIONS INVOLVING OR CREATING CONDITIONS DEEMED HAZARDOUS TO LIFE OR PROPERTY

6-1-92
Date

To Chief of Fire Department, City of Lumberton, N. C.

Application is hereby made by the undersigned for a Permit to { Use / Install / Operate / Conduct ✓ }

in or on the premises known as NICHOLS / 3100 FAYETTEVILLE ROAD ~~Street or Avenue~~

the following materials, processes or operations.

(Describe briefly what is to be done and state what hazardous materials are to be used.)

TO REMOVE ONE 550 GALLON UNDERGROUND STORAGE TANK, FOR USED MOTOR OIL, FROM PREMISES.

#20-92

Conditions, surroundings and arrangements to be in accordance with the Fire Prevention Ordinance.

This application is / is not approved insofar as Zoning and Building Ordinances are concerned.

Inspector of Buildings

Name of Applicant

3041 Stantonsburg Rd.
Address of Applicant
Wilson NC 27893

Complete plans and construction details must be filed on all major projects and when requested by the chief of the fire department.

FREEMAN PRINTING CO., LUMBERTON, N. C., 300-2/66

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: FALCON
Address: 1210 TRINITY ROAD SUITE 116
CARY NC 28513

Contact: CHRISTOPHER BURKHARDY

Project: G19011 U5797

Samples taken Tuesday, April 9, 2019
Samples extracted Tuesday, April 9, 2019
Samples analysed Tuesday, April 16, 2019

Operator DAVIS MARTINEC

U00902

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
										C5 - C10	C10 - C18	C18	
s	B50	20.8	<0.52	<0.52	1.6	1.6	0.91	<0.17	<0.021	0	81	19	Deg.PHC 74.4%,(FCM)
s	B51	10.1	<0.25	<0.25	<0.25	<0.25	<0.05	<0.08	<0.01	0	0	100	,(FCM),(BO)
s	B53	10.3	<0.26	<0.26	23.6	23.6	10.5	0.51	<0.01	0	82.2	17.8	V.Deg.PHC 96.4%,(FCM),(BO)

Initial Calibrator QC check OK Final FCM QC Check OK

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

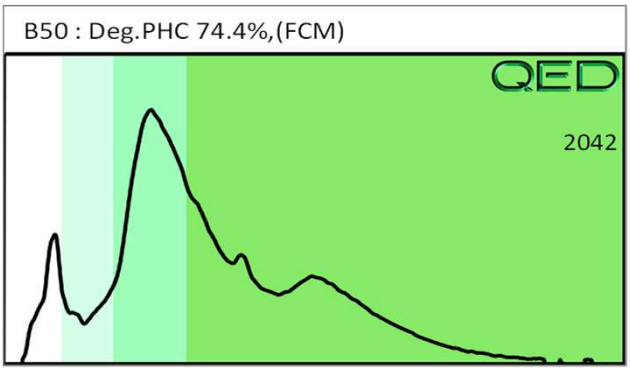
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

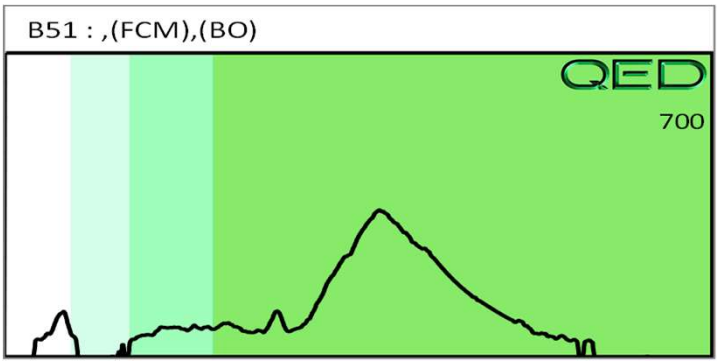
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

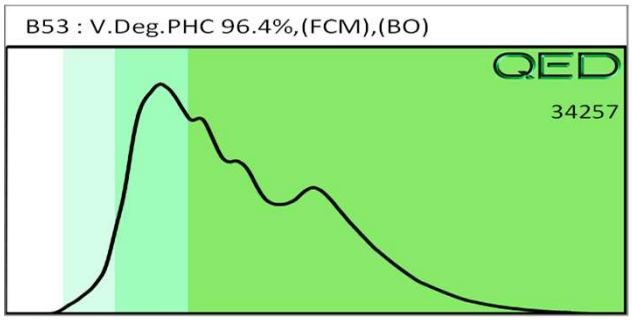
QED Hydrocarbon Fingerprints

Project: G19011 U5797

Tuesday, April 16, 2019







PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 29
NCDOT PROJECT U-5797

3002 FAYETTEVILLE RD., LUMBERTON, NC

APRIL 24, 2019

Report prepared for: **Christopher J. Burkhardt, PWS**
Falcon Engineers
1210 Trinity Rd. #110
Raleigh, NC 27607

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 29 - 3002 Fayetteville Rd.
Lumberton, Robeson County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 29, located at 3002 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 19-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of seventeen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several EM anomalies were associated with interference from vehicles, suspected buried metallic debris, and suspected reinforced concrete and were further investigated with GPR.

GPR verified the presence of metal reinforcement in the concrete on the southeastern portion of the survey area and evidence of possible utilities. No evidence of any larger structures such as USTs was observed. Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 29.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 29, located at 3002 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 19-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by concrete, asphalt, and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on March 28, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Drop Inlet	
2	Surface Metal	
3	Sign	
4	Vehicles	☑
5	Drop Inlet	
6	Shed	
7	Hydrant	
8	Utility	
9	Light	
10	Light	
11	Drop Inlets	
12	Reinforced Concrete	☑
13	Signs	
14	Manhole	
15	Drop Inlet	
16	Suspected Metallic Debris	☑
17	Utility	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including drop inlets, surface metal, signs, vehicles, a shed, a hydrant, utilities, lights, and a manhole. EM Anomaly 4 was associated with interference from vehicles and was further investigated with GPR to verify that the interference did not obscure buried structures such as USTs.

EM Anomaly 12 was associated with suspected reinforced concrete and was further investigated with GPR to confirm that there was reinforcement in the concrete slab and that the reinforcement did not obscure any potential USTs.

EM Anomaly 16 was associated with suspected buried metallic debris and was further investigated with GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of five formal GPR transects were performed at the site. GPR Transect 1 was performed across EM Anomaly 16 and did not record any evidence of significant structures such as USTs.

GPR Transects 2, 3, and 5 were performed across EM Anomaly 4. These transects did not record evidence of significant structures, such as USTs, and verified that the vehicles were the cause for the EM interference. GPR Transect 5 also recorded evidence of possible utilities.

GPR Transect 4 was performed across EM Anomaly 12. This transect verified the presence of metal reinforcement in the concrete on the southeastern portion of the survey area. No evidence of any larger structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 29. **Figure 4** provides an overlay of the EM61 metal detection contour map onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 29 in Lumberton, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Several EM anomalies were associated with interference from vehicles, suspected buried metallic debris, and suspected reinforced concrete and were further investigated with GPR.

- GPR verified the presence of metal reinforcement in the concrete on the southeastern portion of the survey area and evidence of possible utilities. No evidence of any larger structures such as USTs was observed.
- Collectively, the geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 29.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Falcon Engineers in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

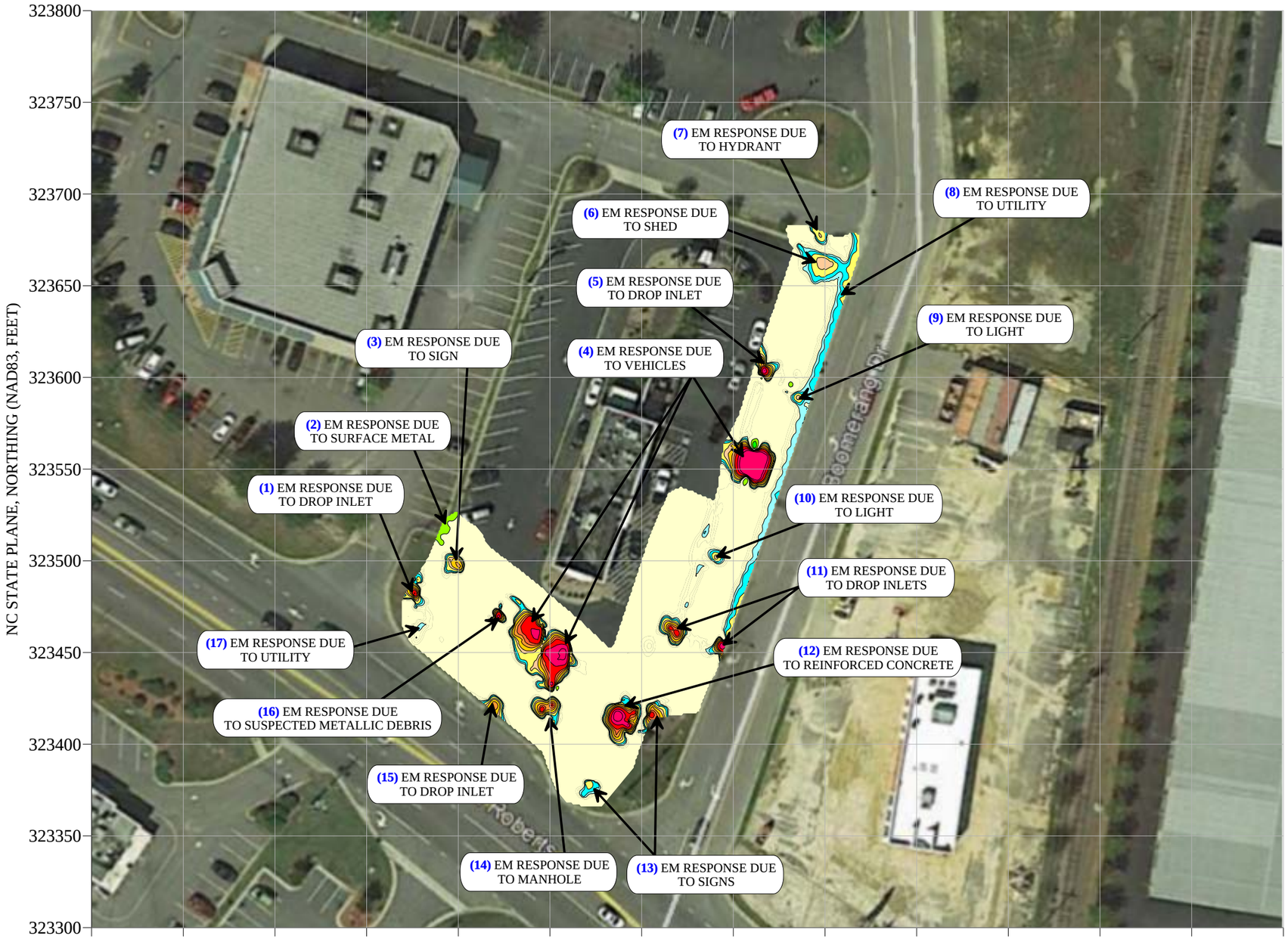
View of Survey Area
(Facing Approximately West)

View of Survey Area
(Facing Approximately North)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 29 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE PARCEL 29 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT FALCON ENGINEERS **FIGURE 1**

EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on March 19, 2019, using a Geonics EM61-MK2 instrument.Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on March 28, 2019.

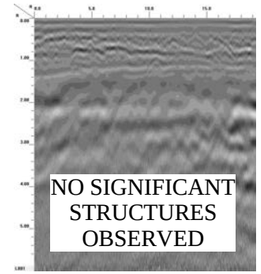
EM61 Metal Detection Response (millivolts)

N

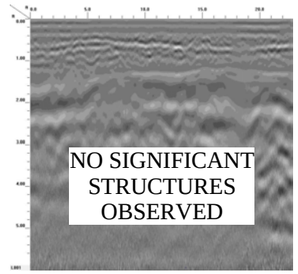
PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 29 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE	PARCEL 29 - EM61 METAL DETECTION CONTOUR MAP	DATE 3/28/2019 PYRAMID PROJECT #: 2019-091
CLIENT	FALCON ENGINEERS			**FIGURE 2**

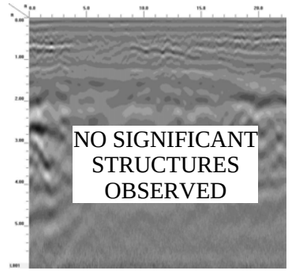
LOCATIONS OF GPR TRANSECTS



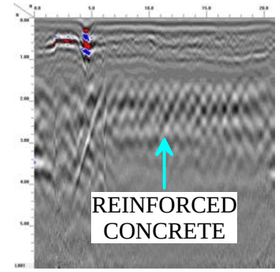
GPR TRANSECT 1 (T1)



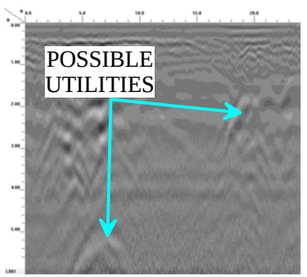
GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)



GPR TRANSECT 4 (T4)



GPR TRANSECT 5 (T5)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 29 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 29 - GPR TRANSECT LOCATIONS AND IMAGES	DATE: 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 3**

EM61 METAL DETECTION CONTOURS (SEE FIGURE 2 FOR ANOMALY LABELS)

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PUE — PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE

MILLIVOLTS (mV)

1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

0 20 40
FEET

N

TITLE
OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 029
LUMBERTON, NORTH CAROLINA
NCDOT PROJECT U-5797

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-11-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-091	FIGURE NO. 4

PRELIMINARY SITE ASSESSMENT

SR 1997 (FAYETTEVILLE ROAD) WIDENING
TIP NO. U-5797, WBS NO. 44367.1.1

NCDOT PARCEL NO. 30
OWNER: BRANCH, STEVEN & LINDA
NORTHWEST CORNER OF FAYETTEVILLE ROAD AND ROBERTS AVE
LUMBERTON, ROBESON COUNTY, NORTH CAROLINA

PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
C/O STV ENGINEERS, INC.
1600 PERIMETER PARK DRIVE, SUITE 225
MORRISVILLE, NC 2756002

PREPARED BY:
FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513

PROJECT NUMBER: G19011.00
JUNE 9, 2020

FALCON ENGINEERING

June 9, 2020

Mr. Patrick Livingston, PE
STV Engineers, Inc.
900 W. Trade St, Suite 715
Charlotte, NC 28202

Re: **Preliminary Site Assessment**
SR 1997 (Fayetteville Road) Widening
TIP No. U-5797, WBS No. 44367.1.1
Parcel No. 30
Owner: Branch, Steven & Linda
Northwest Corner of Fayetteville Road and Roberts Ave
Lumberton, Robeson County, North Carolina

Dear: Mr. Livingston:

Falcon is pleased to present the following Preliminary Site Assessment in support of the above-mentioned Project. Specifically, Falcon sampled soil in proximity to the project limits on this parcel in general accordance with the approved scope of work. Soils requiring remediation or special handling during construction were not identified.

Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

Please review this report and advise us if you have any questions or concerns. We appreciate this opportunity to provide services to you and look forward to partnering with you on future projects. If you have any questions, please give Falcon a call at (919) 871-0800.

Sincerely,
FALCON ENGINEERING, INC.

Christopher J. Burkhardt
Environmental Services Manager

Jeremy R. Hamm, PE
Geotechnical Services Manager

TABLE OF CONTENTS

LIST OF FIGURES AND ATTACHMENTS

SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 30. Parcel No. 30 does not have an address listed on the Robeson County GIS website. Parcel No. 30 is a 0.016 acer remnant of vegetated land in the Northwest Corner of Fayetteville Road and Roberts Ave, Lumberton Robeson County, North Carolina. NCDOT is proposing to widen Fayetteville Road (SR 1997) from Farringdom Street to 22nd Street. The limits of the assessment are between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). Boring locations were placed in the vicinity of proposed excavations for drainage features, utilities, and roadway/ditch cuts to determine if soils requiring remediation or special handling were present where excavation was planned to take place.

1.2 SCOPE OF WORK

Falcon's scope of work included coordination of; public and private utility location near the proposed borings, geophysical surveys, collecting soil samples using direct push methods, and laboratory analysis. Samples were analyzed for petroleum hydro carbons via UVF technology.

SECTION 2: HISTORY

2.1 PARCEL USAGE

Falcon performed a Phase I Environmental Site Assessment (ESA) for U-5797 under Project No. G17057 dated April 2018. The ESA identified this parcel as a Recognized Environmental Condition (REC) based on the history of the parcel and adjoining parcels. Falcon contacted Mr. Joe Oliver the County Fire Marshal during the ESA to inquire about known USTs along Fayetteville Road in the general area of Parcel No. 30. Mr. Oliver sent documents pertaining to USTs that had been installed and/or removed from Nichols addressed as 3100 Fayetteville Road, Baxley's addressed as Highway 211 East, and Taco Bell addressed as Fayetteville Road and Roberts Ave. The adjoining parcel is currently a Taco Bell.

Falcon also contacted Mr. Brandon Love, City of Lumberton Director of Planning & Neighborhood Services, to request information on permits for USTs, wells, or septic systems. Mr. Love remembered the former Nichols Grocery Store being in the general area of Parcel No. 30. Historic air photographs dated 1976 through 2000 show Parcel No. 30 as a cleared lot surrounded by small and large commercial buildings. The exact location of USTs associated with the above listed facilities is unknown. UST closure documentation including soil sampling results were not available for review.

2.2 FACILITY IDENTIFICATION NUMBER

A Facility Identification Number was not identified for this parcel.

2.3 GROUNDWATER INCIDENT NUMBER

A Groundwater Incident Number was not identified for this parcel.

SECTION 3: SITE OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Groundwater monitoring wells (MWs) were not observed on this parcel.

3.2 ACTIVE USTS

Active USTs were not observed within the project limits or registered at this parcel.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

USTs, monitoring wells, remediation systems, or hydraulic lifts were not observed.

SECTION 4: METHODOLOGY

4.1 GEOPHYSICS

Pyramid Geophysical Services (Pyramid) was subcontracted to perform a geophysical survey of the assessment area. The assessment area is between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). The survey was used to locate private utility lines, as well as possible indications of USTs, and/or their pits.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings.

GPR data was acquired across select EM anomalies (where identified), using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Pyramid marked their findings on the surface with paint. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and to obtain adequate coverage. A copy of the full Geophysical Report is included in the Attachments.

4.2 BORINGS

Regional Probing was subcontracted to advance soil borings using direct push technology. Regional Probing used a truck-mounted Geoprobe® 5410 unit mounted on an off-road modified Ford F350 Diesel 4x4. The unit has auger-capabilities and is equipped with a GH-42 soil-probing hammer, with 21,700 pounds of down force and 28,900 pounds of retraction force. The unit has an on-board tank for decontaminating the geoprobe rods before advancing the probe at each sample location.

4.3 SAMPLE PROTOCOL

Prior to initiating sample collection Falcon contacted NC One Call and requested public utility locations be marked around the proposed sample locations. Sampling was in general accordance with the NC Department of Environmental Quality (DEQ) Division of Waste Management's (DWM) "Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases" (March 1, 2007 Version Change 9 – February 1, 2019) guidance document. Sampling strategy was derived based upon the project scope and objectives as outlined above. Red Lab, LLC was selected to perform the UVF laboratory analytical analysis. Appropriate sterile containers were received by Falcon from Red Lab prior to beginning the fieldwork. The containers were labeled appropriately.

