PRELIMINARY SITE ASSESSMENT

PARCEL 003 – QUALITY OIL
1126 MEBANE OAKS ROAD
MEBANE, ALAMANCE COUNTY, NORTH CAROLINA
STATE PROJECT: I-5711
WBS ELEMENT: 50401.1.FS1
OCTOBER 22, 2018

Report prepared for:

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Acronyms

BLS .....Below Land Surface
BTEX .....Benzene, Toluene, Ethylbenzene, & Xylenes
CADD .....Computer Aided Design and Drafting
COC .....Chain of Custody
CSA.....Comprehensive Site Assessment
DEQ .....Department of Environmental Quality
DRO .....Diesel Range Organics
DWM .....Division of Waste Management
EM.....Electromagnetic (as with EM-61)
EPA.....Environmental Protection Agency
GRO .....Gasoline Range Organics
GCLs .....Gross Contaminant Levels
GPR.....Ground Penetrating Radar
HASP .....Health & Safety Plan
MSCC .....Maximum Soil Contaminant Concentration
MTBE .....Methyl Tertiary Butyl Ether
µg/L.....Micrograms per Liter
mg/kg .....Milligrams per kilogram
NPDES.....National Pollutions Discharge Elimination System
NCAC .....North Carolina Administrative Code
NCDOT.....North Carolina Department of Transportation
OSHA.....Occupational Safety and Health Administration
OVA.....Organic Vapor Analyzer
PPM.....Parts Per Million
PID .....Photo-ionization Detector
PSA .....Preliminary Site Assessment
PVC.....Poly-vinyl Chloride
RFP .....Request for Proposal
ROW .....Right of Way
SVOCs .....Semi-Volatile Organic Compounds
TW .....Temporary Well
TPH.....Total Petroleum Hydrocarbons
UVF.....Ultraviolet Fluorescence (UVF) QED Analyzer
UST.....Underground Storage Tank
US EPA.....United States Environmental Protection Agency
VOCs.....Volatile Organic Compounds

PRELIMINARY SITE ASSESSMENT
PARCEL 003 – QUALITY OIL
1126 MEBANE OAKS ROAD
MEBANE, ALAMANCE COUNTY, NORTH CAROLINA

EXECUTIVE SUMMARY OF RESULTS

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this Preliminary Site Assessment (PSA) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 003, owned by Quality Oil. The property currently contains an active gas station surrounded by asphalt and grass medians at 1126 Mebane Oaks Road, Mebane, NC. This PSA was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's August 9, 2018, technical proposal. This PSA is a part of State Project I-5711.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils between the existing edge of pavement and the proposed Right-Of-Way (ROW) and/or easements, whichever distance was greater. The PSA was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features.

The following statements summarize the results of the PSA:

- **Site History:** Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed historical aerial photographs obtained from Google Earth dating back to 1993. Aerial photographs ranging from 1993 to 2017 are included in **Appendix A**. Historical information reviewed as part of the PSA indicated that the property appears to have operated as a service station since at least 1993. Additions and/or changes to building position and construction occurred between 1993 and 1998, as well as between 1998 and 2005. Visual observations and the NCDOT documents indicate that five known USTs are currently operating at the facility. Records review provided the following Facility ID information for the property: Facility ID 00-0-0000024163.

  On August 31, 2018, Pyramid emailed the Alamance County parcel address (1126 Mebane Oaks Road, Mebane, NC) to Ms. Mindy Lepard, Hydrogeologist with the Department of Environmental Quality (DEQ), UST Section, with a request to investigate any environmental incidents associated with the parcel. Ms. Lepard responded to the email and indicated that there were not any environmental incidents associated with the property.

On September 10, 2018, Pyramid Project Manager Eric Cross performed a site investigation at the property. Mr. Cross did not observe any significant environmental risks on the property at the time of the investigation. One of the known USTs (a 100% gasoline UST located in the southwest portion of the property) was located within the proposed ROW/easements. The remaining four known USTs were observed to be outside of the NCDOT proposed ROW and/or easements. It should be noted that the geophysical survey area was extended further into the property beyond the proposed ROW/easements, and this survey area also included one known UST (diesel UST) on the south side of the parcel.

- **Geophysical Survey**: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of fourteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly was associated with suspected interference from a passing vehicle and was investigated further with GPR. No evidence of any subsurface structures was observed at this location.

  GPR verified the sizes and orientations of two known USTs located within the geophysical survey area. The western known UST was approximately 11 feet long by 6 feet wide. The eastern known UST was approximately 23 feet long by 8.5 feet wide. It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy. Collectively, the geophysical data recorded evidence of two known USTs within the geophysical survey area at Parcel 3.

- **Limited Soil Assessment:** A total of eleven soil borings were performed across the property. Soil samples were screened in the field using an organic vapor analyzer (OVA) and select soil samples were analyzed for Diesel Range Organics (DRO) and Gasoline Range Organics (GRO) using a QED Analyzer. The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an OVA and select soil samples were analyzed for DRO and GRO using a QED Analyzer.

  Three of the borings exhibited GRO and/or DRO concentrations above action levels. Specifically, one sample from boring 3-4 (6-8 feet) recorded a GRO concentration of **54.6 mg/kg** and a DRO concentration of **238.2 mg/kg**. One sample from boring 3-5 (4-6 feet) recorded a GRO concentration of **58.6 mg/kg**. A second sample from boring 3-5 (6-8 feet) recorded a GRO concentration of **84.0 mg/kg** and DRO concentration of **1,685 mg/kg**. None of the remaining soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels.

- **Limited Groundwater Assessment:** The water table was not encountered in the upper 8 feet of the soil column that was sampled during this PSA. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities, based on shallow excavations and a water table depth greater than 8 feet below the ground surface. Therefore, it was not necessary to collect a groundwater sample.

- **Contaminated Soil Volumes:** Pyramid's PSA investigation resulted in an **estimated area of 1,168 square feet of petroleum-impacted soil at the locations of borings 3-4 and 3-5**. The NCDOT engineering plans indicate that these contaminated soils are within zones of planned soil excavation for the installation of drainage features. The boundaries of the areas of contamination are approximate due to limited soil analytical data.

  It should be noted that, if additional impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

1.0 INTRODUCTION

Pyramid Environmental & Engineering P.C. (Pyramid) has prepared this Preliminary Site Assessment (PSA) report documenting background information, field activities, assessment activities, findings, conclusions, and recommendations for Parcel 003, owned by Quality Oil. The property currently contains an active gas station surrounded by asphalt and grass medians at 1126 Mebane Oaks Road, Mebane, NC. This PSA was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's August 9, 2018, technical proposal. This PSA is a part of State Project I-5711.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils between the existing edge of pavement and the proposed Right-Of-Way (ROW) and/or easements, whichever distance was greater. The PSA was conducted with particular attention to the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features. The location of the subject site is shown on **Figure 1**.

1.1 Background Information

Based on the NCDOT's August 1, 2018, *Request for Technical and Cost Proposal (RFP),* the PSA was conducted between the existing edge of pavement and the proposed ROW and/or easement lines (whichever distance was greater), with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. The PSA included the following:

- Research the properties for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment across the entire parcel with emphasis on the areas to be cut as indicated by slope stake lines and cross-sections or to be excavated for the installation of drainage features and/or other utilities.
- If groundwater is likely to be encountered by subsequent excavation required by construction, then Pyramid will attempt to obtain a groundwater sample from the parcel.

1.2 Project Information

Prior to field activities, a Health and Safety Plan was prepared. Prior to drilling activities, the public underground utilities were located and marked by the North Carolina One-Call Service. Pyramid's geophysical staff provided additional private utility locating services to mark the on-site private, buried utilities.

2.0 SITE HISTORY

The NCDOT Pre-Scope comments for Parcel 003 in the RFP documents provided to Pyramid on August 1, 2018, provided the following background information related to the site:

> *"Currently convenience store/gas station. Five tanks currently in use. One tank removed in 1994."*

Pyramid interviewed DEQ personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed historical aerial photographs obtained from Google Earth dating back to 1993. Aerial photographs ranging from 1993 to 2017 are included in **Appendix A**. Historical information reviewed as part of the PSA indicated that the property appears to have operated as a service station since at least 1993. Additions and/or changes to building position and construction occurred between 1993 and 1998, as well as between 1998 and 2005. Visual observations and the NCDOT documents indicate that five known USTs are currently operating at the facility. Records review provided the following Facility ID information for the property: Facility ID 00-0-0000024163.

