

PRELIMINARY SITE ASSESSMENT

**MARGIE M. FULLER (PARCEL #11)
523 Capital Boulevard
Raleigh, North Carolina
State Project: B-5121 & B-5317
WBS Element: 42263.1.1
F&R Project #66T-0097**

August 21, 2015

Prepared for:

**North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610**



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Engineering Stability Since 1881

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August 21, 2015

**North Carolina Department of Transportation
Geotechnical Engineering Unit**
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Terry Fox, L.G.
GeoEnvironmental Project Manager

Re: State Project: B-5121 & B-5317
WBS Element: 42263.1.1
BR 277 on US 70/US 401/NC 50 (Capital Blvd.) over Peace Street and
BR 213 on US 70/NC 50 (Wade Ave.) over US 401 (Capital Blvd.)

Subject: **Preliminary Site Assessment**
Parcel #11 – Margie M. Fuller (Unique Motor Sport)
523 Capital Blvd
Raleigh, North Carolina
F&R Project #66T-0097

Dear Mr. Fox:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the Margie M. Fuller property in Raleigh, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1666-00058, dated May 19, 2015. Notice to Proceed was issued to F&R on June 25, 2015. This report documents our field activities, presents the results of laboratory analysis and provides estimated quantities of petroleum impacted soils.

Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

DocuSigned by:
Benjamin Whitley
E425D6E8C23545B...

Benjamin A. Whitley, P.E.
Project Engineer



DocuSigned by:
Michael Sabodish
B4FED45203C345C...

Michael S. Sabodish, Jr., Ph.D, P.E.
Engineering and Remediation Services Manager



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**Preliminary Site Assessment Report
Margie M. Fuller Property (Parcel #11)
Raleigh, Wake County, North Carolina
F&R Project No. 66T-0097**

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment (PSA) Report to document soil assessment activities performed at the Margie M. Fuller Property addressed as 523 Capital Boulevard in Raleigh, Wake County, North Carolina. The site is located on the west side of Capital Boulevard, near the southwest quadrant of the Capital Boulevard and Peace Street intersection, as shown in Appendix I, Figures 1 and 2. As indicated in the Request for Technical and Cost Proposal (RFTCP), the existing business is an automotive repair facility operating as Unique Motor Sports. Posh Nosh (a catering company) also operates at the property. The property is not listed in the NCDENR UST Section registry, and there is no evidence of USTs, UST removal or monitoring wells on the site. NCDOT is planning to acquire the property in its entirety.

The PSA was performed in general accordance with F&R's Proposal No. 1666-00058, dated May 19, 2015 with Notice to Proceed issued to F&R by the NCDOT on June 25, 2015. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide estimated quantities of petroleum impacted soils.

As outlined by the NCDOT in their RFTCP, acquisition of right-of-way is necessary for the Peace Street Bridge, Wade Avenue Bridge and Capital Boulevard improvements in Raleigh (See Figure No. 3). As such, the NCDOT requested a PSA be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs which may exist/existed at the project site.

The existing on-site structure is one-story in height with a full basement. The building is constructed of brick and concrete masonry unit block with steel framing and features a roll-up garage door on the eastern side of the building and concrete ramp and loading dock on the western side of the building. Unique Motor Sports occupies the main (upper) floor of the building, which is accessed by Capital Boulevard on the eastern side of the property. Posh Nosh occupies the basement portion of the building, which is accessed via an alley from West Peace Street. The remainder of the site consists of an asphalt paved parking lot. The site is bordered to the north by Finch's Restaurant; to the east by Capital Boulevard; to the south by Raleigh



Hitch; to the west by a car wash and a vacant office building. Photos detailing existing site features are attached as Appendix IV of this report.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Pyramid Environmental & Engineering, P.C. (Pyramid) conducted a geophysical survey of the project site to locate suspect metal underground storage tanks (USTs) in the accessible areas of the site. The geophysical work was conducted from June 26 to July 1, 2015, and with the exception of the building footprint and loading dock, was performed within the property boundaries.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61 instrument. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were investigated using a Geophysical Survey Systems UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. The EM61 data was collected along parallel survey lines spaced approximately five feet apart. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review. Data was collected over most of the planned survey site with the exception of the building footprint and areas immediately adjacent to metallic objects and other obstacles (such as vehicles). Isolated EM anomalies were identified on the site, including utilities, vehicles, fences, light posts and a dumpster.

Based on the EM data collected at the site, Pyramid did not observe anomalies that were interpreted to be the results of metallic USTs within about 6 feet of the ground surface. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

F&R visited the site on July 30, 2015 to perform the Preliminary Site Assessment. The assessment consisted of advancing 13 borings into the soils at the project site using direct-push technology (Geoprobe). Borings B-1 through B-4 were located on the eastern portion of the site, while Borings B-5 through B-13 were advanced on the western portion of the property (Appendix I, Figure 3). Boring locations were determined by F&R staff based on the results of the geophysical survey, site features and proposed construction activities. The borings were generally advanced to the proposed depth of 10 feet bgs. However, Boring B-2 was terminated at 9 feet bgs, where Geoprobe refusal was encountered on what appeared to the driller to be concrete. In addition, Borings B-7, B-10, B-12 and B-13 were terminated at 7 to 8 feet bgs on a layer of very dense sand.



Soil sample cores from the borings were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a photo-ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC concentrations were performed using a MiniRae 2000 PID which produces results in parts per million (ppm). A representative soil sample was collected from one foot sections of each sleeve and placed in a re-sealable plastic bag. The vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID measurements can be found in the Geoprobe Logs in Appendix III, as well as in Table 1 in Section 5.0 below.

The soil sample which exhibited the highest PID concentration or the sample at boring termination was submitted for laboratory analysis for diesel range organics (DRO), gasoline range organics (GRO), Total BTEX (benzene, toluene, ethylbenzene and xylenes), 16 PAHs (polycyclic aromatic hydrocarbons) and BaP (Benzo(a)pyrene) by Ultraviolet Fluorescence (UVF) technology (QROS QED Hydrocarbon Analyzer).

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and shipped via UPS to QROS in Wilmington, North Carolina following standard chain-of-custody procedures.

4.0 Subsurface Conditions

As indicated in the attached Geoprobe Logs (Appendix III), subsurface conditions from existing ground surface to boring termination primarily included various layers of moist, tan to red-brown fine to medium sandy silt (USCS – ML), silty sandy clay (USCS – CL), and silty fine to medium sand (SM). The borings were generally terminated at the proposed depth of 10 feet bgs. However, Boring B-2 was terminated at 9 feet bgs, where Geoprobe refusal was encountered on what appeared to be concrete. In addition, Borings B-7, B-10, B-12 and B-13 were terminated at 7 to 8 feet bgs on a layer of very dense sand.

Petroleum odors were not observed in the samples collected from the thirteen borings advanced at the site. However, an unknown odor was observed in Boring B-13 from 2 to 8 feet bgs (boring termination).

Wet soils were observed in Borings B-12 and B-13 from 5 to 6 feet bgs and 7 to 8 feet bgs, respectively. It is possible these wet soils may be indicative of perched water, or the groundwater table elevation at the site.



Of the samples screened, PID readings generally did not exceed 1.7 ppm; however, elevated PID readings were recorded in Boring B-13 from 1 to 8 feet bgs.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons identified as DRO were encountered in the soil samples collected from the thirteen boring locations advanced at the site, at depths from 2 feet bgs (B-6) to 10 feet bgs (B-5 and B-11). The laboratory results indicate that the DRO concentrations ranged from 3.3 mg/kg (B-3) to 1,546 mg/kg (B-13). DRO concentrations above the NCDENR Action Level of 10 mg/kg were detected in twelve of the samples submitted (B-1, B-2 and B-4 through B-13).

In addition, GRO was detected in the sample obtained from Boring B-13 at a concentration of 343.5 mg/kg, which is above the NCDENR Action Level of 10 mg/kg.

The laboratory analytical results indicate concentrations of the Sum of 16 PAHs above the method detection limit, but below the NCDENR Action Level of 7,041.14 mg/kg in the thirteen samples submitted. In addition, Benzo(a)pyrene (BaP) was detected in samples B-5, B-10 and B-12 at concentrations above the NCDENR Soil-to-Water MSCC of 0.096 mg/kg.

The soil analytical results are summarized in Table 1 below. The laboratory analytical results can also be found in the attached Appendix V of this report.