A Minirae 3000 photoionization detector (PID) was used to field screen samples for volatile organics to determine if a release had occurred. The instrument was calibrated per manufacturer instructions prior to use. Falcon staff bagged composite soil samples of each boring in approximately two-foot sections. Representative samples were placed in a sealed plastic bag for approximately 10 minutes to allow soil hydrocarbons to reach equilibrium within the headspace prior to scanning with the PID. One sample per boring was collected from the depth of the proposed cut or from the section above the depth of cut with the highest PID reading.

To avoid cross contamination, a new unused pair of non-powdered nitrile gloves was worn while extracting each sample. Samples were placed in the appropriate laboratory provided containers. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used and sampling location identification. Samples were placed in an ice filled cooler and transported to the lab. Appropriate chain-of-custody procedures, including the completion of necessary forms, were followed.

SECTION 5: RESULTS

5.1 GEOPHYSICS

The geophysical investigation was performed on March 19, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area. A single EM anomaly was identified. The anomaly was directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced one boring (B-52) to the proposed excavation depth of the drainage features, utilities, or roadway/ditch cut being assessed. Groundwater was not observed. Please see The Boring Layout Plan in the attachments for a visual depiction of the sample location. The coordinates (latitude and longitude) that correspond to the sample locations are shown below in Table No. 1 Boring Coordinates.

TABLE NO. 1 BORING COORDINATES

Boring	Latitude	Longitude
B-52	34.6385777	-78.9998382

The boring was field screened with a PID in sections for evidence of volatile organics. The PID screening results are presented in Table No. 2 PID Readings. Falcon selected soil samples based on the field screening results and the needs of the project. Red Lab analyzed the selected samples and their full analytical report is attached. The results of the laboratory analysis are shown in Table No. 3 Summary of UVF Soil Sampling Results.

Petroleum hydrocarbons above State Action Levels were not detected in the sample.

TABLE NO. 2 PID READINGS

Boring	Depth BGS*	PID**
B-52	0-2.0	0.3
	2.0-4.0	0.4
	4.0-6.0	1.0
	6.0-8.0	**0.3**

*BGS = Depth below ground surface in feet
**PID readings are in parts per million
Samples shown in **bold** were selected for analysis

TABLE NO. 3 SUMMARY OF UVF SOIL SAMPLING RESULTS

Sample ID	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	
B-52	<0.5	<0.5	1.3	1.3	0.67	<0.16	<0.02	0	80.7	19.3	V.Deg.PHC 77.1%,(FCM)

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious visual indications of a release (stained soils, odors, or oily sheen) were not observed. Table No. 4 Soil Observations lists visual soil observations of color and texture.

TABLE NO. 4 SOIL OBSERVATIONS

Sample ID	Depth	Color	Soil Type
B1	0-2.0	Brown Orange	Slightly Clayey Silty Sand (A-2-4)
	2.0-4.0	Gray Brown	Silty Clayey Sand (A-2-6)
	4.0-6.0	Gray	Slightly Clayey Silty Sand (A-2-4)
	6.0-8.0	Gray Brown	Sandy Clay (A-6)

Depth is in feet below ground surface

5.4 QUANTITIES CALCULATIONS

Soils requiring quantity calculations were not identified.

SECTION 6: CONCLUSIONS

6.1 INTERPRETATION OF RESULTS

This Preliminary Site Assessment was performed to evaluate the soils in proximity to the project limits on this parcel for the presence of petroleum hydrocarbons. The findings are as follows:

- Soil sampling completed on the parcel did not identify contaminants in the soil at levels requiring remediation.

6.2 GEOPHYSICS

The geophysical data did not record evidence of metallic USTs within the geophysical survey area at Parcel 30. Falcon does not anticipate USTs will be encountered within the project limits on this parcel during construction.

6.3 SAMPLING

Sampling results did not identify contaminates in the soil which require remediation in the areas sampled. Based on past project experience, Falcon does not anticipate soil remediation or special handling and disposal will be required during construction on this parcel.

6.4 QUANTITIES

Soils requiring quantities calculations were not identified.

SECTION 7: RECOMMENDATIONS

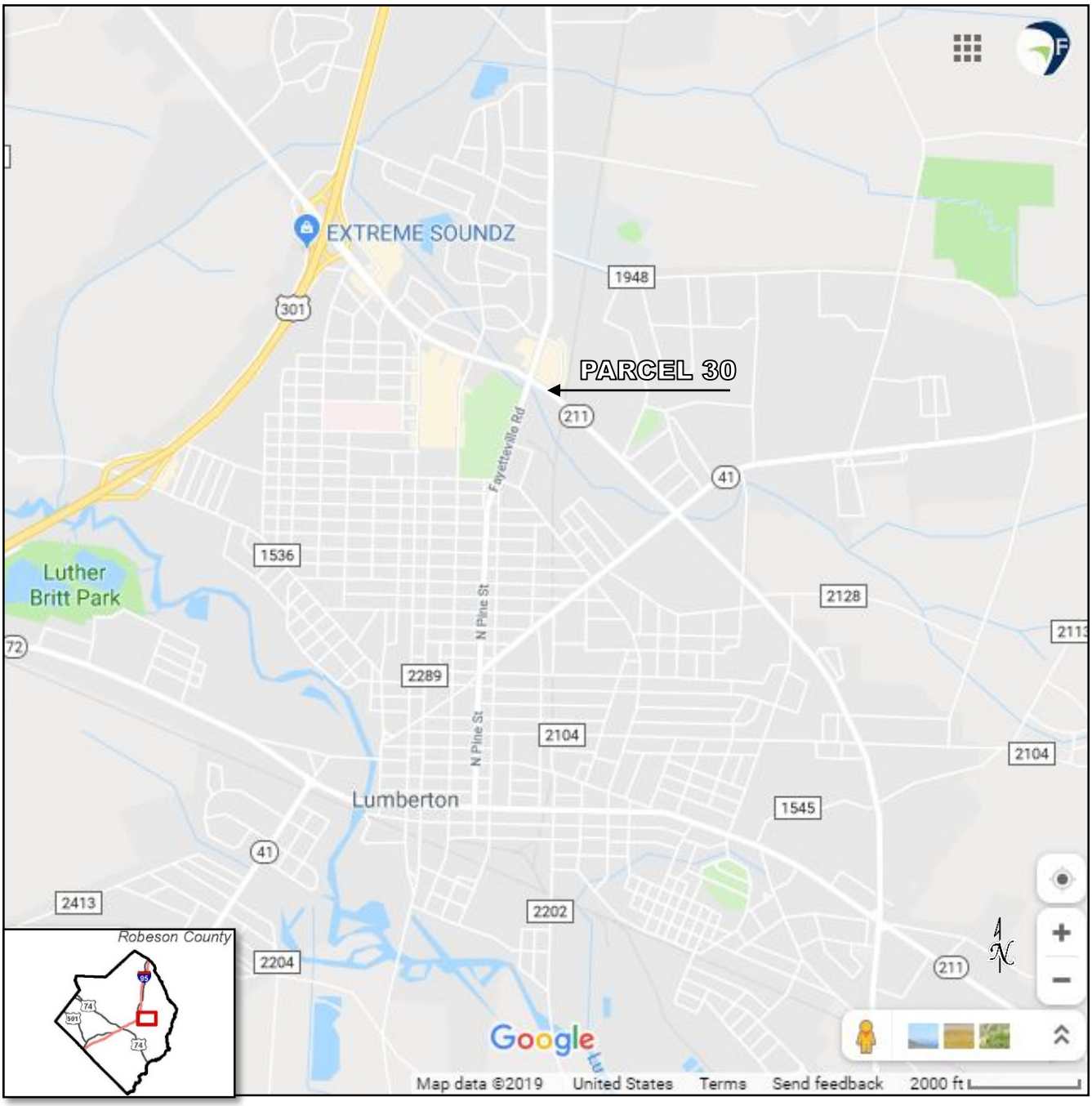
7.1 ADDITIONAL SAMPLING

Contaminants above the Industrial / Commercial Soil Cleanup Levels were not identified; therefore, additional assessment is not warranted at this time. Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

7.2 SPECIAL HANDLING OF IMPACTED SOIL

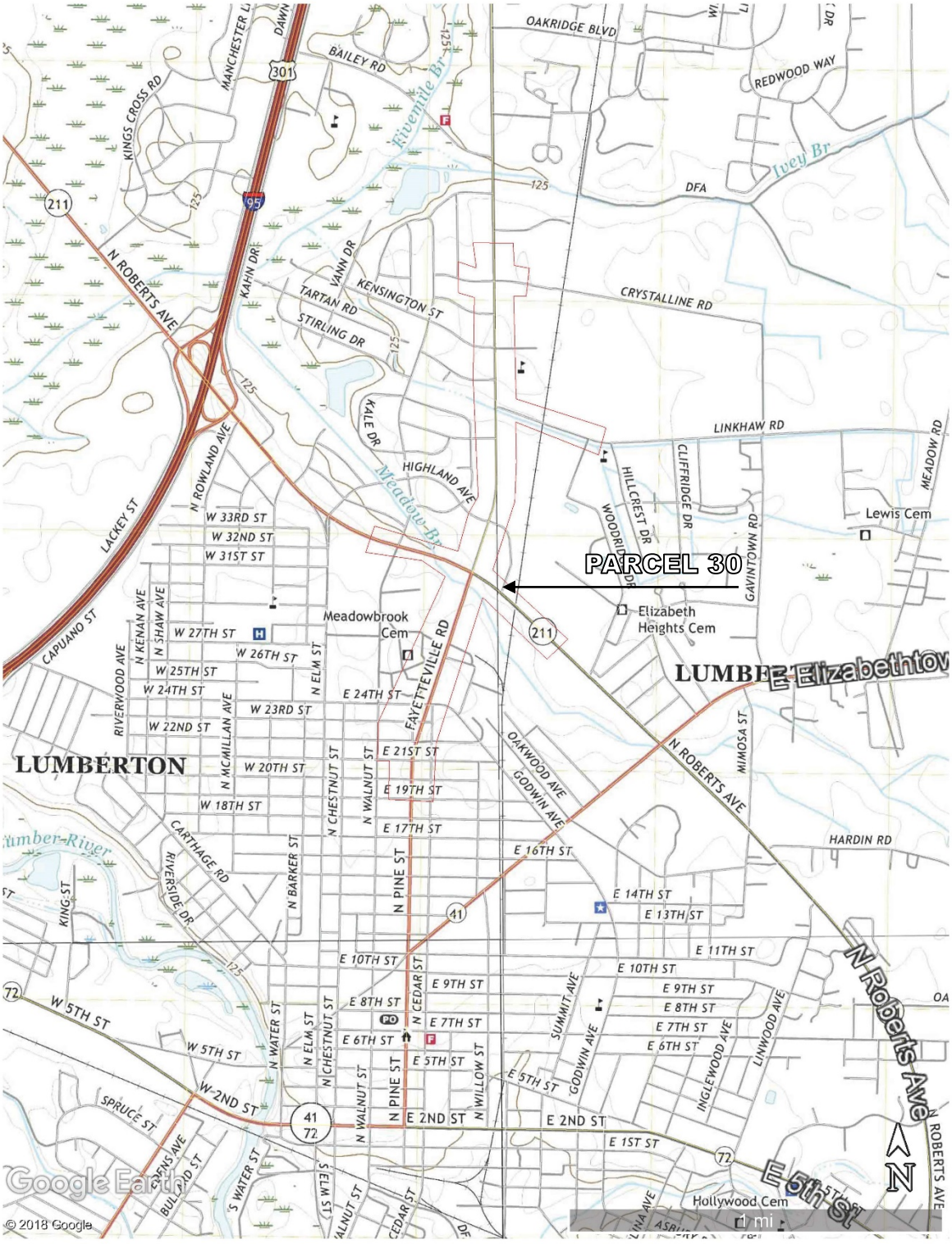
Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
Vicinity Map



Project No.: G19011.00
Date: September 2019
Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
USGS Topographic Maps



Project No.: G19011.00
Date: September 2019
Source: "NW, NE, SW, and SE Lumberton, NC" 2019

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
Parcel Location Map

September 5, 2019

County Line
City Limits
Streets
Parcels

1:532

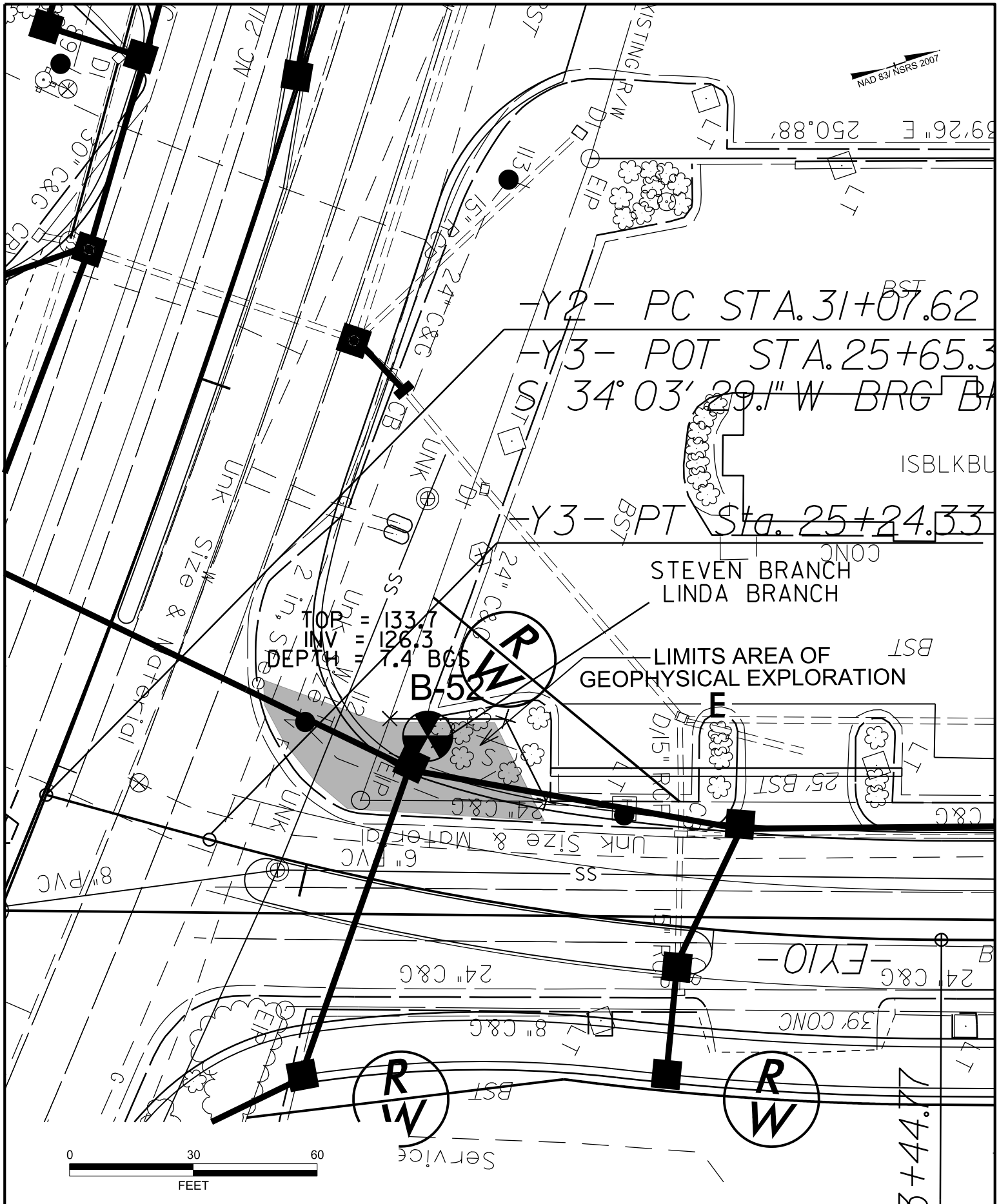
0 0.00425 0.0085 0.017 mi

0 0.005 0.01 0.02 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2019

Project No.: G19011.00
Date: September 2019
Source: Robeson County GIS



NOTES:

- BGS = BELOW GROUND SURFACE

FALCON ENGINEERING
FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607
PHONE: 919.871.0800
FAX: 919.871.0803

BORING LOCATION PLAN

NCDOT U-5797 (SR 1997 WIDENING)
PARCEL 30 - BRANCH
ROBESON / LUMBERTON, NC
WBS NO.: 44367.1.1 & TIP NO.: U-5797
FALCON PROJECT NO. G19011.00

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
1990 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

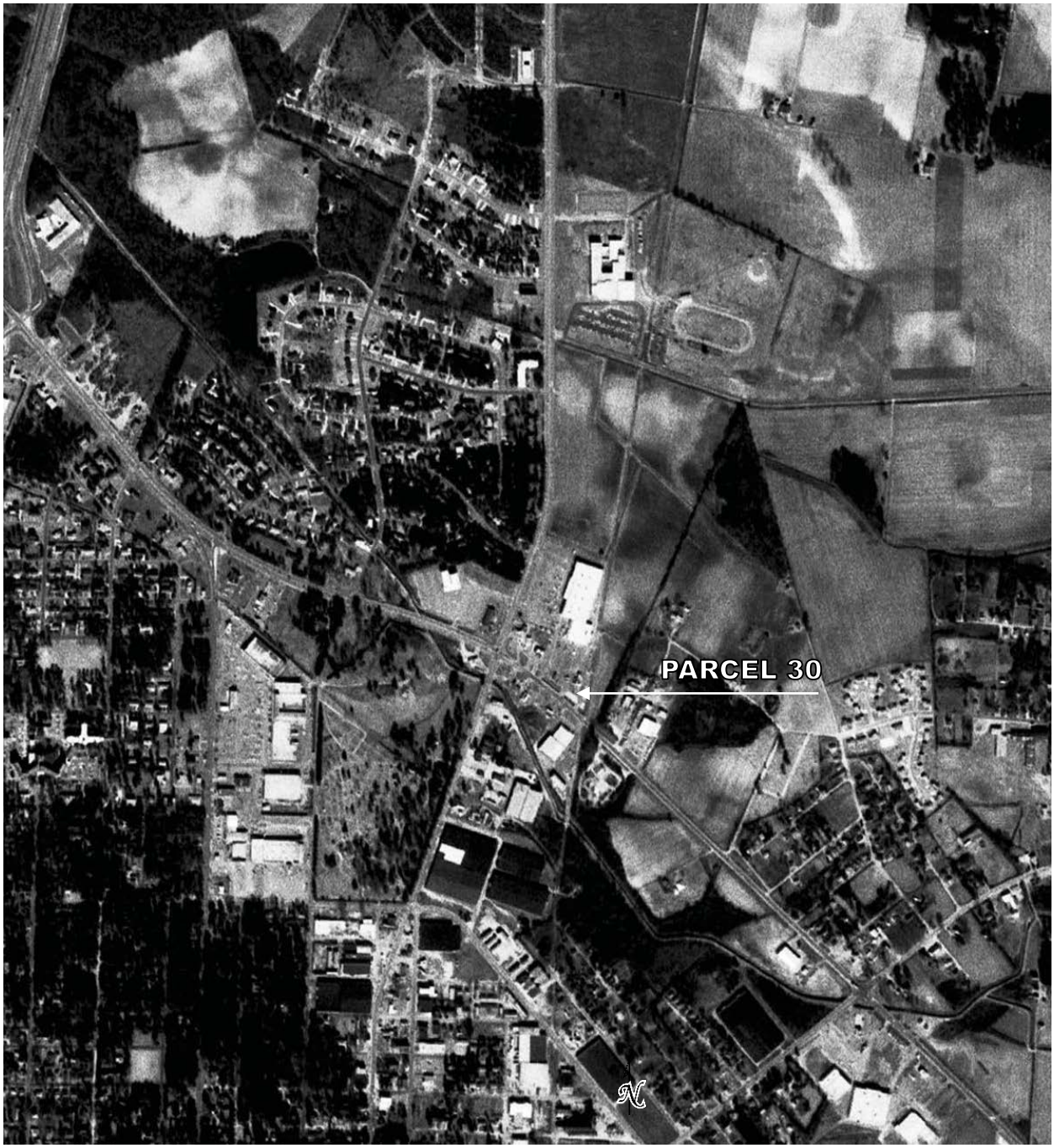
NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
1986 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
1985 Aerial Photograph

Project No.: G19011.00
Date: September 2019
Source: NCDOT Historical Aerial Imagery Index

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
1976 Aerial Photograph



Project No.: G19011.00
Date: September 2019
Source: ERIS Aerial Photographs

NCDOT U-5797 (SR 1997 Widening) Parcel 30
Preliminary Site Assessment
Site Photographs

Photograph No. 1: General view of Boring B-52.