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On September 10, 2018, Pyramid Project Manager Eric Cross performed a site investigation at the property. Mr. Cross did not observe any significant environmental risks on the property at the time of the investigation. One of the known USTs (a 100% gasoline UST located in the southwest portion of the property) was located within the proposed ROW/easements. The remaining four known USTs were observed to be outside of the NCDOT proposed ROW and/or easements. It should be noted that the geophysical survey area (discussed below) was extended further into the property beyond the proposed ROW/easements, and this survey area also included one additional known UST (diesel UST) on the south side of the parcel.

3.0 GEOPHYSICAL INVESTIGATION

Pyramid's classifications of USTs for the purposes of this PSA 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.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of fourteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly was associated with suspected interference from a passing vehicle and was investigated further with GPR. No evidence of any subsurface structures was observed at this location.

GPR verified the sizes and orientations of two known USTs located within the geophysical survey area. The western known UST was approximately 11 feet long by 6 feet wide. The eastern known UST was approximately 23 feet long by 8.5 feet wide. It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy. Collectively, the geophysical data recorded evidence of two known USTs within the geophysical survey area at Parcel 3.

The full details of the geophysical investigation are documented in Pyramid's Geophysical Investigation Report, dated September 17, 2018, which is included as **Appendix B**.

4.0 SOIL SAMPLING ACTIVITIES & RESULTS

4.1 Soil Assessment Field Activities

On October 1, 2018, Pyramid mobilized to the site, drilled soil borings and collected the proposed soil samples for the PSA. Eleven (11) soil borings (3-1 through 3-11) were advanced on the subject property. The soil borings were completed using a truck-mounted Geoprobe drill rig. The selected locations were chosen to avoid public utilities along the adjacent roads and private utilities associated with the business while remaining in the proposed ROW and/or easement, or within other areas of concern such as proposed drainage features and areas designated for soil removal as indicated by the NCDOT engineering plans. The locations of the borings are shown on **Figure 2**.

Soil samples were continuously collected in four-foot long disposable sleeves from each boring for geologic description and visual examination for signs of contamination. Soil recovered from each sleeve was screened in the field using an Organic Vapor Analyzer (OVA) approximately every 2 feet, depending on the soil recovery. In general, the soil sample with the highest OVA reading was selected from each boring for QED Ultra-Violet Fluorescence (UVF) laboratory analysis. If field screening detected multiple elevated readings, then additional soil samples from each boring were selectively chosen for UVF analysis. The soil boring logs with the soil descriptions, visual examination, and OVA screening results are included in **Appendix C**. The OVA field screening results are summarized in **Table 1**. To prevent cross-contamination, new disposable nitrile gloves were worn by the sampling technician during the sampling activities and were changed between samples. Petroleum odor was not detected in any of the boring samples during the field screening.

The soil samples selected for total petroleum hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from RED Lab. The DEQ & NCDOT now accept this instrument as an analytical method to provide total petroleum hydrocarbon (TPH) results for soil analysis for PSA projects. Pyramid preserved the samples for UVF analysis in methanol-filled containers provided by RED Lab, an approved laboratory for performing the UVF screening. The samples were analyzed in the field in real-time when possible by a Pyramid employee who has been certified by RED Lab to perform the QED analyses. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO).

4.2 Soil Sample Analytical Results

QED Results

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an OVA and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Three of the borings exhibited GRO and/or DRO concentrations above action levels. Specifically, one sample

from boring 3-4 (6-8 feet) recorded a GRO concentration of **54.6 mg/kg** and a DRO concentration of **238.2 mg/kg**. One sample from boring 3-5 (4-6 feet) recorded a GRO concentration of **58.6 mg/kg**. A second sample from boring 3-5 (6-8 feet) recorded a GRO concentration of **84.0 mg/kg** and DRO concentration of **1,685 mg/kg**. None of the remaining soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix D**.

4.3 Temporary Monitoring Well Installation

The water table was not encountered in the upper 8 feet of the soil column that was sampled during this PSA. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities, based on shallow excavations and a water table depth greater than 8 feet below the ground surface. Therefore, it was not necessary to collect a groundwater sample.

5.0 CONCLUSIONS AND RECOMMENDATIONS

As requested by the NCDOT, Pyramid has completed a PSA at Parcel 003 (Quality Oil) located at 1126 Mebane Oaks Road, Mebane, NC. The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of fourteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly was associated with suspected interference from a passing vehicle and was investigated further with GPR. No evidence of any subsurface structures was observed at this location.

GPR verified the sizes and orientations of two known USTs located within the geophysical survey area. The western known UST was approximately 11 feet long by 6 feet wide. The eastern known UST was approximately 23 feet long by 8.5 feet wide. It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy. Collectively, the geophysical data recorded evidence of two known USTs within the geophysical survey area at Parcel 3.

5.2 Limited Soil Assessment

The DEQ action level for TPH-GRO is 50 milligrams per kilogram (mg/kg) and the action level for TPH-DRO is 100 mg/kg. Soil samples were screened with an OVA and select soil samples were analyzed for DRO and GRO using a QED Analyzer. Three of the borings exhibited GRO and/or DRO concentrations above action levels. Specifically, one sample from boring 3-4 (6-8 feet) recorded a GRO concentration of **54.6 mg/kg** and a DRO concentration of **238.2 mg/kg**. One sample from boring 3-5 (4-6 feet) recorded a GRO concentration of **58.6 mg/kg**. A second sample from boring 3-5 (6-8 feet) recorded a GRO concentration of **84.0 mg/kg** and DRO concentration of **1,685 mg/kg**. None of the remaining soil samples analyzed exhibited DRO or GRO concentrations above DEQ action levels.

5.3 Limited Groundwater Assessment

The water table was not encountered in the upper 8 feet of the soil column that was sampled during this PSA. Review of the NCDOT engineering plans for this parcel indicate that groundwater will not be encountered during construction activities, based on shallow excavations and a water table depth greater than 8 feet below the ground surface. Therefore, it was not necessary to collect a groundwater sample.

5.4 Recommendations

Petroleum-Impacted Soils

During road construction activities, it is possible the NCDOT may encounter petroleum-impacted soil near soil borings 3-4 and 3-5. It should be noted that these borings are directly adjacent to a known petroleum UST. GRO and DRO concentrations of soil samples from these borings exceeded action levels. The soil analytical results show a petroleum release from the nearby UST systems. The UST owner/operator has an obligation to report the release to the NCDEQ. The proximity of these borings to the known UST suggests that the source may be from the dispensers and/or UST at this location. The proposed NCDOT MicroStation drainage plans indicate that soil will be excavated in this area for the purposes of installing new drainage features.

Estimating the Area of Contamination

The estimated area of soil contamination are depicted on **Figure 2**. The boundaries of the area of contamination are generally estimated by applying a circular area of contamination around a boring exhibiting DRO/GRO levels above action levels with a radius equal to half the distance between that boring and the nearest "clean" boring. In cases where this approach is not feasible, such as near property boundaries or where data does not exist to provide a definitive boundary, the area of contamination is terminated using the distance to the property boundary as a radius, or an educated approximation is applied.

Pyramid's PSA investigation resulted in an **estimated area of 1,168 square feet of impacted soil at the locations of borings 3-4 and 3-5**. The NCDOT engineering plans indicate that these contaminated soils are within zones of planned soil excavation for the installation of drainage features. The boundaries of the areas of contamination are approximate due to limited soil analytical data.

It should be noted that, if additional impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DEQ Division of Waste Management (DWM) guidelines and disposed of at a permitted facility.

6.0 LIMITATIONS

The results of this preliminary investigation are limited to the boring locations completed during this limited assessment and presented in this report. The laboratory results only reflect the current conditions at the locations sampled on the date this PSA was performed.

