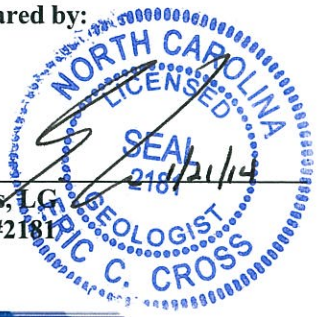
# PRELIMINARY SITE ASSESSMENT

**PARCEL 63, LONNIE WALKER**
**2210 U.S. HIGHWAY 1 NORTH**
**ROCKINGHAM, RICHMOND COUNTY, NORTH CAROLINA**
**STATE PROJECT: R-2501C**
**WBS ELEMENT: 34437.1.1**
**JANUARY 21, 2014**

**Report prepared for:**

**Mr. Gordon Box, LG**
**GeoEnvironmental Project Manager**
**GeoEnvironmental Section**
**Geotechnical Engineering Unit**
**North Carolina Department of Transportation**
**1020 Birch Ridge Drive**
**Raleigh, NC 27610**

**Report prepared by:**




**Eric C. Cross, LG**
**NC License #2181**

**Report reviewed by:**


**Michael G. Jones, LG**
**NC License #1168**

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

**PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.**
**P.O. BOX 16265**
**GREENSBORO, NC 27416-0265**
**(336) 335-3174**

C-257 –Geology
C-1251 - Engineering

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**PARCEL 63, LONNIE WALKER**
**2210 N. US 1**
**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 63, the Lonnie Walker 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 Lonnie Walker property (Parcel 63). On November 26, 2013, Pyramid emailed the Richmond County R-2501C parcel addresses to Mr. Kenneth Currie, the Richmond County Incident Manager 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 2210 N. US 1 (Parcel 63) does not have any environmental incidents in the DENR database.

  It should be noted that an existing UST basin is present at the property containing gasoline and diesel USTs. This UST basin is outside of the area of investigation, and therefore neither the exact boundaries of the UST basin nor the exact locations of the USTs were identified by this PSA. The NCDOT engineering plans provide the location of the UST basin and the fuel ports associated with the tanks.

  On November 26, 2013, Pyramid Project Manager Eric Cross performed a site visit at the property. Mr. Cross spoke with a tenant who reportedly was renting the service station space. The tenant indicated at the time of the interview, that

the USTs at the property were in temporary closure waiting on a new UST permit, and the station was only acting as a convenience store. However, subsequent to the interview and prior to the end of our investigation, it should be noted that the USTs were apparently permitted and reactivated, and the service station was selling gasoline and diesel fuel.

- **Geophysical Survey:** The geophysical investigation provided no evidence of metallic USTs within the existing and proposed ROW and/or easement. Two geophysical anomalies were classified as "no confidence" with respect to the NCDOT UST classification guidelines.

- **Limited Soil Assessment:** The QED results did not detect TPH-GRO or TPH-DRO concentrations above milligrams per kilogram (10 mg/kg) for any of the soil samples collected from borings 63-1, 63-2, 63-3, 63-4, 63-5, or 63-6. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg.

  In contrast, QED analysis of all of the soil samples collected from borings 63-7, 63-8 and 63-9 detected concentrations of both GRO and DRO above 10 mg/kg. Concentrations ranged from a DRO low of 55 mg/kg to a DRO high of 7,045 mg/kg, and a GRO low of 64.9 mg/kg to a GRO high of 15,968 mg/kg. The highest concentrations of both DRO and GRO were observed to be directly down-gradient of the UST basin at the location of boring 63-7.

  Duplicates of soil samples 63-5(7.5-10) and 63-8(6-7.5) were collected and shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 63-5(7.5-10) did not detect GRO or DRO concentrations above detection limits. The laboratory results for soil sample 63-8(6-7.5) detected a DRO concentration of 227 mg/kg and a GRO concentration of 102 mg/kg. It should be noted that these values are slightly lower than those calculated by the QED Analyzer. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination. A petroleum odor was detected during field screening in four of the borings.

- **Limited Groundwater Assessment:** Soil boring 63-5 was converted into a 1-inch diameter temporary monitoring well 63-5(TW) to a total depth of 20 feet BLS. Groundwater was not encountered during the sampling of the well to a depth of 20 feet, and thus no groundwater sample was analyzed.

  Review of the NCDOT engineering plans indicates that it is unlikely the NCDOT may encounter groundwater at the property during construction activities due to its significant depth below the ground surface at the property (20+ feet BLS).

- **Contaminated Soil Volumes:** During road construction activities, it is possible the NCDOT may encounter petroleum impacted soil near soil borings 63-7, 63-8, and 63-9. The direct source of this petroleum is likely associated with the gasoline and diesel USTs located directly to the north (uphill) of these borings in the existing UST basin observed at the site.

  Soils with both GRO and DRO above 10mg/kg were observed at the locations of borings 63-7, 63-8, and 63-9. Petroleum-contaminated soils were observed to depths as great as 10 feet BLS in the borings. For this reason, a depth of 10 feet will be used as a baseline to calculate the approximate volumes of contaminated soil at the site. Pyramid's PSA investigation resulted in an estimated area of **7,246 square feet of impacted soil in the vicinity of borings 63-7, 63-8, and 63-9**. This area was calculated using radii extending half of the distance between the contaminated soil borings and the closest non-contaminated soil borings.

  Using a total thickness of 10 feet of contaminated soil, Pyramid estimates approximately 72,460 cubic feet, or **2,683 cubic yards of petroleum impacted soil between 0 to 10 feet BLS at the location of soil borings 63-7, 63-8, and 63-9.** The estimates of soil volumes are based on the maximum depth of contamination observed in Pyramid's soil samples. It should be noted that the location of existing utilities surrounding the contaminated borings prevented the installation of any more borings which may have assisted in refining the extents of contamination. It should also be noted that this area of contamination extends beyond (north) of the proposed cut line on the NCDOT engineering plans.

  If petroleum impacted soil is removed at the location of these soil borings, the impacted soil should be managed according to DENR Division of Waste Management (DWM) Guidelines and disposed of at a permitted facility. Should the NCDOT want either the property owner or another entity/agency to be notified of the contamination, Pyramid can do so upon specific request by the NCDOT.