PA-2787

DIVISION OF ENVIRONMENTAL MANAGEMENT

June 26, 1991

Mr. Sam Everett
1203 East 11th Street
Lumberton, NC 28358

SUBJECT: Review of Lab Results
UST Soil Assessment
Oscar Baxley Grocery
Highway 211 - East
Lumberton, Robeson County

Dear Mr. Everett:

This is to acknowledge receipt of the above mentioned soil assessment dated June 14, 1991.

Based on review of the lab results, no additional soil excavation and removal is required. Should new information become available concerning this matter, we reserve the right to reverse this finding.

Should you have any questions or need clarification, please contact Mrs. Cindy Hegg of this office at (919) 486-1541.

Sincerely,

original signed by
M. J. Noland

M. J. Noland, P.E.
Regional Supervisor

CH
MJN/CH/gc

Site Investigation Report For Permanent Closure of U.S.T.

FOR TANKS IN NC

Return Completed Form To:
The appropriate DEM Regional Office according to the county of the facility's location. [SEE MAP ON REVERSE SIDE OF OWNER'S COPY (BLUE) FOR REGIONAL OFFICE ADDRESS].

Sate Use Only
I.D. Number _____
Date Received _____

INSTRUCTIONS

Please complete and return within (30) days following completion of site investigation.

I. Ownership of Tank(s)

Owner Name (Corporation, Individual, Public Agency, or Other Entity): Pauline Barley Everett
Street Address: 1203 East 11th Street
County: Robeson
City: Lumberton State: NC Zip Code: 28358
Area Code: 919 Telephone Number: 738-5863

II. Location of Tank(s)

Facility Name or Company: Oscar Barley Grocery
Facility ID # (if available): None
Street Address or State Road: Highway 211 East
County: Robeson City: Lumberton Zip Code: 28358
Area Code: 919 Telephone Number: None

III. Contact Person

Name: Sam Everett Job Title: Husband of Owner Telephone Number: (919) 738-5863
Closure Contractor (Name): Floyd Grading Co (Address): PO Box 3107 Lumberton NC 28359
Lab (Name): Oxford Laboratories Inc (Address): 1316 South 5th Street Wilmington, NC 28401

IV. U.S.T. Information

Tank No.	Size in Gallons	Tank Dimensions	Last Contents
1	550	42" X 7'.6"	GAS
2	550	42" X 7'.6"	GAS

V. Excavation Condition

Tank No.	Water in Excavation Yes	Water in Excavation No	Free Product Yes	Free Product No	Notable Odor or Visible Soil Contamination Yes	Notable Odor or Visible Soil Contamination No
1		✓		✓		✓
2		✓		✓		✓

VI. Additional Information Required

See reverse side of blue copy (owner's copy) for additional information required by N.C. - DEM in the written report and sketch.

VII. Check List

Check the activities completed.

- ✓ Contact local fire marshall
- ✓ Notify DEM Regional Office before abandonment.
- ✓ Drain & flush piping into tank.
- ✓ Remove all product and residuals from tank
- ✓ Excavate down to tank.
- ✓ Clean and inspect tank.
- ✓ Remove drop tube, fill pipe, gauge pipe, vapor recovery tank connections, submersible pumps and other tank fixtures.
- ✓ Cap or plug all lines except the vent and fill lines.
- ✓ Purge tank of all product & flammable vapors.
- ✓ Cut one or more large holes in the tanks.
- ✓ Backfill the area.

Date Tank Permanently closed: 5/23/91

ABANDONMENT IN PLACE
- ☐ Fill tank until material overflows tank opening;
- ☐ Plug or cap all openings;.
- ☐ Disconnect and cap or remove vent line
- ☐ Solid inert material used - please specify: _____

REMOVAL
- ✓ Create vent hole
- ✓ Label tank
- ✓ Dispose of tank in approved manner

Final tank destination: Floyd Grading Co

VIII. Certification (Read and Sign)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

Print name and official title of owner or owner's authorized representative	Signature	Date Signed
Sam Everett	Sam Everett	5/23/91

GW/UST-2 White Copy - Regional Office Yellow Copy - Central Office Blue Copy - Owner

Notice of Intent: UST Permanent Closure or Change-In-Service

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DEM Regional Office according to the county of the facility's location. [SEE REVERSE SIDE OF OWNER'S COPY (BLUE) FOR REGIONAL OFFICE ADDRESS].

State Use Only
I. D. Number _____
Date Received _____

INSTRUCTIONS
Complete and return thirty (30) days prior to closure or change-in-service.

I. OWNERSHIP OF TANK(S)

Tank Owner Name: Pauline Barkley Everett
(Corporation, Individual, Public Agency, or Other Entity)
Street Address: 1203 East 11th Street
County: Robeson
City: Lumberton State: NC Zip Code 28358
Tele. No. (Area Code): 919-738-5863

II. LOCATION OF TANK(S)

Facility Name or Company Oscar Barkley Grocery
Facility ID # (if available) None
Street Address or State Road: Hwy 211 - East
County: Robeson City: Lumberton Zip Code 28358
Tele. No. (Area Code): None

III. CONTACT PERSON

Name: Sam Everett Job Title: Husband Telephone Number: 919) 738-5863

IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN-SERVICE

1. Contact Local Fire Marshall.
2. Plan the entire closure event.
3. Conduct Site Soil Assessments.
4. If Removing Tanks or Closing in Place refer to API Publications. 2015 "Cleaning Petroleum Storage Tanks" & 1604 "Removal & Disposal of Used Underground Petroleum Storage Tanks".
5. Provide a sketch locating piping, tanks and soil sampling locations.
6. Fill out form GW/UST-2 "Site Investigation Report for Permanent Closure" and return within 30 days following the site investigation.
7. Keep records for 3 years.

V. WORK TO BE PERFORMED BY:

(Contractor) Name: Floyd Grading Co.
Address: P.O Box 3197 Lumberton State: N.C. Zip Code: 28359
Contact: Calvin F. Floyd Phone: Office 671-1177

VI. TANK(S) SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE

TANK ID#	TANK CAPACITY	LAST CONTENTS	PROPOSED ACTIVITY: CLOSURE – Removal	CLOSURE – Abandonment In Place	CHANGE-IN-SERVICE – New Contents Stored
1	550	GAS	✓		
2	550	GAS	✓		

VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE

Print name and official title: Sam Everett - Owner
*Scheduled Removal Date: 5/23/91
Signature: Sam Everett
Date Submitted: 5/23/91

*If scheduled work date changes, notify your appropriate DEM Regional Office 48 hours prior to originally scheduled date.

GW/UST-3 White Copy - Regional Office Yellow Copy - Central Office Blue Copy - Owner

Fire Prevention Form 1.

APPLICATION TO USE, INSTALL, CONDUCT PROCESSES OR CARRY ON OPERATIONS INVOLVING OR CREATING CONDITIONS DEEMED HAZARDOUS TO LIFE OR PROPERTY

10-14-83
Date

To Chief of Fire Department, City of Lumberton, N. C.

Application is hereby made by the undersigned for a Permit to { Use / Install / Operate / Conduct }

in or on the premises known as TACO-BELL / FAYETTEVILLE ROAD ROBERTS ~~Street or~~ Avenue

the following materials, processes or operations.

(Describe briefly what is to be done and state what hazardous materials are to be used.)

FOR THE REMOVAL OF 4 - 4000 GALLON UNDERGROUND GASOLINE STORAGE TANKS.

#12-83

Conditions, surroundings and arrangements to be in accordance with the Fire Prevention Ordinance.

This application is / is not approved insofar as Zoning and Building Ordinances are concerned.

Inspector of Buildings

C. M. Lewis Jr.
Name of Applicant

P.O. Box 1887
Lumberton N.C.
Address of Applicant

Complete plans and construction details must be filed on all major projects and when requested by the chief of the fire department.

FREEMAN PRINTING CO., LUMBERTON, N. C., 500-2/68

550 gal.

Fire Prevention Form 1.

APPLICATION TO USE, INSTALL, CONDUCT PROCESSES OR CARRY ON OPERATIONS INVOLVING OR CREATING CONDITIONS DEEMED HAZARDOUS TO LIFE OR PROPERTY

6-1-92
Date

To Chief of Fire Department, City of Lumberton, N. C.

Application is hereby made by the undersigned for a Permit to { Use / Install / Operate / Conduct ✓ }

in or on the premises known as NICHOLS / 3100 FAYETTEVILLE ROAD ~~Street or Avenue~~

the following materials, processes or operations.

(Describe briefly what is to be done and state what hazardous materials are to be used.)

TO REMOVE ONE 550 GALLON UNDERGROUND STORAGE TANK, FOR USED MOTOR OIL, FROM PREMISES.

#20-92

Conditions, surroundings and arrangements to be in accordance with the Fire Prevention Ordinance.

This application is / is not approved insofar as Zoning and Building Ordinances are concerned.

Inspector of Buildings

Name of Applicant

3041 Stantonsburg Rd.
Address of Applicant
Wilson NC 27893

Complete plans and construction details must be filed on all major projects and when requested by the chief of the fire department.

FREEMAN PRINTING CO., LUMBERTON, N. C., 300-2/66

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: FALCON
Address: 1210 TRINITY ROAD SUITE 116
CARY NC 28513

Contact: CHRISTOPHER BURKHARDY

Project: G19011 U5797

Samples taken	Tuesday, April 9, 2019
Samples extracted	Tuesday, April 9, 2019
Samples analysed	Tuesday, April 16, 2019
Operator	DAVIS MARTINEC

U00902

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
										C5 - C10	C10 - C18	C18	
s	B52	19.8	<0.5	<0.5	1.3	1.3	0.67	<0.16	<0.02	0	80.7	19.3	V.Deg.PHC 77.1%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 97.1 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

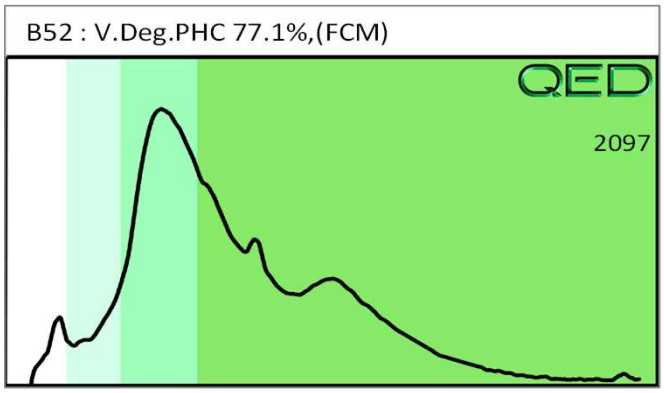
Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

Project: G19011 U5797 Tuesday, April 16, 2019



PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 30
NCDOT PROJECT U-5797

3002 FAYETTEVILLE RD., LUMBERTON, NC

APRIL 24, 2019

Report prepared for: **Christopher J. Burkhardt, PWS**
Falcon Engineers
1210 Trinity Rd. #110
Raleigh, NC 27607

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 30 - 3002 Fayetteville Rd.
Lumberton, Robeson County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 30, located at 3002 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on March 19, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection survey. A total of one collective EM anomaly was identified. The collective anomaly was directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required. The geophysical data did not record any evidence of metallic USTs within the geophysical survey area at Parcel 30.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 30, located at 3002 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted on March 19, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a portion of a grass median surrounded by asphalt and concrete surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection survey. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were not required due to all EM anomalies being directly attributed to visible cultural features at the ground surface (See *Discussion of Results* section below).

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Signs	

All of the EM anomalies were directly attributed to visible cultural features at the ground surface (signs); therefore, a GPR survey was not required.

The geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 30. **Figure 3** provides an overlay of the EM61 metal detection contour map onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

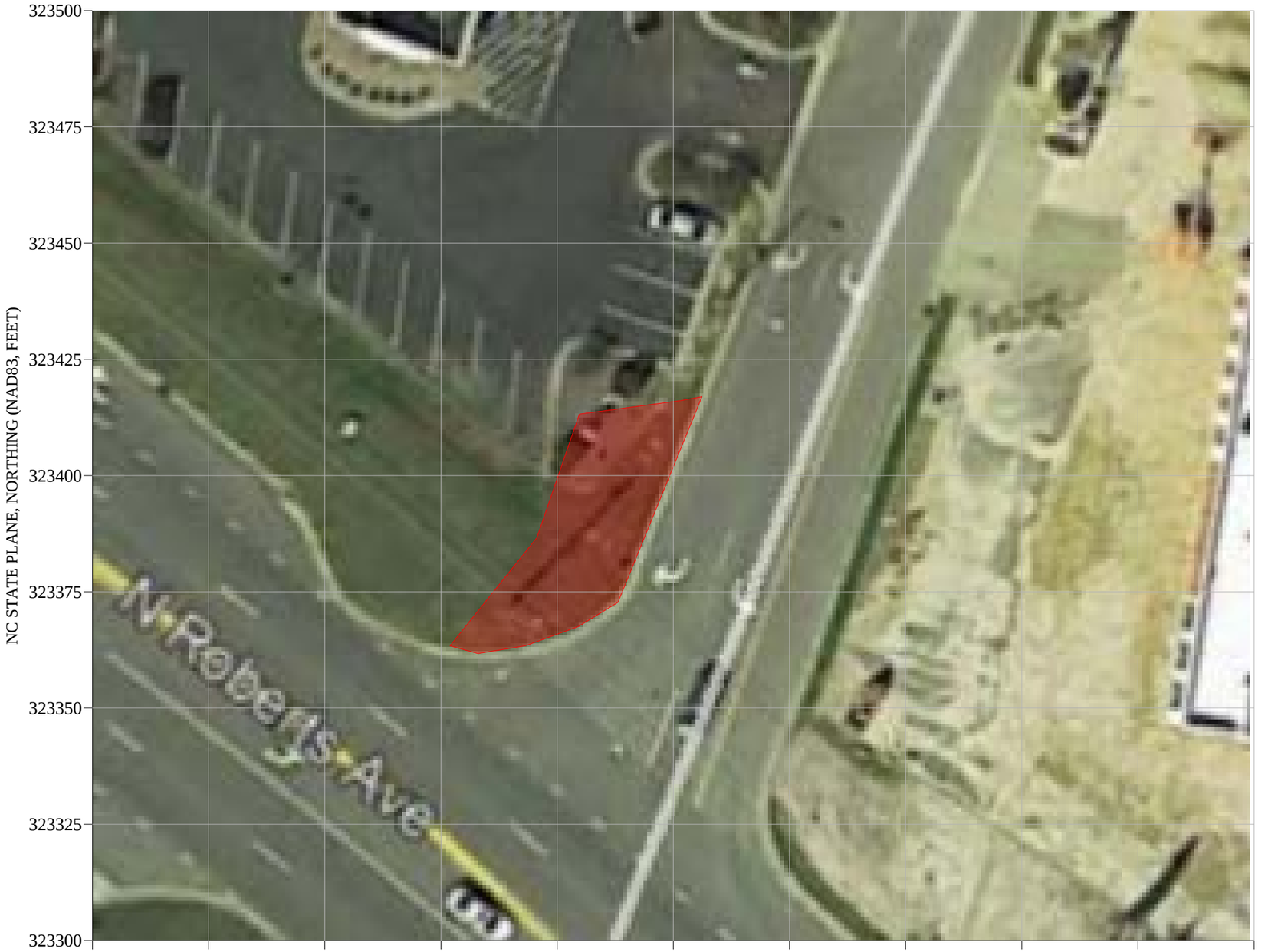
Pyramid's evaluation of the EM61 data collected at Parcel 30 in Lumberton, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All of the EM anomalies were directly attributed to visible cultural features at the ground surface; therefore, a GPR survey was not required.
- The geophysical data did not record any evidence of unknown metallic USTs within the geophysical survey area at Parcel 30.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Falcon Engineers in accordance with generally accepted guidelines for EM61 surveys. It is generally recognized that the results of the EM61 surveys are non-unique and may not represent actual subsurface conditions. The EM61 results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area
(Facing Approximately North)

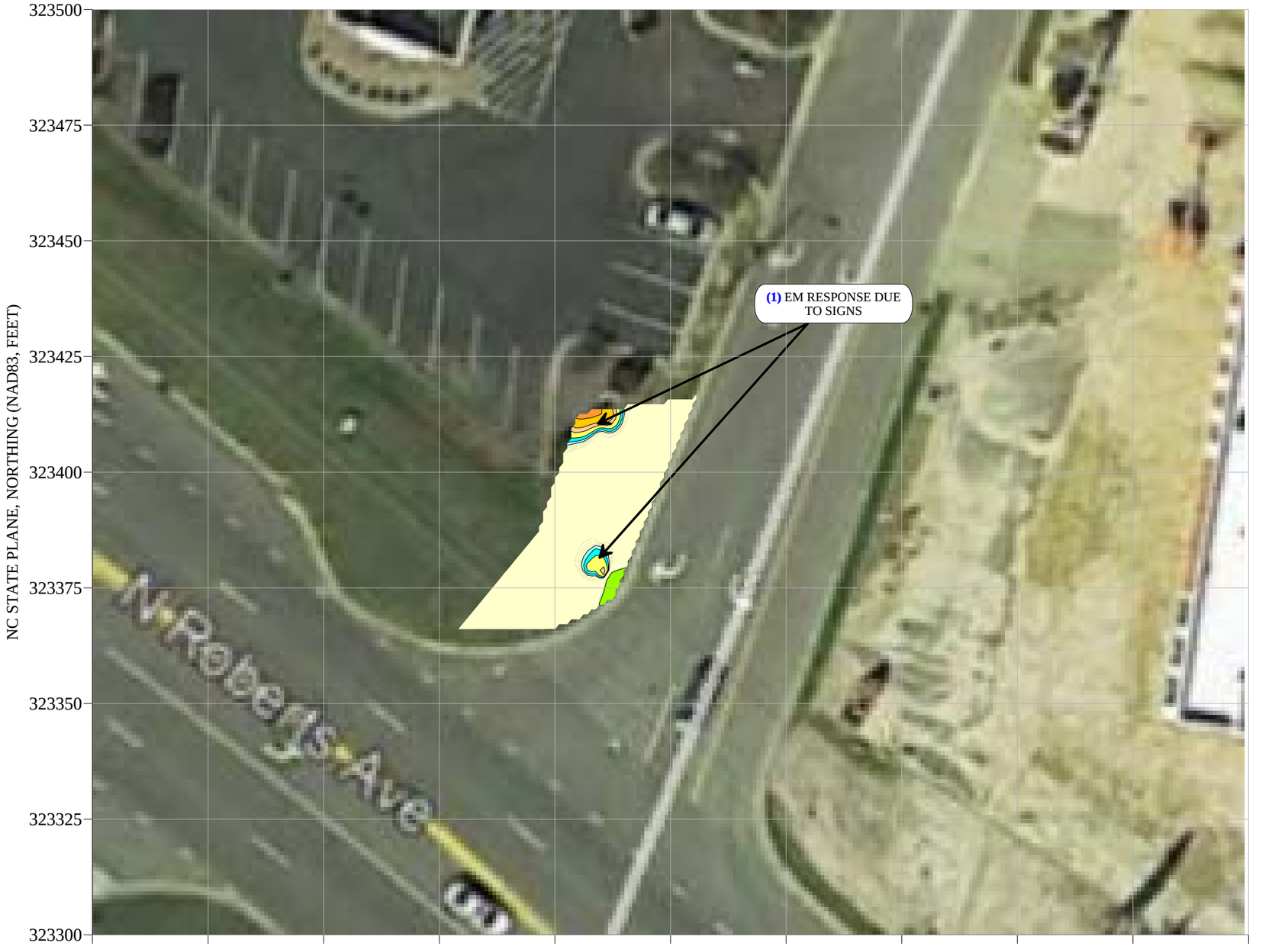
View of Survey Area
(Facing Approximately South)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 30 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 30 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 1**

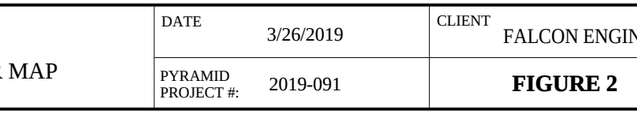
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on March 19, 2019, using a Geonics EM61-MK2 instrument. All of the EM anomalies were associated with surface features and verification GPR was not necessary.

