

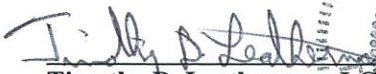
Pyramid Environmental & Engineering, P.C. Project # 2013-278
Preliminary Site Assessment (PSA) – Curtis Williams


PRELIMINARY SITE ASSESSMENT
PARCEL 11, CURTIS WILLIAMS
1826 U.S. HIGHWAY 1 NORTH
ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA
STATE PROJECT: R-2501C
WBS ELEMENT: 34437.1.1
January 21, 2014

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**PRELIMINARY SITE ASSESSMENT
PARCEL 11, CURTIS WILLIAMS
1826 U.S. HIGHWAY 1 NORTH
ROCKINGHAM, RICHMOND 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 11, the Curtis Williams property. The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils at the subject property within the proposed right-of-way (ROW) and/or easement and edge of pavement (State Project R-2501C). 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. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's October 16, 2013, technical proposal.

The following statements summarize the results of the PSA:

- **Site History:** A review of the North Carolina Department of Environment and Natural Resources (DENR) registered UST database and incident database indicated no environmental incidents were on file for the Curtis Williams property (Parcel 11). On November 26, 2013, Pyramid emailed the Richmond County R-2250C parcel addresses to Mr. Kenneth E. Currie, Richmond County Incident Manager, with the Fayetteville Regional Office for the DENR UST Section, with a request to investigate any environmental incidents associated with the parcels. On December 2, 2013, Mr. Currie responded to the email and stated that site address 1826 N. US 1 does not have any environmental incidents in the DENR database.

On November 26, 2013, Pyramid Project Manager Eric Cross performed a site visit at the property. Neither the owner nor any other personnel were present to conduct an interview.

- **Geophysical Survey:** The geophysical investigation provided no evidence of metallic USTs within the existing and proposed ROW and/or easement.
- **Limited Soil Assessment:** A total of five borings were performed across the property and at least one soil sample from each boring was analyzed with the

QED UVF HC-1 Analyzer system from QROS-US for total petroleum hydrocarbon (TPH) petroleum contamination. If field screening detected an elevated reading, then additional soil samples from each boring may have been analyzed with the QED UVF HC-1 Analyzer. The QED results did not detect TPH gasoline range organic (GRO) or TPH diesel range organic (DRO) concentrations above 10 mg/kg for any of the soils samples analyzed. The DENR action level for both TPH-GRO and TPH-DRO is 10 mg/kg. A duplicate of soil sample 11-5(2.5-5) was shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 11-5(2.5-5) did not detect GRO or DRO concentrations above detection limits. No odors were detected during the field screening.

- **Limited Groundwater Assessment:** Groundwater was not encountered in the temporary monitoring well at 11-3(TW), and thus no groundwater sample was analyzed. The depth to groundwater at boring 11-3(TW) on the property was deeper than 20 feet below land surface (BLS). It is unlikely that the NCDOT will encounter groundwater at the property during their road construction activities.
- **Contaminated Soil Volumes:** No petroleum-impacted soils above 10 milligrams per kilogram (mg/kg) were encountered during the PSA investigation at Parcel 11, nor were any probable or possible USTs encountered within the proposed right of way or easement. Therefore, no recommendations are necessary for the treatment or disposal of such materials. It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DENR Division of Waste Management (DWM) UST Section 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 11, the Curtis Williams property. The Curtis Williams property is currently occupied by three mobile homes and a vacant commercial building. Pyramid did not observe any activities at the commercial building located on Parcel 11 during field activities. The approximate address for Parcel 11 is 1826 U.S. Highway 1 North in Rockingham, NC. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's October 16, 2013, technical proposal.

The purpose of this assessment was to determine the presence or absence of underground storage tanks (USTs) and impacted soils at the subject properties within the proposed ROW and/or easement and edge of pavement (State Project R-2501C). The location of the subject site is shown on **Figure 1**.

1.1 Background Information

Based on the NCDOT's October 10, 2013, *Request for Technical and Cost Proposal*, the PSA was conducted in between the existing pavement and the proposed right-of-way and/or easement, 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 in the proposed easement and the area between the existing ROW and the edge of pavement 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.
- Should groundwater be encountered at a depth that might impact the NCDOT construction activities, report the depth to groundwater for that site and attempt to obtain one groundwater sample for laboratory analysis by installing a temporary monitoring well.

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. A private utility locator, Northstate Utility Locating Incorporated of Colfax, North Carolina was used to mark the on-site private, buried utilities.

2.0 Site History

The NCDOT description of the parcel in the RFP provided to Pyramid on October 10, 2013, provided the following background information related to the site:

The building front of the former store on this site is approximately 73 feet south of the existing US 1 centerline. A Facility ID has not been discovered for this site. Evidence of USTs or UST removal was not observed during field reconnaissance along the project corridor on November 14, 2007. However, there may be environmental concerns with this site such as USTs, hydraulic lifts, or chemical concerns.

Pyramid completed a records review of the parcel, interviewed DENR personnel, interviewed property owners, and reviewed aerial photographs to assess past uses of the property. Pyramid reviewed historical aerial photographs dating back to 1938 available from Richmond County Soil and Water Conservation office in Rockingham, North Carolina and on Google Earth. The 1938, 1956, 1975, 1993, 1999, 2005, 2008, 2010, and 2013 aerial photographs are included in **Appendix A**. Historical information reviewed as part of the PSA indicated that the Curtis Williams property was first developed for commercial use between 1956 and 1975. The earliest aerial to show the building was the 1975 aerial. The 1938 and 1956 aerial photos show the property to be undeveloped agricultural land.

On November 26, 2013, Pyramid emailed the Richmond County R-2250C parcel addresses to Mr. Kenneth E. Currie, Richmond County Incident Manager, with the Fayetteville Regional Office for the DENR UST Section, with a request to investigate any environmental incidents associated with the parcels. On December 2, 2013, Mr. Currie responded to the email and stated that site address 1826 U.S. Highway 1 North does not have any environmental incidents in the DENR database.

On November 26, 2013, Pyramid Project Manager Eric Cross performed a site visit at the property. Neither the owner nor any other personnel were present to conduct an interview.

3.0 Geophysical Investigation

Pyramid performed electromagnetic (EM) surveys across the accessible portions of the Parcel. The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. A suspected gas line was observed to extend from north to south across the survey area at X=270. All remaining anomalies investigated by the GPR were attributed to reinforced concrete, utilities or metallic debris. The geophysical investigation did not record evidence of any metallic USTs at the property.

The full details of the geophysical investigation are included in the Geophysical Investigation Report as **Appendix B**.

4.0 Soil Sampling Activities & Results

4.1 Soil Assessment Field Activities

On December 16, 2013, Pyramid mobilized to the site and drilled soil borings, installed one temporary monitoring well, and collected the proposed soil samples for the PSA. The soil borings and temporary well (TW) were completed using a track mounted Geoprobe® Direct-Push rig. Five (5) soil borings (11-1, 11-2, 11-3, 11-4, and 11-5) were advanced on the subject property between the NCDOT proposed ROW and easements, and edge of pavement. The selected locations were chosen to avoid public utilities along U.S. 1, and private utilities associated with the property while remaining in the proposed right of way. The soil borings were installed parallel to U.S. 1 in the area proposed to be cut as indicated by the NCDOT slope stake lines. Boring 11-5 was installed near drainage feature 0601, in the vicinity of a proposed 18-inch drainage pipe. 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 a Photo-Ionization Detector (PID) approximately every 2 feet depending on the soil recovery of each sleeve. In general, the soil sample with the highest PID reading was selected from each boring for laboratory analysis. If field screening detected an elevated reading, then additional soil samples from each boring were selectively analyzed with the QED UVF HC-1 Analyzer. The soil boring logs with the soil descriptions, visual examination, and PID screening results are included in **Appendix C**. The PID 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. No odors were detected 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 QROS-US. The NCDOT has indicated that this instrument is an acceptable method to provide total petroleum hydrocarbon (TPH) results for soil analysis for the PSA projects. Pyramid's QED-certified technician performed the soil 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). The soil samples selected for analysis using the QED were preserved in the field with methanol and were analyzed at the end of each day using the QED. Additionally, a duplicate soil sample for Parcel 11 was collected and submitted to a laboratory for analysis to verify the QED results.

The duplicate soil sample selected for laboratory analyses 11-5(2.5-5) was placed in laboratory prepared containers and shipped to Pace Analytical in Huntersville, NC for analysis. The selected soil sample was analyzed for TPH as GRO by EPA Method 8015C and DRO by EPA Method 8015C/3541.

4.2 Soil Sample Analytical Results

The QED results did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg in any of the samples analyzed. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix D**.

A duplicate of soil sample 11-5(2.5-5) was shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 11-5(2.5-5) did not detect GRO or DRO concentrations above detection limits. A copy of the laboratory report and chain-of-custody is included in **Appendix E**. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination.

4.3 Temporary Monitoring Well Installation

On December 16, 2013, Pyramid converted soil boring 11-3 into a 1-inch diameter temporary monitoring well (TW). Soil boring 11-3(TW) was completed to a total depth of 20 feet below land surface (BLS). The temporary well at 11-3 was constructed with 10 feet of 1-inch diameter of schedule 80 PVC casing and 10 feet of 1-inch diameter of schedule 80 PVC slotted screen. The temporary well was set in the boring with 10 feet of slotted screen at the bottom of the well.

On December 17, 2013, the temporary monitoring well 11-3(TW) was gauged using a properly decontaminated electric water level probe. No water was detected in temporary well 11-3(TW). Upon completion of the gauging and sampling, the temporary monitoring well was properly abandoned by the drillers by removing the casing, and filling the borehole with bentonite chips and portland cement.

4.4 Groundwater Analytical Results

Groundwater was not encountered in the temporary well at 11-3(TW), and thus no groundwater sample was analyzed. Site observations indicate it is likely the depth of the water table is well below any planned excavation associated with road construction at this property.