# 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 63, the Lonnie Walker property. The Lonnie Walker property currently contains an active service station located at 2210 N. US 1 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 the potential for 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 the proposed easement/proposed right of way (ROW) and the area between the existing NCDOT right of way 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, 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:

*This gas station and convenience store is apparently no longer active. It is located in the fork of the road, between the south side of the existing US 1 and the northwest side of NC 177, east of the Rockingham Motor Speedway. Four known USTs are located east of the pump island. The tank bed is just beyond the existing NCDOT right of way. No evidence of monitoring wells and/or other USTs or UST removal was observed during field reconnaissance along the project corridor on November 14, 2007. No right of way is anticipated to require acquisition for this TIP, however, the PSA should be conducted between the edge of pavement and the existing right of way that could have formerly been considered to be part of the gas station (e.g., approximately 60 feet from edge of pavement on the southeastern side of the parcel and approximately 35 feet from edge of pavement on the northern side of the parcel).*

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 the Richmond County Soil and Water Conservation office in Rockingham and on Google Earth. The 1938, 1956, 1975, 1993, 1999, 2005, 2008, 2011, and 2013 aerial photographs are included in **Appendix A**. Historical information reviewed as part of the PSA indicated that the building appears to have been constructed between 1938 and 1956. The earliest aerial to show the building appears to be the 1956 aerial. The 1938 aerial shows the property to be undeveloped land.

Research of the NCDENR UST Database indicates this facility is entitled Speedway 66 Service. It contains four USTs (one 4,000 gallon gasoline UST; two 3,000 gallon gasoline USTs, and one 2,000 gallon diesel UST). It is listed as **Facility ID 0-018740**.

On November 26, 2013, Pyramid emailed the Richmond County R-2501C parcel addresses to Mr. Kenneth Currie, the Richmond County Incident Manager 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 2210 N. US 1 (Parcel 63) does not have any environmental incidents in the DENR database.

It should be noted that the existing UST basin is outside of the area of investigation, and therefore neither the exact boundaries of the UST basin nor the exact locations of the USTs were identified by this PSA. The NCDOT engineering plans provide the location of the UST basin and the fuel ports associated with the tanks.

On November 26, 2013, Pyramid Project Manager Eric Cross performed a site visit at the property. Mr. Cross spoke with a tenant who reportedly was renting the service station space. The tenant indicated at the time of the interview, that the USTs at the property were in temporary closure waiting on a new UST permit, and the station was only acting as a convenience store. However, subsequent to the interview and prior to the end of our investigation, it should be noted that the USTs were apparently permitted and reactivated, and the service station was selling gasoline and diesel fuel.

# 3.0 Geophysical Investigation

Pyramid performed an electromagnetic (EM) survey across the accessible portions of the Parcel. The majority of the EM61 anomalies in the north survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. All of the EM61 anomalies in the south survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features, or were too minor to be considered USTs. GPR surveys performed across the two anomalies at the southwest boundary of the north survey area recorded evidence of possible utilities or other structures. The lack of significant definition to these structures resulted in classifying them as "no confidence" in terms of metallic USTs.

The geophysical investigation did not record evidence of metallic USTs within the proposed ROW and/or easement.

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 17, 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. Nine (9) soil borings (63-1, 63-2, 63-3,…to 63-9) 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 business while remaining in the proposed right of way. The soil borings were installed parallel to U.S. 1 on the north side and the adjacent roadway on the south side of the parcel. Borings 63-3, 63-4, 63-5, and 63-9 were installed at the approximate locations of proposed drainage structures, as indicated

by the NCDOT engineering plans. Borings 63-7 and 63-8 were installed directly downhill of the existing UST basin. 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. A petroleum odor was detected during field screening in four of the borings.

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. Two duplicate soil samples were selected for laboratory analysis from Parcel 63.

The duplicate soil samples selected for laboratory analyses 63-5(7.5-10) and 63-8(6-7.5) were placed in laboratory prepared containers and shipped to Pace Analytical in Huntersville, NC for analysis. The selected soil samples were 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 for any of the soil samples collected from borings 63-1, 63-2, 63-3, 63-4, 63-5, or 63-6. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg.

In contrast, QED analysis of all of the soil samples collected from borings 63-7, 63-8 and 63-9 detected concentrations of both GRO and DRO above 10 mg/kg. Concentrations ranged from a DRO low of 55 mg/kg to a DRO high of 7,045 mg/kg, and a GRO low of 64.9 mg/kg to a GRO high of 15,968 mg/kg. The highest concentrations of both DRO and GRO were observed to be directly downhill of the UST basin at the location of

boring 63-7. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix D**.

Duplicates of soil samples 63-5(7.5-10) and 63-8(6-7.5) were shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 63-5(7.5-10) did not detect GRO or DRO concentrations above detection limits. The laboratory results for soil sample 63-8(6-7.5) detected a DRO concentration of 227 mg/kg and a GRO concentration of 102 mg/kg. It should be noted that these values are slightly lower than those calculated by the QED Analyzer. 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 17, 2013, Pyramid converted soil boring 63-5 into a 1-inch diameter temporary monitoring well (TW). Soil boring 63-5(TW) was completed to a total depth of 20 feet below land surface (BLS). The temporary well 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 18, 2013, the temporary monitoring well 63-5(TW) was gauged using a properly decontaminated electric water level probe. Groundwater was not encountered by the probe, and the well was concluded to be dry. Upon completion of the gauging, 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

As discussed above, no groundwater sample was collected at the property, therefore, no analytical results are reported for this parcel.

# 5.0 Conclusions and Recommendations

As requested by NCDOT, Pyramid has completed a PSA at the Lonnie Walker property located 2210 N. US 1, Rockingham, NC (Parcel 63). 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. Two geophysical anomalies were classified as "no confidence" with respect to the NCDOT UST classification guidelines.

## 5.2 Limited Soil Assessment

The QED results did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg for any of the soil samples collected from borings 63-1, 63-2, 63-3, 63-4, 63-5, or 63-6. The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg.