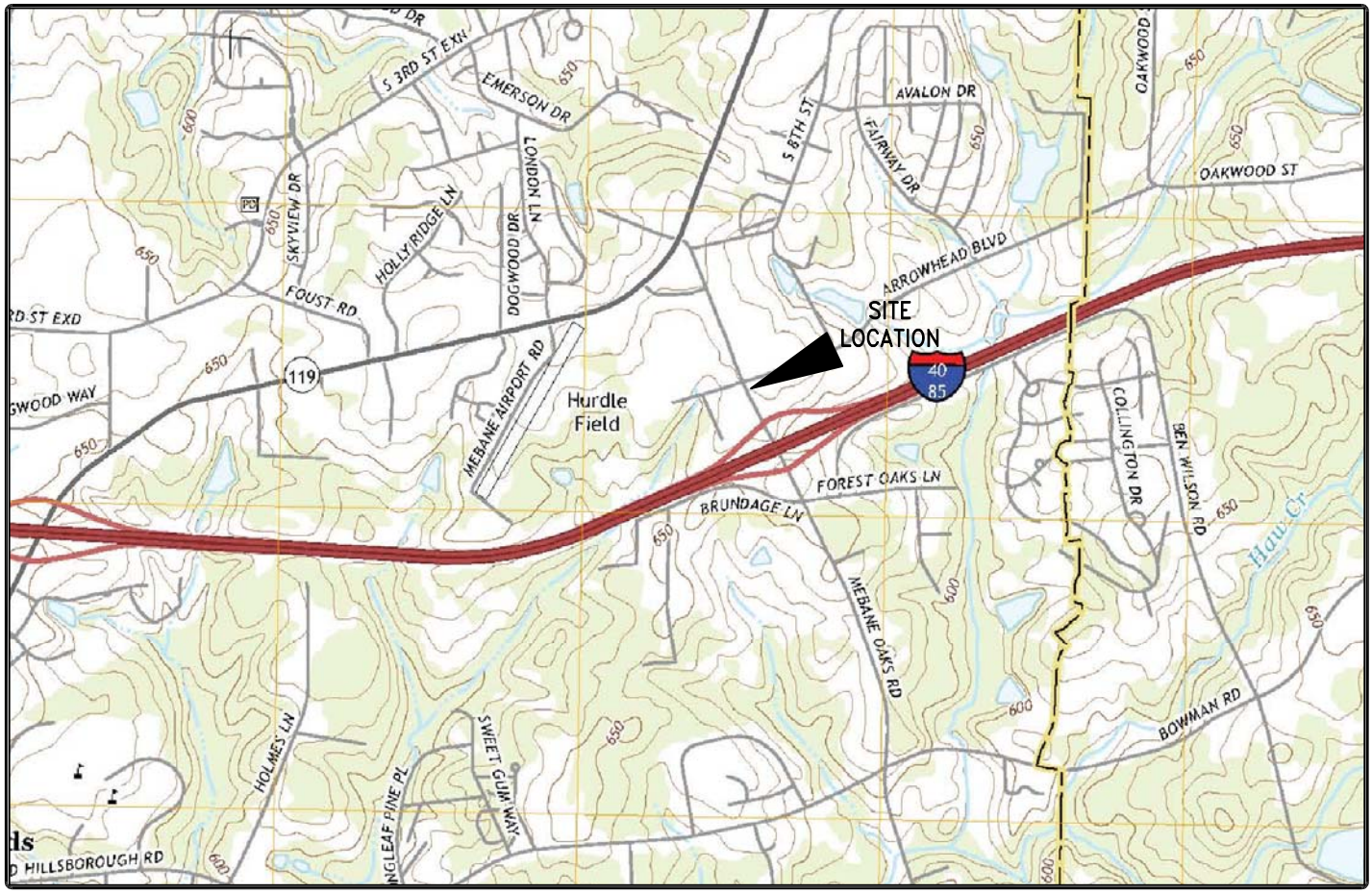
7.0 CLOSURE

This report was prepared for, and is available solely for use by, the NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The observations, conclusions, and recommendations documented in this report are based on site conditions and information reviewed at the time of Pyramid's investigation. Pyramid appreciates the opportunity to provide this environmental service.

FIGURES

USGS TOPOGRAPHIC MAP

SITE: PARCEL 003 LOCATION: MEBANE, NORTH CAROLINA



USGS IDENTIFICATION

USGS 7.5 MINUTE MAP	MEBANE, N.C.
ORIGINAL DATE:	1969
PHOTOREVISION DATE:	2016

	PRIMARY HIGHWAY, HARD SURFACE
	SECONDARY HIGHWAY, HARD SURFACE
	LIGHT-DUTY ROAD HARD OR IMPROVED SURFACE
	UNIMPROVED ROAD
	STATE ROAD
	U.S. ROUTE
	INTERSTATE ROUTE

SCALES

MILES: 1/2 0 1

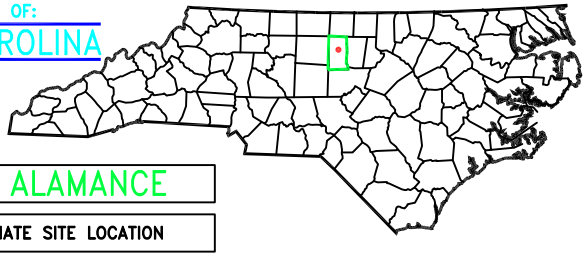
FEET: 1000 0 2000 4000 6000

1" = 2000'

NOTES: ▶ TOPOGRAPHICAL CONTOUR INTERVAL = 10 FEET
▶ PHOTOREVISIONS DENOTED IN PURPLE

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: ALAMANCE

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NCDOT I-5711
PROPERTY NAME: 1126 MEBANE OAKS RD.
CITY: MEBANE STATE: NORTH CAROLINA
TITLE: TOPOGRAPHIC MAP

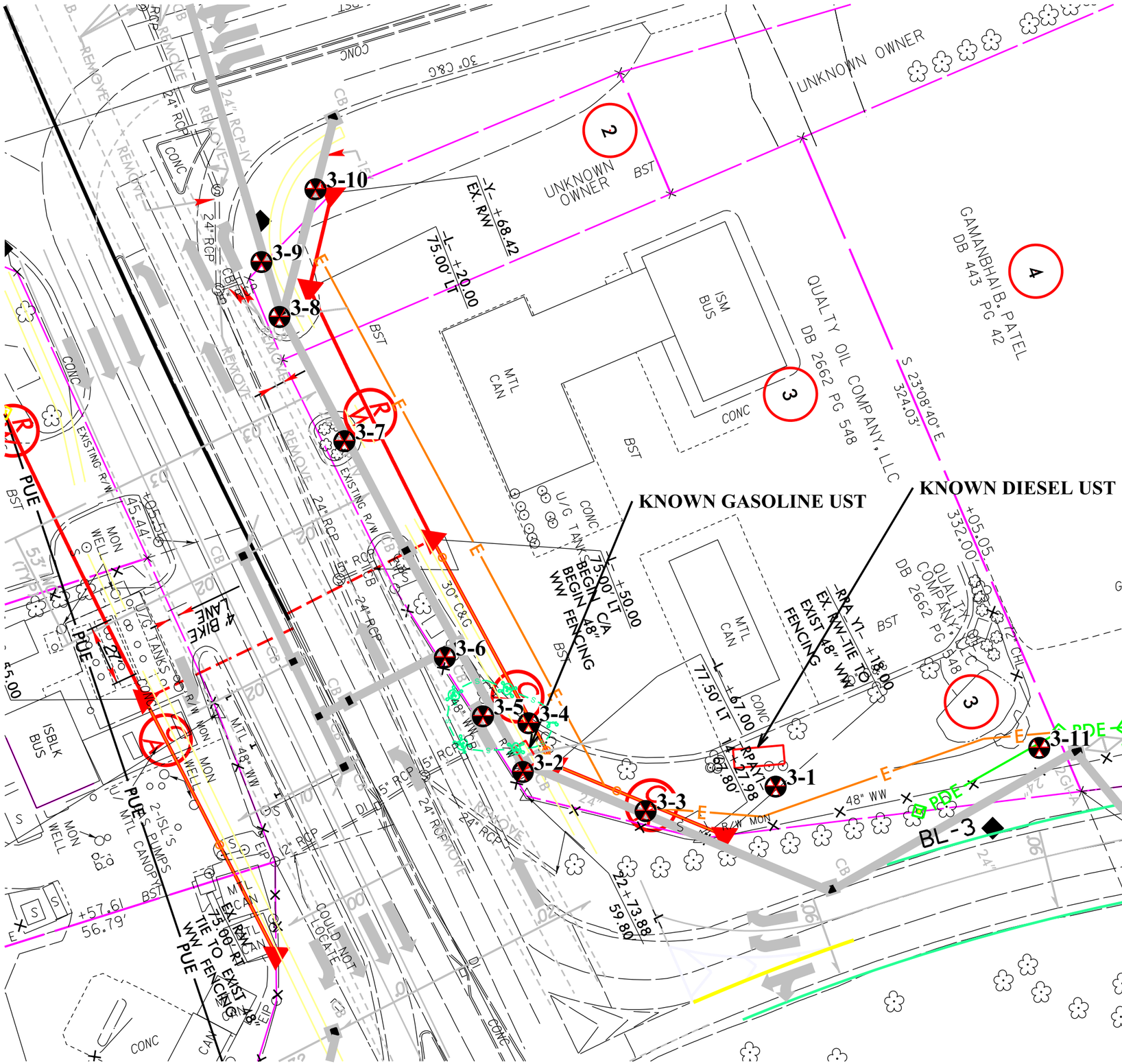
SCALE: 1"=2000'
DATE: 10/10/18
DRAWING NAME: USGSTOPO