5.0 Conclusions and Recommendations

As requested by NCDOT, Pyramid has completed a PSA at the Curtis Williams property located 1826 U.S. Highway 1 North, Rockingham, NC (Parcel 11). The following is a summary of the assessment activities and results.

5.1 Geophysical Investigation

The geophysical investigation provided no evidence of metallic USTs within the existing and proposed ROW and/or easement.

5.2 Limited Soil Assessment

The QED results did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg in any of the samples analyzed. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. The Pace laboratory results for soil sample 11-5(2.5-5) did not detect GRO or DRO concentrations above laboratory detection limits. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination.

5.3 Limited Groundwater Assessment

Groundwater was not encountered in the temporary well at 11-3(TW), and thus no groundwater sample was analyzed. Site observations indicate it is likely the depth of the water table is well below any planned excavation associated with road construction at this property.

5.4 Recommendations

No petroleum impacted soils were encountered above 10 mg/kg during the PSA investigation at Parcel 11, no odors were detected during field screening, and there was no evidence of probable or possible USTs recorded within the proposed right of way or easement. Therefore, no recommendations are necessary for the treatment or disposal of such materials.

It should be noted that, if impacted soil is encountered during road construction outside of the area analyzed by this investigation, the impacted soil should be managed according to NC DENR Division of Waste Management (DWM) UST Section 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

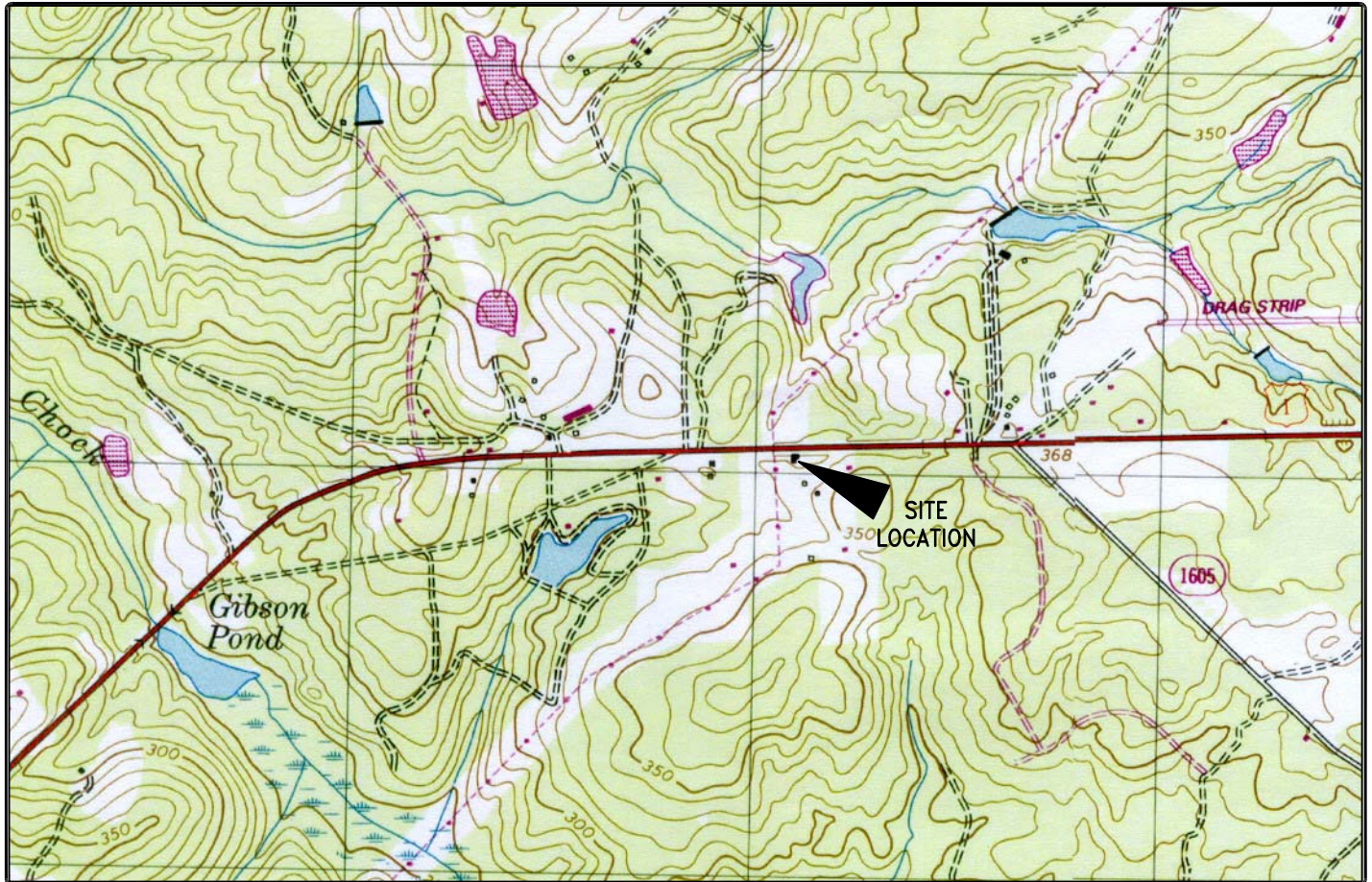
This report was prepared for, and is available solely for use by NCDOT and their designees. The contents thereof may not be used or relied upon by any other person without the express written consent and authorization of Pyramid Environmental & Engineering, P.C. (Pyramid). The observations, conclusions, 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: 1826 U.S. HIGHWAY 1 NORTH

LOCATION: ROCKINGHAM, NORTH CAROLINA



USGS IDENTIFICATION

SCALES

USGS 7.5
MINUTE MAP

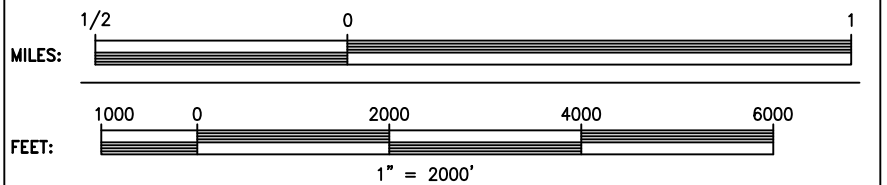
HAMLET, N.C.

ORIGINAL DATE:

2002

PHOTOREVISION
DATE:

NA



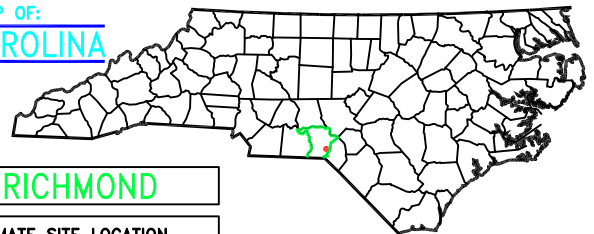
	PRIMARY HIGHWAY, HARD SURFACE
	SECONDARY HIGHWAY, HARD SURFACE
	LIGHT-DUTY ROAD HARD OR IMPROVED SURFACE
	UNIMPROVED ROAD
	STATE ROAD
	U.S. ROUTE
	INTERSTATE ROUTE

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

MAGNETIC
NORTH

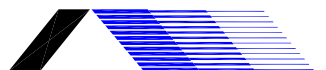


COUNTY MAP OF:
NORTH CAROLINA



COUNTY: **RICHMOND**

APPROXIMATE SITE LOCATION



PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NC DOT R-2501C

PROPERTY NAME: PARCEL 011, CURTIS WILLIAMS

CITY: ROCKINGHAM

STATE: NORTH CAROLINA

TITLE: TOPOGRAPHIC MAP

SCALE:
1"=2000'

DATE:
1/7/14

DRAWING NAME:
USGSTOPO

DRAWN BY: KAM

CHECK BY: TDL

JOB NO.: 2013-278

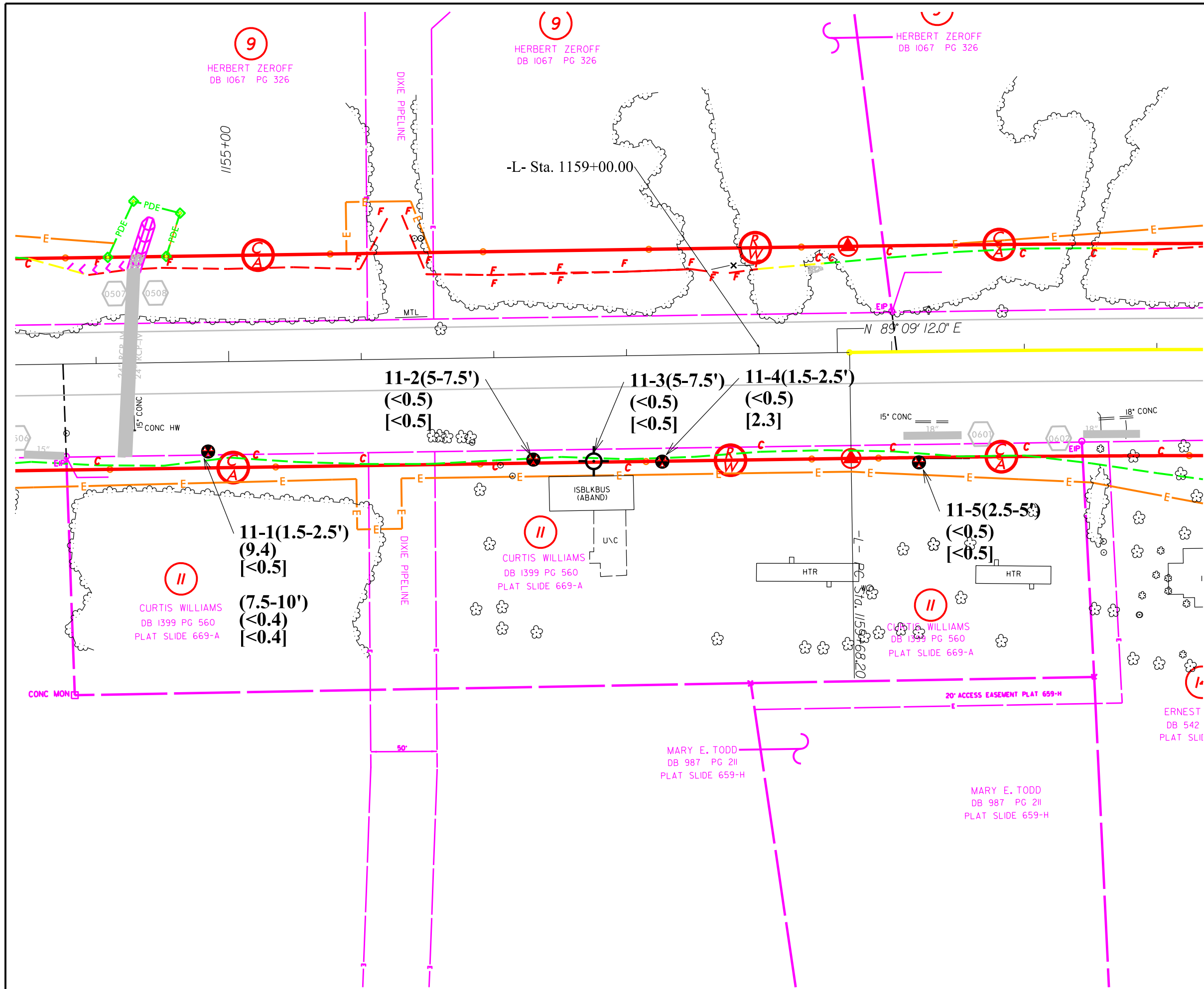
TYPE: PSA

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.