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Duplicates of soil samples 63-5(7.5-10) and 63-8(6-7.5) were shipped to Pace Analytical for laboratory analysis. The laboratory results for soil sample 63-5(7.5-10) did not detect GRO or DRO concentrations above detection limits. The laboratory results for soil sample 63-8(6-7.5) detected a DRO concentration of 227 mg/kg and a GRO concentration of 102 mg/kg. It should be noted that these values are slightly lower than those calculated by the QED Analyzer. To maintain consistency, the QED results are utilized in this report to determine the presence and level of potential contamination. A petroleum odor was detected during field screening in four of the borings.

## 5.3 Limited Groundwater Assessment

Soil boring 63-5 was converted into a 1-inch diameter temporary monitoring well 63-5(TW) to a total depth of 20 feet BLS. Groundwater was not encountered during the sampling of the well to a depth of 20 feet, and thus no groundwater sample was analyzed.

Review of the NCDOT engineering plans indicates that it is unlikely the NCDOT may encounter groundwater at the property during construction activities due to its significant depth below the ground surface at the property (20+ feet BLS).

**5.4 Recommendations**

During road construction activities, it is possible the NCDOT may encounter petroleum impacted soil near soil borings 63-7, 63-8, and 63-9. The direct source of this petroleum is likely associated with the gasoline and diesel USTs located directly to the north of these borings in the existing UST basin observed at the site.

Soils with both GRO and DRO above 10mg/kg were observed at the locations of borings 63-7, 63-8, and 63-9. Petroleum-contaminated soils were observed to depths as great as 10 feet BLS in the borings. For this reason, a depth of 10 feet will be used as a baseline to calculate the approximate volumes of contaminated soil at the site. Pyramid's PSA investigation resulted in an estimated area of **7,246 square feet of impacted soil in the vicinity of borings 63-7, 63-8, and 63-9**. This area was calculated using radii extending half of the distance between the contaminated soil borings and the closest non-contaminated soil borings.

Using a total thickness of 10 feet of contaminated soil, Pyramid estimates approximately 72,460 cubic feet, or **2,683 cubic yards of petroleum impacted soil between 0 to 10 feet BLS at the location of soil borings 63-7, 63-8, and 63-9.** The estimates of soil volumes are based on the maximum depth of contamination observed in Pyramid's soil samples. It should be noted that the location of existing utilities surrounding the contaminated borings prevented the installation of any more borings which may have assisted in refining the extents of contamination. It should also be noted that this area of contamination extends beyond (north) of the proposed cut line on the NCDOT engineering plans.

If petroleum impacted soil is removed at the location of these soil borings, the impacted soil should be managed according to DENR Division of Waste Management (DWM) Guidelines and disposed of at a permitted facility. Should the NCDOT want either the property owner or another entity/agency to be notified of the contamination, Pyramid can do so upon specific request by the NCDOT.

# 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.

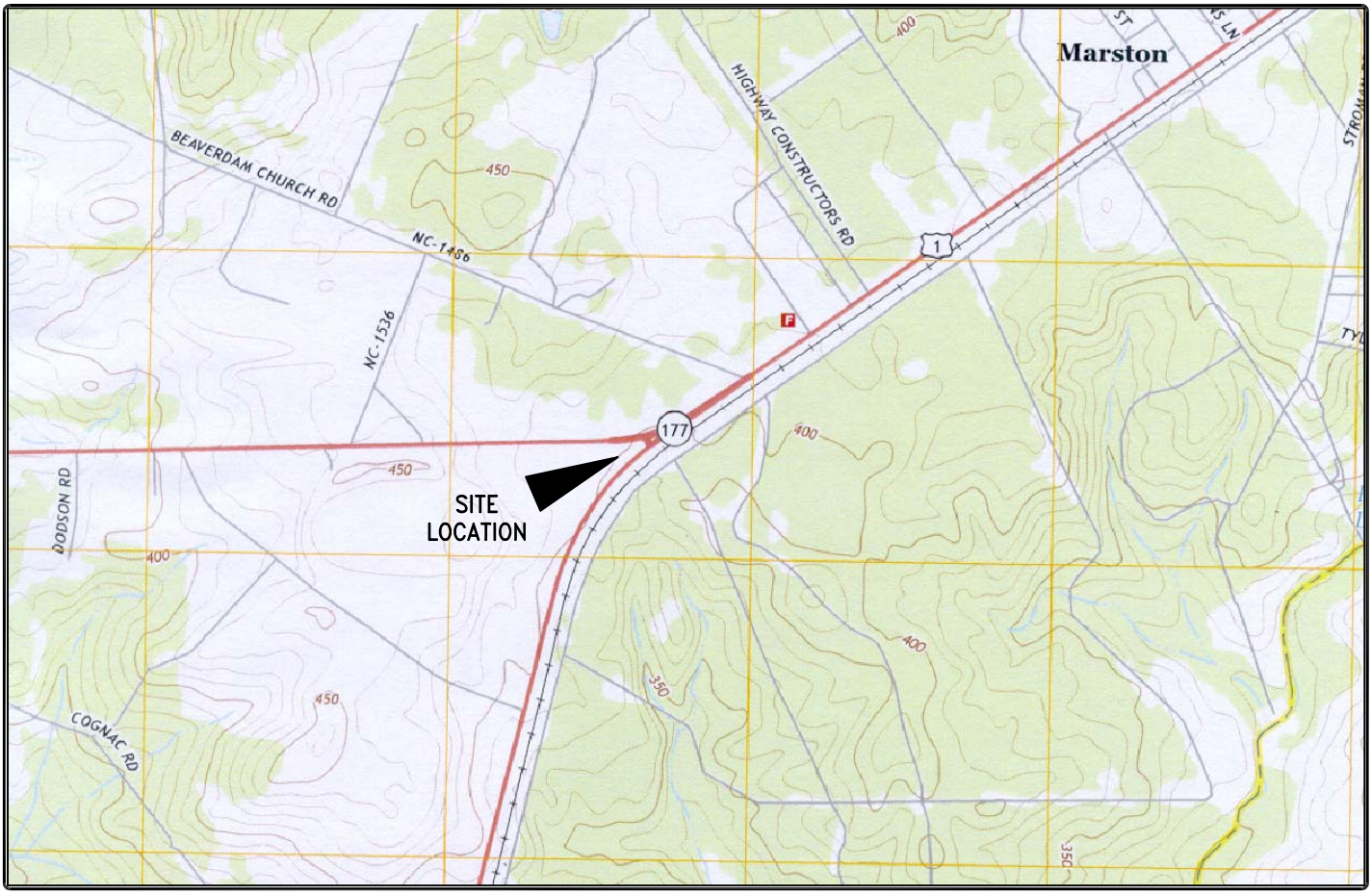
# 7.0 Closure

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: 2210 U.S. HIGHWAY 1 NORTH LOCATION: ROCKINGHAM, NORTH CAROLINA




## USGS IDENTIFICATION

| | |
|---|---|
| USGS 7.5 MINUTE MAP | MARSTON, N.C. |
| ORIGINAL DATE: | 2013 |
| 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 | |