DRAWN BY: KAM
CHECK BY: TDL
JOB NO.: 2018-242
TYPE: PSA
FIGURE NUMBER: 1

NOTES

TOPOGRAPHIC MAP USED IN THIS GRAPHIC IS MAPPED, EDITED, AND PUBLISHED BY THE UNITED STATES GEOLOGIC SURVEY, DEPARTMENT OF THE INTERIOR, RESTON VIRGINIA.

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS.



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- E — TEMPORARY CONSTRUCTION EASEMENT
- PDE — PROPOSED PERMANENT DRAINAGE
- PUE — PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED DRAINAGE PIPING
- SOIL BORING LOCATION
- KNOWN UST WITHIN SURVEY AREA
- ESTIMATED AREA OF SOIL CONTAMINATION

Analytical results are presented in Table 2 of PSA Report

TITLE

LOCATIONS OF SOIL BORINGS, KNOWN USTs, AND ESTIMATED AREA OF CONTAMINATION

PROJECT

PARCEL 3
MEBANE, NORTH CAROLINA
NCDOT PROJECT I-5711

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

DATE: 10-10-2018	REVISION NO. 0
PYRAMID PROJECT NO. 2018-242	FIGURE NO. 2

TABLES

TABLE 1
Summary of Soil Field Screening Results
NCDOT Project I-5711
Parcel 003 - Quality Mart #2
1126 Mebane Oaks Road
Mebane, Alamance County, North Carolina

SOIL BORING 10/1/2018	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
3-1	3-1(0-2)	0 to 2	3.4
	3-1(2-4)	2 to 4	4.6
	3-1(4-6)	4 to 6	3.4
	3-1(6-8)	6 to 8	4.1
3-2	3-2(0-2)	0 to 2	3.5
	3-2(2-4)	2 to 4	3.9
	3-2(4-6)	4 to 6	3.7
	3-2(6-8)	6 to 8	3.7
3-3	3-3(0-2)	0 to 2	2.9
	3-3(2-4)	2 to 4	2.4
	3-3(4-6)	4 to 6	3.9
	3-3(6-8)	6 to 8	4.0
3-4	3-4(0-2)	0 to 2	2.4
	3-4(2-4)	2 to 4	4.0
	3-4(4-6)	4 to 6	89.3
	3-4(6-8)	6 to 8	181.3
3-5	3-5(0-2)	0 to 2	2.4
	3-5(2-4)	2 to 4	4.8
	3-5(4-8)	4 to 6	379.2
	3-5(6-8)	6 to 8	707.6
3-6	3-6(0-2)	0 to 2	5.5
	3-6(2-4)	2 to 4	6.4
	3-6(4-6)	4 to 6	4.8
	3-6(6-8)	6 to 8	5.3
3-7	3-7(0-2)	0 to 2	5.0
	3-7(2-4)	2 to 4	5.0
	3-7(4-6)	4 to 6	4.7
	3-7(6-8)	6 to 8	5.0
3-8	3-8(0-2)	0 to 2	4.1
	3-8(2-4)	2 to 4	4.7
	3-8(4-6)	4 to 6	4.0
	3-8(6-8)	6 to 8	2.5
3-9	3-9(0-2)	0 to 2	4.3
	3-9(2-4)	2 to 4	4.7
	3-9(4-6)	4 to 6	4.0
	3-9(6-8)	6 to 8	3.9
3-10	3-10(0-2)	0 to 2	4.1
	3-10(2-4)	2 to 4	4.5
	3-10(4-6)	4 to 6	4.5
	3-10(6-8)	6 to 8	3.0
3-11	3-11(2-3)	2 to 3	1.2

bgs= below ground surface
PID= photo-ionization detector
PPM= parts-per-million
= sampled for lab analysis &/or QROS-QED analysis
OVA= Organic Vapor Analyzer

TABLE 2

Summary of Soil Sample QED Analytical Results for GRO/DRO

NCDOT State Project I-5711

Parcel 3 (Quality Mart #2) - 1126 Mebane Oaks Road

Mebane, Alamance County, North Carolina

				QROS - QED Analysis		
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**
3-1(2-4)	10/1/2018	2-4	4.6	<0.58	0.58	0.58
3-2(2-4)	10/1/2018	2-4	3.9	<0.28	<0.28	0.25
3-3(6-8)	10/1/2018	6-8	4.0	<0.53	<0.53	<0.53
3-4(4-6)	10/1/2018	4-6	89.3	7.9	16.8	24.7
3-4(6-8)	10/1/2018	6-8	181.3	**54.6**	**238.2**	292.8
3-5(4-6)	10/1/2018	4-6	379.2	**58.6**	19.3	77.9
3-5(6-8)	10/1/2018	6-8	707.6	**84**	**1685**	1769
3-6(2-4)	10/1/2018	2-4	6.4	<0.49	<0.49	<0.49
3-7(2-4)	10/1/2018	2-4	5.0	<0.6	<0.6	<0.6
3-8(2-4)	10/1/2018	2-4	4.7	<0.29	<0.29	<0.29
3-9(2-4)	10/1/2018	2-4	4.7	<0.32	<0.32	<0.32
3-10(2-4)	10/1/2018	2-4	4.5	<0.65	<0.65	<0.65
3-11(2-3)	10/1/2018	2-3	1.2	<0.36	<0.36	<0.36
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				50	100	NA

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable

* Bold values indicate concentrations above initial action levels

APPENDIX A

1993 Aerial Photograph

Parcel 3

Legend

Parcel 3

Arrowhead Blvd

Cameron Ln

Parcel 3

Mebane Oaks Rd

1007

Google Earth

N

200 ft

1998 Aerial Photograph

Parcel 3

Legend

Parcel 3

Arrowhead Blvd

Cameron Ln

Parcel 3

Mebane Oaks Rd

1007

Google Earth

N

200 ft

2005 Aerial Photograph

Parcel 3

Legend

Parcel 3

Arrowhead Blvd

Cameron Ln

Parcel 3

Mebane Oaks Rd

1007

Google Earth

N

200 ft

2017 Aerial Photograph

Parcel 3

Legend

Parcel 3

Arrowhead Blvd

Cameron Ln

Parcel 3

Mebane Oaks Rd

1007

Google Earth

N

200 ft

APPENDIX B

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2018-242)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 3
NCDOT PROJECT I-5711 (50401.1.FS1)

1126 MEBANE OAKS ROAD, MEBANE, NC

SEPTEMBER 17, 2018

Report prepared for: **Gordon Box**
NCDOT Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

Prepared by: _____

Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____

Douglas A. Canavello, P.G.
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C257: GEOLOGY C1251: ENGINEERING

GEOPHYSICAL INVESTIGATION REPORT
Parcel 3 – 1126 Mebane Oaks Road
Mebane, Alamance 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 the North Carolina Department of Transportation (NCDOT) at Parcel 3, located at 1126 Mebane Oaks Road, in Mebane, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project I-5711). 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 September 10-12, 2018, 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 fourteen EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM anomaly was associated with suspected interference from a passing vehicle and was investigated further with GPR. No evidence of any subsurface structures was observed at this location.