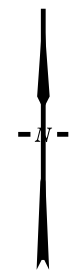
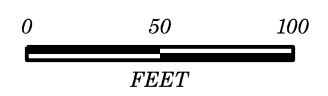
LEGEND

- PROPOSED UTILITY EASEMENT
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED CONST. EASEMENT
- PROP. DRAINAGE UTIL. EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED SS TRANSITION LINE
- PROPOSED DRAINAGE PIPING
- PROPOSED DRAINAGE EASEMENT

- SOIL SAMPLE BORING LOCATION
- BORING CONVERTED TO MW

(<0.1) TPH-DRO concentration (mg/kg)
 [<0.1] TPH-GRO concentration (mg/kg)

* Analytical data collected by the method of QROS, QED Analyzer



TITLE	SOIL BORING LOCATIONS AND QED ANALYTICAL RESULTS	
PROJECT	NCDOT ROW PROJECT R-2501C (34437.1.1) CURTIS WILLIAMS PROPERTY - PARCEL 011 U.S. 1, RICHMOND COUNTY, NORTH CAROLINA	
	503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
	DATE: 12-19-13	REVISION NO. 0
PYRAMID PROJECT NO. 2012-278	FIGURE NO. 2	

TABLES

TABLE 1
Summary of Soil Field Screening Results
NCDOT Project R-2501C
1826 US Highway 1 North - Parcel 011
Rockingham, Richmond County, North Carolina

SOIL BORING	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
11-1	11-1(1.5-2.5)	1.5 to 2.5	2.3
	11-1(2.5-5)	2.5 to 5	1.4
	11-1(5-7.5)	5 to 7.5	1.3
	11-1(7.5-10)	7.5 to 10	3.5
11-2	11-2(1.5-2.5)	1.5 to 2.5	2.2
	11-2(2.5-5)	2.5 to 5	1.9
	11-2(5-7.5)	5 to 7.5	3.2
	11-2(7.5-10)	7.5 to 10	3.0
11-3	11-3(2.5-5)	2.5 to 5	1.0
	11-3(5-7.5)	5 to 7.5	5.2
	11-3(7.5-10)	7.5 to 10	1.9
11-4	11-4(1.5-2.5)	1.5 to 2.5	5.6
	11-4(2.5-5)	2.5 to 5	2.1
	11-4(5-7.5)	5 to 7.5	2.2
	11-4(7.5-10)	7.5 to 10	3.8
11-5	11-5(1.5-2.5)	1.5 to 2.5	1.8
	11-5(2.5-5)	2.5 to 5	2.6
	11-5(5-7.5)	5 to 7.5	0.5
	11-5(7.5-10)	7.5 to 10	1.8

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 Analytical Results
 NCDOT State Project R-2501C
 1826 US Highway 1 North - Parcel 011
 Rockingham, Richmond County, North Carolina

SAMPLE ID	DATE	DEPTH (feet)	PID (ppm)	QROS - QED Analysis			Laboratory Analysis (Pace)	
				GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)	TPH (mg/kg) (C5-C35)	EPA Method 3550 DRO (mg/kg)	EPA Method 5035 GRO (mg/kg)
11-1(1.5-2.5)	12/16/2013	1.5 to 2.5	2.3	<0.5	9.4	9.4	-----	-----
11-1(7.5-10)	12/16/2013	7.5 to 10	3.5	<0.4	<0.4	<0.4	-----	-----
11-2(5-7.5)	12/16/2013	5 to 7.5	3.2	<0.5	<0.5	<0.5	-----	-----
11-3(5-7.5)	12/16/2013	5 to 7.5	5.2	<0.5	<0.5	<0.5	-----	-----
11-4(1.5-2.5)	12/16/2013	1.5 to 2.5	5.6	<0.5	2.3	2.3	-----	-----
11-5(2.5-5)	12/16/2013	2.5 to 5	2.6	<0.5	<0.5	<0.5	<5.7	<7.2
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				10	10	NA	10	10

PID= photo-ionization 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
 "-----" = No Laboratory Analysis

* Bold values indicate concentrations above initial action levels

APPENDIX A

Parcel 11

1



© 2013 Google

Google earth

2013

Google earth





Parcel 11

1

240 ft

Image © 2013 DigitalGlobe

Google earth

2010

Google earth

feet meters 100 600





Parcel 11

1

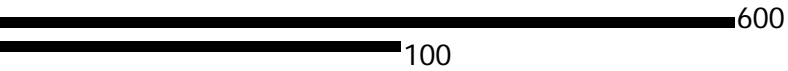
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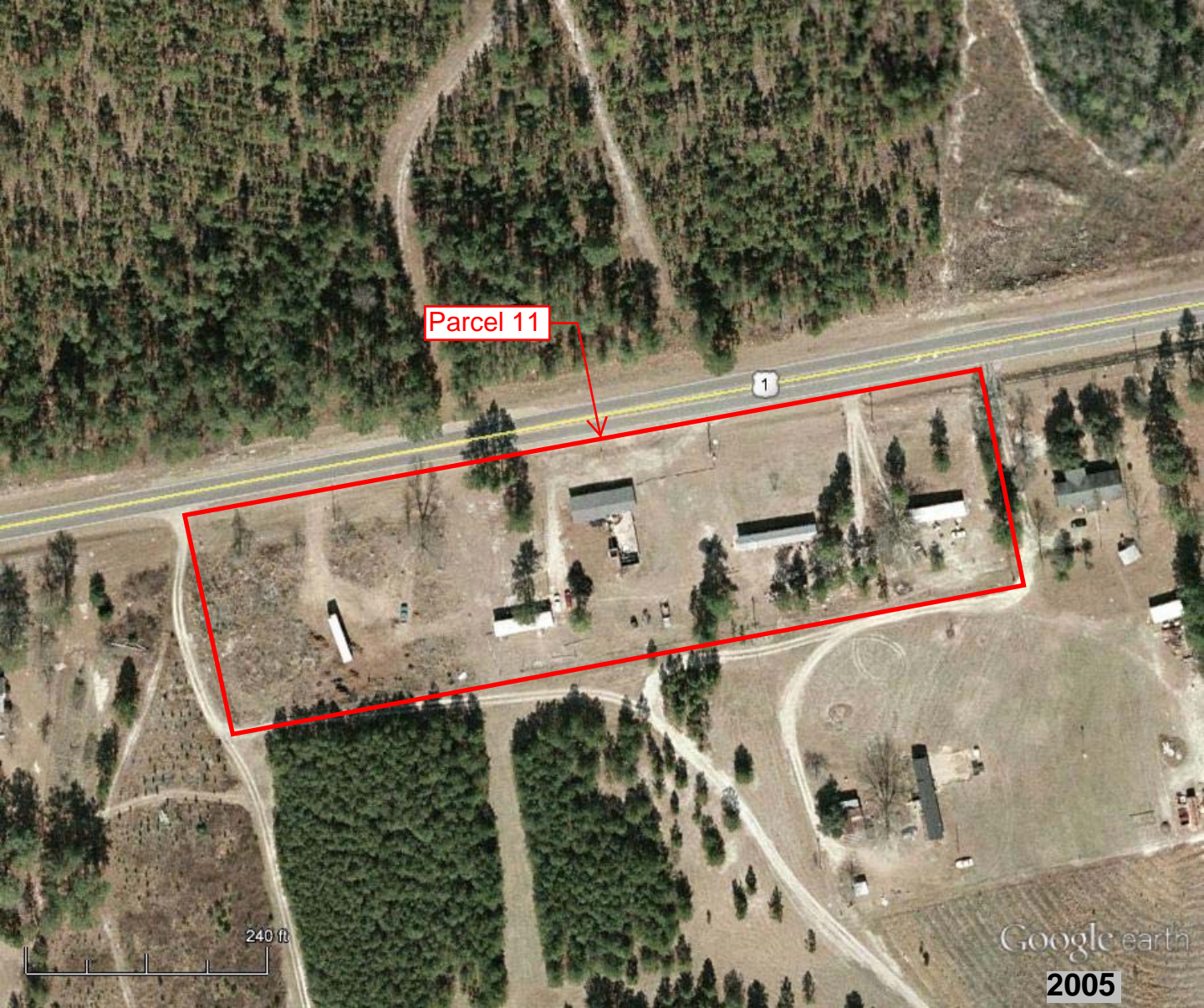
Google earth