Table 1
Soil Sampling Analytical Results

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)	Total BTEX (mg/kg)	Total Aromatics (mg/kg)	16 EPA PAHs (mg/kg)	BaP (mg/kg)
B-1	7/29/15	7-8	1.1	< 0.49	12.5	12.5	< 0.98	12.3	2.2	0.006
B-2		8-9	0.8	< 0.49	30.6	30.6	< 0.98	30.4	5.1	0.042
B-3		8-9	1.1	< 0.52	3.3	3.3	< 1	1.6	0.06	< 0.01
B-4		5-6	1.3	< 6.6	92.8	92.8	< 6.6	86.1	4	0.055
B-5		9-10	1.4	< 7.3	34.8	34.8	< 14.7	32.4	5.8	0.085
B-6		2-3	1.2	< 0.51	67.4	67.4	< 1	34.2	1.4	0.02
B-7		6-7	1.7	< 7.2	48.9	48.9	< 14.4	45.3	8.3	0.077
B-8		6-7	1.3	< 7.9	35.8	35.8	< 15.8	32.8	5.9	< 0.16
B-9		3-4	1.6	< 7.3	73.7	73.7	< 7.3	71.7	3.4	0.15
B-10		5-6	1.4	< 6.7	83.4	83.4	< 6.7	81.4	15.5	0.3
B-11		9-10	1.3	< 7.5	10.7	10.7	< 15	10.7	1.1	< 0.15
B-12		2-3	1.4	< 6.3	67	67	< 6.3	61.5	11.8	0.1
B-13		2-3	8.1	8.1	343.5	1,202	1,546	< 20.1	746.5	35.9
NC DENR Action Level				10	10	10	13.8	NSE	7,041.41	0.096

Samples shown in bold exceed the NCDENR Action Level as outlined in the NCDENR, DWM, UST Section Guidelines
 ppm = parts per million
 GRO = Gasoline Range Organics
 DRO = Diesel Range Organics
 TPH = Total Petroleum Hydrocarbons
 BTEX = Benzene, Toluene, Ethylbenzene and Xylenes
 NSE = No Standard Exists

6.0 Conclusions and Recommendations

F&R conducted a PSA at the Margie M. Fuller Property located at 523 Capital Boulevard in Raleigh, Wake County, North Carolina. A geophysical investigation was performed by Pyramid Environmental & Engineering to investigate the existence of unknown/known USTs at the site. Based on the results of the geophysical survey, it was determined that USTs were not present within the surveyed area.

Thirteen Geoprobe borings were advanced on this parcel during the assessment, where grading activities are proposed in association with the Peace Street Bridge, Wade Avenue Bridge and Capital Boulevard improvements. Due to NCDOT's total acquisition of this property, F&R advanced the borings within the parcel boundaries. Based on the results of laboratory testing and observed PID readings, petroleum impacted soils were found at concentrations above the NCDENR Action Level of 10 mg/kg within the areas evaluated. Therefore, it is estimated that



petroleum impacted soils, at concentrations above the NCDENR Action Level, are present at the following areas:

- Area 1: In the vicinity of Borings B-1 and B-2, from existing ground surface to a depth of at least ten feet bgs;
- Area 2: In the vicinity of Boring B-4, from existing ground surface to a depth of ten feet bgs;
- Area 3: In the vicinity of Borings B-5, B-6, B-8, B-9 and B-11, from existing ground surface to a depth of ten feet bgs; and
- Area 4: In the vicinity of Borings B-7, B-10, B-12 and B-13 soils, from existing ground surface to a depth of at least eight feet bgs.

No below grade utilities appear on the proposed improvement plans. However, a realignment is depicted on the construction plans, which will extend Capital Boulevard onto the eastern portion of the property. This construction will likely require re-grading of the existing ground surface and demolition of the existing structure. For the purpose of this assessment, we have estimated the following approximate petroleum-impacted areas:

- Area 1: 1,748.4 square feet, extending to a depth of ten feet bgs;
- Area 2: 2,317.1 square feet, extending to a depth of ten feet bgs;
- Area 3: 6,063.5 square feet, extending to a depth of ten feet bgs; and
- Area 4: 5,025.4square feet, extending to a depth of eight feet bgs.

These areas account for impacted soils that may be generated during re-grading activities and for unknown below grade utilities that may be installed during construction. The areas were determined by averaging distances between the property boundaries and the existing edge of pavement on the construction drawings, and do not include the footprint area of the building located on the property (Appendix I, Figure 4).



Table 2
Approximate Volume of Petroleum Impacted Soil

Excavation Location (As Shown on Figure 4)	L x W x D (feet)	Soil Volume (cubic feet)	Soil Volume (tons)
Area 1 (vicinity of B-1 and B-2)	L x W varies (1,748.4 SF) X 10' depth	17,484	1,049.0
Area 2 (vicinity of B-4)	L x W varies (2,317.1 SF) X 10' depth	23,171	1,390.3
Area 3 (vicinity of B-5, B-6, B-8, B-9 and B11)	L x W varies (6,063.5 SF) X 10' depth	60,635	3,638.1
Area 4 (vicinity of B-7, B-10, B-12 and B-13)	L x W varies (5,025.4 SF) X 8' depth	40,203.2	2,412.2
Soil Volume (assuming a soil density of 120 pcf)		Total	8,489.6

It should be noted that a delineation of the soil contamination was not performed, as this was not included in the proposed scope of work. The above estimates are based on interpretations of soil analytical results, PID readings and our experience with petroleum UST releases. In order to generate estimated quantities of petroleum impacted soils, we have inferred that the contamination has occurred between the existing ground surface and the sample collection depth. The amount of impacted soil can only be determined after excavation or by advancing additional borings and performing additional laboratory analysis to possibly delineate the extents (horizontal and vertical) of contamination.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.



Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.



APPENDIX I

Figure No. 1 – SITE VICINITY MAP

Figure No. 2 – TOPOGRAPHIC MAP

Figure No. 3 – LABORATORY RESULTS & BORING LOCATION PLAN

Figure No. 4 – ESTIMATED EXTENTS OF SOIL CONTAMINATION

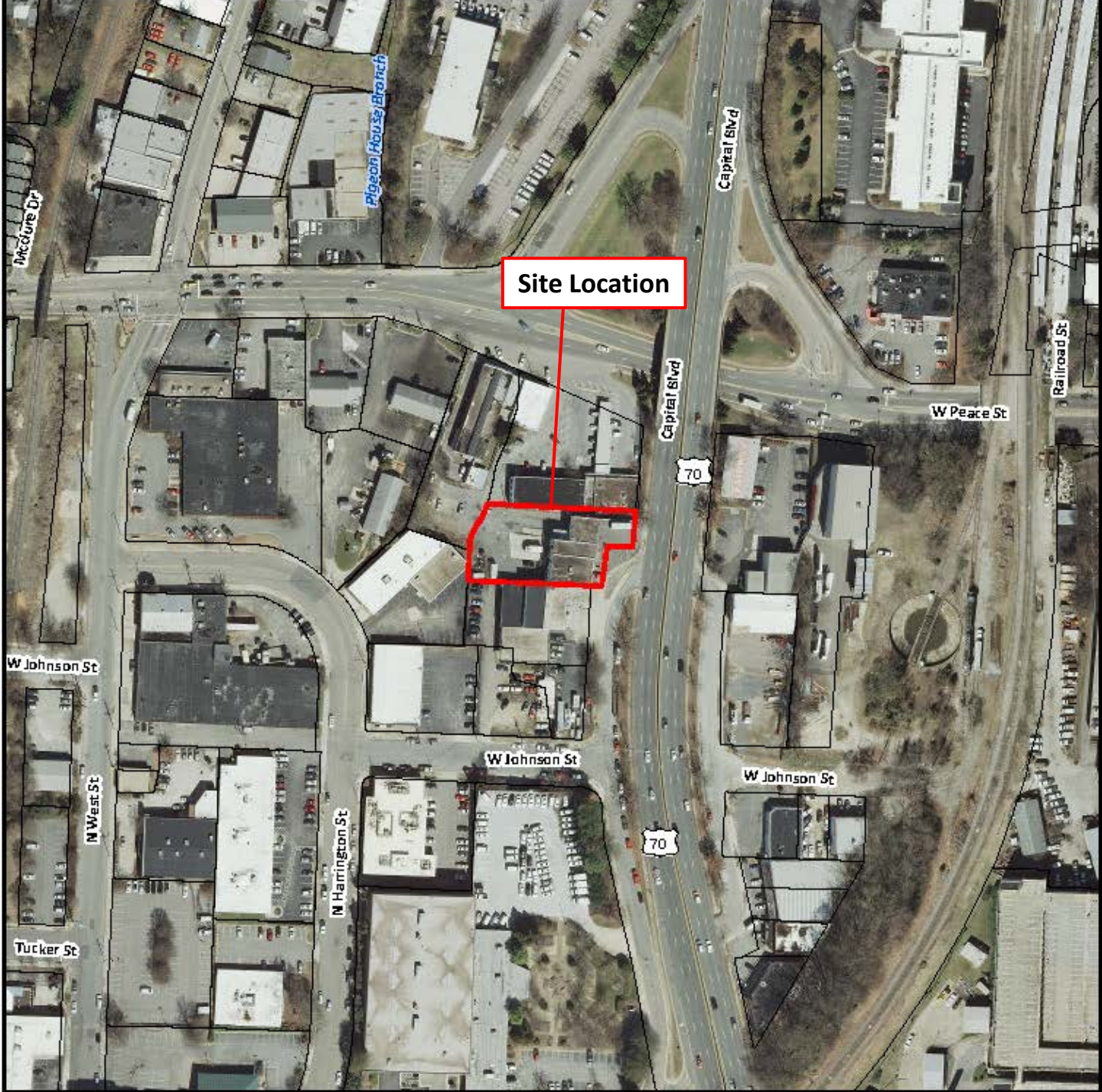
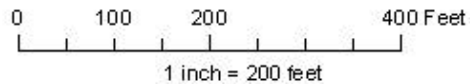