## SCALES

MILES: 1/2 0 1

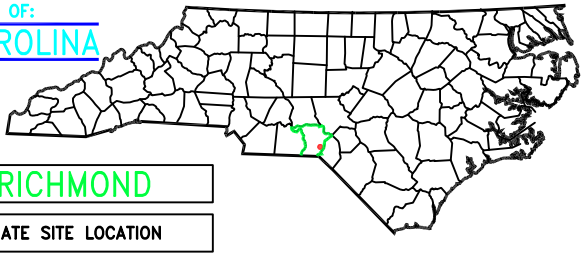
FEET: 1000 0 2000 4000 6000

1" = 2000'

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

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: RICHMOND

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NC DOT R-2501C

PROPERTY NAME: PARCEL 063, LONNIE WALKER

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

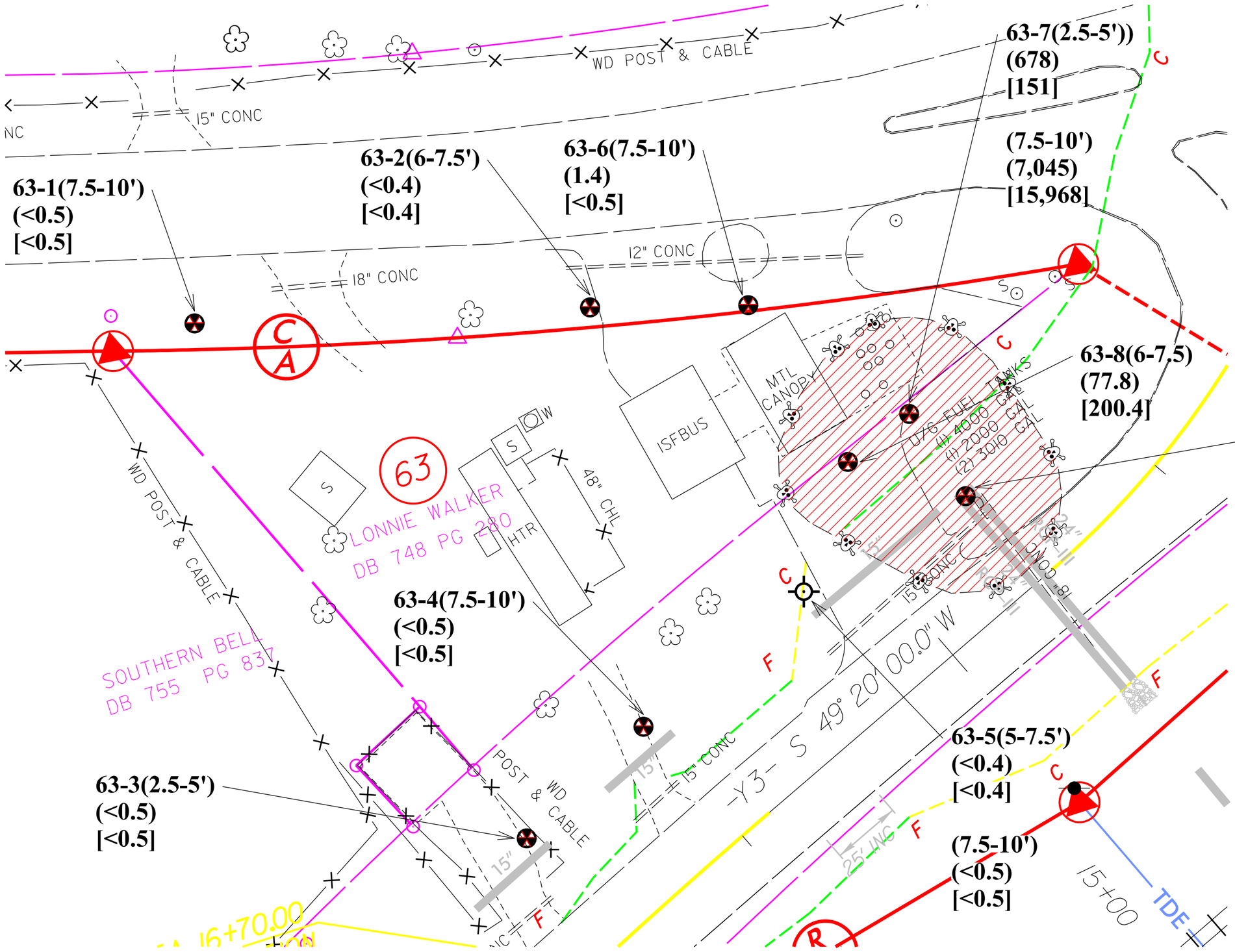
TYPE: PSA

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

- PUE — PROPOSED UTILITY EASEMENT
- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW
- E — PROPOSED CONST. EASEMENT
- DUE — PROP. DRAINAGE UTIL. EASEMENT
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- PROPOSED SS TRANSITION LINE
- PROPOSED DRAINAGE PIPING
- PDE — PROPOSED DRAINAGE EASEMENT
- SOIL SAMPLE BORING LOCATION
- BORING CONVERTED TO MW
- AREA OF CONTAMINATION (>10 PPM)

(<6.1) TPH-DRO concentration (mg/kg)

[<6.1] TPH-GRO concentration (mg/kg)