2008

Google earth

feet
meters





Parcel 11

1

240 ft

Google earth

2005

Google earth

feet
meters





Parcel 11

1

240 ft

Image U.S. Geological Survey

Google earth

1999

Google earth

feet
meters





Parcel 11

1

240 ft

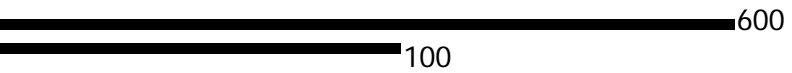
Image U.S. Geological Survey

Google earth

1993

Google earth

feet
meters





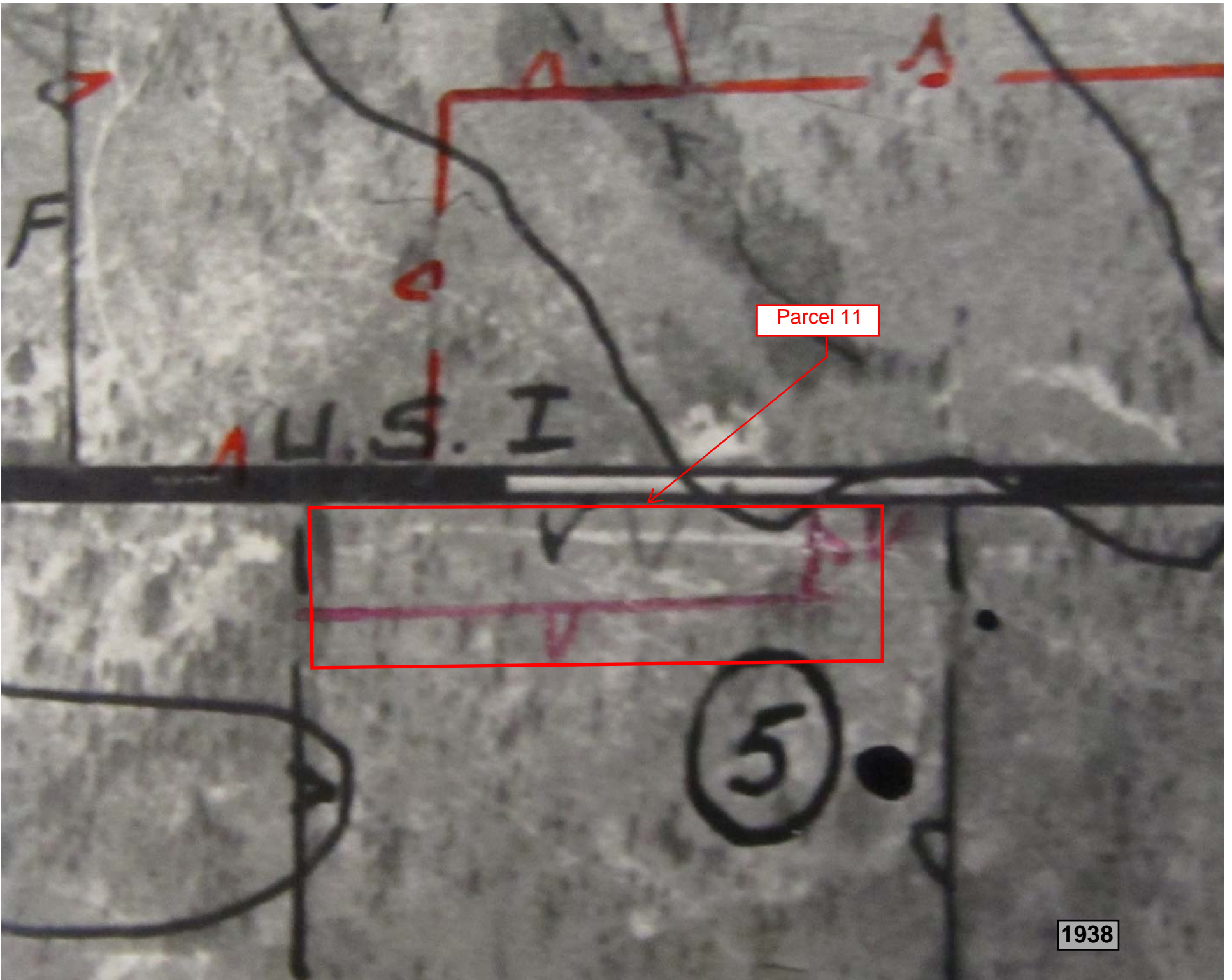
Parcel 11

1975



Parcel 11

1956



Parcel 11

U.S. I

5

1938

APPENDIX B



PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2013-278)


GEOPHYSICAL SURVEY


PARCEL 011 – CURTIS WILLIAMS
1826 N. US 1
NCDOT PROJECT R-2501C (34437.1.1)

ROCKINGHAM, RICHMOND COUNTY, NC

JANUARY 13, 2013

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Geotechnical Engineering Unit
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GEOPHYSICAL INVESTIGATION REPORT
Parcel 011, 1826 N. US 1
Rockingham, Richmond County, North Carolina

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- Figure 4 – Parcel 011 – GPR Transect Locations and Select Images

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Curtis Williams property, Parcel 011, 1826 N. US 1, Rockingham, Richmond County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-2501C). The geophysical survey boundaries at the project site were designed to include the portions of the property between the existing edge of pavement and the proposed ROW and easements, whichever distance was greater. The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys.

Geophysical Results: The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. A suspected gas line was observed to extend from north to south across the survey area at X=270. All remaining anomalies investigated by the GPR were attributed to reinforced concrete, utilities or metallic debris. The geophysical investigation did not record evidence of any metallic USTs at the property.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Curtis Williams property, Parcel 011, 1826 N. US 1, Rockingham, Richmond County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project R-2501C). The geophysical survey boundaries at the project site were designed to include the portions of the property between the existing edge of pavement and the proposed ROW and easements, whichever distance was greater. The survey grid spanned approximately 780 feet from west to east and approximately 50 feet from north to south. Conducted on December 3 and 9, 2013, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site contained a vacant store building as well as some mobile home structures, and otherwise consisted primarily of open grassy areas. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

Prior to conducting the geophysical investigation, a 20-foot by 10-foot survey grid was established across the geophysical survey areas using measuring tapes and water-based marking paint. These grid marks were used as X-Y coordinates for location control when collecting the geophysical data and establishing base maps for the geophysical results.

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. The EM survey was performed on December 3, 2013, using a Geonics EM61 metal detection instrument. 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, parallel survey lines spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics DAT61 and Surfer for Windows Version 11.0 software programs.

GPR data were acquired across select EM differential anomalies on December 9, 2013, using a Geophysical Survey Systems, Inc. (GSSI) SIR-2000 unit equipped with a 400 MHz antenna. Data were collected generally from east to west and north to south across the property. 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 8 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. GPR Transects across specific anomalies were saved to the hard drive of the SIR unit for post-processing and figure generation.

DISCUSSION OF RESULTS

Contour plots of the EM61 bottom coil and differential results obtained across survey area at the property are presented in **Figure 2**. The bottom coil results represent the most sensitive component of the EM61 instrument and detect metal objects regardless of size. The bottom coil response can be used to delineate metal conduits or utility lines; small, isolated metal objects, and areas containing insignificant metal debris. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Discussion of EM Anomalies: The EM anomaly at X=35, Y=40 was the result of a utility box and metal sign. The EM anomaly centered at X=70, Y=60 was the result of a drain pipe. The EM anomaly at X=258, Y=35 was the result of a metal pole. The north/south oriented EM feature at X=270 was suspected to be associated with an underground gas line that was marked by bollards across this area. The EM anomaly at X=345, Y=55 was the result of a water meter cover. The EM anomaly at X=410, Y=50 was the result of a large metal sign. The EM anomaly at X=420, Y=20 was suspected to be associated with reinforced concrete in front of the building. The EM anomaly at X=430, Y=35 was suspected to be the result of isolated metallic debris or a utility. The EM anomaly at X=530, Y=35 was the result of a collection of utility boxes. The EM anomaly from X=660, Y=55 to X=680, Y=85 was the result of a metal drain culvert and metallic

debris at the ground surface. The EM anomaly at X=700, Y=50 was the result of a water meter cover. The EM anomaly centered at X=790, Y=30 was associated with a metal fence and metal pole. The EM anomaly at X=800, Y=60 was the result of a drain culvert. The suspected gas line, reinforced concrete, and suspected debris in front of the vacant store were investigated further with the GPR. Any anomalies not discussed in this section are considered minor, and not significant enough to warrant further investigation. **Figure 3** presents an overlay of the EM61 bottom coil contour map on the NCDOT engineering plans for reference.

Discussion of GPR Survey: **Figure 4** presents the locations of the formal GPR transects performed at the property, as well as images of the transects. GPR Transects 1 and 2 were performed in an east/west fashion across the suspected gas line at X=270. These transects confirmed the presence of an underground utility spanning across this area that was likely the gas line marked at the ground surface. GPR Transects 3 and 4 were performed across the anomaly adjacent to the vacant building, and verified the presence of reinforced concrete as well as a possible utility at this location. GPR Transects 5 and 6 were performed across the anomaly at X=430, Y=35, and recorded reflectors that suggested a portion of a utility line was present at this location, or isolated metallic debris. No evidence of any USTs was recorded by the GPR survey.

The geophysical investigation did not record evidence of any metallic USTs at the property.