Image Courtesy of Wake County iMaps



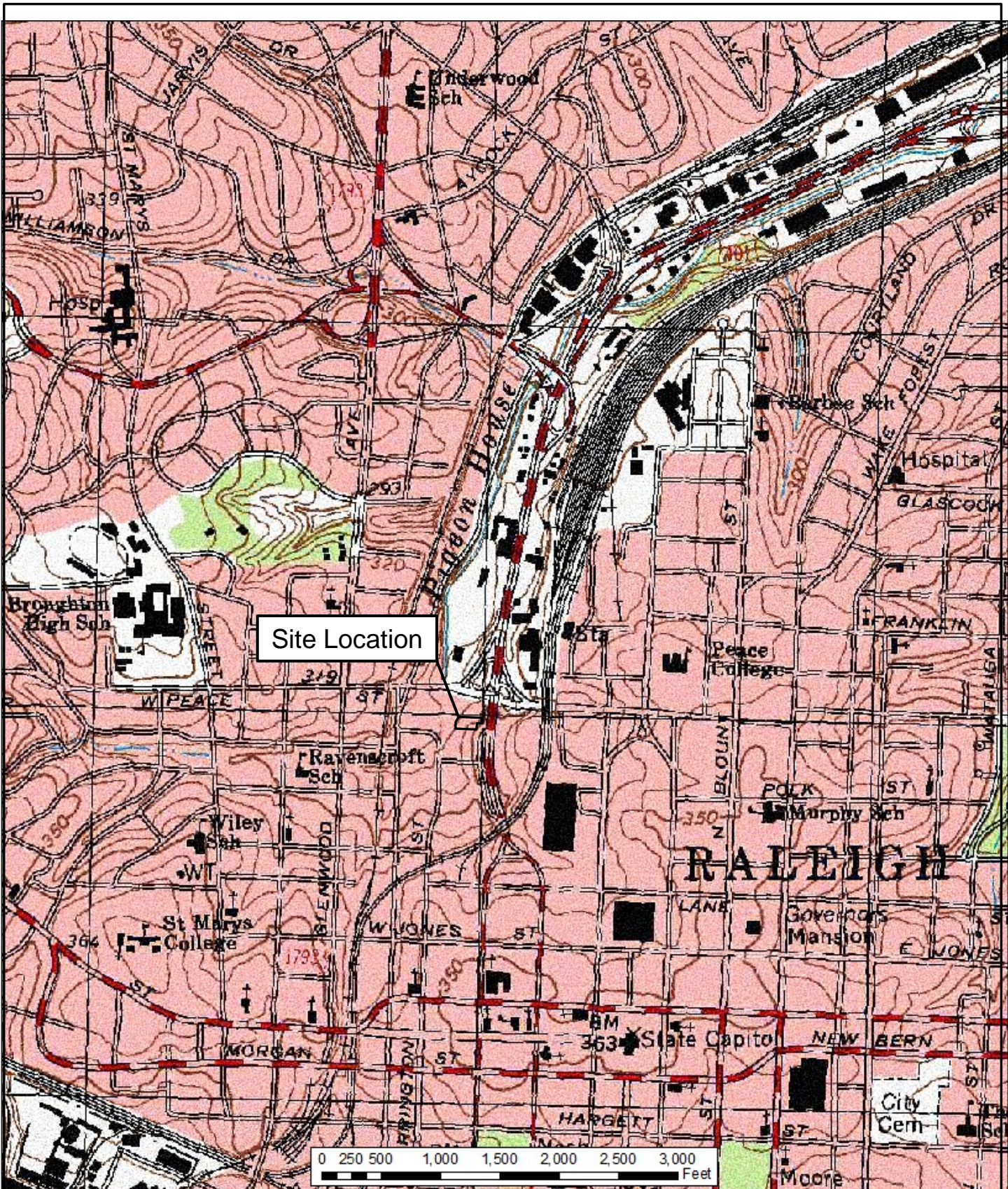
SITE VICINITY MAP

North ▲

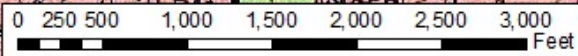


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CLIENT: NCDOT		FIGURE No.: 1
PROJECT: B-5121 & B-5317, Margie M. Fuller Property, NCDOT Parcel #11		
LOCATION: Raleigh, Wake County, North Carolina		
F&R PROJECT No.: 66T-0097		
DRAWN BY: B. Whitley		
DATE: August 2015	SCALE: 1" = 200'	