GPR verified the sizes and orientations of two known USTs located within the geophysical survey area. The western known UST was approximately 11 feet long by 6 feet wide. The eastern known UST was approximately 23 feet long by 8.5 feet wide. It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy. Collectively, the geophysical data recorded evidence of two known USTs within the geophysical survey area at Parcel 3.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT) at Parcel 3, located at 1126 Mebane Oaks Road, in Mebane, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project I-5711). 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 September 10-12, 2018, 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 surrounded by concrete, asphalt, and grass surfaces. Two known USTs were observed to be within the geophysical survey area. Additional known USTs were observed outside of the geophysical survey area at the southwest side of the main gas station canopy. 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 September 12, 2018, 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	Sign	
2	Utility	
3	Signs	
4	Vehicles	
5	Water Meter	
6	Suspected Vehicle Interference	☑
7	Signs/Utilities	
8	Vehicle/Pump	
9	**One Known UST**	☑
10	Drop Inlet	
11	**One Known UST**	☑
12	Reinforced Concrete Pipe	
13	Sign	
14	Signs	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including signs, utilities, vehicles, a water meter, a pump, known USTs, a drop inlet, and a reinforced concrete pipe. Anomaly 6 was suspected to be the result of interference from a passing vehicle during the survey and was investigated further with GPR to verify no structures such as USTs were present.

Two large high-amplitude EM anomalies (Anomalies 9 and 11), were associated with known USTs within the survey area. GPR was performed across the known USTs to verify their sizes and orientations.

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 GPR transects were performed at the site. GPR Transect 1 was performed across EM Anomaly 6. No evidence of any significant structures or debris was identified. It is likely this anomaly was the result of interference from a passing vehicle during the EM survey.

GPR Transects 2 and 3 were performed across the known USTs at the locations of EM Anomalies 9 and 11, respectively. These transects verified the sizes and orientations of the known USTs. The western UST (UST #1) was approximately 11 feet long by 6 feet wide. The eastern UST (UST #2) was approximately 23 feet long by 8.5 feet wide. **Figure 4** provides the locations and sizes of the two known USTs overlain on an aerial, along with ground-level photographs.

Collectively, the geophysical data recorded evidence of two known USTs within the survey area at Parcel 3. It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy. **Figure 5** provides an overlay of the geophysical survey area and the locations of the known USTs onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 3 in Mebane, 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.
- One EM anomaly was associated with suspected interference from a passing vehicle and was investigated further with GPR. No evidence of any subsurface structures was observed at this location.

- GPR verified the sizes and orientations of two known USTs located within the geophysical survey area.
- The western known UST was approximately 11 feet long by 6 feet wide. The eastern known UST was approximately 23 feet long by 8.5 feet wide.
- It should be noted that additional known USTs are present at the parcel outside of the survey area on the southwest side of the main gas station canopy.
- Collectively, the geophysical data recorded evidence of two known USTs within the geophysical survey area at Parcel 3.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for NCDOT 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
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License # C1251 Eng. / License # C257 Geology

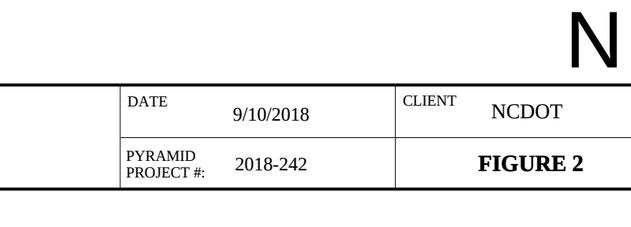
PROJECT: PARCEL 3 MEBANE, NORTH CAROLINA NCDOT PROJECT I-5711	TITLE: PARCEL 3 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE: 9/10/2018	CLIENT: NCDOT
		PYRAMID PROJECT #: 2018-242	**FIGURE 1**

EM61 METAL DETECTION RESULTS

EVIDENCE OF TWO KNOWN 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 EM61 data were collected on September 10, 2018, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency 300/800 MHz antenna on September 12, 2018.

EM61 Metal Detection Response (millivolts)



N

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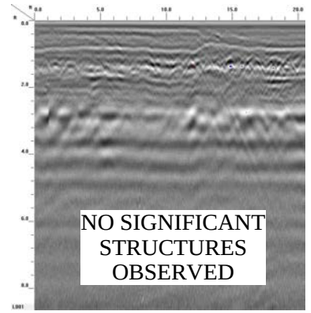
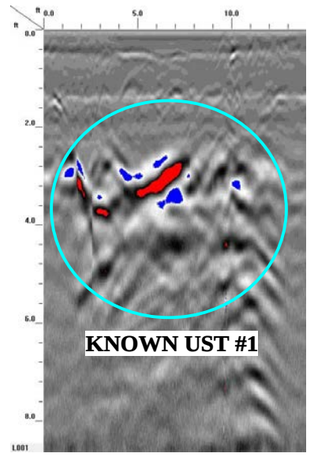
PROJECT: PARCEL 3 MEBANE, NORTH CAROLINA NCDOT PROJECT I-5711	TITLE: PARCEL 3 - EM61 METAL DETECTION CONTOUR MAP	DATE: 9/10/2018	CLIENT: NCDOT
		PYRAMID PROJECT #: 2018-242	**FIGURE 2**

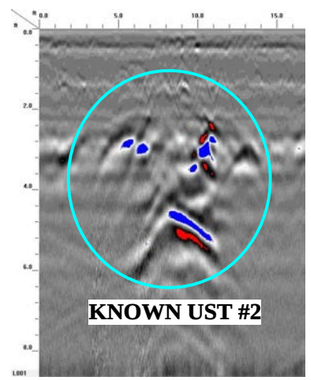
LOCATIONS OF GPR TRANSECTS



GPR TRANSECT 1 (T1)



GPR TRANSECT 2 (T2)



GPR TRANSECT 3 (T3)

N

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PROJECT	PARCEL 3 MEBANE, NORTH CAROLINA NCDOT PROJECT I-5711
TITLE	PARCEL 3 - GPR TRANSECT LOCATIONS AND IMAGES
DATE	9/12/2018
CLIENT	NCDOT
PYRAMID PROJECT #:	2018-242
	FIGURE 3