SUMMARY & CONCLUSIONS

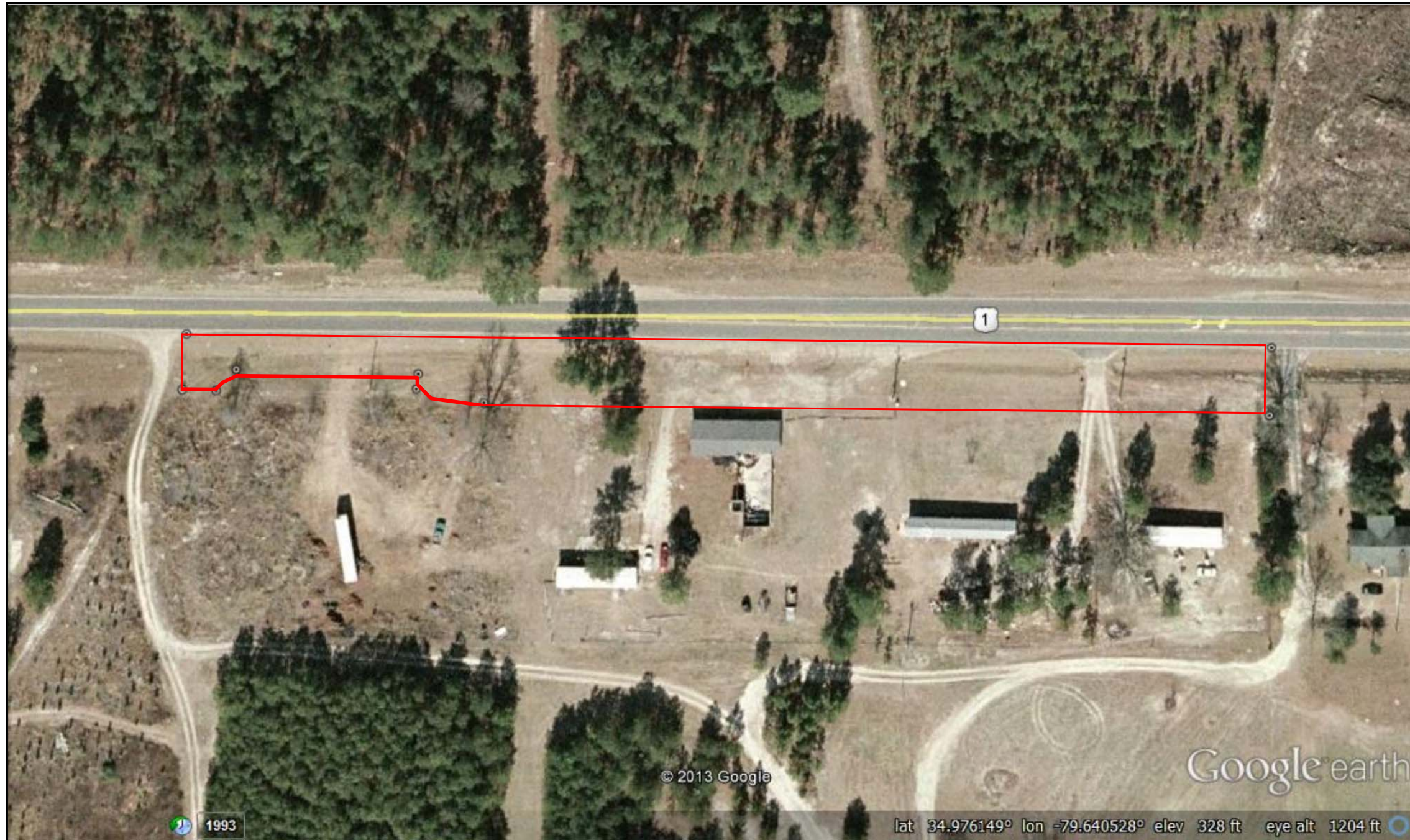
Our evaluation of the EM61 and GPR data collected across Parcel 011 in Rockingham, North Carolina, provides the following summary and conclusions:

- 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 EM61 anomalies detected could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features.
- A suspected gas line was observed to extend from north to south across the survey area at X=270.

- All remaining anomalies investigated by the GPR were attributed to reinforced concrete, utilities or metallic debris.
- The geophysical investigation did not record evidence of any metallic USTs at the property.

LIMITATIONS

Geophysical surveys have been performed and this report prepared for the 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 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.




Approximate Boundaries of the Geophysical Survey Area



View of East Portion of Survey Area
(Facing Approximately West)



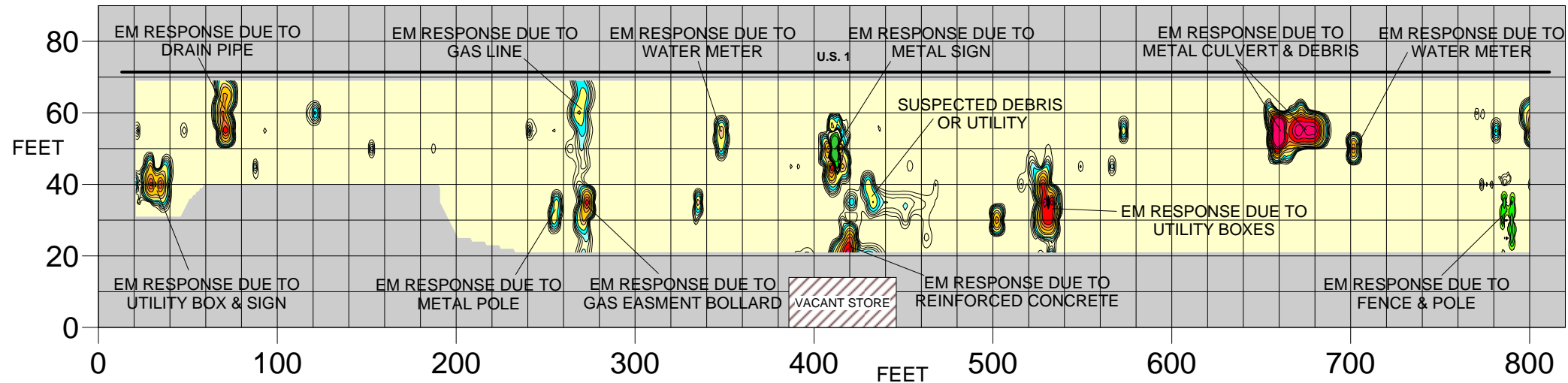
View of West Portion of Survey Area
(Facing Approximately West)

TITLE		PARCEL 011: GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	
PROJECT		NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	1/6/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2013-278	FIGURE 1	



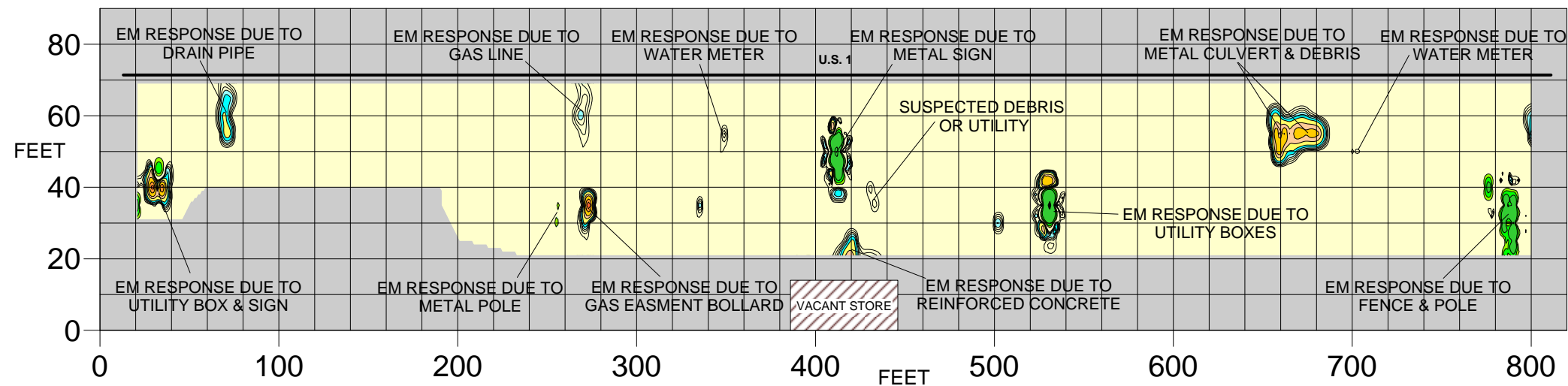
NO EVIDENCE OF METALLIC USTs OBSERVED

EM61 Bottom Coil Results




The contour plots show the bottom coil (most sensitive) and differential results of the EM61 instrument in millivolts (mV). The bottom coil response shows buried metallic objects regardless of size. The differential response focuses on larger, buried metallic objects such as drums and USTs and ignores smaller miscellaneous buried, metal debris. The EM61 data were collected on December 3, 2013 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on December 9, 2013, using a GSSI SIR 2000 unit coupled to a 400 MHz antennae.

EM61 Differential Results



EM61 Metal Detection Response (millivolts)



TITLE	PARCEL 011: EM61 BOTTOM COIL & DIFFERENTIAL RESULTS CONTOUR MAPS	
PROJECT	NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC	
	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
	DATE	1/6/2014
	CLIENT	NCDOT
PYRAMID PROJECT #:	2013-278	FIGURE 2