Site Location



TOPOGRAPHIC MAP – RALEIGH, NC

North



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CLIENT: NCDOT

PROJECT: B-5121 & B-5317, Margie M. Fuller Property, NCDOT Parcel #11

LOCATION: Raleigh, Wake County, North Carolina

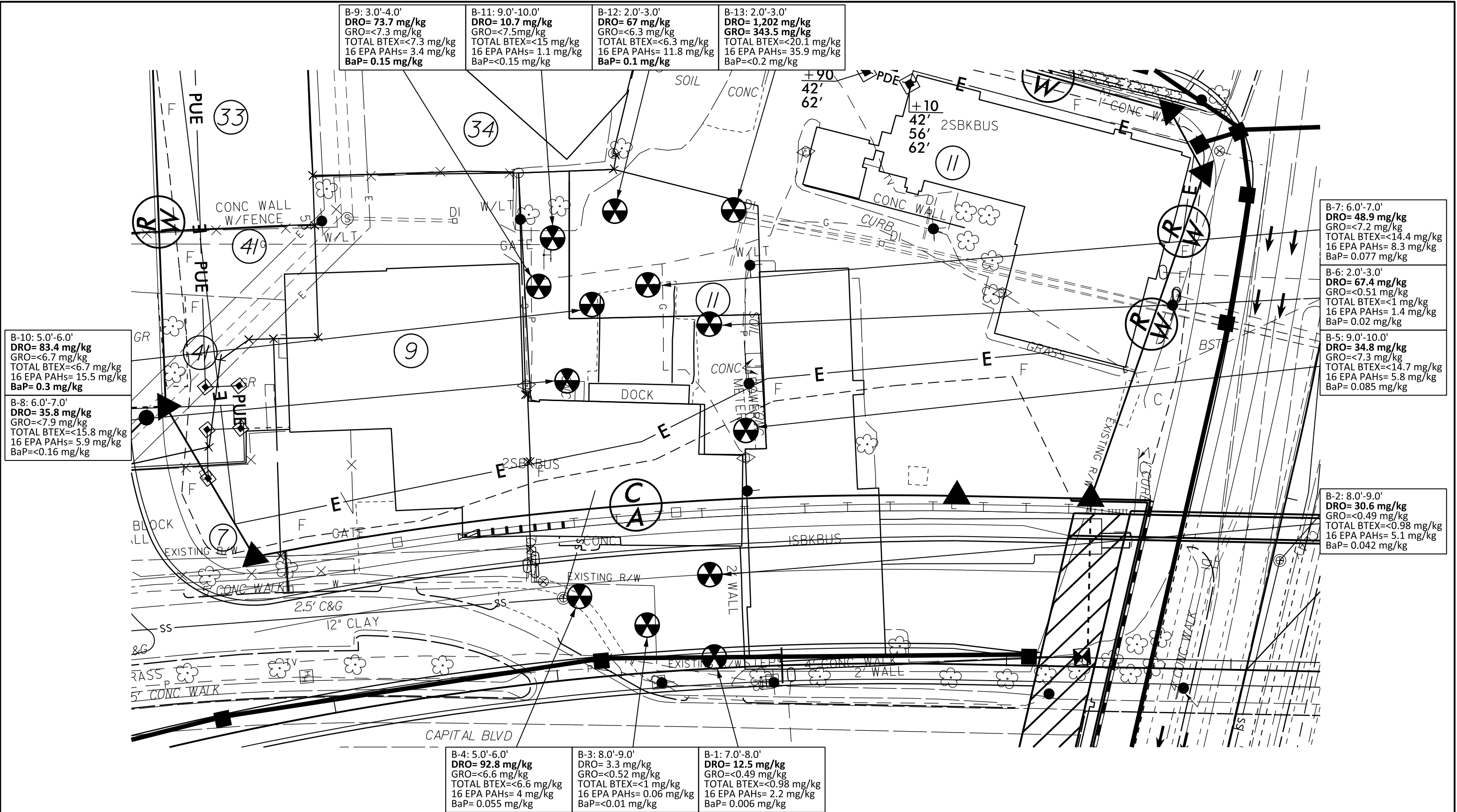
F&R PROJECT No.: 66T-0097

DRAWN BY: B. Whitley

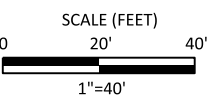
DATE: August 2015

SCALE: As Shown

FIGURE
No.: 2



NAD 83/NSRS 2007



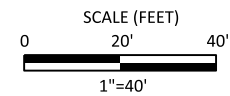
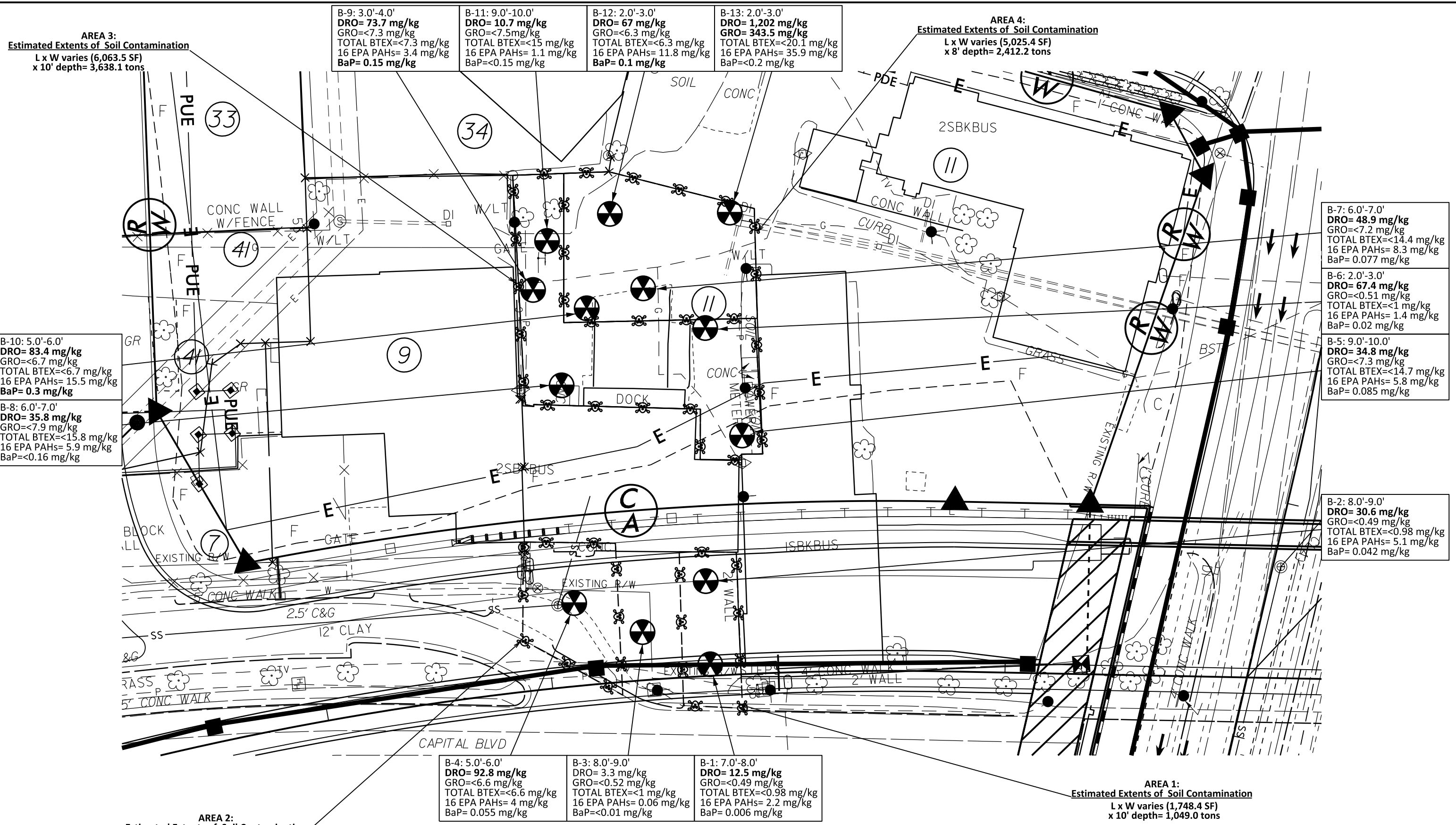
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LEGEND

Approximate Geoprobe Boring Location

Samples Shown in Bold Exceed the NCDENR Action Level as Outlined in the NCDENR, DWM, UST Section Guideline

LABORATORY RESULTS & BORING LOCATION PLAN	
CLIENT: NCDOT	
PROJECT: B-5121/B-5317 Margie Marie Fuller (Parcel #11)	
LOCATION: Raleigh, Wake, County, North Carolina	
F&R PROJECT No.: 66T-0097	
DRAWN BY: T. T. Walker	CHECKED BY: M. Sabodish, P.E.
DATE: August 2015	SCALE: 1"=40'
FIGURE No.:	3



NAD 83/NSRS 2007

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LEGEND

Approximate Geoprobe Boring Location

Samples Shown in Bold Exceed the NCDENR Action Level as Outlined in the NCDENR, DWM, UST Section Guideline

ESTIMATED EXTENTS OF SOIL CONTAMINATION	
CLIENT: NCDOT	
PROJECT: B-5121/B-5317 Margie Marie Fuller (Parcel #11)	
LOCATION: Raleigh, Wake County, North Carolina	
F&R PROJECT No.: 66T-0097	
DRAWN BY: T. T. Walker	CHECKED BY: M. Sabodish, P.E.
DATE: August 2015	SCALE: 1"=40'



APPENDIX II

GEOPHYSICAL REPORT PREPARED BY PYRAMID



PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2015-176)


GEOPHYSICAL SURVEY


**METALLIC UST INVESTIGATION:
PARCEL 11 – MARGIE M. FULLER
NCDOT PROJECT B-5121/B5317
(WBS 42263.1.1)**

523 CAPITAL BLVD., RALEIGH, WAKE COUNTY, NC

JULY 17, 2015

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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 11 – Margie M. Fuller
Raleigh, Wake County, North Carolina

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- Figure 1 – Parcel 11 Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 11 EM61 Results Contour Map

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
SVE.....	Soil Vapor Extraction
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Froehling & Robertson (F&R) at Parcel 11, located at 523 Capital Blvd., Raleigh, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project B-5121/B-5317). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to include all accessible portions of the property due to its designation by the NCDOT as a total take. Conducted from June 26 to July 1, 2015, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: All EM anomalies were directly attributed to visible cultural features at the ground surface. For this reason, a GPR survey was not required. Portions of the property were inaccessible due to parked motorcycles and vehicles. Collectively, the geophysical data did not record any evidence of metallic USTs at the property.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Froehling & Robertson (F&R) at Parcel 11, located at 523 Capital Blvd., Raleigh, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project B-5121/B-5317). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to include all accessible portions of the property due to its designation by the NCDOT as a total take. Conducted from June 26 to July 1, 2015, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a motorcycle sales building surrounded by asphalt parking areas and sections of reinforced concrete. The survey area was divided into east and west sections due to the building location and the elevated nature of the east side of the property. Portions of the survey area were inaccessible due to parked motorcycles, vehicles and a trailer. Aerial photographs 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 metal detector integrated with a Trimble AG-114 GPS antenna. 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 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 11.0 software programs.

GPR data were not required for this parcel due to all EM anomalies being directly attributed to visible cultural features at the ground surface (see discussion below).

Pyramid’s classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided to us 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 to 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	Dumpster	
3	Chain Link Fence	
4	Suspected Gas Line	
5	Building	
6	Vehicle	
7	Stairs/Rail	
8	Reinforced Ramp	
9	Vehicle	
10	Gas Meter	
11	Utility Boxes	
12	Storm Drain Pipe	
13	Building	
14	Fence	
15	Light Posts	
16	Motorcycles	
17	Vehicle	

All EM anomalies recorded by the survey were directly attributed to visible cultural features such as utilities, motorcycles, cars, fences, light posts, and a dumpster. For this reason, a GPR survey was not required.