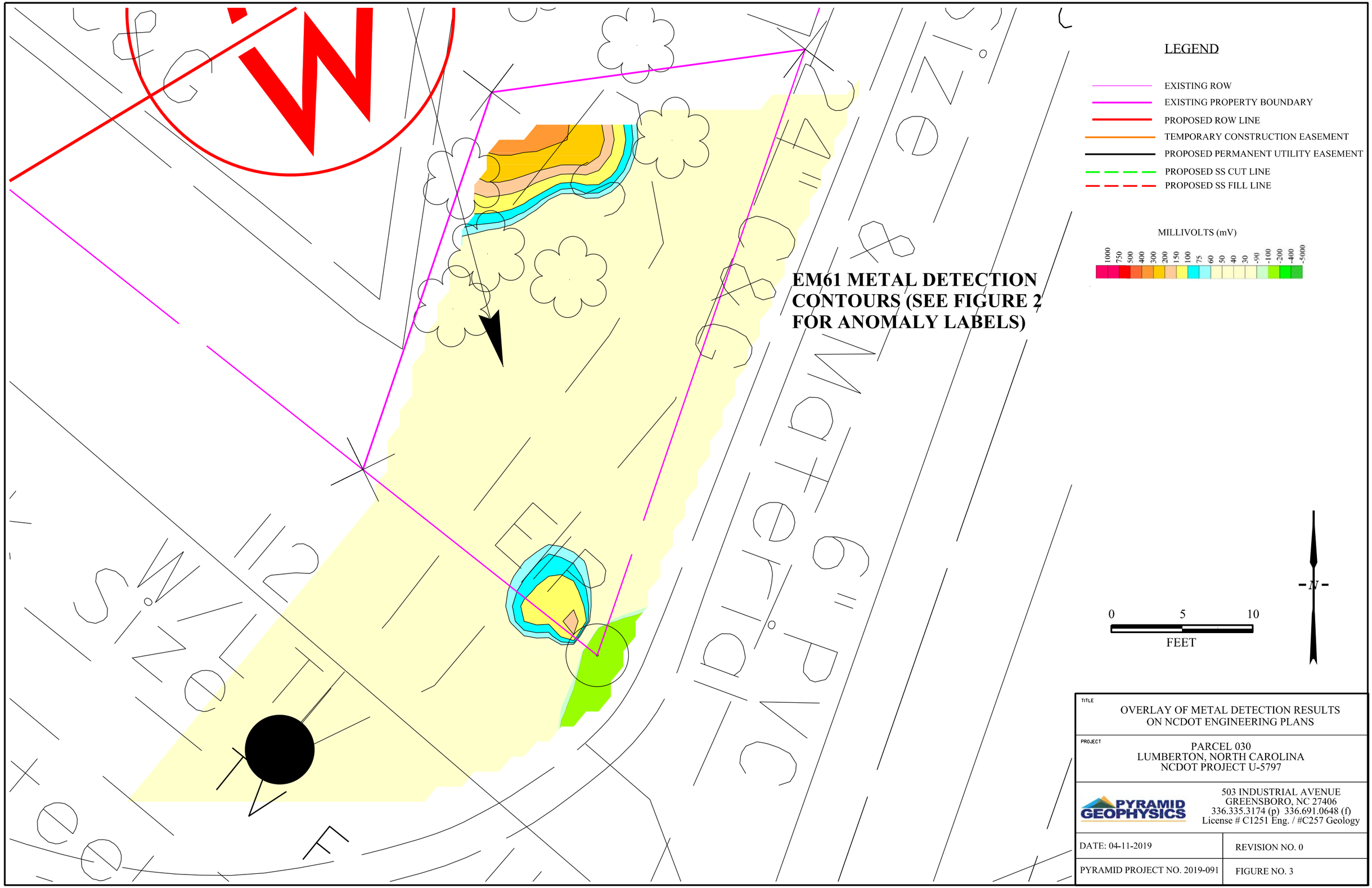
EM61 Metal Detection Response (millivolts)



N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 30 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 30 - EM61 METAL DETECTION CONTOUR MAP	DATE: 3/26/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 2**



TITLE

OVERLAY OF METAL DETECTION RESULTS
ON NCDOT ENGINEERING PLANS

PROJECT

PARCEL 030
LUMBERTON, NORTH CAROLINA
NCDOT PROJECT U-5797

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-11-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-091	FIGURE NO. 3

PRELIMINARY SITE ASSESSMENT

SR 1997 (FAYETTEVILLE ROAD) WIDENING
TIP NO. U-5797, WBS NO. 44367.1.1

NCDOT PARCEL NO. 50
OWNER: PLANTERS OIL COMPANY
3795 FAYETTEVILLE ROAD
LUMBERTON, ROBESON COUNTY, NORTH CAROLINA

PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
C/O STV ENGINEERS, INC.
1600 PERIMETER PARK DRIVE, SUITE 225
MORRISVILLE, NC 2756002

PREPARED BY:
FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513

PROJECT NUMBER: G19011.00
JUNE 9, 2020

FALCON ENGINEERING

June 9, 2020

Mr. Patrick Livingston, PE
STV Engineers, Inc.
900 W. Trade St, Suite 715
Charlotte, NC 28202

Re: **Preliminary Site Assessment**
SR 1997 (Fayetteville Road) Widening
TIP No. U-5797, WBS No. 44367.1.1
Parcel No. 50
Owner: Planters Oil Company
3795 Fayetteville Road
Lumberton, Robeson County, North Carolina

Dear: Mr. Livingston:

Falcon is pleased to present the following Preliminary Site Assessment in support of the above-mentioned Project. Specifically, Falcon sampled soil in proximity to the project limits on this parcel in general accordance with the approved scope of work. Soils requiring remediation or special handling during construction were not identified. There are three known 10,000-gallon gasoline USTs on Parcel No. 50.

Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

Please review this report and advise us if you have any questions or concerns. We appreciate this opportunity to provide services to you and look forward to partnering with you on future projects. If you have any questions, please give Falcon a call at (919) 871-0800.

Sincerely,
FALCON ENGINEERING, INC.

Christopher J. Burkhardt
Environmental Services Manager

Jeremy R. Hamm, PE
Geotechnical Services Manager

TABLE OF CONTENTS

LIST OF FIGURES AND ATTACHMENTS

SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 50. Parcel No. 50 is addressed as 3795 Fayetteville Road, Lumberton Robeson County, North Carolina. NCDOT is proposing to widen Fayetteville Road (SR 1997) from Farringdom Street to 22nd Street. The limits of the assessment are between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). Boring locations were placed in the vicinity of proposed excavations for drainage features, utilities, and roadway/ditch cuts to determine if soils requiring remediation or special handling were present where excavation was planned to take place.

1.2 SCOPE OF WORK

Falcon's scope of work included coordination of; public and private utility location near the proposed borings, geophysical surveys, collecting soil samples using direct push methods, and laboratory analysis. Samples were analyzed for petroleum hydrocarbons via UVF technology.

SECTION 2: HISTORY

2.1 PARCEL USAGE

Falcon performed a Phase I Environmental Site Assessment (ESA) for U-5797 under Project No. G17057 dated April 2018. The ESA identified this parcel as a Recognized Environmental Condition (REC) based on its use as an active gas station. Robeson County GIS list the address for this parcel as 3795; however, the UST database list 3801 Fayetteville Road. According to the UST Database, three 10,000-gallon gasoline USTs are registered to Parcel No. 50. The three USTs were reportedly installed in 1987.

2.2 FACILITY IDENTIFICATION NUMBER

Facility Identification No. 00-0-0000021553 corresponds to this parcel.

2.3 GROUNDWATER INCIDENT NUMBER

A Groundwater Incident Number was not identified for this parcel.

SECTION 3: SITE OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Groundwater monitoring wells (MWs) were not observed on this parcel.

3.2 ACTIVE USTS

Three 10,000-gallon gasoline USTs are registered to Parcel No. 50.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

Monitoring wells, remediation systems, or hydraulic lifts were not observed within the project limits.

SECTION 4: METHODOLOGY

4.1 GEOPHYSICS

Pyramid Geophysical Services (Pyramid) was subcontracted to perform a geophysical survey of the assessment area. The assessment area is between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). The survey was used to locate private utility lines, as well as possible indications of USTs, and/or their pits.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings.

GPR data was acquired across select EM anomalies (where identified), using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Pyramid marked their findings on the surface with paint. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and to obtain adequate coverage. A copy of the full Geophysical Report is included in the Attachments.

4.2 BORINGS

Regional Probing was subcontracted to advance soil borings using direct push technology. Regional Probing used a truck-mounted Geoprobe® 5410 unit mounted on an off-road modified Ford F350 Diesel 4x4. The unit has auger-capabilities and is equipped with a GH-42 soil-probing hammer, with 21,700 pounds of down force and 28,900 pounds of retraction force. The unit has an on-board tank for decontaminating the geoprobe rods before advancing the probe at each sample location.

4.3 SAMPLE PROTOCOL

Prior to initiating sample collection Falcon contacted NC One Call and requested public utility locations be marked around the proposed sample locations. Sampling was in general accordance with the NC Department of Environmental Quality (DEQ) Division of Waste Management's (DWM) "Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases" (March 1, 2007 Version Change 9 – February 1, 2019) guidance document. Sampling strategy was derived based upon the project scope and objectives as outlined above. Red Lab, LLC was selected to perform the UVF laboratory analytical analysis. Appropriate sterile containers were received by Falcon from Red Lab prior to beginning the fieldwork. The containers were labeled appropriately.

A Minirae 3000 photoionization detector (PID) was used to field screen samples for volatile organics to determine if a release had occurred. The instrument was calibrated per manufacturer instructions prior to use. Falcon staff bagged composite soil samples of each boring in approximately two-foot sections. Representative samples were placed in a sealed plastic bag for approximately 10 minutes to allow soil hydrocarbons to reach equilibrium within the headspace prior to scanning with the PID. One sample per boring was collected from the depth of the proposed cut or from the section above the depth of cut with the highest PID reading.

To avoid cross contamination, a new unused pair of non-powdered nitrile gloves was worn while extracting each sample. Samples were placed in the appropriate laboratory provided containers. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used and sampling location identification. Samples were placed in an ice filled cooler and transported to the lab. Appropriate chain-of-custody procedures, including the completion of necessary forms, were followed.

SECTION 5: RESULTS

5.1 GEOPHYSICS

The geophysical investigation was performed from March 20 through March 28, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area A total of sixteen EM anomalies were identified. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.

GPR recorded minor reflectors that were suggestive of possible buried metallic debris at the southwest corner of the property. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly. GPR also verified the presence of reinforcement in the concrete at the site, verified that several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.

GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced four borings (B-54 through B-57) to the proposed excavation depth of the drainage features, utilities, or roadway/ditch cut being assessed. Groundwater was not observed. Please see the Boring Location Plan in the attachments for a visual depiction of the sample locations. The coordinates (latitude and longitude) that correspond to the sample locations are shown below in Table No. 1 Boring Coordinates.

TABLE NO. 1 BORING COORDINATES

Boring	Latitude	Longitude
B-54	34.6447298	-78.9998548
B-55	34.6448507	-78.999849
B-56	34.6451201	-78.9998291
B-57	34.6451169	-78.9994159

Borings were field screened with a PID in sections for evidence of volatile organics. The PID screening results are presented in Table No. 2 PID Readings. Falcon selected soil samples based on the field screening results and the needs of the project. Red Lab analyzed the selected samples and their full analytical report is attached. The results of the laboratory analysis are shown in Table No. 3 Summary of UVF Soil Sampling Results.

Petroleum hydrocarbons above State Action Levels were not detected in the samples.

TABLE NO. 2 PID READINGS

Boring	Depth BGS*	PID**
B-54	0-2.0	1.6
	2.0-4.0	2.4
	4.0-6.0	**3.6**
	6.0-8.0	0.8
B-55	0-2.0	1.1
	2.0-4.0	3
	4.0-6.0	**8.3**
	6.0-8.0	1.9
B-56	0-2.5	1.2
	2.5-5.0	**11.2**
B-57	0-2.5	0.7
	2.5-5.0	1.2
	5.0-7.5	1.6
	7.5-10.0	**1.4**

*BGS = Depth below ground surface in feet
**PID readings are in parts per million
Samples shown in **bold** were selected for analysis

TABLE NO. 3 SUMMARY OF UVF SOIL SAMPLING RESULTS

Sample ID	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	
B-54	<0.28	<0.28	5.5	5.5	2.7	0.3	<0.011	0	82.9	17.1	Road Tar 90.4%,(FCM)
B-55	<6.8	<6.8	40.3	40.3	19.5	<2.2	<0.27	0	82.6	17.4	Road Tar 90.6%,(FCM)
B-56	<0.5	2.2	6	8.2	4.6	0.26	<0.02	41.7	51.8	6.5	Deg Fuel 77.3%,(FCM)
B-57	<0.27	<0.27	0.27	0.27	0.13	<0.09	<0.011	0	80.3	19.7	V.Deg.PHC 91.7%,(FCM)

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious indications of a release (stained soils, odors, or oily sheen) were not observed. Table No. 4 Soil Observations lists visual soil observations of color and texture.

TABLE NO. 4 SOIL OBSERVATIONS

Sample ID	Depth	Color	Soil Type
B-54	0-2.0	Brown Orangge	Silty Clayey Sand (A-2-6)
	2.0-4.0	Gray Brown	Silty Sandy Clay (A-6)
	4.0-6.0	Brown Tan	Silty Sandy Clay (A-6)
	6.0-8.0	Gray Tan (mottled)	Silty Clayey Sand (A-2-6)
B-55	0-2.0	Orange Brown	Clayey Silty Sand (A-2-4)
	2.0-4.0	Orange Gray	Silty Sand (A-2-4)
	4.0-6.0	Brown Tan	Clayey Silty Sand (A-2-4)
	6.0-8.0	Gray Tan	Silty Clayey Sand (A-2-6)
B-56	0-2.5	Orange	Clayey Silty Sand (A-2-4)
	2.5-5.0	Dark Brown Gray	Clayey Silty Sand (A-2-4)
B-57	0-2.5	Dark Brown to Tan	Clayey Silty Sand (A-2-4)
	2.5-5.0	Brown	Sandy Clay (A-6)
	5.0-7.5	Gray	Clayey Sand (A-2-6)
	7.5-10.0	Gray	Sand (A-3)

Depth is in feet below ground surface

5.4 QUANTITIES CALCULATIONS

Soils requiring quantity calculations were not identified.

SECTION 6: CONCLUSIONS

6.1 INTERPRETATION OF RESULTS

This Preliminary Site Assessment was performed to evaluate the soils in proximity to the project limits on this parcel for the presence of petroleum hydrocarbons. The findings are as follows:

- Soil sampling completed on the parcel did not identify contaminants in the soil at levels requiring remediation.

6.2 GEOPHYSICS

The geophysical data recorded evidence of one known UST pit (3 known USTs) and one No Confidence anomaly within the geophysical survey area at Parcel No. 50.

6.3 SAMPLING

Sampling results did not identify contaminates in the soil which require remediation in the areas sampled. Based on past project experience, Falcon does not anticipate soil remediation or special handling and disposal will be required during construction on this parcel.

6.4 QUANTITIES

Soils requiring quantities calculations were not identified.