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

-N-

0 50 100

FEET

TITLE: SOIL BORING LOCATIONS AND ESTIMATED AREA OF CONTAMINATION

PROJECT: NCDOT ROW PROJECT R-2501C (34437.1.1)
LONNIE WALKER - PARCEL 063
U.S. 1, RICHMOND COUNTY, NORTH CAROLINA

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
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**
**2210 US Highway 1 North - Parcel 063**
**Rockingham, Richmond County, North Carolina**

| SOIL BORING | SAMPLE ID | DEPTH (feet bgs) | PID READINGS (PPM) |
|---|---|---|---|
| **63-1** | 63-1(2.5-5) | 2.5 to 5 | 0.2 |
| | 63-1(6-7.5) | 6 to 7.5 | 0.0 |
| | 63-1(7.5-10) | 7.5 to 10 | 0.6 |
| **63-2** | 63-2(2.5-5) | 2.5 to 5 | 0.0 |
| | 63-2(6-7.5) | 6 to 7.5 | 0.2 |
| | 63-2(7.5-10) | 7.5 to 10 | 0.2 |
| **63-3** | 63-3(2.5-2.5) | 2.5 to 5 | 0.3 |
| | 63-3(5-7.5) | 5 to 7.5 | 0.2 |
| | 63-3(7.5-10) | 7.5 to 10 | 0.0 |
| **63-4** | 63-4(2.5-5) | 2.5 to 5 | 0.1 |
| | 63-4(5-7.5) | 5 to 7.5 | 0.3 |
| | 63-4(7.5-10) | 7.5 to 10 | 0.5 |
| **63-5** | 63-5(2.5-5) | 2.5 to 5 | 0.1 |
| | 63-5(5-7.5) | 5 to 7.5 | 0.3 |
| | 63-5(7.5-10) | 7.5 to 10 | 1.1 |
| **63-6** | 63-6(2.5-5) | 2.5 to 5 | 0.0 |
| | 63-6(6-7.5) | 6 to 7.5 | 0.0 |
| | 63-6(7.5-10) | 7.5 to 10 | 46.0 |
| **63-7** | 63-7(2.5-5) | 2.5 to 5 | 200.0 |
| | 63-7(6-7.5) | 6 to 7.5 | 185.0 |
| | 63-7(7.5-10) | 7.5 to 10 | 1300.0 |
| **63-8** | 63-8(2.5-5) | 2.5 to 5 | 215.0 |
| | 63-8(6-7.5) | 6 to 7.5 | 1381.0 |
| | 63-8(7.5-10) | 7.5 to 10 | 1100.0 |
| **63-9** | 63-9(2.5-5) | 2.5 to 5 | 9.0 |
| | 63-9(6-7.5) | 6 to 7.5 | 38.0 |
| | 63-9(7.5-10) | 7.5 to 10 | 450.0 |

**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

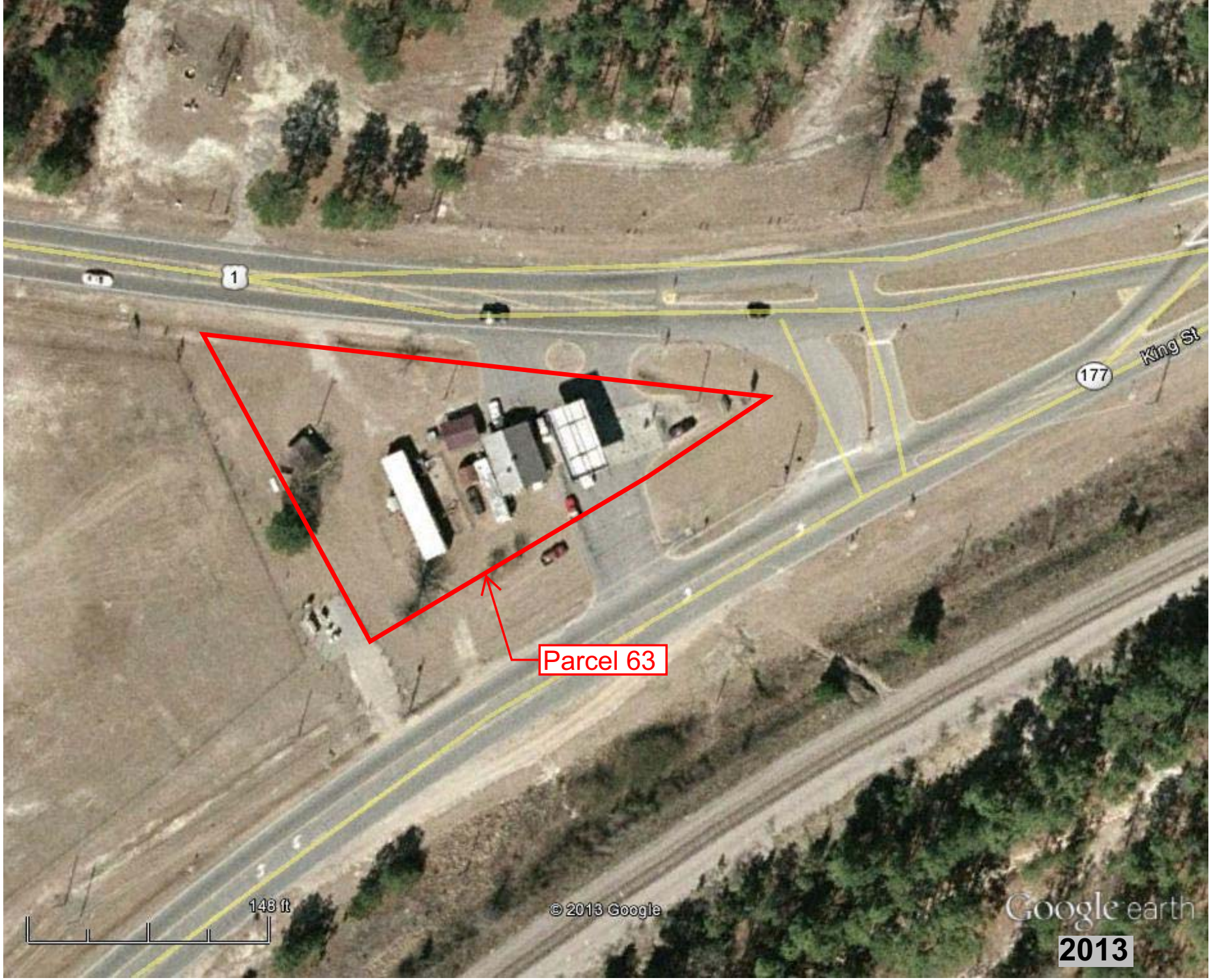
**NCDOT State Project R-2501C**
**2210 US Highway 1 North - Parcel 063**
**Rockingham, Richmond County, North Carolina**