Collectively, the geophysical data did not record any evidence of unknown metallic USTs at the property.

SUMMARY & CONCLUSIONS

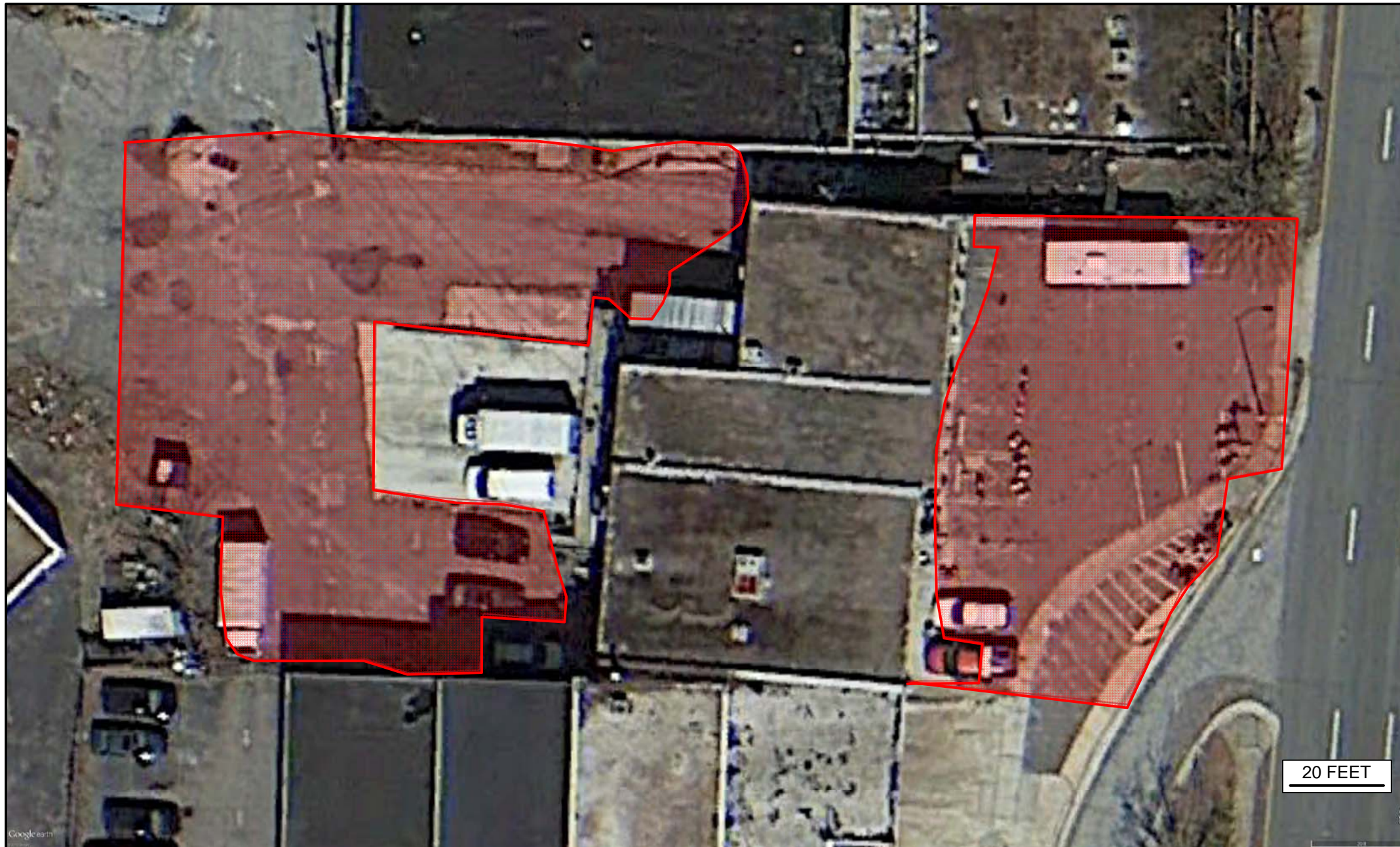
Our evaluation of the EM61 data collected at Parcel 11 in Raleigh, Wake County, North Carolina, provides the following summary and conclusions:

- The EM61 survey provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- All EM anomalies were directly attributed to visible cultural features at the ground surface. For this reason, a GPR survey was not required.
- Portions of the property were inaccessible due to parked motorcycles and vehicles.
- Collectively, the geophysical data did not record any evidence of metallic USTs at the property.

LIMITATIONS

Geophysical surveys have been performed and this report prepared for F&R 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 that 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.

N ↑




APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of East Survey Area
(Facing Approximately North)

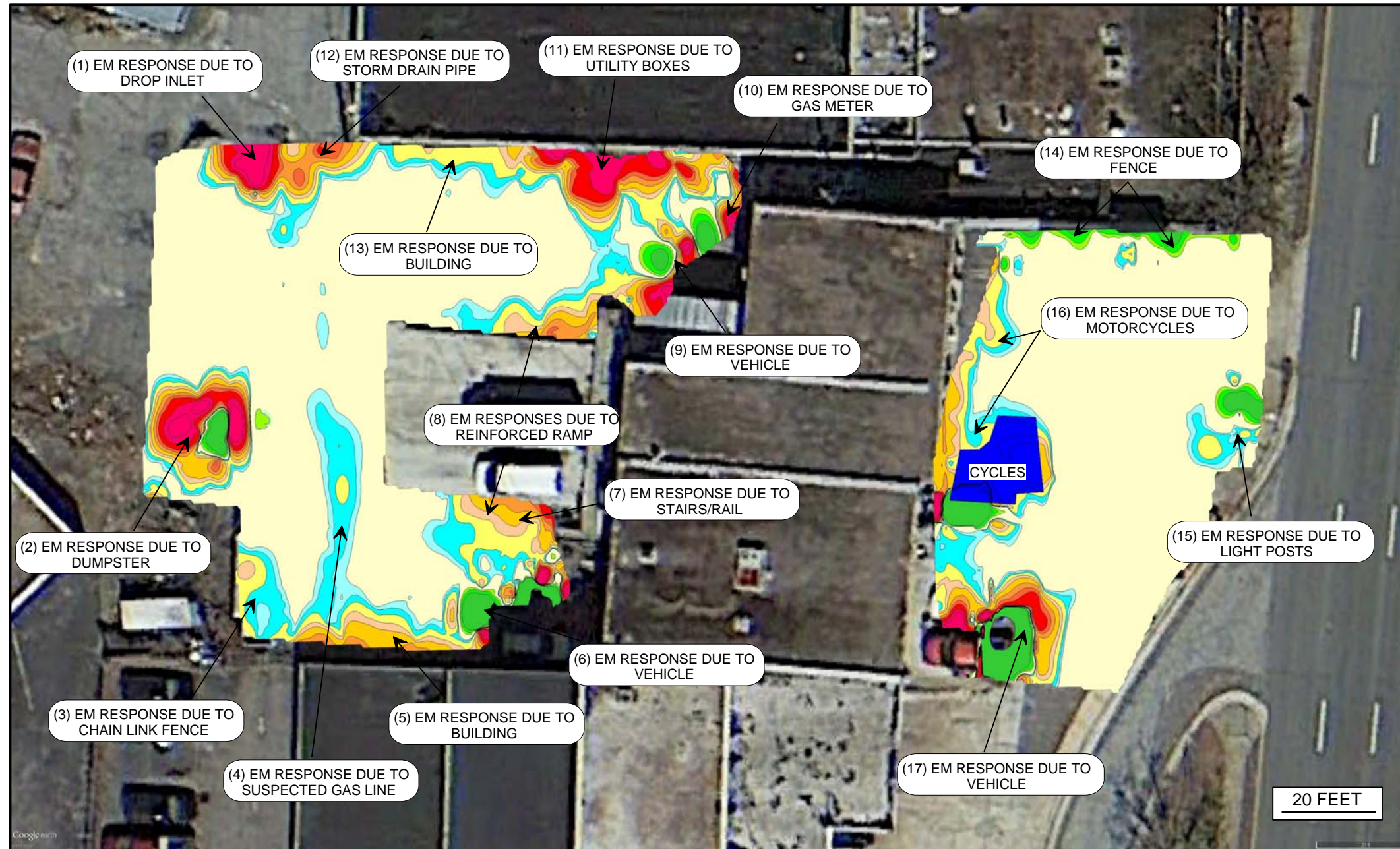


View of West Survey Area
(Facing Approximately East)

TITLE		PARCEL 11 - 523 CAPITAL BLVD. GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	
PROJECT		METALLIC UST INVESTIGATION NCDOT B-5121/B-5317, RALEIGH, NC	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	7/6/2015	CLIENT	FROEHLING & ROBERTSON
PYRAMID PROJECT #:	2015-176	FIGURE 1	



Parcel 11 - EM61 Differential Results

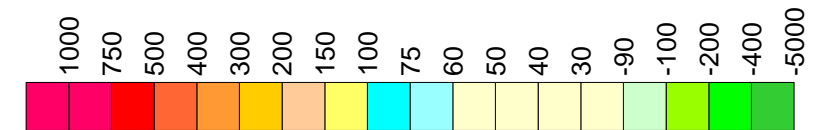



Locations of metallic anomalies detected by the EM61 survey. Numbers correspond to descriptive Table in report.