LOCATIONS OF TWO KNOWN USTs

View of One Known UST Facing Approximately East

View of One Known UST Facing Approximately North

N

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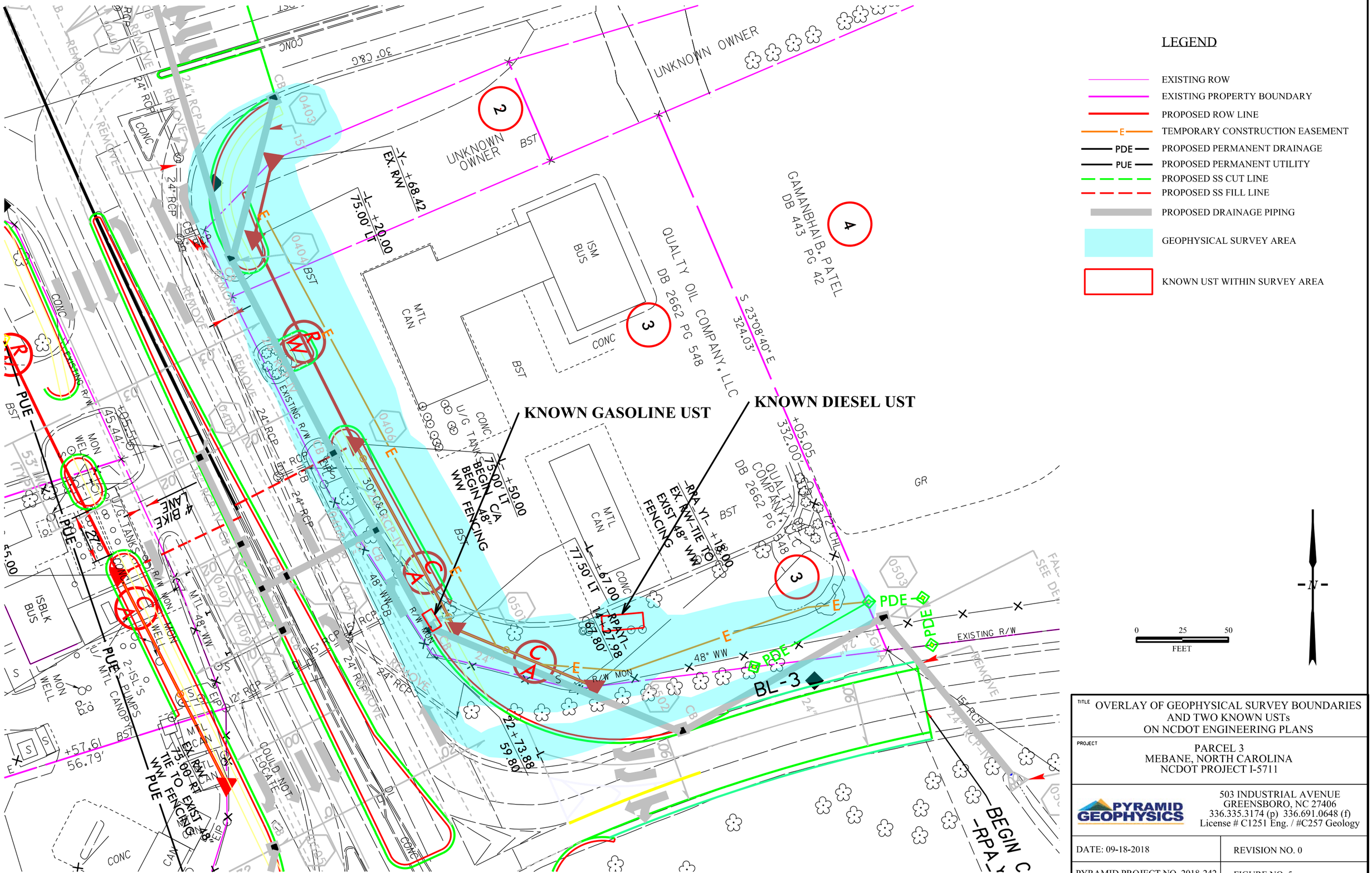
PROJECT: PARCEL 3 MEBANE, NORTH CAROLINA NCDOT PROJECT I-5711	TITLE: PARCEL 3 - LOCATIONS AND SIZES OF TWO KNOWN USTs	DATE: 9/12/2018 PYRAMID PROJECT #: 2018-242	CLIENT: NCDOT **FIGURE 4**



TITLE	OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES AND TWO KNOWN USTs ON NCDOT ENGINEERING PLANS
PROJECT	PARCEL 3 MEBANE, NORTH CAROLINA NCDOT PROJECT I-5711
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology
DATE: 09-18-2018	REVISION NO. 0
PYRAMID PROJECT NO. 2018-242	FIGURE NO. 5

APPENDIX C

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-1
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, SE portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.4 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.6 PPM
4-6	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.4 PPM
6-8	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.1 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-2
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, South portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.5 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.9 PPM
4-6	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.7 PPM
6-8	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.7 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-3
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, South portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish-brown, silty-clay (ML), moist, no odor	PID= 2.9 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 2.4 PPM
4-6	Reddish-brown, silty-clay (ML), moist, no odor	PID= 3.9 PPM
6-8	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.0 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-4
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, SW portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish-brown, silty-clay (ML), moist, no odor	PID= 2.4 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.0 PPM
4-6	Reddish-brown, silty-clay (ML), moist, petroleum odor	PID= 89.3 PPM
6-8	Reddish-brown, silty-clay (ML), moist, petroleum odor	PID= 181.3 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-5
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, SW portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Brown, clayey-silt (ML), moist, no odor	PID= 2.4 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.8 PPM
4-6	Reddish-brown, silty-clay (ML), moist, petroleum odor	PID= 379.2 PPM
6-8	Reddish-brown, silty-clay (ML), moist, petroleum odor	PID= 707.6 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-6
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, SW portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Brown, clayey-silt (ML), moist, no odor	PID= 5.5 PPM
2-4	Reddish-brown, silty-clay (ML), moist, no odor	PID= 6.4 PPM
4-6	Reddish-brown, silty-clay (ML), moist, no odor	PID= 4.8 PPM
6-8	Reddish-brown, silty-clay (ML), moist, no odor	PID= 5.3 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-7
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, West portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Light brown to tan, sandy-silt (ML), moist, no odor	PID= 5.0 PPM
2-4	Light brown to tan, sandy-silt (ML), moist, no odor	PID= 5.0 PPM
4-6	Light brown to tan, sandy-silt (ML), moist, no odor	PID= 4.7 PPM
6-8	Light brown to tan, sandy-silt (ML), moist, no odor	PID= 5.0 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-8
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, West portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.1 PPM
2-4	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.7 PPM
4-6	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.0 PPM
6-8	Reddish brown, silty-clay (ML), moist, no odor	PID= 2.5 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-9
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, NW portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.3 PPM
2-4	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.7 PPM
4-6	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.0 PPM
6-8	Reddish brown, silty-clay (ML), moist, no odor	PID= 3.9 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-10
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, North portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.1 PPM
2-4	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.5 PPM
4-6	Reddish brown, silty-clay (ML), moist, no odor	PID= 4.5 PPM
6-8	Reddish brown, silty-clay (ML), moist, no odor	PID= 3.0 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT I-5711, Parcel 003, Mebane, NC (2018-242)	**BORING/WELL NO:**	3-11
SITE LOCATION:	Alamance County, NC	**BORING/WELL LOCATION:**	Parcel 003, SE portion
START DATE:	10/01/18	**COMPLETED:**	10/01/18
GEOLOGIST:	M. Trifunovic / T. Leatherman	**DRILLER:**	Solutions-IES
DRILL METHOD:	Hand-auger	**SAMPLE METHOD:**	Hand-auger Bucket
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	3 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0-2	Reddish brown, silty-clay (ML), moist, no odor	PID= NA
2-3	Reddish brown, silty-clay (ML), moist, no odor	PID= 1.2 PPM
	Water table not encountered	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
SCREEN LENGTH (ft) ___ DEPTH (ft) _____ DIAMETER (in) ___ MATERIAL _____.
DEPTH TO TOP OF SAND _____ BAGS OF SAND ___.
DEPTH TO TOP SEAL _____ BENTONITE USED _____ BAGS OF CEMENT USED 0___.

APPENDIX D

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: NCDOT Alamance Mebane I-5711
Address: 1126 Mebane Oks Rd.
Mebane, NC

Samples taken 3-1 through 3-8
Samples extracted 3-1 through 3-8
Samples analysed 3-1 through 3-8

Contact: Tim Leaherman / Pyramid

Operator Tim Leatherman

Project: NCDOT Alamance - Parcel 003

H09382

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	3-1(2-4)	23.2	<0.58	<0.58	0.58	0.58	0.29	<0.19	<0.023	0	65.9	34.1	V.Deg.PHC 91.5%,(FCM),(P)
s	3-2(2-4)	11.1	<0.56	<0.28	<0.28	0.25	0.25	<0.09	<0.011	0	58.3	41.7	Residual HC,(P)
s	3-3(6-8)	21.1	<0.53	<0.53	<0.53	<0.53	<0.11	<0.17	<0.021	0	100	0	PHC not detected,(BO),(P)
s	3-4(6-8)	53.8	15.6	54.6	238.2	292.8	106.5	4	<0.054	85.2	14	0.8	Deg.Diesel 77.9%,(FCM)
s	3-4(4-6)	41.0	<1	7.9	16.8	24.7	6.3	<0.33	<0.041	93.9	5.5	0.5	Deg.Diesel 78.8%,(FCM),(BO)
s	3-5(4-6)	44.6	10	58.6	19.3	77.9	14.5	0.55	<0.045	98.8	1	0.1	Deg.Fuel 82.1%,(FCM)
s	3-5(6-8)	39.4	20.3	84	1685	1769	49.3	1.9	<0.039	97.8	2.1	0.1	Deg.JP-5 87.6%,(FCM)
s	3-6(2-4)	19.5	<0.49	<0.49	<0.49	<0.49	<0.1	<0.16	<0.02	0	0	0	PHC not detected,(P)
s	3-7(2-4)	24.1	<0.6	<0.6	<0.6	<0.6	<0.12	<0.19	<0.024	97.3	0	2.7	Residual HC,(BO),(P)
s	3-8(2-4)	11.7	<0.29	<0.29	<0.29	<0.29	<0.06	<0.09	<0.012	0	100	0	Residual HC
	Initial Calibrator 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 REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: NCDOT Alamance Mebane I-5711
Address: 1126 Mebane Oks Rd.
Mebane, NC