| | | | | QROS - QED Analysis | | | Laboratory Analysis (Pace) | |
|---|---|---|---|---|---|---|---|---|
| **SAMPLE ID** | **DATE** | **DEPTH (feet)** | **PID (ppm)** | **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)** |
| 63-1(7.5-10) | 12/17/2013 | 7.5 to 10 | 0.6 | <0.5 | <0.5 | <0.5 | ------ | ------ |
| 63-2(6-7.5) | 12/17/2013 | 6 to 7.5 | 0.2 | <0.4 | <0.4 | <0.4 | ------ | ------ |
| 63-3(2.5-5) | 12/17/2013 | 2.5 to 5 | 0.3 | <0.5 | <0.5 | <0.5 | ------ | ------ |
| 63-4(7.5-10) | 12/17/2013 | 7.5 to 10 | 0.5 | <0.5 | <0.5 | <0.5 | ------ | ------ |
| 63-5(5-7.5) | 12/17/2013 | 5 to 7.5 | 0.3 | <0.4 | <0.4 | <0.4 | ------ | ------ |
| 63-5(7.5-10) | 12/17/2013 | 7.5 to 10 | 1.1 | <0.5 | <0.5 | <0.5 | <5.7 | <4.2 |
| 63-6(7.5-10) | 12/18/2013 | 7.5 to 10 | 46.0 | <0.5 | 1.4 | 1.4 | ------ | ------ |
| 63-7(2.5-5) | 12/18/2013 | 2.5 to 5 | 200.0 | <151 | **678** | 678 | ------ | ------ |
| 63-7(7.5-10) | 12/18/2013 | 7.5 to 10 | 1300.0 | **15968** | **7045** | 23013 | ------ | ------ |
| 63-8(6-7.5) | 12/18/2013 | 6 to 7.5 | 1318.0 | **200.4** | **77.8** | 278.2 | **227** | **102** |
| 63-9(6-7.5) | 12/18/2013 | 6 to 7.5 | 38.0 | <47 | **160** | 160 | ------ | ------ |
| 63-9(7.5-10) | 12/18/2013 | 7.5 to 10 | 450.0 | **64.9** | **55** | 119.6 | ------ | ------ |
| **NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO** | | | | 10 | 10 | NA | 10 | 10 |

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
"------" = No Laboratory Analysis