NO EVIDENCE OF METALLIC USTs OBSERVED

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The EM61 data were collected on June 29, 2015, using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were not required due to all AM anomalies being directly attributed to visible cultural features.

EM61 Metal Detection Response (millivolts)



TITLE	PARCEL 11 - 523 CAPITAL BLVD. EM 61 RESULTS CONTOUR MAP	
PROJECT	METALLIC UST INVESTIGATION NCDOT PROJECT B-5121/B-5317 (42263.1.1)	
	 503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	7/6/2015	CLIENT FROEHLING & ROBERTSON
PYRAMID PROJECT #:	2015-176	FIGURE 2



APPENDIX III
GEOPROBE LOGS



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.8	Petroleum Odors not Observed in Boring
		Moist, Tan, Medium Sandy CLAY (CL)			
	1.0	Moist, Tan, Fine to Medium Sandy SILT (ML)	1.0	0.6	
	2.0	Moist, Red-Brown, Fine Sandy SILT with Mica (ML)	2.0	0.7	
	3.0	Moist, Tan, Fine Sandy SILT with Mica (ML)	3.0	0.7	
	4.0		4.0	0.8	
	5.0	Moist, Tan, Fine to Medium Sandy CLAY with Mica (CL)	5.0	0.9	
	6.0		6.0	1.1	
	7.0	Moist, Orange-Tan, Fine Sandy Silty CLAY with Mica (CL)	7.0	1.1*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	8.0		8.0	1.4	
	9.0		9.0	0.8	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 9.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.6	Petroleum Odors not Observed in Boring
		Moist, Tan, Fine Sandy Silty CLAY (CL)			
	2.0	Moist, Red-Tan, Fine Sandy SILT (ML)	2.0	0.8	
	4.0	Moist, Tan, Fine Sandy SILT (ML)	4.0	0.6	
	6.0	Moist, Tan, Fine to Medium Sandy SILT (ML)	6.0	0.8	
	8.0	Moist, Red-Brown, Fine to Medium Sandy CLAY (CL)	8.0	0.8*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	9.0	Geoprobe Refusal on Concrete at 9 feet.	9.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.8	Petroleum Odors not Observed in Boring
		Moist, Tan, Fine to Medium Sandy Silty CLAY with Mica (CL)			
	1.0	Moist, Red-Tan, Fine Sandy SILT with Mica (ML)	1.0	0.7	
	2.0	Moist, Red-Tan, Fine to Medium Sandy Silty CLAY with Mica (CL)	2.0	0.7	
			3.0	0.9	
			4.0	0.8	
			5.0	1.0	
	6.0	Moist, Tan, Fine to Medium Sandy SILT with Mica (ML)	6.0	0.8	
	7.0	Moist, Pink-Brown, Fine to Medium Sandy SILT with Mica (ML)	7.0	0.9	
	8.0	Moist, Tan, Silty Fine to Medium SAND with Mica (SM)	8.0	1.1*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
			9.0	0.7	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.0	Petroleum Odors not Observed in Boring
		Moist, Red-Brown, Sandy Silty CLAY with Mica (CL)			
	1.0	Moist, Tan and Red-Brown, Sandy Silty CLAY with Mica (CL)	1.0	1.1	
			2.0	1.1	
			3.0	1.0	
	4.0	Moist, Tan, Silty Fine to Medium SAND with Mica (SM)	4.0	1.2	
	5.0	Moist, Tan, Fine to Medium Sandy CLAY (CL)	5.0	1.3*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	6.0	Moist, Tan, Fine Sandy Silty CLAY (CL)	6.0	1.2	
			7.0	0.9	
			8.0	1.0	
	9.0	Moist, Tan, Fine to Medium SAND (SM)	9.0	1.0	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.4	Petroleum Odors not Observed in Boring
		Moist, Tan, Medium Sandy CLAY (CL)	1.0	0.5	
			2.0	1.3	
	3.0	Moist, Orange-Tan, Silty Fine SAND (SM)	3.0	1.3	
			4.0	1.2	
			5.0	1.0	
	6.0	Moist, Brown, Silty Fine Sandy CLAY (CL)	6.0	1.1	
	7.0	Moist, Tan, Silty Fine SAND (SM)	7.0	1.2	
	8.0	Moist, Tan, Fine Sandy SILT (ML)	8.0	1.1	
			9.0	1.4*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ F&R.GDT 8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.8	Petroleum Odors not Observed in Boring
		Moist, Tan, Medium Sandy CLAY (CL)			
	1.0	Moist, Tan, Fine to Medium SAND (SP)	1.0	1.0	
	2.0	Moist, Tan-Gray, Fine to Medium SAND (SP)	2.0	1.2*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	3.0	Moist, Tan, Silty Fine to Medium SAND (SM)	3.0	0.8	
	4.0	Moist, Tan, Medium to Coarse Sandy CLAY (CL)	4.0	1.0	
	5.0	Moist, Tan, Fine to Medium Sandy CLAY (CL)	5.0	1.0	
	6.0	Moist, Tan, Fine to Medium SAND (SP)	6.0	1.1	
	7.0	Moist, Tan, Fine Sandy CLAY (CL)	7.0	1.0	
	8.0	Moist, Tan, Silty Fine to Medium SAND (SM)	8.0	1.0	
			9.0	0.8	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 7.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.0	Petroleum Odors not Observed in Boring
		Moist, Dark Gray, Fine to Medium SAND (SP)			
	1.0	Moist, Tan, Fine to Medium Sandy CLAY (CL)	1.0	1.2	
	2.0	Moist, Tan, Silty CLAY (CL)	2.0	1.3	
	3.0	Moist, Tan, CLAY (CH)	3.0	1.2	
	4.0	Moist, Tan, Fine Sandy SILT (ML)	4.0	1.0	
	5.0	Moist, Tan-Black, Fine to Medium Sandy SILT (ML)	5.0	1.1	
			6.0	1.7*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	7.0	Geoprobe Boring Terminated on Very Dense SANDS at 7 feet.	7.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.0	Petroleum Odors not Observed in Boring
		Moist, Tan, Fine Sandy SILT (ML)			
	1.0	Moist, Tan, Silty Fine to Medium SAND (SM)	1.0	0.9	
	2.0	Moist, Tan, Fine Sandy Silt (ML)	2.0	0.8	
	3.0	Moist, Tan, Fine Sandy Silty CLAY (CL)	3.0	0.7	
	4.0	Moist, Tan, Silty Sandy CLAY (CL)	4.0	0.9	
	5.0	Moist, Tan, Silty Fine SAND (SM)	5.0	1.1	
			6.0	1.3*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
			7.0	1.2	
			8.0	1.1	
			9.0	0.8	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT 8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	0.8	Petroleum Odors not Observed in Boring
		Moist, Gray, Fine to Medium Sandy CLAY (CL)			
	1.0	Moist, Tan, Fine to Medium Sandy CLAY (CL)	1.0	0.9	
	2.0	Moist, Tan, Fine Sandy Silty CLAY (CL)	2.0	1.3	
	3.0	Moist, Tan, Silty Fine to Medium SAND (SM)	3.0	1.6*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
			4.0	1.3	
			5.0	1.4	
	6.0	Moist, Tan, Fine to Medium SAND (SP)	6.0	1.2	
			7.0	1.4	
	8.0	Moist, Tan, Silty Fine to Medium SAND (SM)	8.0	1.0	
			9.0	1.1	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 7.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.2	Petroleum Odors not Observed in Boring
		Moist, Orange-Tan, Sandy CLAY (CL)	1.0	1.0	
			2.0	1.3	
			3.0	1.2	
	4.0	Moist, Tan, Silty Fine to Coarse SAND (SM)	4.0	1.1	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	5.0	Moist, Tan, Fine to Medium Sandy SILT (ML)	5.0	1.4*	
			6.0	1.1	
	7.0	Geoprobe Refusal on PWR at 7 feet.	7.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 10.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.2	Petroleum Odors not Observed in Boring
		Moist, Brown, Fine to Medium SAND (SP)			
	1.0	Moist, Tan, Medium Sandy CLAY (CL)	1.0	1.2	
	2.0	Moist, Tan, Fine to Medium SAND (SP)	2.0	1.1	
			3.0	1.0	
			4.0	0.9	
	5.0	Moist, Brown, Silty Fine to Medium SAND (SM)	5.0	1.0	
	6.0	Moist, Tan, Fine to Medium SAND (SM)	6.0	1.2	
			7.0	1.0	
			8.0	1.0	
			9.0	1.3*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 8.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks	
	0.2	Asphalt	0.0	0.7	Petroleum Odors not Observed in Boring	
		Moist, Tan-Brown, Sandy CLAY (CL)				
	1.0	Moist, Brown, Medium Sandy SILT (ML)	1.0	1.2		
	2.0	Moist, Brown-Gray, Medium Sandy CLAY (CL)	2.0	1.4*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP	
			3.0	1.3		
	4.0	Moist, Brown-Gray, Medium SAND (SP)	4.0	1.1		
	5.0	Wet, Brown-Gray, Medium Sandy CLAY (CL)	5.0	1.0		
	6.0	Moist, Brown, Medium to Coarse Sandy CLAY (CL)	6.0	0.9		
	7.0	Moist, Tan, Silty Fine to Medium SAND (SM)	7.0	0.6		
	8.0	Geoprobe Boring Terminated on Very Dense SANDS at 8 feet.				