SECTION 7: RECOMMENDATIONS

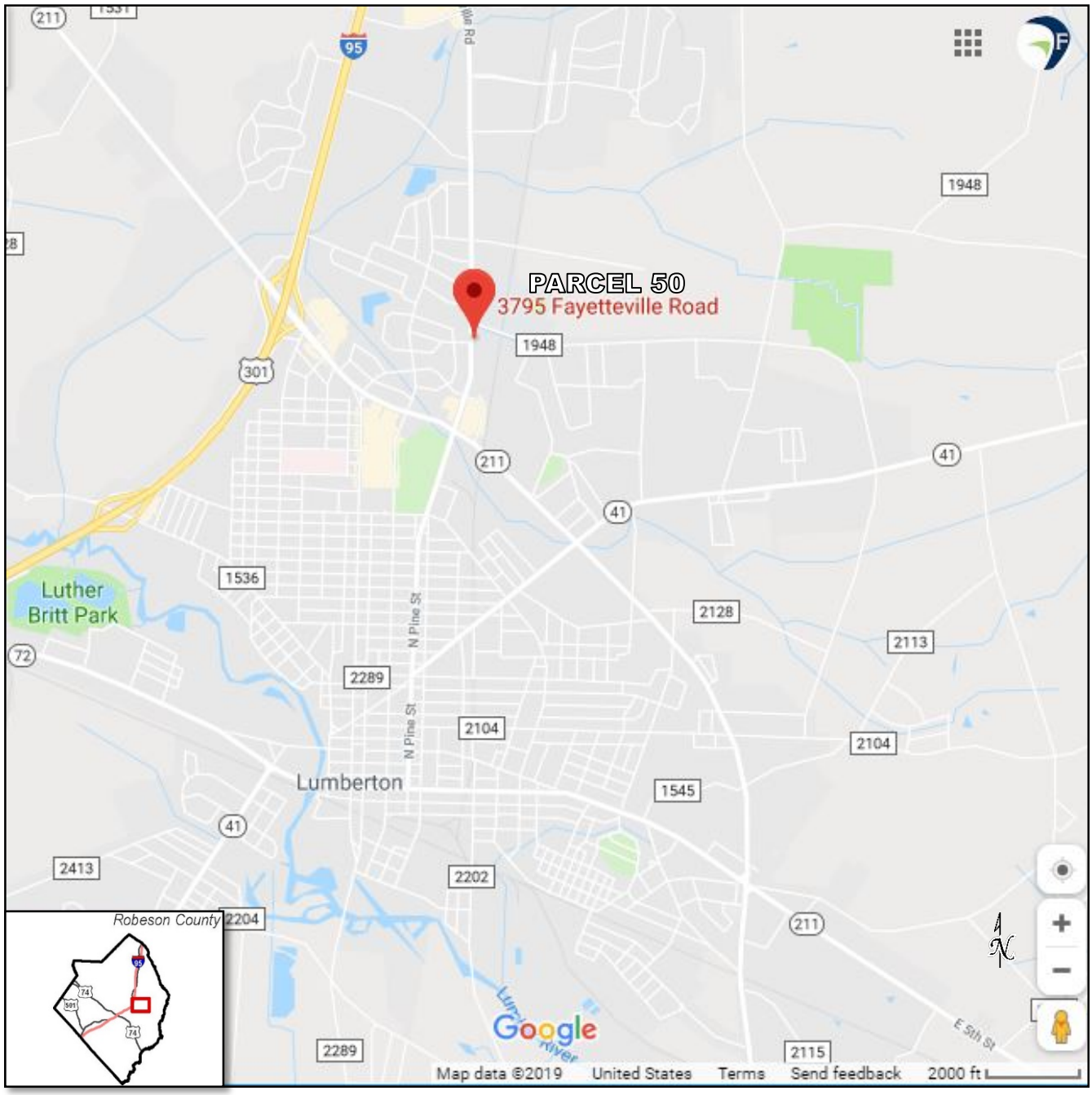
7.1 ADDITIONAL SAMPLING

Contaminants above the Industrial / Commercial Soil Cleanup Levels were not identified; therefore, additional assessment is not warranted at this time. Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

7.2 SPECIAL HANDLING OF IMPACTED SOIL

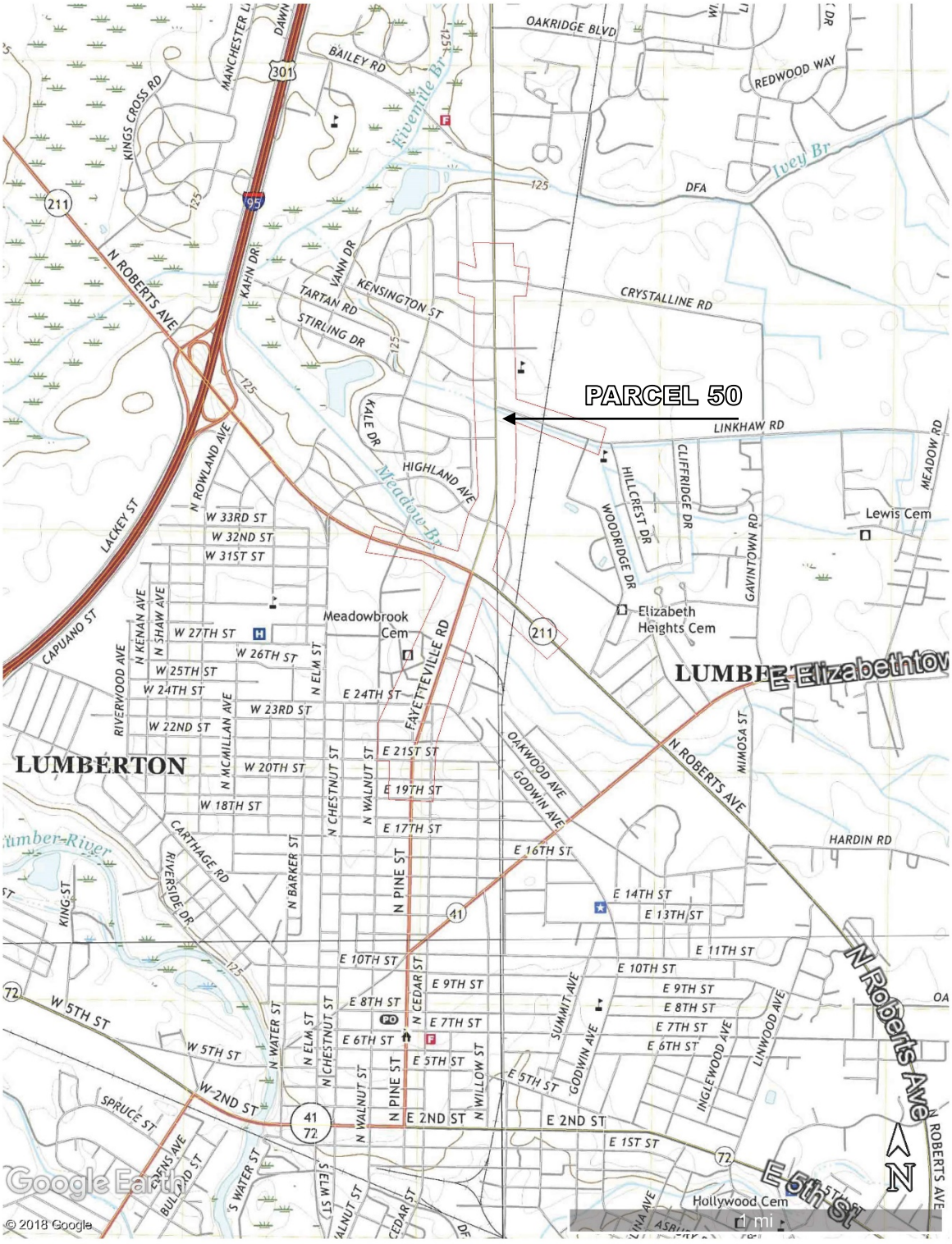
Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 50
Preliminary Site Assessment
Vicinity Map



Project No.: G19011.00
Date: September 2019
Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 50
Preliminary Site Assessment
USGS Topographic Maps



Project No.: G19011.00
Date: September 2019
Source: "NW, NE, SW, and SE Lumberton, NC" 2019

NCDOT U-5797 (SR 1997 Widening) Parcel 50
Preliminary Site Assessment
Parcel Location Map

September 5, 2019

County Line
City Limits
Streets
Parcels

1:2,128

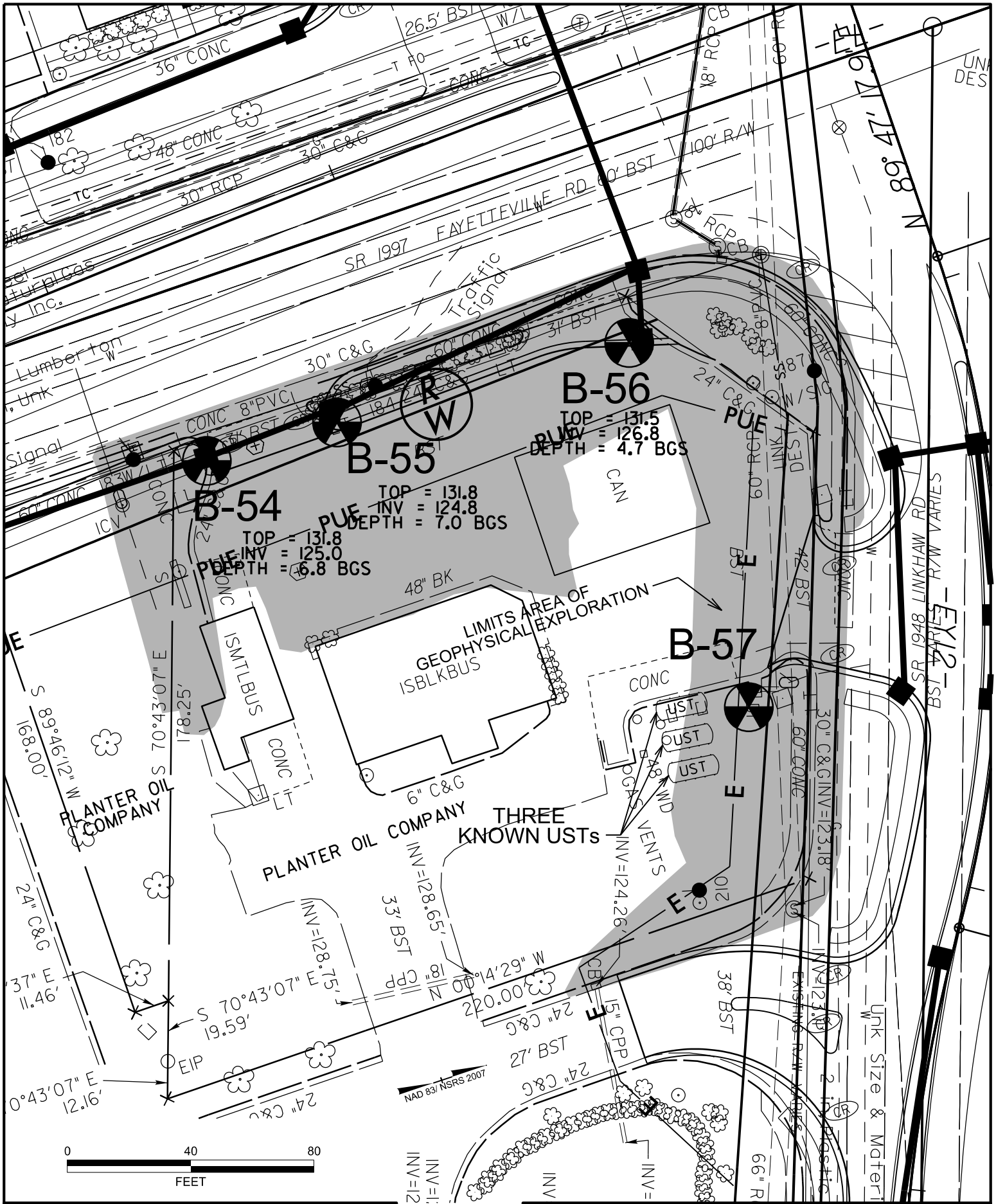
0 0.0175 0.035 0.07 mi

0 0.0275 0.055 0.11 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2019

Project No.: G19011.00
Date: September 2019
Source: Robeson County GIS



NOTES:

- BGS = BELOW GROUND SURFACE
- BORING B-57 WAS DRILLED TO 10.0 BGS

FALCON ENGINEERING

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607

PHONE: 919.871.0800
FAX: 919.871.0803

BORING LOCATION PLAN

NCDOT U-5797 (SR 1997 WIDENING)
PARCEL 50 - PLANTER OIL COMPANY
ROBESON / LUMBERTON, NC
WBS NO.: 44367.1.1 & TIP NO.: U-5797
FALCON PROJECT NO. G19011.00

NCDOT U-5797 (SR 1997 Widening) Parcel 50
Preliminary Site Assessment
Site Photographs

Photograph No. 1: General view of Boring B-54.

Photograph No. 2: General view of Boring B-55.

NCDOT U-5797 (SR 1997 Widening) Parcel 50
Preliminary Site Assessment
Site Photographs

Photograph No. 3: General view of Boring B-56.

Photograph No. 4: General view of Boring B-57.

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: FALCON
Address: 1210 TRINITY ROAD SUITE 116
CARY NC 28513

Samples taken Tuesday, April 9, 2019
Samples extracted Tuesday, April 9, 2019
Samples analysed Tuesday, April 16, 2019

Contact: CHRISTOPHER BURKHARDY

Operator DAVIS MARTINEC

Project: G19011 U5797

U00902

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
										C5 - C10	C10 - C18	C18	
s	B54	11.1	<0.28	<0.28	5.5	5.5	2.7	0.3	<0.011	0	82.9	17.1	Road Tar 90.4%,(FCM)
s	B 55	273.0	<6.8	<6.8	40.3	40.3	19.5	<2.2	<0.27	0	82.6	17.4	Road Tar 90.6%,(FCM)
s	B56	20.0	<0.5	2.2	6	8.2	4.6	0.26	<0.02	41.7	51.8	6.5	Deg Fuel 77.3%,(FCM)
s	B57	10.8	<0.27	<0.27	0.27	0.27	0.13	<0.09	<0.011	0	80.3	19.7	V.Deg.PHC 91.7%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 97.3 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

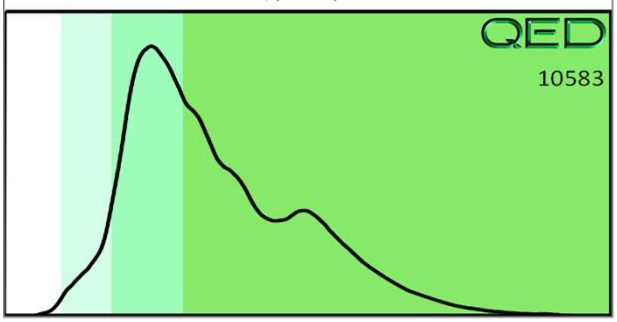
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

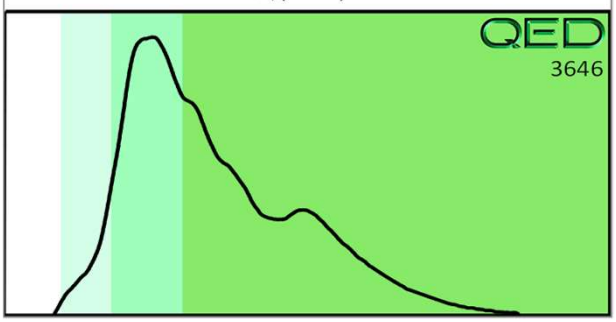
QED Hydrocarbon Fingerprints

Project: G19011 U5797 Tuesday, April 16, 2019

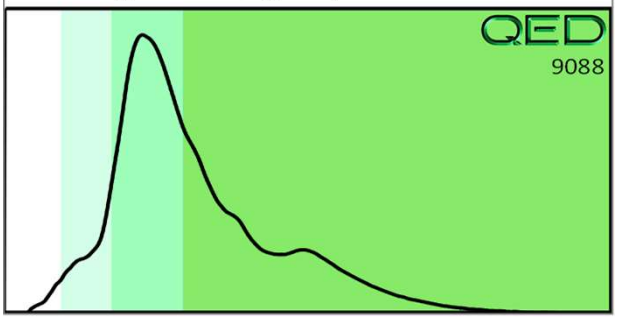
B54 : Road Tar 90.4%,(FCM)



B 55 : Road Tar 90.6%,(FCM)



B56 : Deg Fuel 77.3%,(FCM)



B57 : V.Deg.PHC 91.7%,(FCM)

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 50
NCDOT PROJECT U-5797

3801 FAYETTEVILLE ST., LUMBERTON, NC

APRIL 24, 2019

Report prepared for: **Christopher J. Burkhardt, PWS**
Falcon Engineers
1210 Trinity Rd. #110
Raleigh, NC 27607

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 50 - 3801 Fayetteville St.
Lumberton, Robeson County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 50, located at 3801 Fayetteville St. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 20-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of sixteen EM anomalies were identified. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.

GPR recorded minor reflectors that were suggestive of possible buried metallic debris at the southwest corner of the property. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly. GPR also verified the presence of reinforcement in the concrete at the site, verified that several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.

GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.

Collectively, the geophysical data recorded evidence of one known UST pit (3 known USTs) and one No Confidence anomaly within the geophysical survey area at Parcel 50.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 50, located at 3801 Fayetteville St. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 20-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active gas station, including a car wash, surrounded by concrete, asphalt, and grass surfaces. One Known UST Pit (containing 3 known USTs) was observed within the geophysical survey area during the investigation. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on March 28, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	**No Confidence Anomaly** (Suspected Buried Metal)	☑
2	Water Meter	
3	Lights	
4	Drop Inlet	
5	Utility	
6	Air Pump	
7	Drop Inlet	☑
8	**Known UST Pit (Three Known USTs)**	☑
9	Pump Island/Reinforced Concrete	☑
10	Utility	
11	Vehicles	☑
12	Drop Inlet	
13	Surface Metal	
14	Car Wash	
15	Reinforced Concrete	☑
16	Sign	

Several of the EM anomalies were directly attributed to visible cultural features at the ground surface, including a water meter, lights, drop inlets, utilities, an air pump, the pump island, vehicles, surface metal, the car wash building, and a sign. EM Anomaly 1 was associated with unknown buried metal and was further investigated with GPR.

EM Anomalies 7-8 were associated with the known UST pit (3 known USTs). GPR was performed across the known UST pit to verify its size and orientation.

EM Anomalies 9 and 15 were associated with suspected reinforced concrete and were further investigated with GPR to verify the presence of the reinforcement and to verify that no other structures were obscured by the interference.

EM Anomaly 11 was associated with interference from vehicles and was further investigated with GPR to verify that the interference did not obscure buried structures such as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as select transect images. All of the transect images are included in **Appendix A**. A total of 14 formal GPR transects were performed at the site.

GPR Transects 1-2 were performed across an area of suspected buried metal (EM Anomaly 1). These transects recorded minor reflectors that were suggestive of possible buried metallic debris. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly. No evidence of any larger structures such as USTs was observed.

GPR Transects 3-5 were performed across EM Anomaly 15 and verified the presence of reinforcement in the concrete. No other structures such as USTs were observed beneath the reinforcement.

GPR Transects 6-8 were performed across an area of vehicle interference (EM Anomaly 11). These transects recorded no evidence of buried structures, such as USTs, and verified that the EM interference was the result of the vehicles.

GPR Transects 9-11 were performed across an area of suspected reinforced concrete and the location of a pump island (EM Anomaly 9). These transects recorded no evidence of buried structures, such as USTs, and verified the presence of reinforcement in the concrete. No other structures such as USTs were observed beneath the reinforcement.

GPR Transects 12-14 were performed across the known UST pit (3 known USTs) at EM Anomalies 7 and 8. These transects verified the size and orientation of the known UST pit (3 known USTs) at the site. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area. **Figure 4** provides the location and size of the known UST pit (3 known USTs) overlain on an aerial, along with ground-level photographs. GPR Transects 12 and 13 also indicated the presence of reinforcement in the concrete and evidence of a suspected utility.