9
HERBERT ZEROFF
DB 1067 PG 326

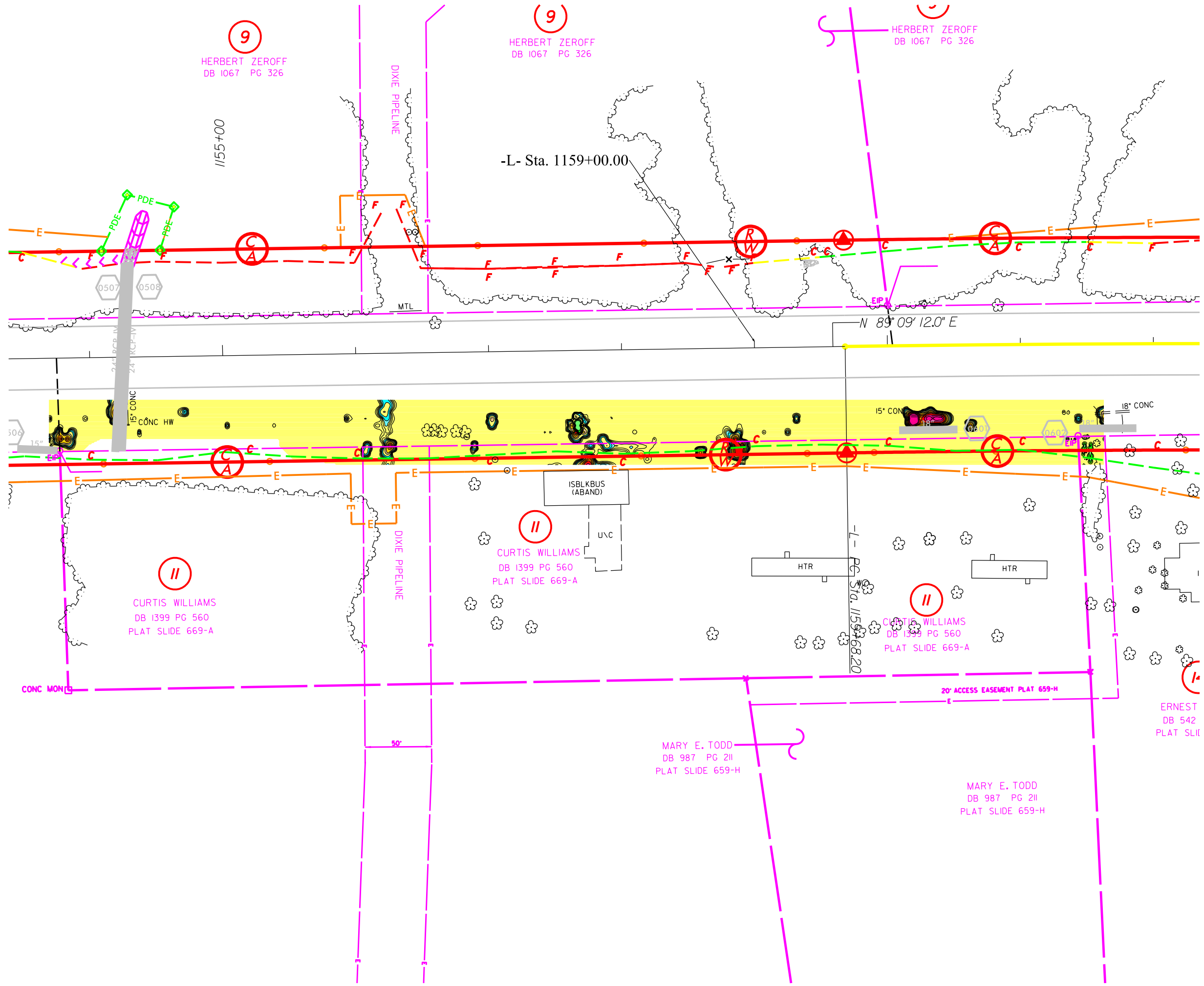
9
HERBERT ZEROFF
DB 1067 PG 326

HERBERT ZEROFF
DB 1067 PG 326

1155+00

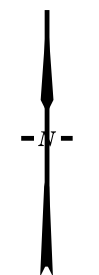
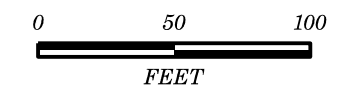
-L- Sta. 1159+00.00

N 89° 09' 12.0" E

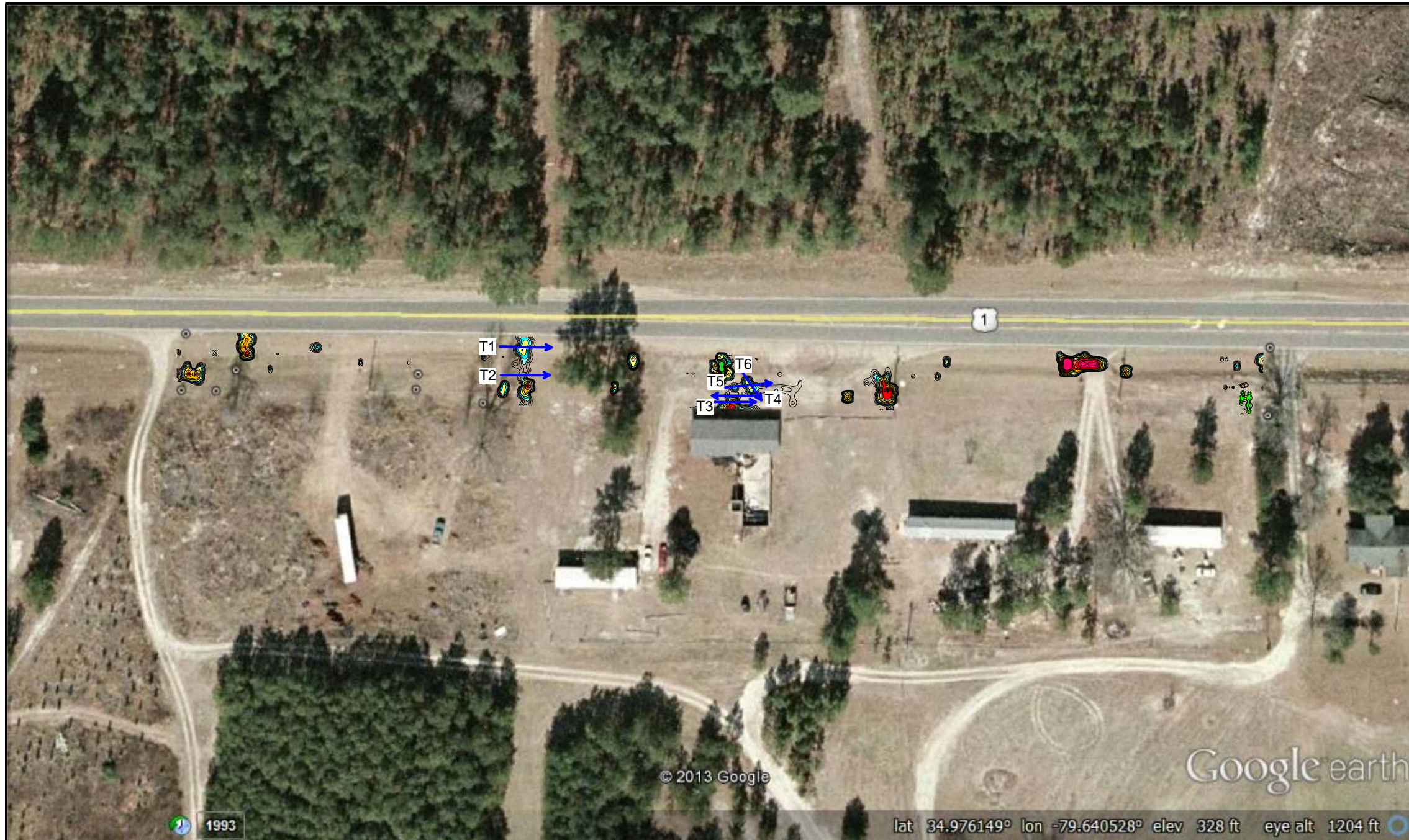


LEGEND

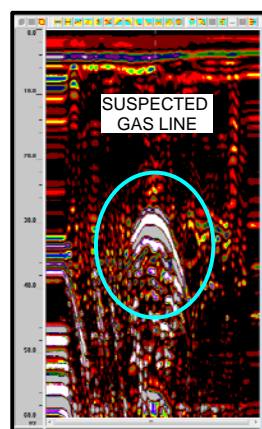
- PROPOSED UTILITY EASEMENT
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW
- PROPOSED CONST. EASEMENT
- PROP. DRAINAGE UTIL. EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED SS TRANSITION LINE
- PROPOSED DRAINAGE PIPING
- PROPOSED DRAINAGE EASEMENT
- YELLOW ZONE REPRESENTS GEOPHYSICAL SURVEY AREA, CONTOURS ARE EM61 RESULTS (METALLIC RESPONSES)



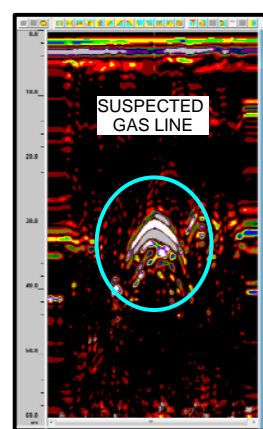
TITLE OVERLAY OF EM61 CONTOUR MAP ON ENGINEERING PLANS	
PROJECT NCDOT ROW PROJECT R-2501C (34437.1.1) CURTIS WILLIAMS PROPERTY - PARCEL 011 U.S. 1, RICHMOND COUNTY, NORTH CAROLINA	
503 INDUSTRIAL AVENUE GREENSBORO, NC 27406 336.335.3174 (p) 336.691.0648 (f) License # C1251 Eng. / #C257 Geology	
DATE: 12-19-13	REVISION NO. 0
PYRAMID PROJECT NO. 2012-278	FIGURE NO. 3



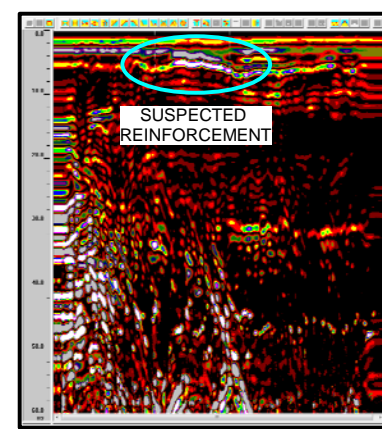
Approximate Locations of GPR Transects



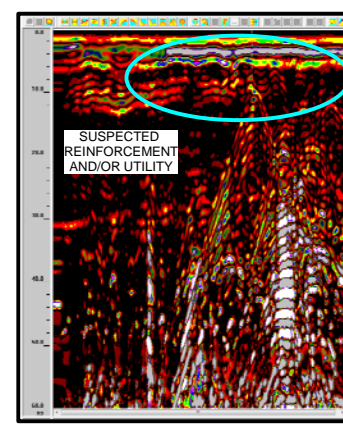
GPR Transect 1



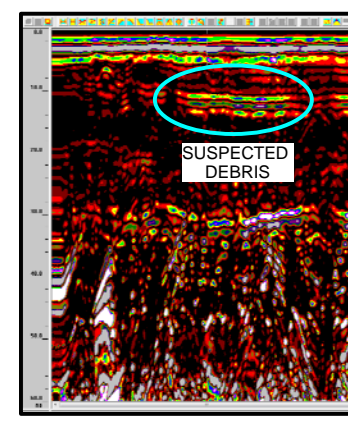
GPR Transect 2



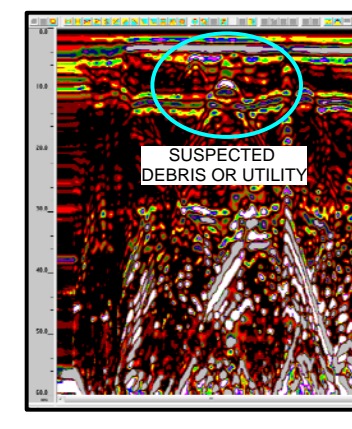
GPR Transect 3




GPR Transect 4



GPR Transect 5



GPR Transect 6

TITLE	PARCEL 011: GPR TRANSECT LOCATIONS AND IMAGES	
PROJECT	NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC	
	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
	DATE	1/6/2014
	CLIENT	NCDOT
PYRAMID PROJECT #:	2013-278	FIGURE 4