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



Project No: 66T-0097

Elevation: Existing Ground Surface

Drilling Method: Geoprobe

Client: NCDOT

Total Depth: 8.0'

Hammer Type: N/A

Project: Margie M. Fuller (Parcel #11)

Boring Location: See Plan

Date Drilled: 7/30/15

City/State: Raleigh, NC

Driller: Regional Probing Services

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
	0.2	Asphalt	0.0	1.4	
		Dry, Gray, Fine to Medium SAND (SP)			
	1.0	Dry, Gray-Black, Silty Fine to Medium SAND (SM)	1.0	5.9	
	2.0	Moist, Gray, SILT (ML)	2.0	8.1*	*Sample Submitted for Laboratory Analysis for TPH, DRO/GRO, Total BTEX, 16 PAHs, and BaP Unknown Odor Observed
	3.0	Dry, Gray-Black, Silty Fine SAND (SM)	3.0	7.0	
	4.0	Dry, Black, Medium to Coarse SAND (SP)	4.0	5.3	
	5.0	Dry, Brown-Black, Silty Medium to Coarse SAND (SM)	5.0	3.3	
	6.0	Dry, Brown-Black, Coarse Sandy CLAY (CL)	6.0	1.8	
	7.0	Wet, Gray, Medium to Coarse Sandy CLAY with Gravel (CL)	7.0	1.6	
	8.0	Geoprobe Boring Terminated on Very Dense SANDS at 8 feet.	8.0		

GEOPROBE_LOG_B5121_GEOENV_GEOPROBEBORELOGS_PARCEL11.GPJ_F&R.GDT_8/21/15

*Geoprobe soil samples were collected by continuous push of a 2 inch ID stainless steel barrel containing a 4 foot long acetate collection sleeve. The 4 foot long soil sample sleeves were cut open and the soil was separated into 1 foot long sample intervals.



APPENDIX IV

SITE PHOTOS



Photo #1: A view of Borings B-1 and B-2, facing west.



Photo #2: A view of Borings B-3 and B-4, facing north.



B-5

Photo #3: Boring location B-5, facing east.



B-7

B-6

Photo #4: A view of boring locations B-6 and B-7, facing south.



B-8

Photo #5: A view of Boring B-8, facing east.



B-9

B-11

Photo #6: A view of Borings B-9 and B-11, facing southeast



B-10

B-8

Photo #7: A view of Borings B-8 and B-10, facing east.



B-13

B-12

Photo #8: A view of Borings B-12 and B-13, facing south.



APPENDIX V

LABORATORY ANALYTICAL RESULTS



Hydrocarbon Analysis Results

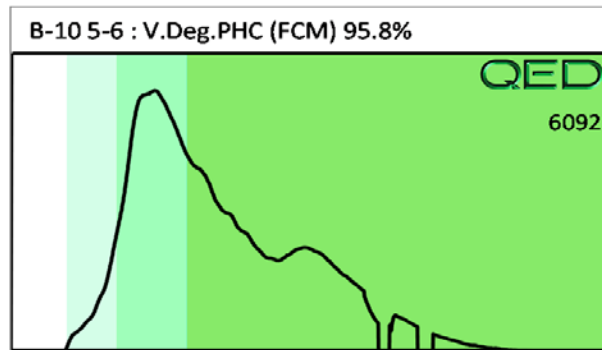
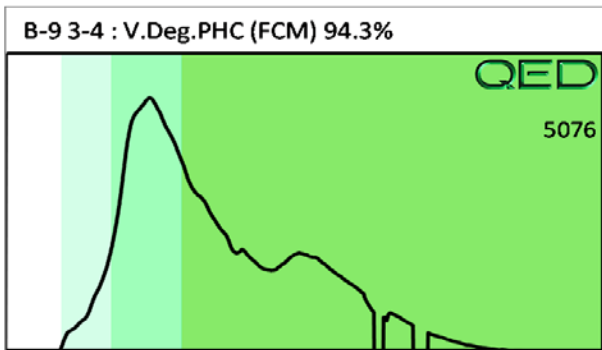
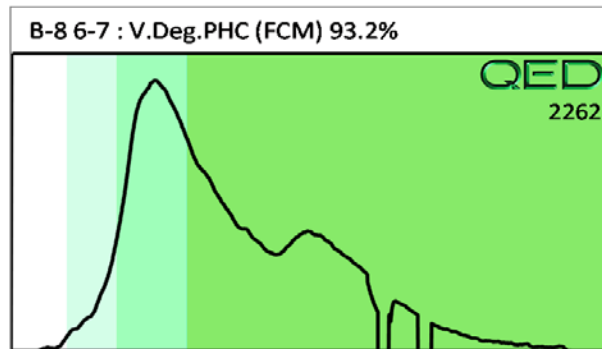
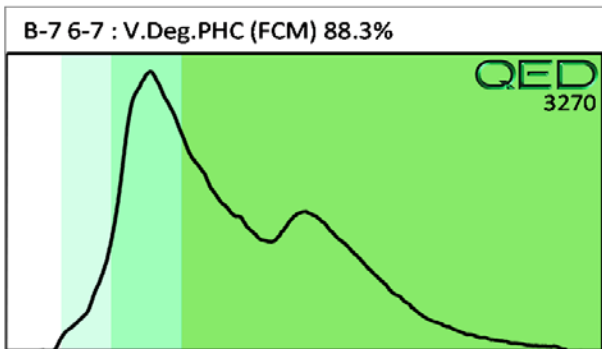
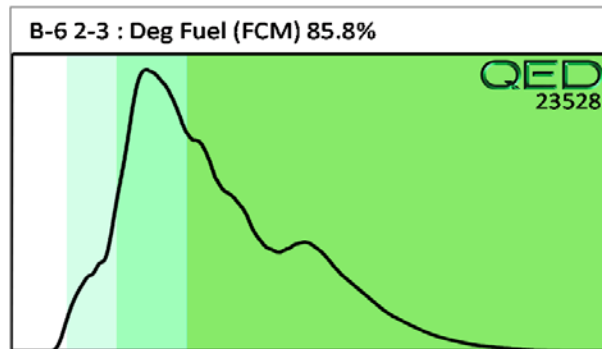
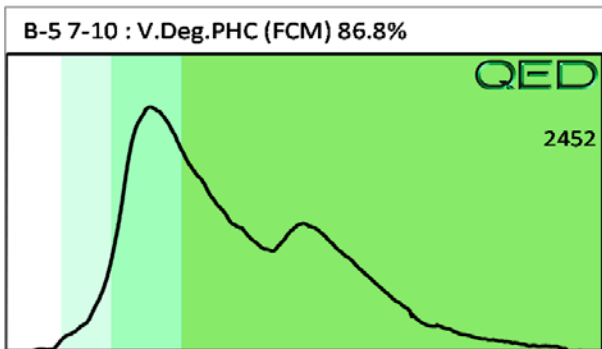
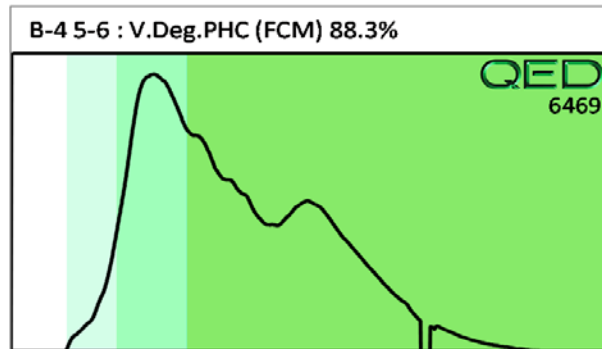
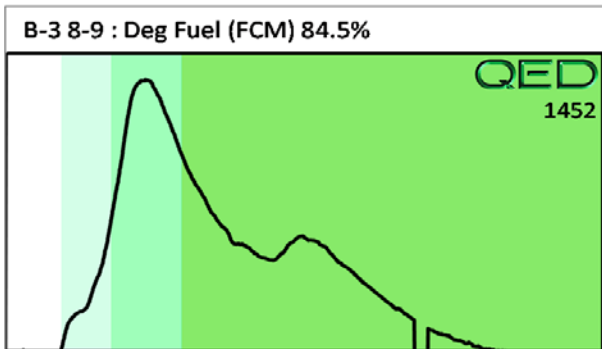
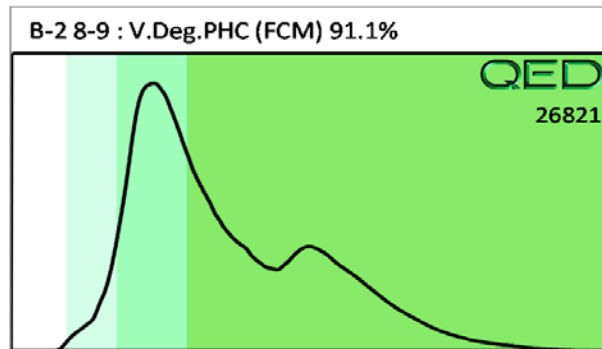
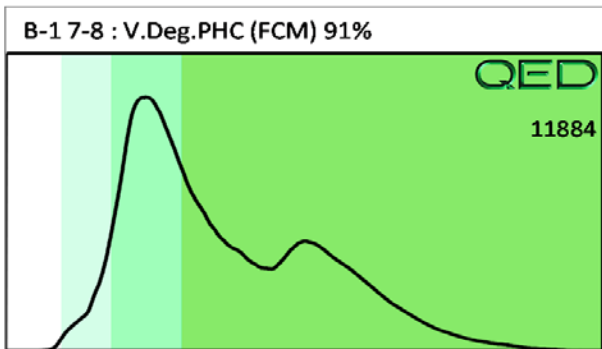
Client: F&R Address:	Samples taken Samples extracted Samples analysed	Thursday, July 30, 2015 Thursday, July 30, 2015 Monday, August 03, 2015
Contact: Ben Whitley	Operator	King
Project: NCDOT B-5121/B-5317		