Collectively, the geophysical data recorded evidence of one known UST pit (3 known USTs) and one No Confidence anomaly within the geophysical survey area at Parcel 50. **Figure 5** provides an overlay of the EM61 metal detection contour map, along with the locations of the known UST pit (3 known USTs), onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 50 in Lumberton, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- Several of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Several other EM anomalies were associated with suspected buried metal, a known UST pit, reinforced concrete, and vehicle interference and were investigated further with GPR.
- GPR recorded minor reflectors that were suggestive of possible buried metallic debris. The location of the anomaly, along with the fact that the reflectors lacked the size and characteristics typically associated with a UST, resulted in this feature being classified as a No Confidence anomaly.
- GPR verified the presence of reinforcement in the concrete at the site, verified that

several areas of EM interference were the result of vehicles, and provided evidence of a suspected utility.

- GPR also verified the size and orientation of one known UST pit (3 known USTs) located within the geophysical survey area. The known UST pit was located on the northeastern portion of the property and was approximately 30.5 feet long by 27 feet wide. No unknown buried structures were identified in this area.
- Collectively, the geophysical data recorded evidence of one known UST pit (3 known USTs) and one No Confidence anomaly within the geophysical survey area at Parcel 50.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Falcon Engineers in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately East)

View of Survey Area
(Facing Approximately North)

N

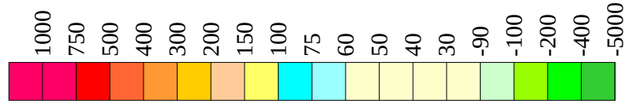
PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE PARCEL 50 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT FALCON ENGINEERS **FIGURE 1**

EM61 METAL DETECTION RESULTS

EVIDENCE OF A KNOWN UST PIT (3 KNOWN USTs) AND ONE NO CONFIDENCE ANOMALY OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on March 20, 2019, using a Geonics EM61-MK2 instrument.Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on March 28, 2019.

EM61 Metal Detection Response (millivolts)

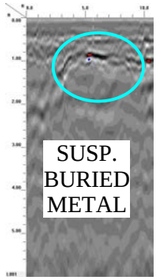


N

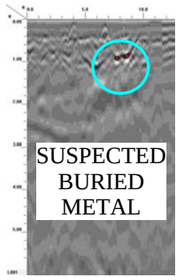
PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797
TITLE	PARCEL 50 - EM61 METAL DETECTION CONTOUR MAP
DATE	3/28/2019
PYRAMID PROJECT #:	2019-091
CLIENT	FALCON ENGINEERS
	FIGURE 2

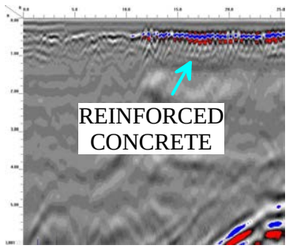
LOCATIONS OF GPR TRANSECTS



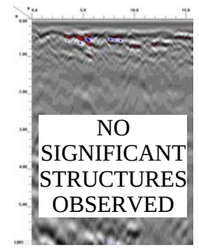
GPR TRANSECT 1 (T1)



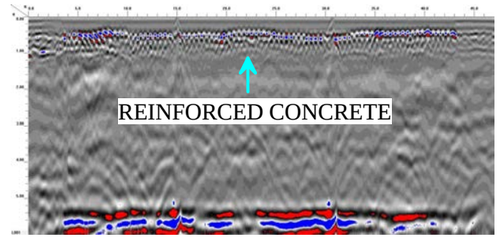
GPR TRANSECT 2 (T2)



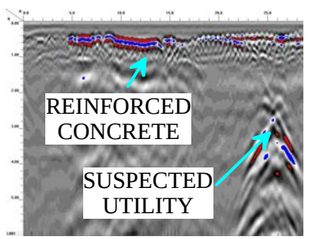
GPR TRANSECT 5 (T5)



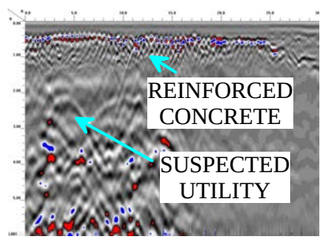
GPR TRANSECT 8 (T8)



GPR TRANSECT 9 (T9)



GPR TRANSECT 12 (T12)



GPR TRANSECT 13 (T13)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT
PARCEL 50
LUMBERTON, NORTH CAROLINA
NCDOT PROJECT U-5797

TITLE
PARCEL 50 -
GPR TRANSECT LOCATIONS AND SELECT IMAGES

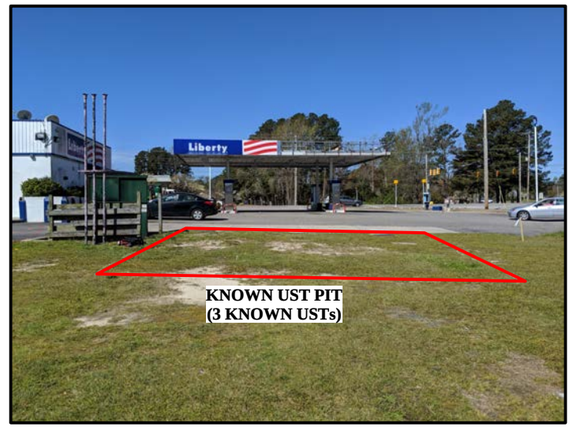
DATE 3/28/2019

PYRAMID PROJECT #: 2019-091

CLIENT FALCON ENGINEERS

FIGURE 3

LOCATIONS OF ONE KNOWN UST PIT (3 KNOWN USTs)



View of One Known UST Pit (3 Known USTs) Facing Approximately West

View of One Known UST Pit (3 Known USTs) Facing Approximately South

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 50 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 50 - LOCATION AND SIZE OF ONE KNOWN UST PIT (3 KNOWN USTs)	DATE: 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 4**

EM61 METAL DETECTION CONTOURS (SEE FIGURE 2 FOR ANOMALY LABELS)

KNOWN UST PIT (3 KNOWN USTs)

LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PUE — PROPOSED PERMANENT UTILITY EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- KNOWN UST PIT (3 KNOWN USTs)

MILLIVOLTS (mV)

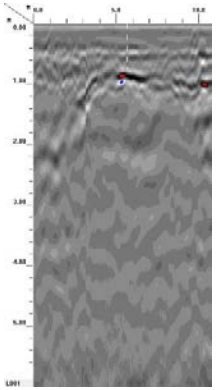
1000 750 500 400 300 200 150 100 75 60 50 40 30 -90 -100 -200 -400 -5000

N

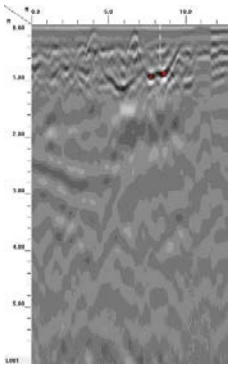
0 20 40
FEET

TITLE: OVERLAY OF METAL DETECTION RESULTS AND ONE KNOWN UST PIT (3 KNOWN USTs) ON NCDOT ENGINEERING PLANS	
PROJECT: PARCEL 050 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	
PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 04-11-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-091	FIGURE NO. 5

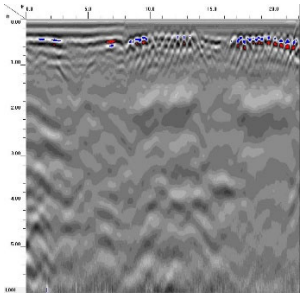
Appendix A – GPR Transect Images



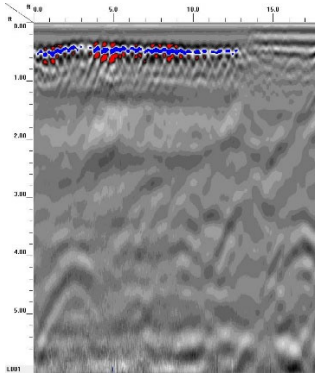
GPR TRANSECT 1



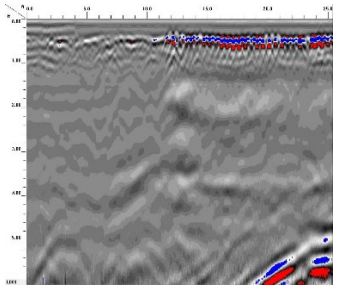
GPR TRANSECT 2



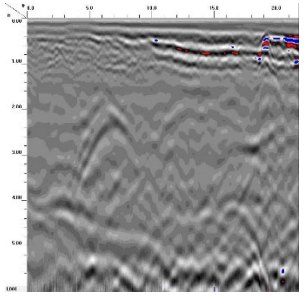
GPR TRANSECT 3



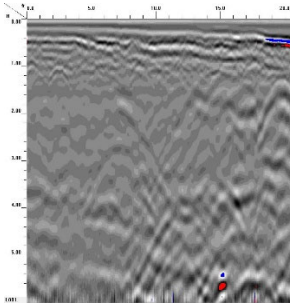
GPR TRANSECT 4



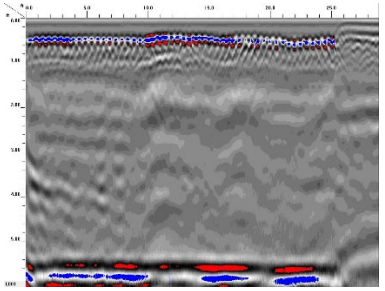
GPR TRANSECT 5



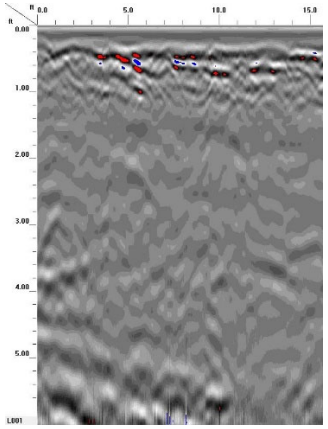
GPR TRANSECT 6



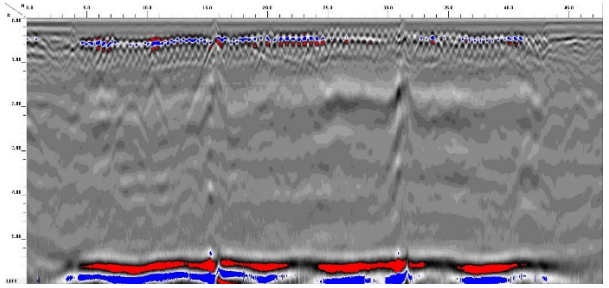
GPR TRANSECT 7



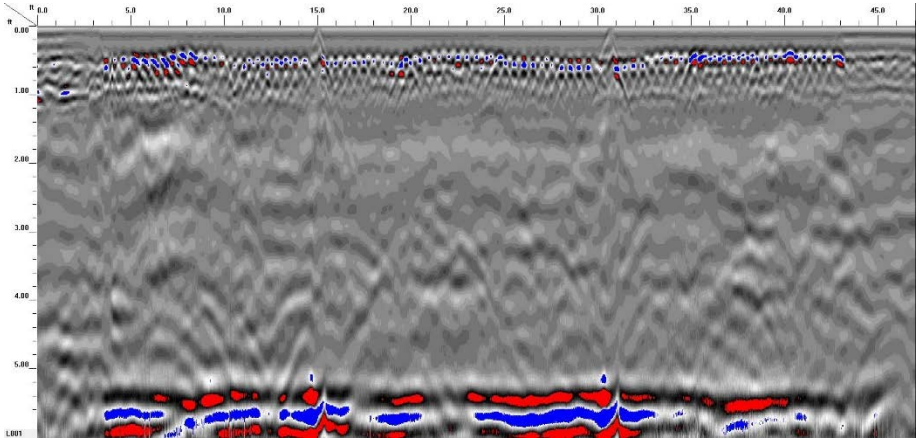
GPR TRANSECT 10



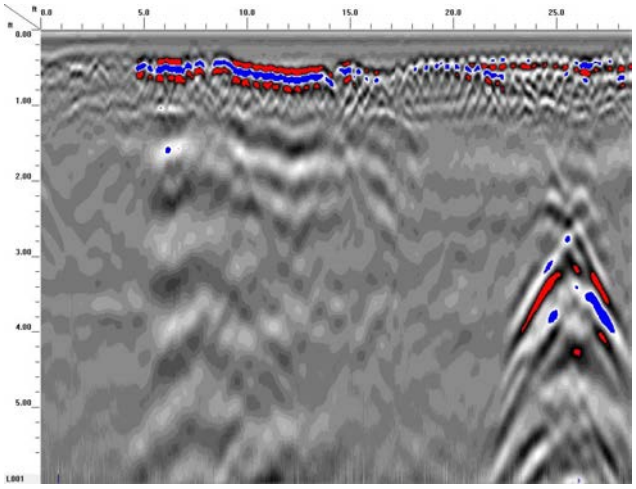
GPR TRANSECT 8



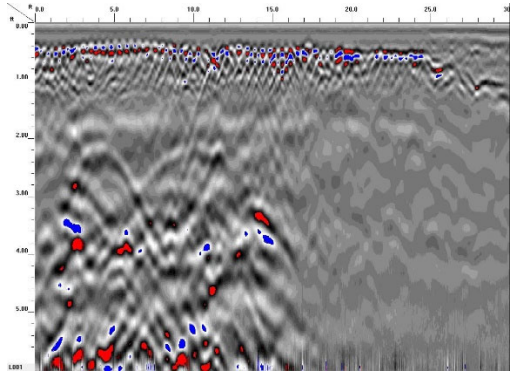
GPR TRANSECT 11



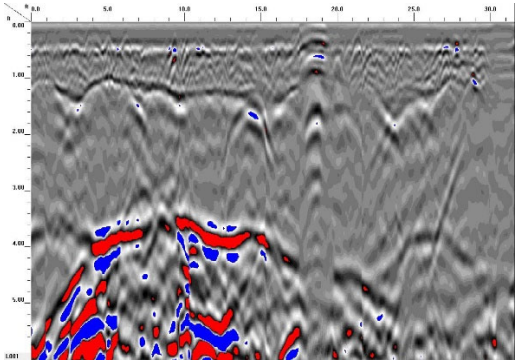
GPR TRANSECT 9



GPR TRANSECT 12



GPR TRANSECT 13



GPR TRANSECT 14

PRELIMINARY SITE ASSESSMENT

SR 1997 (FAYETTEVILLE ROAD) WIDENING
TIP NO. U-5797, WBS NO. 44367.1.1

NCDOT PARCEL NO. 57
OWNER: MCM PROPERTIES LLC
4129 FAYETTEVILLE ROAD
LUMBERTON, ROBESON COUNTY, NORTH CAROLINA

PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
C/O STV ENGINEERS, INC.
1600 PERIMETER PARK DRIVE, SUITE 225
MORRISVILLE, NC 2756002

PREPARED BY:
FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513

PROJECT NUMBER: G19011.00
JUNE 9, 2020

FALCON ENGINEERING

June 9, 2020

Mr. Patrick Livingston, PE
STV Engineers, Inc.
900 W. Trade St, Suite 715
Charlotte, NC 28202

Re: **Preliminary Site Assessment**
SR 1997 (Fayetteville Road) Widening
TIP No. U-5797, WBS No. 44367.1.1
Parcel No. 57
Owner: MCM Properties LLC
4129 Fayetteville Road
Lumberton, Robeson County, North Carolina

Dear: Mr. Livingston:

Falcon is pleased to present the following Preliminary Site Assessment in support of the above-mentioned Project. Specifically, Falcon sampled soil in proximity to the project limits on this parcel in general accordance with the approved scope of work. Soils requiring remediation or special handling during construction were not identified.

Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

Please review this report and advise us if you have any questions or concerns. We appreciate this opportunity to provide services to you and look forward to partnering with you on future projects. If you have any questions, please give Falcon a call at (919) 871-0800.

Sincerely,
FALCON ENGINEERING, INC.

Christopher J. Burkhardt
Environmental Services Manager

Jeremy R. Hamm, PE
Geotechnical Services Manager

TABLE OF CONTENTS

LIST OF FIGURES AND ATTACHMENTS

SECTION 1: INTRODUCTION

1.1 DESCRIPTION

Falcon Engineering, Inc. (Falcon) has completed a Preliminary Site Assessment of NCDOT TIP Project U-5797 Parcel No. 57. Parcel No. 57 is addressed as 4129 Fayetteville Road, Lumberton Robeson County, North Carolina. NCDOT is proposing to widen Fayetteville Road (SR 1997) from Farringdom Street to 22nd Street. The limits of the assessment are between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). Boring locations were placed in the vicinity of proposed excavations for drainage features, utilities, and roadway/ditch cuts to determine if soils requiring remediation or special handling were present where excavation was planned to take place.

1.2 SCOPE OF WORK

Falcon's scope of work included coordination of; public and private utility location near the proposed borings, geophysical surveys, collecting soil samples using direct push methods, and laboratory analysis. Samples were analyzed for petroleum hydrocarbons via UVF technology.

SECTION 2: HISTORY

2.1 PARCEL USAGE

Falcon performed a Phase I Environmental Site Assessment (ESA) for U-5797 under Project No. G17057 dated April 2018. The ESA identified this parcel as a Recognized Environmental Condition (REC) based on the parcel's history as a Shell Rapid Lube oil changing facility and the potential for an undiscovered or un-reported release.

2.2 FACILITY IDENTIFICATION NUMBER

A Facility Identification Number was not identified for this parcel.

2.3 GROUNDWATER INCIDENT NUMBER

A Groundwater Incident Number was not identified for this parcel.

SECTION 3: SITE OBSERVATIONS

3.1 GROUNDWATER MONITORING WELLS

Groundwater monitoring wells (MWs) were not observed on this parcel.

3.2 ACTIVE USTS

Active USTs were not observed within the project limits or registered at this parcel.

3.3 FEATURES APPARENT BEYOND ROW/EASEMENT

USTs, monitoring wells, remediation systems, or hydraulic lifts were not observed.

SECTION 4: METHODOLOGY

4.1 GEOPHYSICS

Pyramid Geophysical Services (Pyramid) was subcontracted to perform a geophysical survey of the assessment area. The assessment area is between the existing edge of NCDOT maintained pavement (within the existing NCDOT ROW) where accessible, and the proposed NCDOT ROW and/or easement (whichever boundary represents the largest area). The survey was used to locate private utility lines, as well as possible indications of USTs, and/or their pits.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is georeferenced and can be overlain on aerial photographs and CADD drawings.

GPR data was acquired across select EM anomalies (where identified), using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Pyramid marked their findings on the surface with paint. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and to obtain adequate coverage. A copy of the full Geophysical Report is included in the Attachments.

4.2 BORINGS

Regional Probing was subcontracted to advance soil borings using direct push technology. Regional Probing used a truck-mounted Geoprobe® 5410 unit mounted on an off-road modified Ford F350 Diesel 4x4. The unit has auger-capabilities and is equipped with a GH-42 soil-probing hammer, with 21,700 pounds of down force and 28,900 pounds of retraction force. The unit has an on-board tank for decontaminating the geoprobe rods before advancing the probe at each sample location.

4.3 SAMPLE PROTOCOL

Prior to initiating sample collection Falcon contacted NC One Call and requested public utility locations be marked around the proposed sample locations. Sampling was in general accordance with the NC Department of Environmental Quality (DEQ) Division of Waste Management's (DWM) "Guidelines for Site Checks, Tank Closure, and Initial Response and Abatement for UST Releases" (March 1, 2007 Version Change 9 – February 1, 2019) guidance document. Sampling strategy was derived based upon the project scope and objectives as outlined above. Red Lab, LLC was selected to perform the UVF laboratory analytical analysis. Appropriate sterile containers were received by Falcon from Red Lab prior to beginning the fieldwork. The containers were labeled appropriately.