Samples taken 3-9 and 3-10
Samples extracted
Samples analysed 3-9 and 3-10

Contact: Tim Leaherman / Pyramid

Operator Tim Leatherman

Project: NCDOT Alamance - Parcel 003

H09382

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	3-9(2-4)	13.0	#DIV/0!	<0.32	<0.32	<0.32	<0.06	<0.1	<0.013	0	0	0	,(FCM),(BO)
s	3-10(2-4)	26.0	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	0	0	PHC not detected,(BO)

Initial Calibrator QC check OK Final FCM QC Check OK 92.4 %

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

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: NCDOT Alamance Mebane Parcels 3 & 6
Address: Parcels 3 and 6

Samples taken
Samples extracted
Samples analysed

Contact:

Operator Tim Leatherman

Project: NCDOT Alamance Mebane Parcels 3 & 6

H09382

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	3-11(2-3)	14.6	#DIV/0!	<0.36	<0.36	<0.36	<0.07	<0.12	<0.015	0	0	0	,(FCM),(BO),(P)
s	6-1(4-6)	22.4	<0.56	<0.56	15.7	15.7	7.6	0.85	<0.022	0	79.9	20.1	Road Tar 91.5%,(FCM)
s	6-3(4-6)	20.2	<0.5	<0.5	7.4	7.4	3.6	0.41	<0.02	0	79.2	20.8	Road Tar 92%,(FCM)
s	6-2(0-2)	25.7	<0.64	2	0.8	2.8	0.55	<0.21	<0.026	80.1	14.5	5.4	V.Deg.PHC 81.4%,(FCM)
s	6-4(2-4)	25.0	<0.63	5.8	2.6	8.4	1.5	<0.2	<0.025	82.1	12.5	5.4	Deg.PHC 88.7%,(FCM),(BO)
s	6-4(6-8)	26.5	<0.66	<0.66	0.66	0.66	0.36	<0.21	<0.027	0	76.8	23.2	Road Tar 89.7%,(FCM)
s	6-5(4-6)	25.5	<0.64	<0.64	<0.64	<0.64	<0.13	<0.2	<0.025	0	100	0	PHC not detected
s	6-5(6-8)	23.6	<0.59	<0.59	3.5	3.5	1.7	<0.19	<0.024	0	76.3	23.7	Road Tar 76.1%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 105.5 %

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.

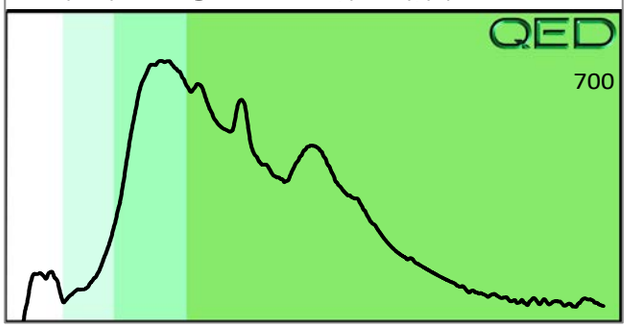
% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

QED Hydrocarbon Fingerprints

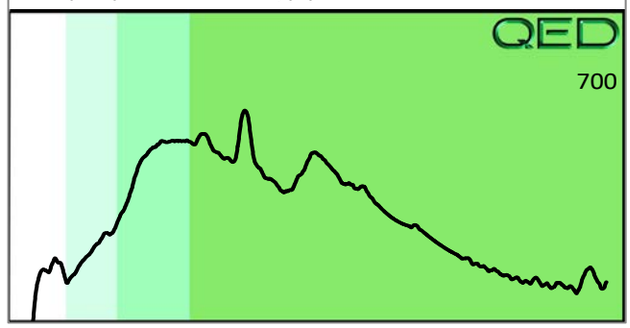
Project: NCDOT Alamance - Parcel 003

3-1 through 3-8

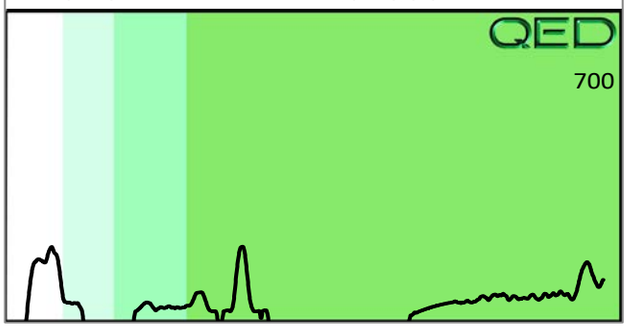
3-1(2-4) : V.Deg.PHC 91.5%,(FCM),(P)



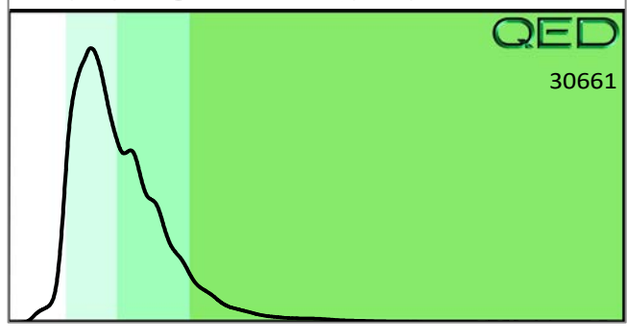
3-2(2-4) : Residual HC,(P)



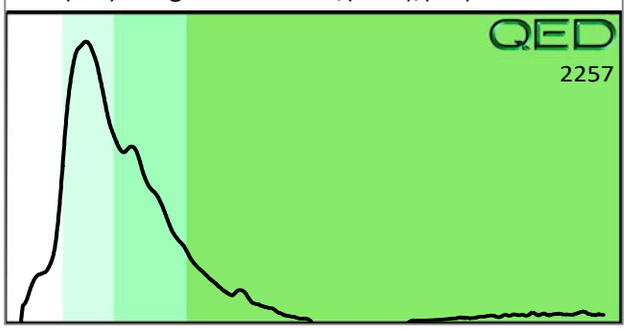
3-3(6-8) : PHC not detected,(BO),(P)



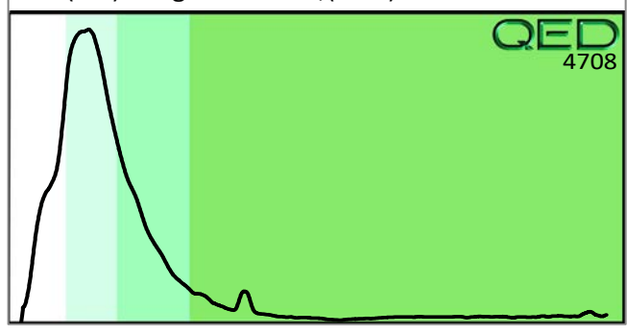
3-4(6-8) : Deg.Diesel 77.9%,(FCM)



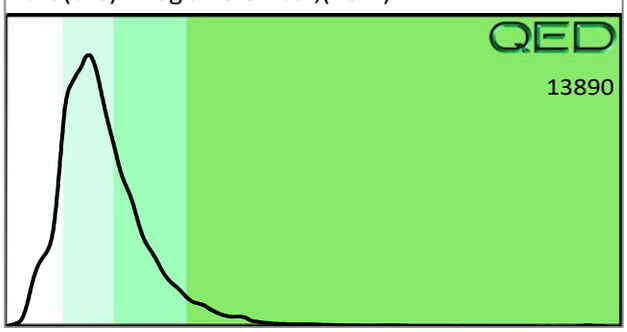
3-4(4-6) : Deg.Diesel 78.8%,(FCM),(BO)



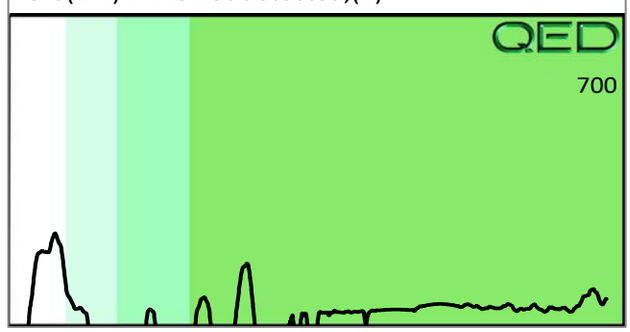
3-5(4-6) : Deg.Fuel 82.1%,(FCM)