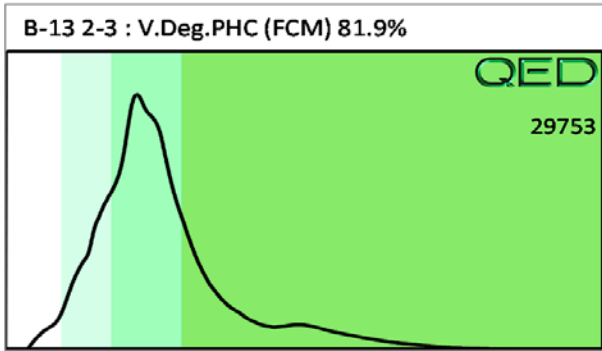
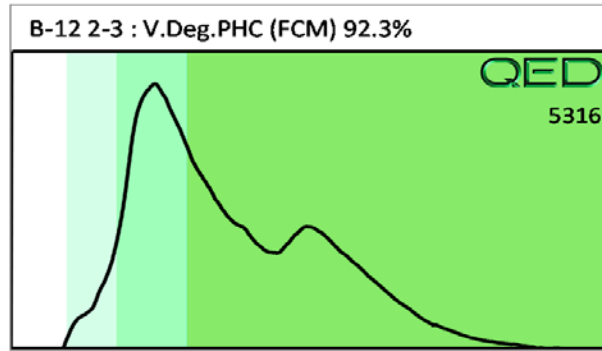
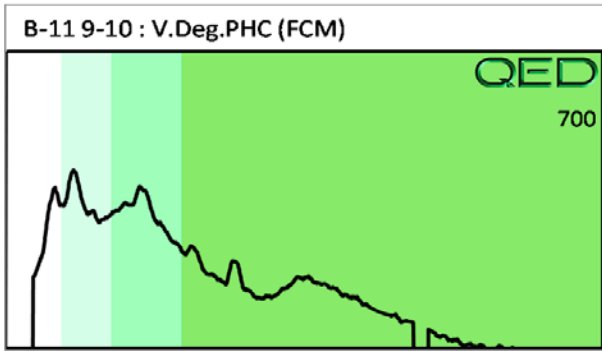
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	B-1 7-8	19.5	<0.98	<0.49	12.5	12.5	12.3	2.2	0.006	0	90.8	9.2	V.Deg.PHC (FCM) 91%
s	B-2 8-9	19.7	<0.98	<0.49	30.6	30.6	30.4	5.1	0.042	0	91.5	8.5	V.Deg.PHC (FCM) 91.1%
s	B-3 8-9	20.8	<1	<0.52	3.3	3.3	1.6	0.06	<0.01	0	91.1	8.9	Deg Fuel (FCM) 84.5%
s	B-4 5-6	262.0	<6.6	<6.6	92.8	92.8	86.1	4	0.055	0	87.8	12.2	V.Deg.PHC (FCM) 88.3%
s	B-5 7-10	293.9	<14.7	<7.3	34.8	34.8	32.4	5.8	0.085	0	86.7	13.3	V.Deg.PHC (FCM) 86.8%
s	B-6 2-3	20.5	<1	<0.51	67.4	67.4	34.2	1.4	0.02	0	93.1	6.9	Deg Fuel (FCM) 85.8%
s	B-7 6-7	288.9	<14.4	<7.2	48.9	48.9	45.3	8.3	0.077	0	88	12	V.Deg.PHC (FCM) 88.3%
s	B-8 6-7	315.9	<15.8	<7.9	35.8	35.8	32.8	5.9	<0.16	0	89.4	10.6	V.Deg.PHC (FCM) 93.2%
s	B-9 3-4	291.4	<7.3	<7.3	73.7	73.7	71.7	3.4	0.15	0	91.2	8.8	V.Deg.PHC (FCM) 94.3%
s	B-10 5-6	268.3	<6.7	<6.7	83.4	83.4	81.4	15.5	0.3	0	91.1	8.9	V.Deg.PHC (FCM) 95.8%
Initial Calibrator QC check			OK			Final FCM QC Check			OK			109.5%	

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

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

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







Chain of Custody Record and Analytical Request Form

Sample ID QED UVF	Sample Collection		Initials	TAT Requested		
	Date	Time		24 Hour	48 Hour	
B-1	7-8	7-30-15	855	8AW	13.3	X
B-2	8-9	↓	900	↓	13.2	↓
B-3	8-9		930		12.5	
B-4	5-6		935		12.9	
B-5	7-10		1030		11.5	
B-6	2-3		1050		12.7	
B-7	6-7		1115		11.7	
B-8	6-7		1130		10.7	
B-9	3-4		1235		11.6	
B-10	5-6		1245		12.6	
B-11	9-10		1255		11.3	
B-12	2-3		1310		13.4	
B-13	2-3		1325		8.4	

Client: F&R

Contact: Brian Whitley

Phone: 919-630-5661

Email: bwhitley@fandr.com

Project Reference: NCDOT B-5121 / B-5317

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

Each sample will generate a fingerprint representative of the petroleum product within the samples. Electronic data will be submitted to the email above.

Parcel 11

<u>F&R</u>	<u>7-31-15</u>	<u>UPS</u>	<u>7-31-15</u>
Relinquished by	Date/Time	Accepted by	Date/Time
		<u>[Signature]</u>	<u>8/1/15</u>
Relinquished by	Date/Time	Accepted by	Date/Time
Relinquished by	Date/Time	Accepted by	Date/Time

SHIP TO:
 QROS, LLC
 420 Raleigh Street, Suite E
 Wilmington, NC 28412

Hannah King
hannahk@grosllc.com
 (704)-654-7391

ATTENTION

When shipping, please **DO NOT** submerge sample vials in ice or water. This is to avoid dilution errors and contamination. To keep the samples cool we suggest using a freezer pack or a bag of ice sealed that will not leak.

SINCE



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