APPENDIX C

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-2501C, Parcel 011, Curtis Williams, Rockingham, NC / 2013-278	BORING/WELL NO:	11-1
SITE LOCATION:	Richmond County, NC	BORING/WELL LOCATION:	Parcel 011, Curtis Williams, Western Edge of Property
START DATE:	12/16/13	COMPLETED:	12/16/13
GEOLOGIST:	Eric Cross	DRILLER:	Geologic Exploration
DRILL METHOD:	Geoprobe	SAMPLE METHOD:	Macro-core
BORING DIA:	2-inch	CASING DIA:	N/A
TOTAL DEPTH:	10 feet	CASING DEPTH:	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
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	Depths correspond to soil type transitions	Core Sample Depths
1.5-2.5'	Dark brown, fine to medium grain sand (SP), with trace roots, no odor	PID=11-1(1.5-2.5): 2.3 PPM
2.5-5'	Dark brown to brown, fine to medium grain sand (SP), moist, no odor	PID=11-1(2.5-5): 1.4 PPM
5-7.5'	Orange to brown, clayey-sand (SC) (fine grain), moist, no odor	PID=11-1(5-7.5): 1.3 PPM
7.5-10'	Orange to brown, clayey-sand (SC) to fine to medium grained sand, moist, no odor	PID=11-1(7.5-10): 3.5 PPM

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 R-2501C, Parcel 011, Curtis Williams, Rockingham, NC / 2013-278	BORING/WELL NO:	11-2
SITE LOCATION:	Richmond County, NC	BORING/WELL LOCATION:	Parcel 011, Curtis Williams, Near NW Corner of Store
START DATE:	12/16/13	COMPLETED:	12/16/13
GEOLOGIST:	Eric Cross	DRILLER:	Geologic Exploration
DRILL METHOD:	Geoprobe	SAMPLE METHOD:	Macro-core
BORING DIA:	2-inch	CASING DIA:	N/A
TOTAL DEPTH:	10 feet	CASING DEPTH:	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
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	Depths correspond to soil type transitions	Core Sample Depths
1.5-2.5'	Grayish brown, fine grain sand (SP), with trace roots, no odor	PID=11-2(1.5-2.5): 2.2 PPM
2.5-5'	Light brown, fine grain sand (SP) to clayey-sand (SP - SC), moist, no odor	PID=11-2(2.5-5): 1.9 PPM
5-7.5'	Orange to brown, clayey-sand (fined grain), (SC), no odor	PID=11-2(5-7.5): 3.2 PPM
7.5-10'	Orange to brown, clayey-sand (SC) to fine to medium grained sand, no odor	PID=11-2(7.5-10): 3.0 PPM

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 R-2501C, Parcel 011, Curtis Williams, Rockingham, NC / 2013-278	BORING/WELL NO:	11-3
SITE LOCATION:	Richmond County, NC	BORING/WELL LOCATION:	Parcel 011, Curtis Williams, Center of Store
START DATE:	12/16/13	COMPLETED:	12/16/13
GEOLOGIST:	Eric Cross	DRILLER:	Geologic Exploration
DRILL METHOD:	Geoprobe	SAMPLE METHOD:	Macro-core
BORING DIA:	2-inch	CASING DIA:	N/A
TOTAL DEPTH:	20 feet	CASING DEPTH:	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
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DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
	Depths correspond to soil type transitions	Core Sample Depths
2.5-5'	Light grayish brown to dark brown, fine grained sand (SP), no odor	PID=11-3(2.5-5): 1.0 PPM
5-7.5'	Light brown with orange mottling, fine grained sand (SC) to clayey-sand (SC), very moist, no odor	PID=11-3(5-7.5): 5.2 PPM
7.5-10'	Tan with orange mottling, clayey-sand (SC) to fine grain sand (SP), no odor	PID=11-3(7.5-10): 1.9 PPM
10-12.5'	Light brown, fine to medium grain sand (SP), no odor	
12.5-17.5'	Tan to white, fine to medium grain sand (SP) to clayey sand (SC), no odor	
17.5-20'	Tan to white with red mottling, fine to medium grain sand (SP), to clayey-sand (SC), no odor	
	Set one (1) inch diameter temporary well at 20 feet with 10 feet of screen.	
	On December 17th, gauged with water level indicator; well was dry.	

MONITORING WELL INFORMATION (IF APPLICABLE)

RISER LENGTH (ft) 10 DEPTH (ft) 0-10 DIAMETER (in) 1 MATERIAL PVC
 SCREEN LENGTH (ft) 10 DEPTH (ft) 10-20 DIAMETER (in) 1 MATERIAL PVC
 DEPTH TO TOP OF SAND 8 BAGS OF SAND
 DEPTH TO TOP SEAL 5 BENTONITE USED BAGS OF CEMENT USED 0

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT R-2501C, Parcel 011, Curtis Williams, Rockingham, NC / 2013-278	BORING/WELL NO:	11-4
SITE LOCATION:	Richmond County, NC	BORING/WELL LOCATION:	Parcel 011, Curtis Williams, Near NE Corner of Store
START DATE:	12/16/13	COMPLETED:	12/16/13
GEOLOGIST:	Eric Cross	DRILLER:	Geologic Exploration
DRILL METHOD:	Geoprobe	SAMPLE METHOD:	Macro-core
BORING DIA:	2-inch	CASING DIA:	N/A
TOTAL DEPTH:	10 feet	CASING DEPTH:	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
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	Depths correspond to soil type transitions	Core Sample Depths
1.5-2.5'	Brown, fine grain sand (SP), with pebbles, no odor	PID=11-4(1.5-2.5): 5.6 PPM
2.5-5'	Brown, fine grain sand (SP), no odor	PID=11-4(2.5-5): 2.1 PPM
5-7.5'	Orange to brown, fine to medium grain sand (SP) to clayey-sand (SC),	PID=11-4(5-7.5): 2.2 PPM
	no odor	
7.5-10'	Brownish orange, clayey-sand (SC) to fine to medium grained sand (SP),	PID=11-4(7.5-10): 3.8 PPM
	no odor	

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 R-2501C, Parcel 011, Curtis Williams, Rockingham, NC / 2013-278	BORING/WELL NO:	11-5
SITE LOCATION:	Richmond County, NC	BORING/WELL LOCATION:	Parcel 011, Curtis Williams, Eastern Drainage Feature
START DATE:	12/16/13	COMPLETED:	12/16/13
GEOLOGIST:	Eric Cross	DRILLER:	Geologic Exploration
DRILL METHOD:	Geoprobe	SAMPLE METHOD:	Macro-core
BORING DIA:	2-inch	CASING DIA:	N/A
TOTAL DEPTH:	10 feet	CASING DEPTH:	N/A

DEPTH (ft.)	VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.	OVA RESULTS PERCENT RECOVERY BLOW COUNTS
----------------	---	--

	Depths correspond to soil type transitions	Core Sample Depths
1.5-2.5'	Dark gray, fine grain sand (SP), no odor	PID=11-5(1.5-2.5): 1.8 PPM
2.5-5'	Tan & orange, fine grain sand (SP) to clayey-sand (SC), very moist at five (5) feet, no odor	PID=11-5(2.5-5): 2.6 PPM
5-7.5'	Brown, fine grain sand (SP), no odor	PID=11-5(5-7.5): 0.5 PPM
7.5-10'	Brown and tan, clayey-sand (SC) to fine grained sand (SP), no odor	PID=11-5(7.5-10): 1.8 PPM

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



Hydrocarbon Analysis Results

Client: NCDOT Richmond County
Address: 1826 US Highway 1 North - PARCEL 011
 Rockingham, NC

Samples taken 11-1, 11-2, 11-3, 11-4, 11-5
Samples extracted 6 Samples Extracted
Samples analysed 6 Samples Analyzed

Contact:

Operator Tim Leatherman

Project: NCDOT Richmond R-2501C

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 % light % mid % heavy	HC Fingerprint Match
S	11-1(1.5-2.5)	12.6	<0.6	<0.6	#DIV/0!	#DIV/0!	< 0.63	#DIV/0!	#DIV/0!	0 66.6 33.4	#DIV/0!
S	11-1(1.5-2.5)R	9.0	<0.5	<0.5	9.4	9.4	2.13	< 0.05	< 0.023	30.1 54.1 15.7	Deg.Fuel (PFM)
S	11-1(7.5-10)	8.8	<0.4	<0.4	<0.4	<0.4	< 0.44	< 0.04	< 0.022	0 0 100	Degraded Fuel (est) 0%
S	11-2(5-7.5)	9.5	<0.5	<0.5	<0.5	<0.5	< 0.48	< 0.05	< 0.024	0 0 100	#DIV/0!
S	11-4(1.5-2.5)	10.9	<0.5	<0.5	2.3	2.3	2.33	0.22	< 0.027	44.4 40.4 15.2	#DIV/0!
S	11-3(5-7.5)	9.3	<0.5	<0.5	<0.5	<0.5	< 0.47	< 0.05	< 0.023	0 0 100	Degraded Fuel (est) 0%
S	11-5(2.5-5)	10.6	<0.5	<0.5	<0.5	<0.5	< 0.53	< 0.05	< 0.027	0 0 100	Match not possible

Initial Calibrator QC check

Low Range Calibrator Final check
 High Range Calibrator Final check

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 based on operator selected library matches
 Fingerprint match abbreviations Est = Specific calibrator not used, result estimated (PFM)= Poor library fingerprint match
 (SBS)= site specific background subtracted (LBS)= Library background subtracted % = match confidence

CHAIN-OF-CUSTODY / Analytical Request Document - QROS / QED

Pyramid Environmental & Engineering, P.C.