A Minirae 3000 photoionization detector (PID) was used to field screen samples for volatile organics to determine if a release had occurred. The instrument was calibrated per manufacturer instructions prior to use. Falcon staff bagged composite soil samples of each boring in approximately two-foot sections. Representative samples were placed in a sealed plastic bag for approximately 10 minutes to allow soil hydrocarbons to reach equilibrium within the headspace prior to scanning with the PID. One sample per boring was collected from the depth of the proposed cut or from the section above the depth of cut with the highest PID reading.

To avoid cross contamination, a new unused pair of non-powdered nitrile gloves was worn while extracting each sample. Samples were placed in the appropriate laboratory provided containers. The labels on each container were then completed so that each provided the date and time of sampling, method of analysis, sample collector, preservative used and sampling location identification. Samples were placed in an ice filled cooler and transported to the lab. Appropriate chain-of-custody procedures, including the completion of necessary forms, were followed.

SECTION 5: RESULTS

5.1 GEOPHYSICS

The geophysical investigation was performed from March 19 through March 28, 2019 to investigate for metallic underground storage tanks (USTs) beneath the survey area. A total of two EM anomalies were identified at the site. One EM anomaly was associated with interference from a vehicle and was further investigated with GPR. One EM anomaly was associated with unknown buried metal and was further investigated with GPR.

GPR verified that no other structures such as USTs were associated with the area of vehicle interference. GPR also recorded an isolated hyperbolic reflector that was indicative of a small metal structure but lacked the size and characteristics typically associated with a UST in the area of unknown buried metal. Therefore, this feature is classified as a No Confidence anomaly.

5.2 SAMPLE DATA

Falcon and our subcontractor advanced two borings (B-58 and B-59) to the proposed excavation depth of the drainage features, utilities, or roadway/ditch cut being assessed. Groundwater was not observed. Please see the Boring Layout in the attachments for a visual depiction of the sample locations. The coordinates (latitude and longitude) that correspond to the sample locations are shown below in Table No. 1 Boring Coordinates.

TABLE NO. 1 BORING COORDINATES

Boring	Latitude	Longitude
B-58	34.6481497	-78.9998717
B-59	34.6484477	-78.9998639

Borings were field screened with a PID in sections for evidence of volatile organics. The PID screening results are presented in Table No. 2 PID Readings. Falcon selected soil samples based on the field screening results and the needs of the project. Red Lab analyzed the selected samples and their full analytical report is attached. The results of the laboratory analysis are shown in Table No. 3 Summary of UVF Soil Sampling Results.

Petroleum hydrocarbons above State Action Levels were not detected in the samples.

TABLE NO. 2 PID READINGS

Boring	Depth BGS*	PID**
B-58	0-2.0	0.9
	2.0-4.0	**0.7**
B-59	0-2.0	1.1
	2.0-4.0	**1.2**

*BGS = Depth below ground surface in feet
**PID readings are in parts per million
Samples shown in **bold** were selected for analysis

TABLE NO. 3 SUMMARY OF UVF SOIL SAMPLING RESULTS

Sample ID	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	
B-58	<0.19	<0.19	<0.19	<0.19	<0.04	<0.06	<0.007	0	87.5	12.5	Residual HC
B-59	<0.31	<0.31	0.31	0.31	0.15	<0.1	<0.012	63	27.5	9.5	Deg.PHC 93.7%,(FCM)

Results reported in mg/kg (milligrams per kilogram)

5.3 SAMPLE OBSERVATIONS

Obvious visual indications of a release (stained soils, odors, or oily sheen) were not observed. Table No. 4 Soil Observations lists visual soil observations of color and texture.

TABLE NO. 4 SOIL OBSERVATIONS

Sample ID	Depth	Color	Soil Type
B-58	0-2.0	Brown Tan	Slightly Clayey Silty Sand (A-2-4)
	2.0-4.0	Brown Tan	Silty Clayey Sand (A-2-6)
B-59	0-2.0	Orange Brown	Silty Clayey Sand (A-2-6)
	2.0-4.0	Orange Brown	Silty Clayey Sand (A-2-6)

Depth is in feet below ground surface

5.4 QUANTITIES CALCULATIONS

Soils requiring quantity calculations were not identified.

SECTION 6: CONCLUSIONS

6.1 INTERPRETATION OF RESULTS

This Preliminary Site Assessment was performed to evaluate the soils in proximity to the project limits on this parcel for the presence of petroleum hydrocarbons. The findings are as follows:

- Soil sampling completed on the parcel did not identify contaminants in the soil at levels requiring remediation.

6.2 GEOPHYSICS

The geophysical data did not record evidence of unknown metallic USTs within the geophysical survey area at Parcel No. 57. Falcon does not anticipate USTs will be encountered within the project limits on this parcel during construction.

6.3 SAMPLING

Sampling results did not identify contaminates in the soil which require remediation in the areas sampled. Based on past project experience, Falcon does not anticipate soil remediation or special handling and disposal will be required during construction on this parcel.

6.4 QUANTITIES

Soils requiring quantities calculations were not identified.

SECTION 7: RECOMMENDATIONS

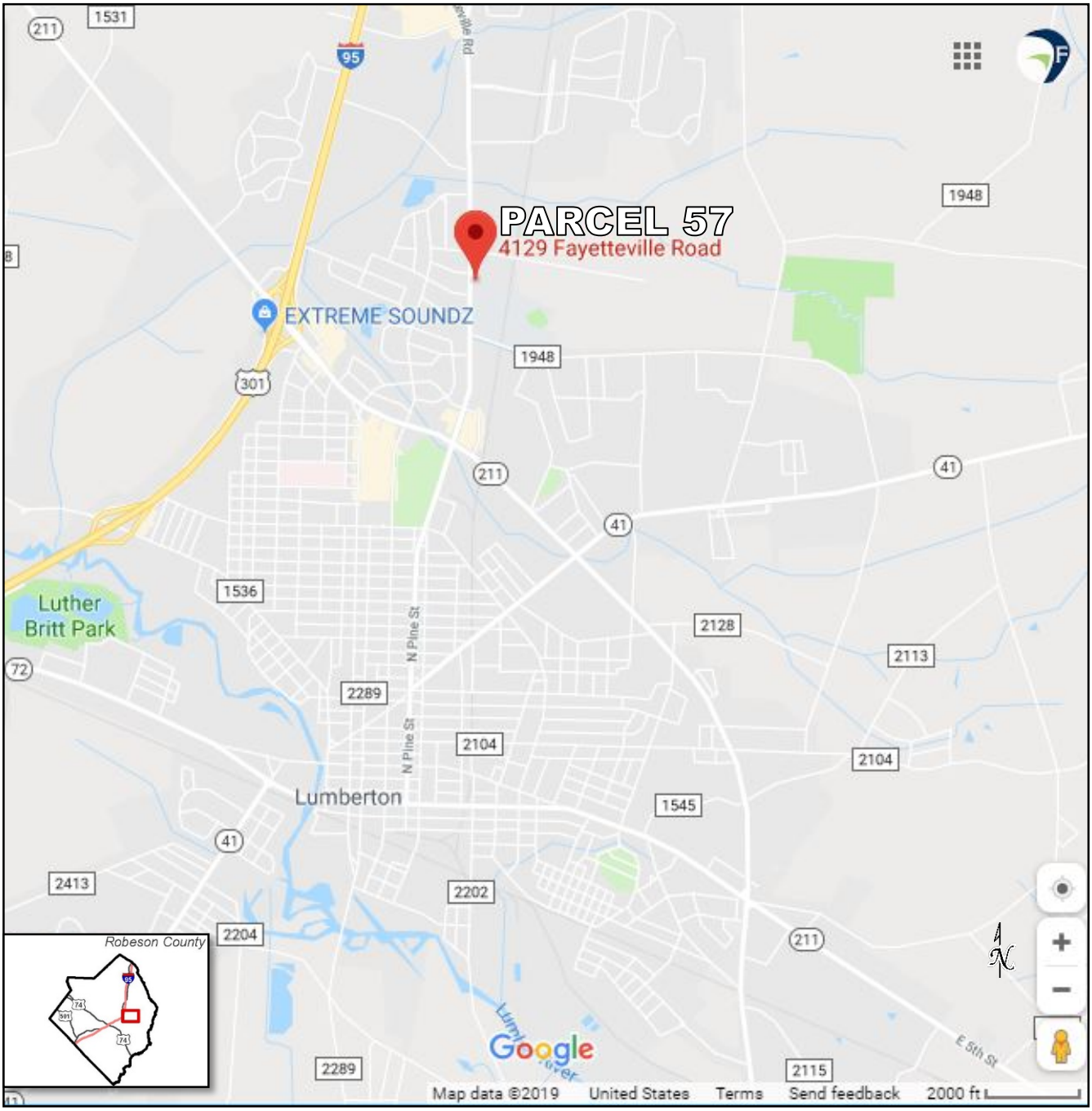
7.1 ADDITIONAL SAMPLING

Contaminants above the Industrial / Commercial Soil Cleanup Levels were not identified; therefore, additional assessment is not warranted at this time. Falcon recommends if drums, USTs, above ground storage tanks (ASTs), petroleum odors or sheen are observed during any excavation associated with any property involved in the project that all work in the vicinity stop until further assessment takes place. Further assessment can include but is not limited to; sampling the soil and groundwater, excavation, and proper handling and disposal of contaminated soils and groundwater.

7.2 SPECIAL HANDLING OF IMPACTED SOIL

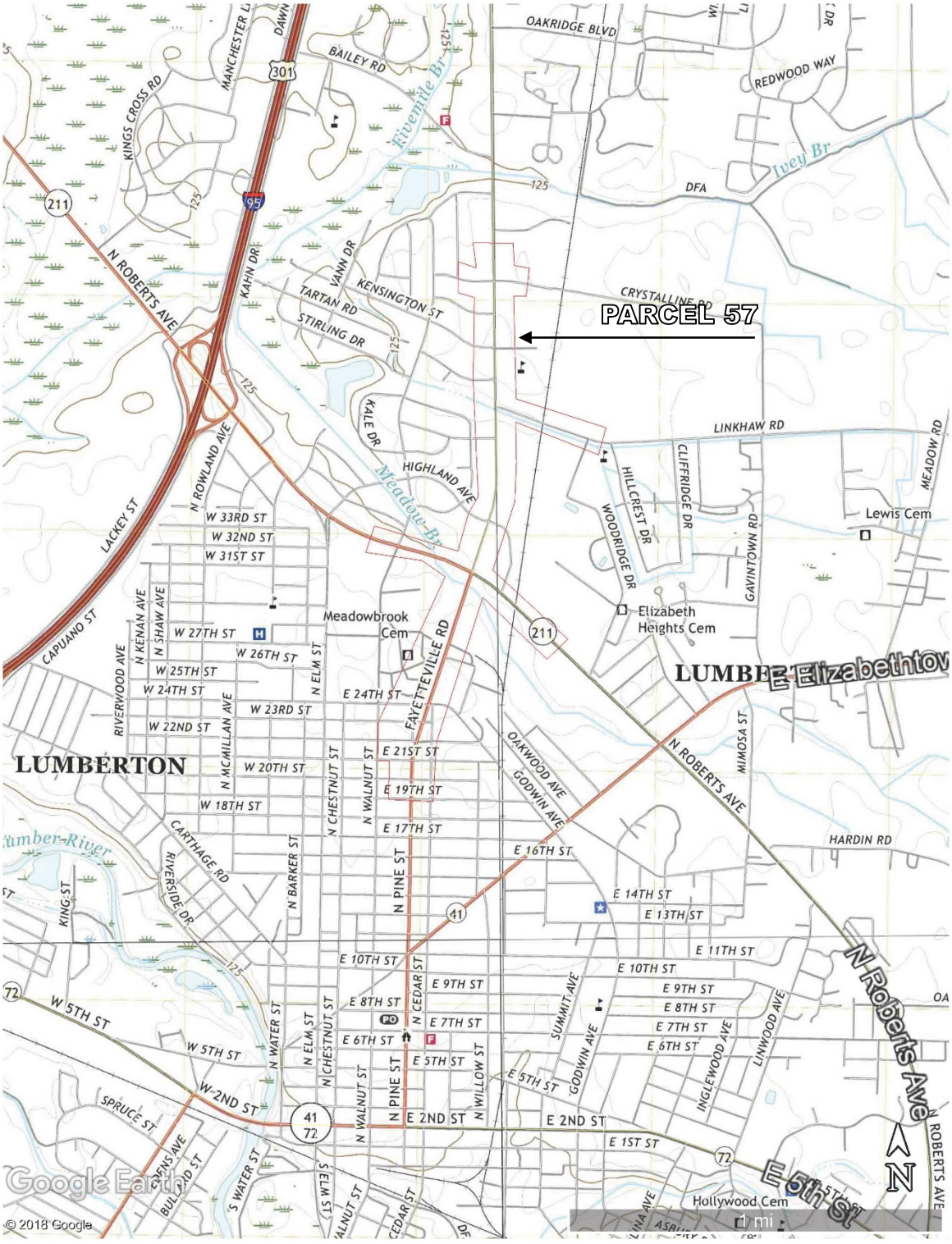
Soils requiring special handling were not identified. If suspect contaminated soils are encountered during construction Falcon and the NCDOT GeoEnvironmental Group should be contacted for proper handling instructions.

NCDOT U-5797 (SR 1997 Widening) Parcel 57
Preliminary Site Assessment
Vicinity Map



Project No.: G19011.00
Date: September 2019
Source: Google Maps

NCDOT U-5797 (SR 1997 Widening) Parcel 57
Preliminary Site Assessment
USGS Topographic Maps



Project No.: G19011.00
Date: September 2019
Source: "NW, NE, SW, and SE Lumberton, NC" 2019

NCDOT U-5797 (SR 1997 Widening) Parcel 57
Preliminary Site Assessment
Parcel Location Map

September 5, 2019

County Line
City Limits
Streets
Parcels

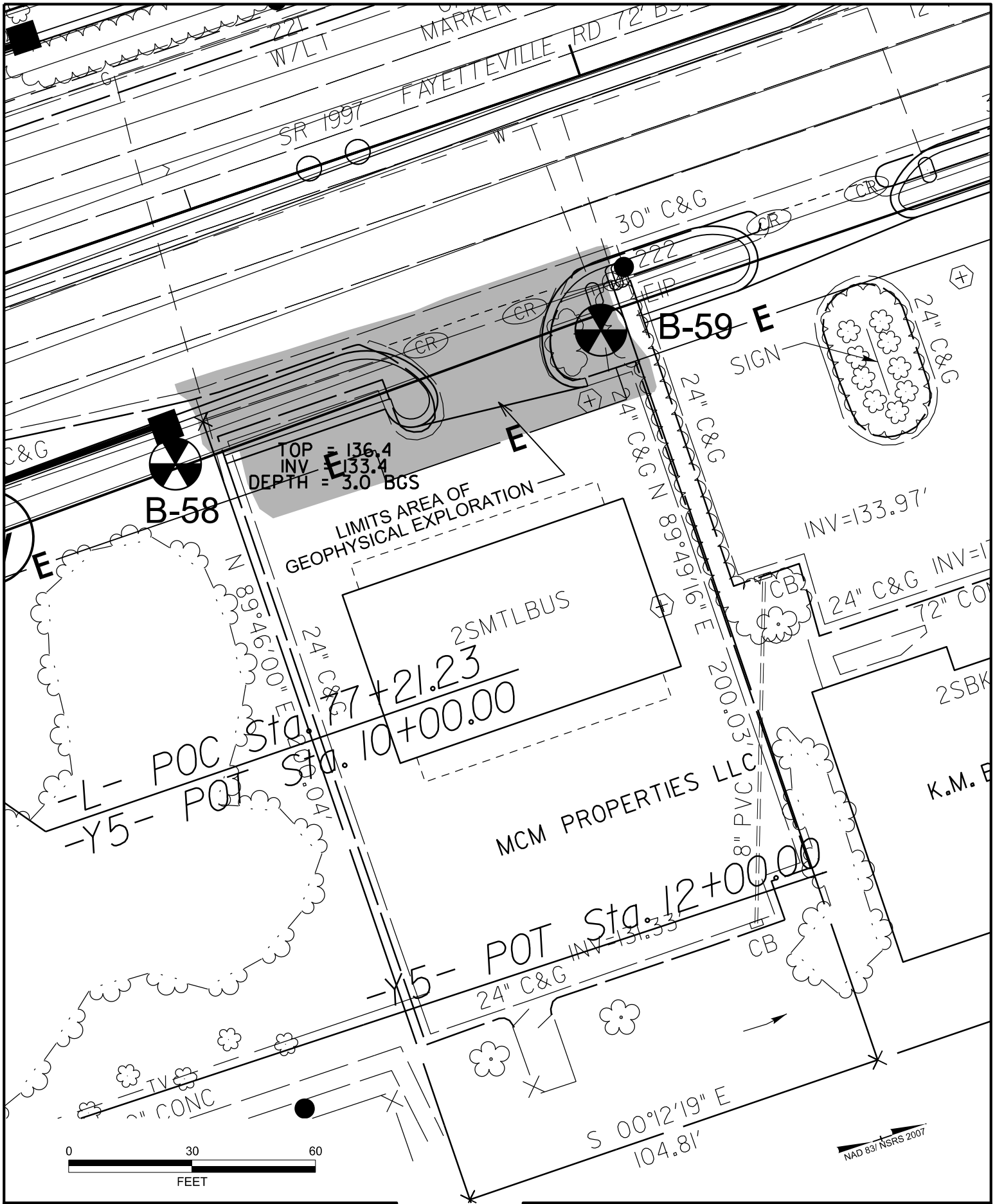
1:2,138

0 0.0175 0.035 0.07 mi
0 0.0275 0.055 0.11 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2019

Project No.: G19011.00
Date: September 2019
Source: Robeson County GIS



NOTES:

- BGS = BELOW GROUND SURFACE
- BORING B-59 WAS DRILLED TO 4.0 BGS

FALCON ENGINEERING

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607

PHONE: 919.871.0800
FAX: 919.871.0803

BORING LOCATION PLAN

NCDOT U-5797 (SR 1997 WIDENING)
PARCEL 57 - MCM PROPERTIES LLC
ROBESON / LUMBERTON, NC
WBS NO.: 44367.1.1 & TIP NO.: U-5797
FALCON PROJECT NO. G19011.00

NCDOT U-5797 (SR 1997 Widening) Parcel 57
Preliminary Site Assessment
Site Photographs

Photograph No. 1: General view of Boring B-58.

Photograph No. 2: General view of Boring B-59.