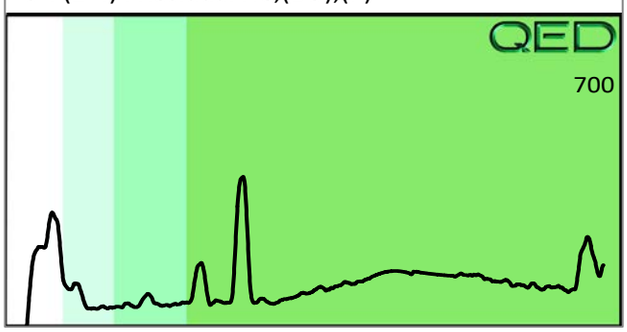
3-5(6-8) : Deg.JP-5 87.6%,(FCM)



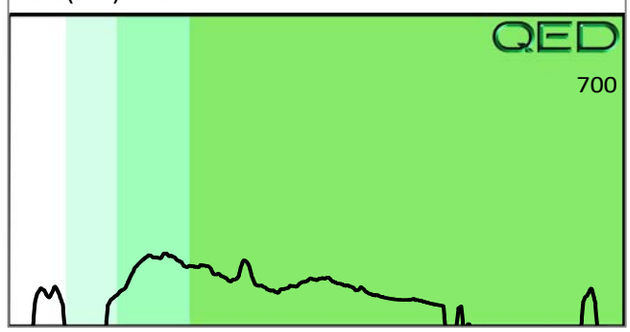
3-6(2-4) : PHC not detected,(P)



3-7(2-4) : Residual HC,(BO),(P)

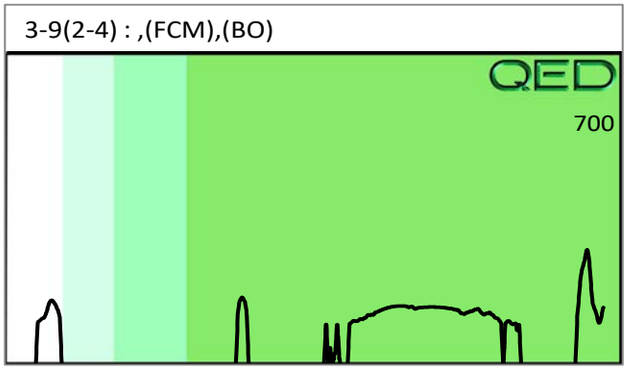


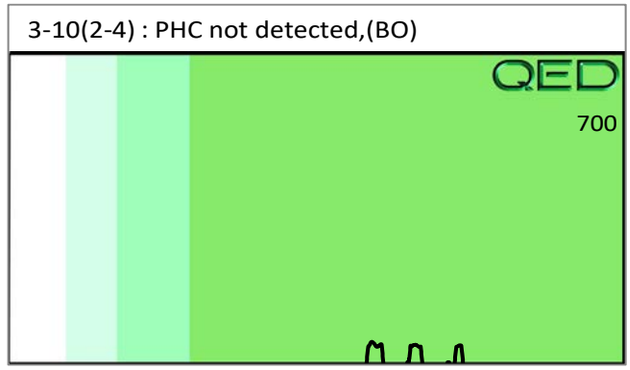
3-8(2-4) : Residual HC



QED Hydrocarbon Fingerprints

Project: NCDOT Alamance - Parcel 003 3-9 and 3-10

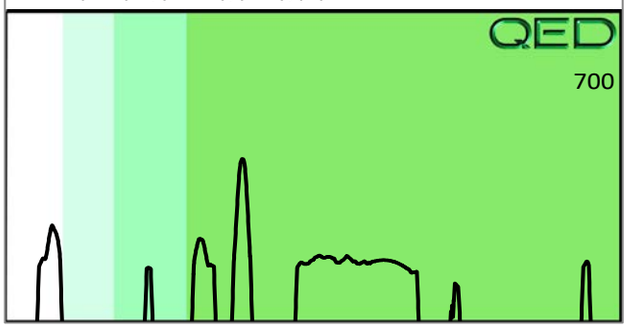




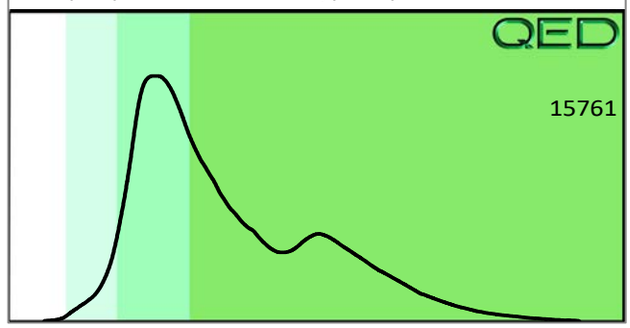
QED Hydrocarbon Fingerprints

Project: NCDOT Alamance Mebane Parcels 3 & 6

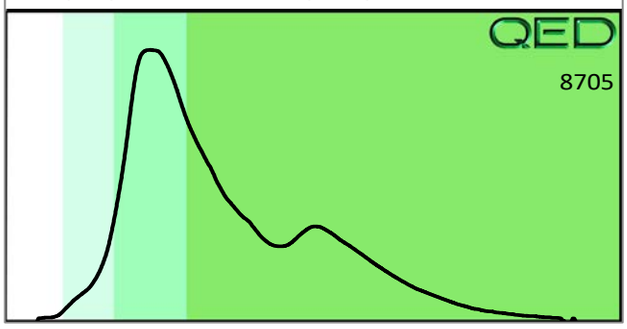
3-11(2-3) : ,(FCM),(BO),(P)



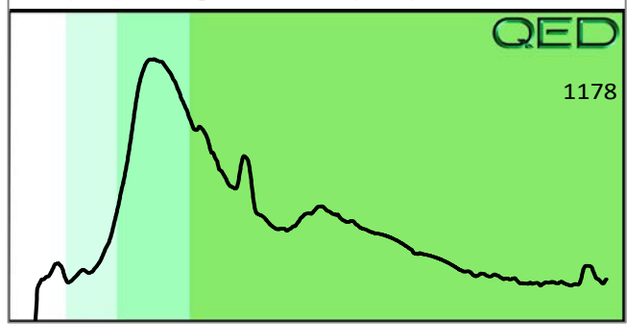
6-1(4-6) : Road Tar 91.5%,(FCM)



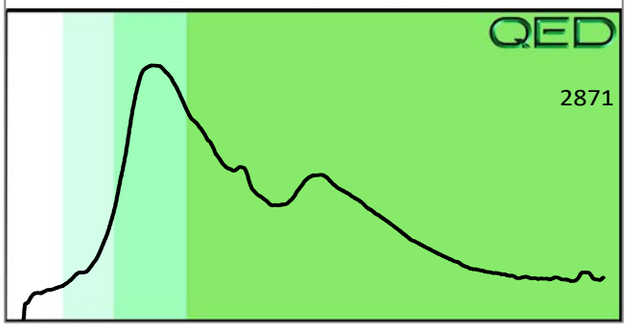
6-3(4-6) : Road Tar 92%,(FCM)



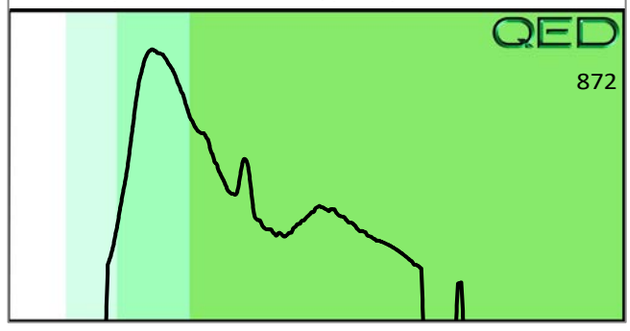
6-2(0-2) : V.Deg.PHC 81.4%,(FCM)



6-4(2-4) : Deg.PHC 88.7%,(FCM),(BO)



6-4(6-8) : Road Tar 89.7%,(FCM)



6-5(4-6) : PHC not detected

6-5(6-8) : Road Tar 76.1%,(FCM)