Company:

Pyramid Environmental & Engineering, P.C.

Address: 503 Industrial Ave.

Greensboro, NC 27406

Purchase Order No.: WBS # 344374
 Project Name: NC DOT Richmond County Parcel 011
 Project Number: 2013-278

ITEM	SAMPLE ID	Matrix	COLLECTED		Containers	Ur-preserved	Methanol	Requested Analysis	
			C=Comp. G=Grab	Date Time				GRO	DRG
	11-1 (1.5-2.5)	Soil	G	12/16/13 9:45	1	11.1g	20ml	X	X
	11-1 (7.5-10)	Soil	G	12/16/13 10:00	1	11.1g	20ml	X	X
	11-2 (5-7.5)	Soil	G	12/16/13 10:15	1	10.5g	20ml	X	X
	11-3 (5-7.5)	Soil	G	12/16/13 10:30	1	10.7g	20ml	X	X
	11-4 (1.5-2.5)	Soil	G	12/16/13 10:45	1	9.2g	20ml	X	X
	11-5 (2.5-5)	Soil	G	12/16/13 11:00	1	9.1g	20ml	X	X

SAMPLER NAME AND SIGNATURE

Print Name of Sampler: J. J. [Signature]

Signature of Sampler: [Signature]

Print Name of Sampler: J. J. [Signature]

Signature of Sampler: [Signature]

Date Signed: 12/16/13

Relinquished By / Affiliation: [Signature]

Date: 12/16/13

Accepted By / Affiliation: [Signature]

Date: 12-16-13

Time: 17:00

APPENDIX E

January 06, 2014

Chemical Testing Engineer
NCDOT
Materials & Tests Unit
1801 Blue Ridge Road
Raleigh, NC 27607

RE: Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

Dear Chemical Engineer:

Enclosed are the analytical results for sample(s) received by the laboratory on December 20, 2013. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jon D Bradley

jon.bradley@pacelabs.com
Project Manager

Enclosures

cc: Tim Leatherman, Pyramid



REPORT OF LABORATORY ANALYSIS

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2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

Pace Analytical Services, Inc.
9800 Kinsey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

Charlotte Certification IDs

9800 Kinsey Ave. Ste 100, Huntersville, NC 28078
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001

Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
West Virginia Certification #: 357
Virginia/VELAP Certification #: 460221

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SAMPLE ANALYTE COUNT

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92184275001	11-5 (2.5-5)	EPA 8015 Modified	NU1	2	PASI-C
		EPA 8015 Modified	GAW	2	PASI-C
		ASTM D2974-87	TNM	1	PASI-C

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PROJECT NARRATIVE

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

Method: EPA 8015 Modified
Description: 8015 GCS THC-Diesel
Client: NCDOT East Central
Date: January 06, 2014

General Information:

1 sample was analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 3546 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

REPORT OF LABORATORY ANALYSIS

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PROJECT NARRATIVE

Project: Richmond 011 WBS#34437.1.1

Pace Project No.: 92184275

Method: EPA 8015 Modified

Description: Gasoline Range Organics

Client: NCDOT East Central

Date: January 06, 2014

General Information:

1 sample was analyzed for EPA 8015 Modified. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 5035A/5030B with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

Surrogates:

All surrogates were within QC limits with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Richmond 011 WBS#34437.1.1

Pace Project No.: 92184275

Sample: 11-5 (2.5-5) **Lab ID: 92184275001** Collected: 12/16/13 11:00 Received: 12/20/13 14:11 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8015 GCS THC-Diesel		Analytical Method: EPA 8015 Modified Preparation Method: EPA 3546						
Diesel Components	ND	mg/kg	5.7	1	12/20/13 18:42	12/23/13 15:30	68334-30-5	
Surrogates								
n-Pentacosane (S)	77	%	41-119	1	12/20/13 18:42	12/23/13 15:30	629-99-2	
Gasoline Range Organics		Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B						
Gasoline Range Organics	ND	mg/kg	7.2	1	12/30/13 14:50	12/30/13 21:34	8006-61-9	
Surrogates								
4-Bromofluorobenzene (S)	107	%	70-167	1	12/30/13 14:50	12/30/13 21:34	460-00-4	
Percent Moisture		Analytical Method: ASTM D2974-87						
Percent Moisture	12.9	%	0.10	1		12/28/13 10:38		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

QC Batch: GCV/7658 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 5035A/5030B Analysis Description: Gasoline Range Organics
Associated Lab Samples: 92184275001

METHOD BLANK: 1114325 Matrix: Solid
Associated Lab Samples: 92184275001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Gasoline Range Organics	mg/kg	ND	6.0	12/30/13 20:25	
4-Bromofluorobenzene (S)	%	103	70-167	12/30/13 20:25	

LABORATORY CONTROL SAMPLE: 1114326

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Gasoline Range Organics	mg/kg	49.7	49.5	100	70-165	
4-Bromofluorobenzene (S)	%			103	70-167	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1114327 1114328

Parameter	Units	92184283001 Result	MS		MSD		MS		MSD		% Rec Limits	RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	% Rec					
Gasoline Range Organics	mg/kg	ND	34.7	34.7	38.2	38.4	110	111	47-187	1			
4-Bromofluorobenzene (S)	%						107	102	70-167				

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

QC Batch: OEXT/25303 Analysis Method: EPA 8015 Modified
QC Batch Method: EPA 3546 Analysis Description: 8015 Solid GCSV
Associated Lab Samples: 92184275001

METHOD BLANK: 1111061 Matrix: Solid
Associated Lab Samples: 92184275001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Components	mg/kg	ND	5.0	12/23/13 12:23	
n-Pentacosane (S)	%	89	41-119	12/23/13 12:23	

LABORATORY CONTROL SAMPLE: 1111062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diesel Components	mg/kg	66.7	49.8	75	49-113	
n-Pentacosane (S)	%			81	41-119	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1111063 1111064

Parameter	Units	92184266001 Result	MS		MSD		% Rec		% Rec Limits	RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Diesel Components	mg/kg	ND	78.4	78.4	54.8	62.2	68	77	10-146	13	
n-Pentacosane (S)	%						77	82	41-119		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Richmond 011 WBS#34437.1.1

Pace Project No.: 92184275

QC Batch:	PMST/6122	Analysis Method:	ASTM D2974-87
QC Batch Method:	ASTM D2974-87	Analysis Description:	Dry Weight/Percent Moisture
Associated Lab Samples:	92184275001		

SAMPLE DUPLICATE: 1113487

Parameter	Units	92184176001 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	99.0	99.0	0	

SAMPLE DUPLICATE: 1113488

Parameter	Units	92184283002 Result	Dup Result	RPD	Qualifiers
Percent Moisture	%	6.7	6.2	7	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Richmond 011 WBS#34437.1.1

Pace Project No.: 92184275

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C Pace Analytical Services - Charlotte

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Richmond 011 WBS#34437.1.1
Pace Project No.: 92184275

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92184275001	11-5 (2.5-5)	EPA 3546	OEXT/25303	EPA 8015 Modified	GCSV/16310
92184275001	11-5 (2.5-5)	EPA 5035A/5030B	GCV/7658	EPA 8015 Modified	GCV/7661
92184275001	11-5 (2.5-5)	ASTM D2974-87	PMST/6122		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt (SCUR)

Document Number:
F-CHR-CS-03-rev.13

Issuing Authority:
Pace Huntersville Quality Office

Client Name: Pyramid Environmental

Courier: Fed Ex UPS USPS Client Commercial Pace Other _____

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Optional
Proj. Due Date:
Proj. Name:

Packing Material: Bubble Wrap Bubble Bags None Other _____

Thermometer Used: IR Gun T1102 T1301 Type of Ice: Wet Blue None Samples on ice, cooling process has begun

Temp Correction Factor T1102: No Correction T1301: No Correction

Corrected Cooler Temp.: 23 °C Biological Tissue is Frozen: Yes No N/A

Date and Initials of person examining contents: ED 12/23/13

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:		
All containers needing preservation have been checked.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:

JDB

Date: 12/20/13

SRF Review:

JY

Date: 12/20/13

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)



CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Section B Required Project Information: Section C Invoice Information:

Company: **Pyramid Environmental Services**
 Report To: **Tom Leffers**
 Copy To: **NCDDOT**
 Attention: **NCDDOT**
 Company Name: **NCDDOT**
 Address: **1085# 34437.1.1**
 Project Name: **Richmond County Parcel 011**
 Project Number: **2013-278#34437.1.1**
 Pace Order: **1085# 34437.1.1**
 Reference: **John Bradley**
 Pace Project Manager: **John Bradley**
 Pace Profile #:
 Regulatory Agency: NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER
 Site Location STATE: **NC**
 Requested Analysis Filtered (Y/N)
 Requested Due Date: **March**

ITEM #	Section D Required Client Information	Matrix Codes MATRIX CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives		Analysis Test	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
					COMPOSITE START	COMPOSITE END/GRAB			H ₂ SO ₄	HNO ₃			
1	11-5(2.5-5)		SLG		DATE	TIME	DATE	TIME					
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	<i>[Signature]</i>	12/20	1120	<i>[Signature]</i>	12/20	1120	Temp in °C: 2.3 Received on Ice (Y/N): Y Custody Sealed Cooler (Y/N): N Samples Intact (Y/N): Y
	<i>[Signature]</i>	12/20	1411	<i>[Signature]</i>	12/20	1411	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **Tom Leffers**
 SIGNATURE of SAMPLER: *[Signature]*
 DATE Signed (MM/DD/YY): **12/20/13**

ORIGINAL

APPENDIX F