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: FALCON
Address: 1210 TRINITY ROAD SUITE 116
CARY NC 28513

Contact: CHRISTOPHER BURKHARDY

Project: G19011 U5797

Samples taken Tuesday, April 9, 2019
Samples extracted Tuesday, April 9, 2019
Samples analysed Tuesday, April 16, 2019

Operator DAVIS MARTINEC

U00902

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
										C5 - C10	C10 - C18	C18	
s	B58	7.4	<0.19	<0.19	<0.19	<0.19	<0.04	<0.06	<0.007	0	87.5	12.5	Residual HC
s	B59	12.3	<0.31	<0.31	0.31	0.31	0.15	<0.1	<0.012	63	27.5	9.5	Deg.PHC 93.7%,(FCM)

Initial Calibrator QC check OK Final FCM QC Check OK 97.3 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

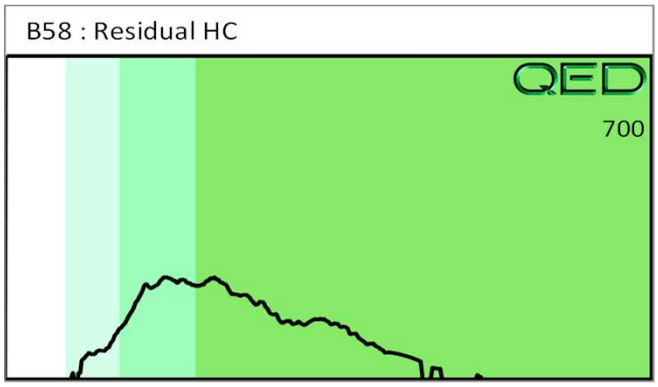
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

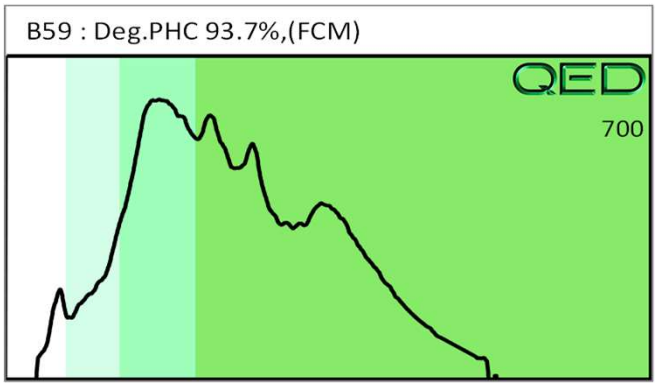
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

Project: G19011 U5797

Tuesday, April 16, 2019





PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2019-091)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 57
NCDOT PROJECT U-5797

4029 FAYETTEVILLE RD., LUMBERTON, NC

APRIL 24, 2019

Report prepared for: **Christopher J. Burkhardt, PWS**
Falcon Engineers
1210 Trinity Rd. #110
Raleigh, NC 27607

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
Douglas A. Canavello, P.G.
NC License #1066

503 INDUSTRIAL AVENUE, GREENSBORO, NC 27406
P: 336.335.3174 F: 336.691.0648
C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 57 - 4029 Fayetteville Rd.
Lumberton, Robeson County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 57, located at 4029 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 19-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of two EM anomalies were identified at the site. One EM anomaly was associated with interference from a vehicle and was further investigated with GPR. One EM anomaly was associated with unknown buried metal and was further investigated with GPR.

GPR verified that no other structures such as USTs were associated with the area of vehicle interference. GPR also recorded an isolated hyperbolic reflector that was indicative of a small metal structure but lacked the size and characteristics typically associated with a UST in the area of unknown buried metal. Therefore, this feature is classified as a No Confidence anomaly. Collectively, the geophysical data recorded evidence of one No Confidence anomaly within the geophysical survey area at Parcel 57.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Falcon Engineers at Parcel 57, located at 4029 Fayetteville Rd. in Lumberton, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5797). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from March 19-28, 2019, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by concrete, asphalt, and grass surfaces. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61-MK2 (EM61) metal detector integrated with a Geode External GPS/GLONASS receiver. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on March 28, 2019, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	**No Confidence Anomaly**	☑
2	Vehicle	☑

EM Anomaly 1 was associated with unknown buried metal and was further investigated with GPR. EM Anomaly 2 (vehicle) was directly attributed to a visible cultural feature at the ground surface; however, it was further investigated with GPR to verify that the interference did not obscure buried structures such as USTs.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property as well as the transect images. A total of three formal GPR transects were performed at the site. GPR Transect 1 was performed across unknown buried metal (EM Anomaly 1). This transect recorded an isolated hyperbolic reflector that was indicative of a small metal structure but lacked the size and characteristics typically associated with a UST. Therefore, this feature is classified as a No Confidence anomaly.

GPR Transects 2-3 were performed across EM Anomaly 2. These transects recorded no evidence of buried structures, such as USTs and verified that the EM interference was the result of the vehicle.

Collectively, the geophysical data recorded evidence of one No Confidence anomaly within the geophysical survey area at Parcel 57. **Figure 4** provides an overlay of the EM61 metal detection contour map onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

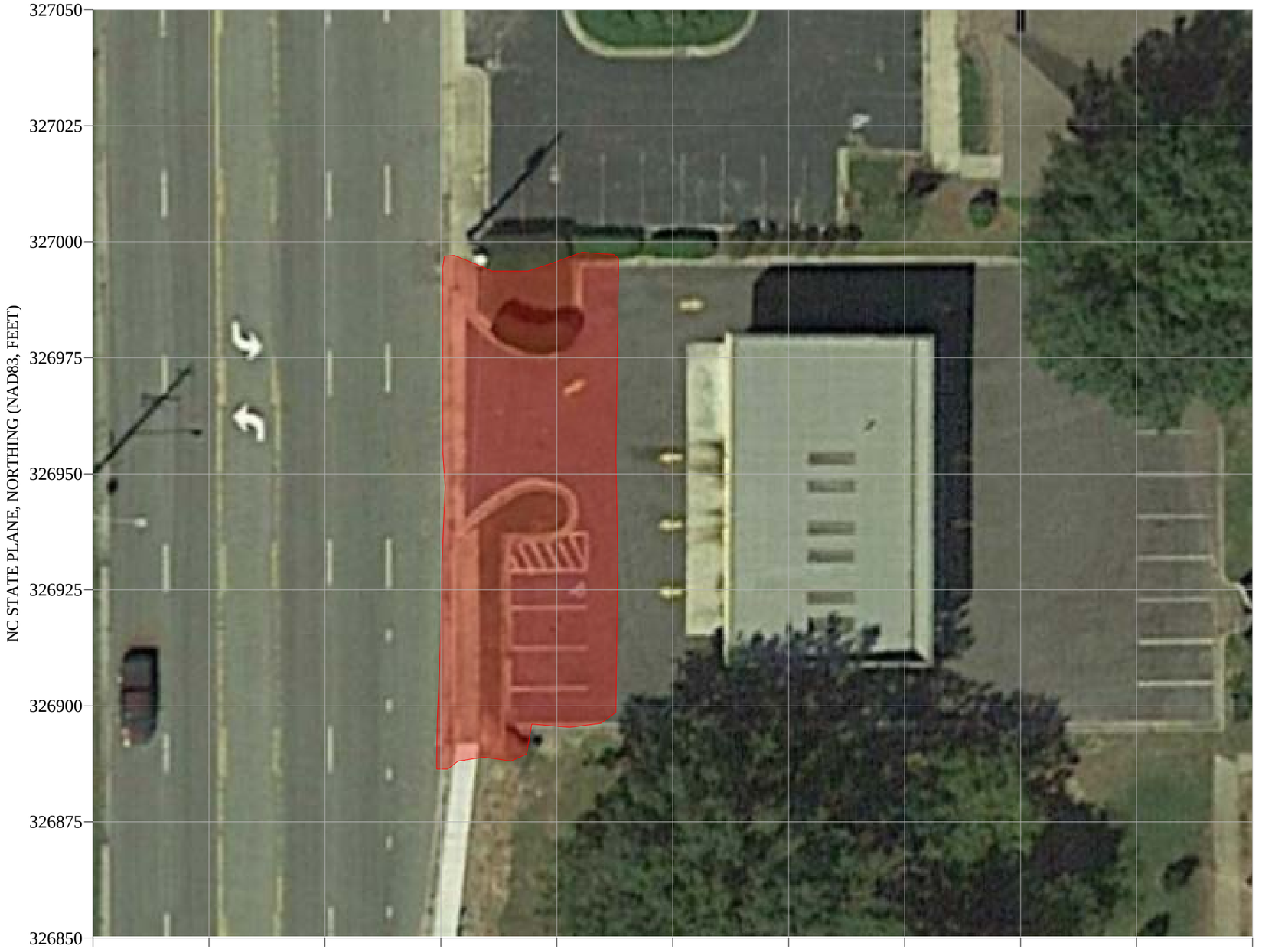
Pyramid's evaluation of the EM61 and GPR data collected at Parcel 57 in Lumberton, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- Two EM anomalies were identified at the site. One EM anomaly was associated with interference from a vehicle and was further investigated with GPR. One EM anomaly was associated with unknown buried metal and was further investigated with GPR.
- GPR verified that no other structures such as USTs were associated with the area of vehicle interference. GPR also recorded an isolated hyperbolic reflector that was indicative of a small metal structure but lacked the size and characteristics typically associated with a UST in the area of unknown buried metal. Therefore, this feature is classified as a No Confidence anomaly.
- Collectively, the geophysical data recorded evidence of one No Confidence anomaly within the geophysical survey area at Parcel 57.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Falcon Engineers in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area
(Facing Approximately West)

View of Survey Area
(Facing Approximately North)

N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 57 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797
TITLE	PARCEL 57 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS
DATE	3/28/2019
PYRAMID PROJECT #:	2019-091
CLIENT	FALCON ENGINEERS
	FIGURE 1

EM61 METAL DETECTION RESULTS

NO EVIDENCE OF METALLIC USTs OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM data were collected on March 19, 2019, using a Geonics EM61-MK2 instrument.Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on March 28, 2019.

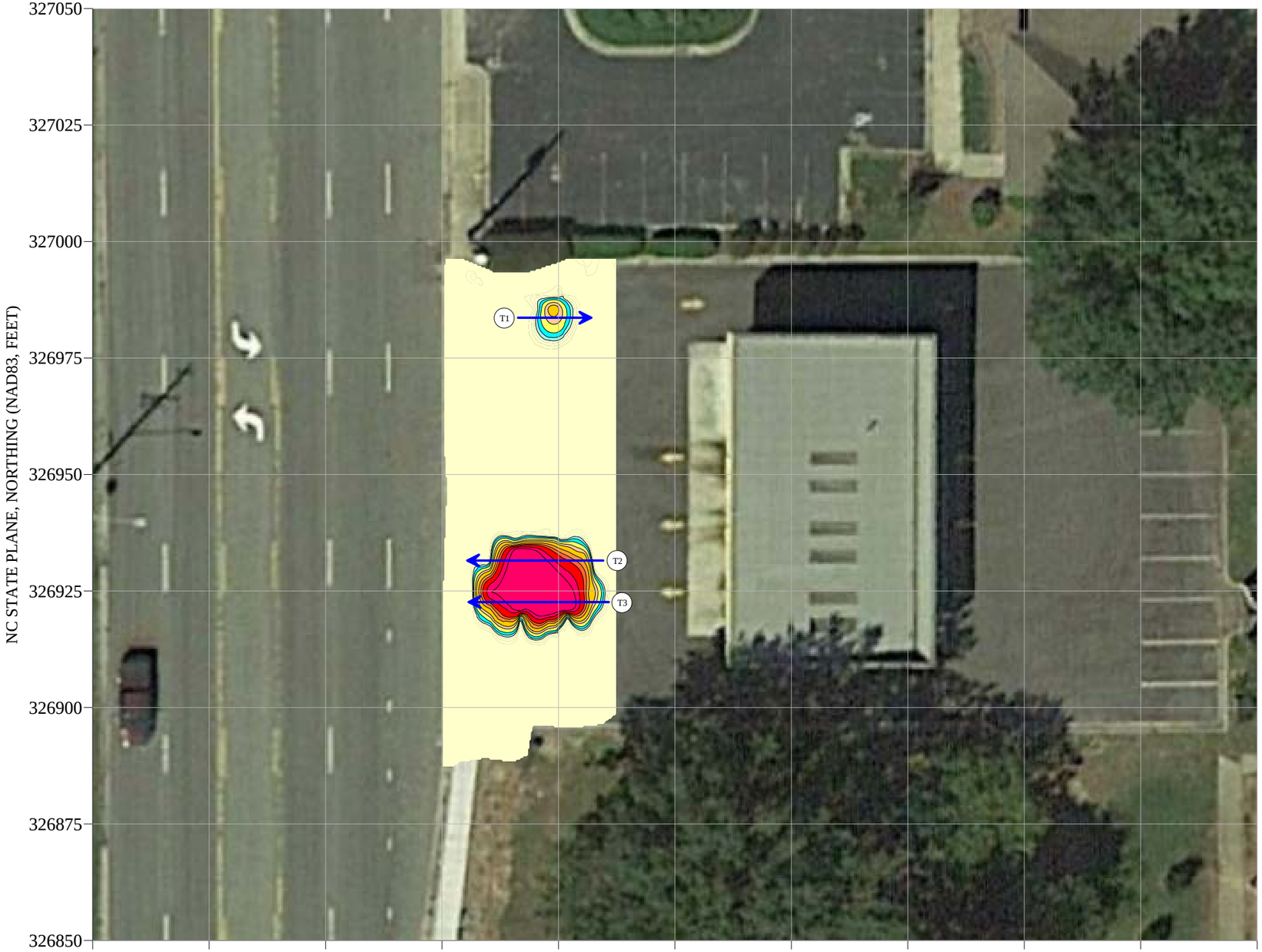
EM61 Metal Detection Response (millivolts)

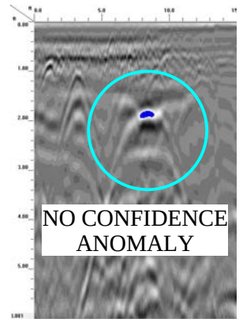
N

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

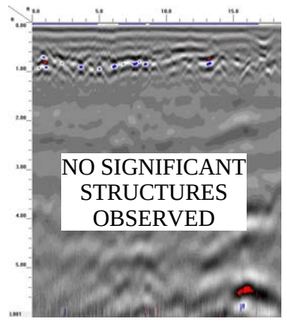
PROJECT: PARCEL 57 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 57 - EM61 METAL DETECTION CONTOUR MAP	DATE: 3/28/2019	CLIENT: FALCON ENGINEERS
		PYRAMID PROJECT #: 2019-091	**FIGURE 2**

LOCATIONS OF GPR TRANSECTS

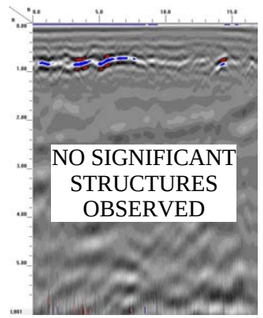




GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



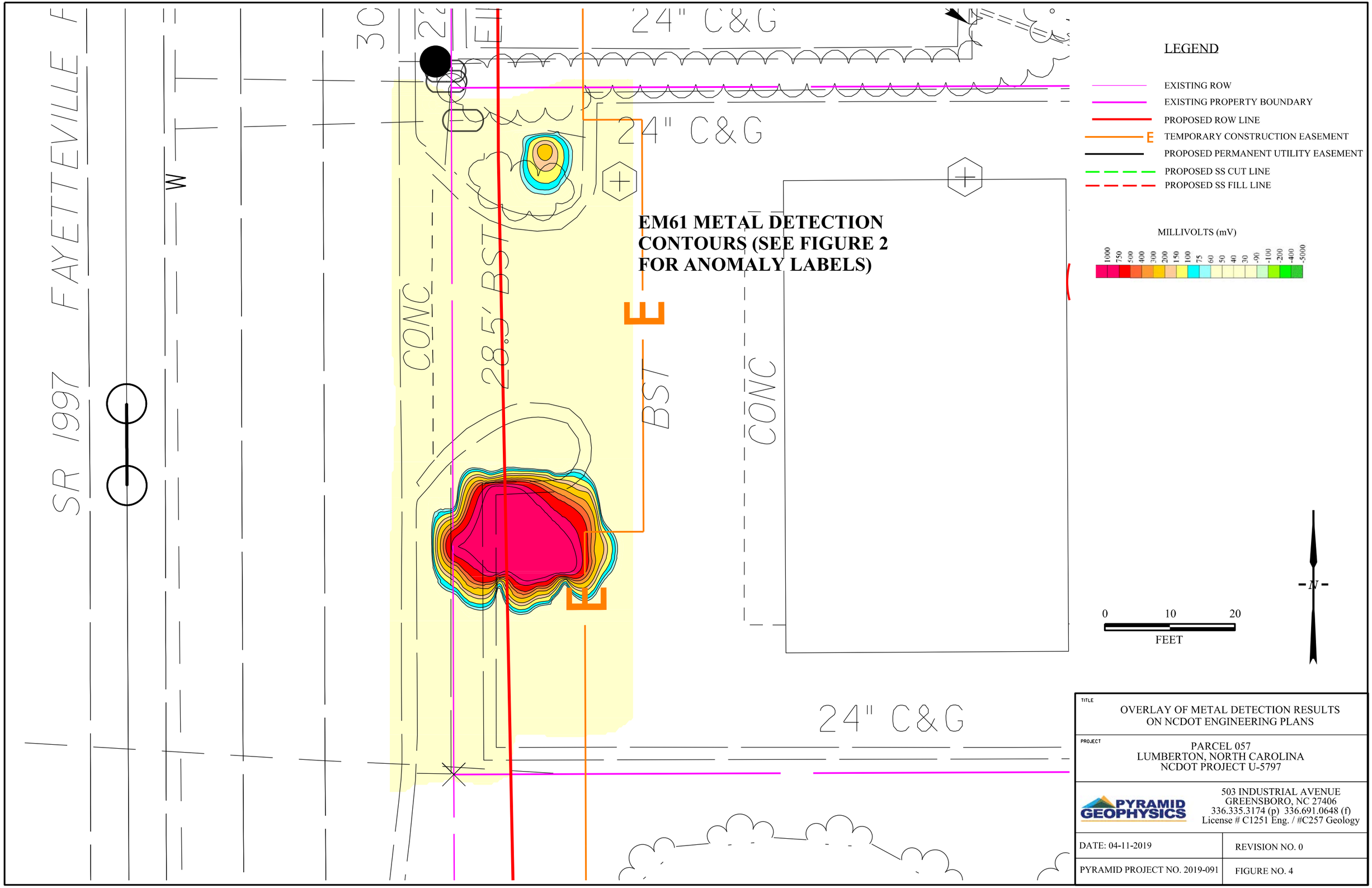
GPR TRANSECT 3 (T3)

N

PYRAMID GEOPHYSICS

503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

PROJECT: PARCEL 57 LUMBERTON, NORTH CAROLINA NCDOT PROJECT U-5797	TITLE: PARCEL 57 - GPR TRANSECT LOCATIONS AND IMAGES	DATE: 3/28/2019 PYRAMID PROJECT #: 2019-091	CLIENT: FALCON ENGINEERS **FIGURE 3**



TITLE

OVERLAY OF METAL DETECTION RESULTS ON NCDOT ENGINEERING PLANS

PROJECT

PARCEL 057
LUMBERTON, NORTH CAROLINA
NCDOT PROJECT U-5797

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 04-11-2019	REVISION NO. 0
PYRAMID PROJECT NO. 2019-091	FIGURE NO. 4