* Bold values indicate concentrations above initial action levels

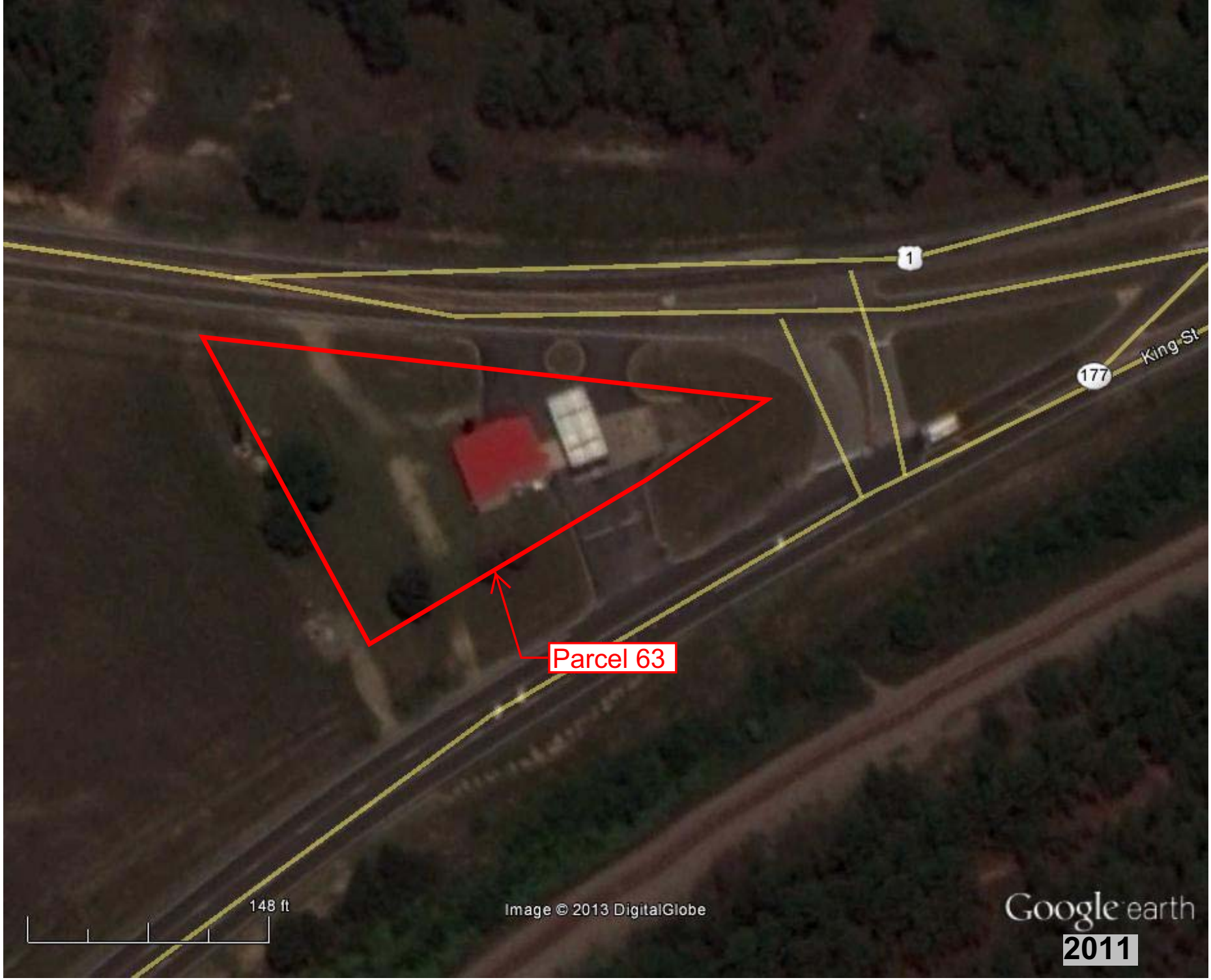
# APPENDIX A




Google earth

feet 300

meters 100




Google earth

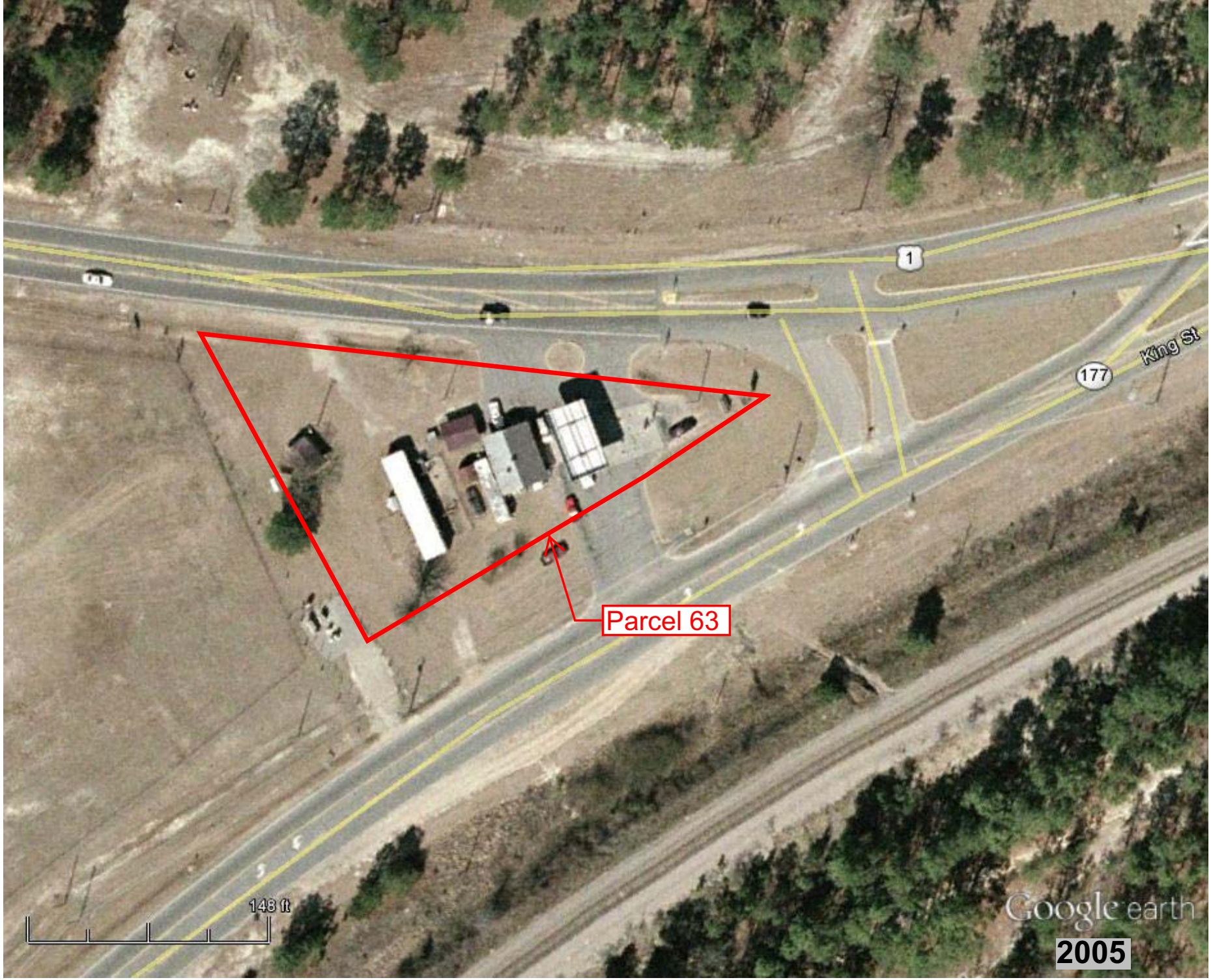
feet 300

meters 100


Google earth

feet 300

meters 100




Google earth

feet 300

meters 100


Google earth

feet 300

meters 100


Google earth

feet 300

meters 100


Parcel 63
1975


Parcel 63
1956


Parcel 63
1938

# APPENDIX B

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2013-278)

# GEOPHYSICAL SURVEY

## PARCEL 063 – LONNIE WALKER
## 2210 N. US 1
## NCDOT PROJECT R-2501C (34437.1.1)

**ROCKINGHAM, RICHMOND COUNTY, NC**

**JANUARY 13, 2013**

**Report prepared for:** **Mr. Gordon Box**
**GeoEnvironmental Project Manager**
**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.**
**NC License #1066**

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

**GEOPHYSICAL INVESTIGATION REPORT**
**Parcel 063, 2210 N. US 1**
**Rockingham, Richmond County, North Carolina**

# Table of Contents



# Figures

## EXECUTIVE SUMMARY

**Project Description:** Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Lonnie Walker Property, Parcel 063, 2210 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 parcel was divided into two separate geophysical survey grids due to its location at intersecting roads. The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys.

**Geophysical Results:** 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 in the north survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features. All of the EM61 anomalies in the south survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features, or were too minor to be considered USTs. GPR surveys performed across the two anomalies at the southwest boundary of the north survey area recorded evidence of possible utilities or other structures. The lack of significant lateral definition to these structures resulted in classifying them as “no confidence” in terms of metallic USTs.

The geophysical investigation did not record any evidence of metallic USTs at the property. Two unidentified anomalies were classified as “no confidence.”

## INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Lonnie Walker Property, Parcel 063, 2210 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 parcel was divided into two separate geophysical survey grids due to its location at intersecting roads. The north survey grid area extended approximately 400 feet from west to east and 35 feet from north to south. The south survey area extended approximately 310 feet from west to east and 60 feet from north to south. Conducted on December 5 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 an active service station, and otherwise consisted of asphalt parking areas and 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 5, 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 north and south survey areas at the property are presented in **Figures 2 and 3,** respectively. 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.

**North Survey Area – Discussion of EM Anomalies**: The EM anomalies at X=25, Y=20 and X=60, Y=15 were suspected to be associated with unmarked utilities. The EM anomaly at X=110, Y=40 was the result of metal stakes in the ground. The EM anomaly at X=152, Y=15 was the result of a reinforced right-of-way monument. The EM anomaly at X=188, Y=30 was the result of a water meter cover. The EM anomaly at X=242, Y=35 was suspected to be the result of isolated buried debris. The EM anomalies at X=310, Y=45 and X=365, Y=45 were associated with street signs. The EM anomaly at X=370, Y=20 was the result of the gas station

sign. The EM anomaly at X=396, Y=20 was the result of a reinforced right-of-way monument. Unknown anomalies were investigated further with the GPR.

**South Survey Area – Discussion of EM Anomalies**: The EM anomalies at X=70, X=160, and X=215 at Y=30 were the result of drainage culverts. The EM anomaly centered at X=220, Y=50 was associated with a mailbox. The EM anomaly at X=235, Y=75 was minor and suspected to be associated with isolated debris. The EM anomaly at X=285, Y=25 was associated with a reinforced bollard. The EM anomaly at X=293, Y=40 was the result of a metal guy wire. The EM anomaly at X=313, Y=40 was the result of a utility box. All anomalies were either directly attributed to visible cultural features or were considered insignificant with regards to USTs. Therefore, a GPR survey was not required for the south grid area.

**Figure 4** presents an overlay of the EM61 bottom coil contour maps for the north and south grid areas on the NCDOT engineering plans for reference.

**North Survey Area – Discussion of the GPR survey:** GPR Transects were performed across specific differential anomalies in the north grid area that were not explained by visible cultural features. **Figure 5** presents the location of the formal GPR transects that were saved to the hard drive, as well as the transect images. GPR Transects 1 and 2were performed across the suspected utilities located near the southwest boundary of the survey area. These transects recorded distinct reflectors that were consistent with a possible utility or other structure such as a drainage pipe in this area. While the EM amplitude associated with these anomalies was relatively high (similar to a metallic UST), the lack of a coherent lateral structure resembling a UST resulted in the conclusion that these features were likely associated with utilities or other structures. We classify these two anomalies as “no confidence” in accordance with the NCDOT classifications of USTs. Reconnaissance transects were performed across the anomaly at X=242, Y=35, and no evidence of any specific structures, utilities, or defined debris was observed.

## SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across Parcel 063 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 in the north survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features.
- All of the EM61 anomalies in the south survey area could be attributed to visible objects at the ground surface such as signs, culverts, and other cultural features, or were too minor to be considered USTs.
- GPR surveys performed across the two anomalies at the southwest boundary of the north survey area recorded evidence of possible utilities or other structures. The lack of significant lateral definition to these structures resulted in classifying them as "no confidence" in terms of metallic USTs.
- The geophysical investigation did not record any evidence of metallic USTs at the property. Two unidentified anomalies were classified as "no confidence."

## 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.

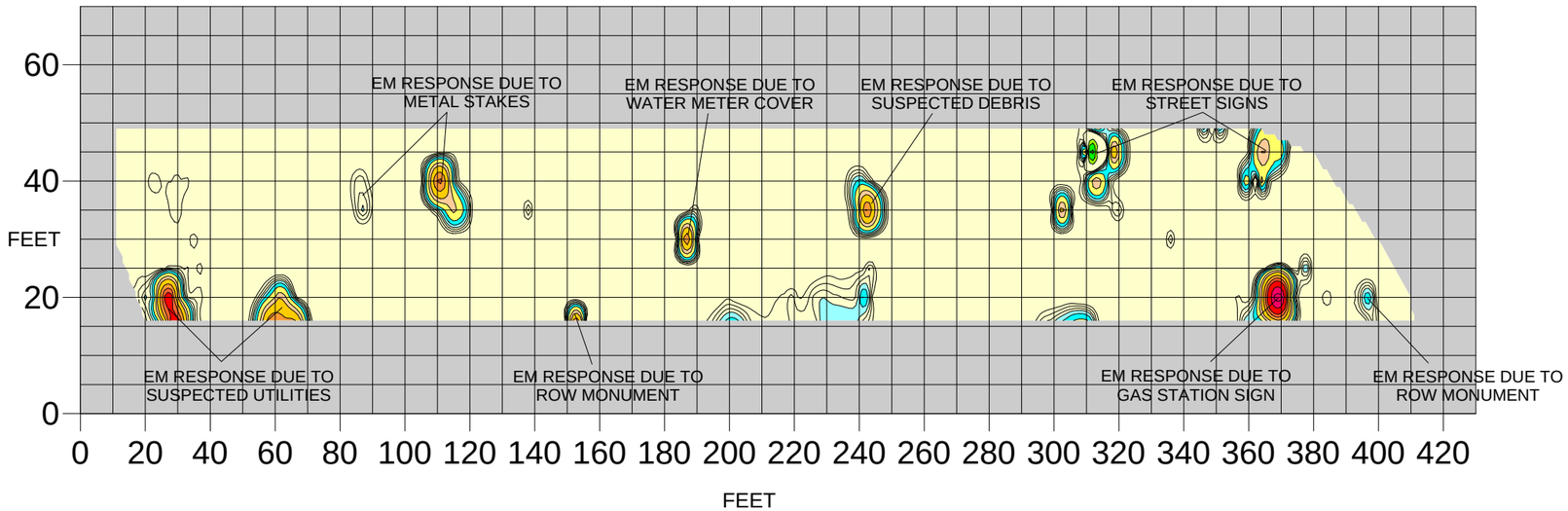

Approximate Boundaries of the Geophysical Survey Area

View of North Survey Area
(Facing Approximately East)

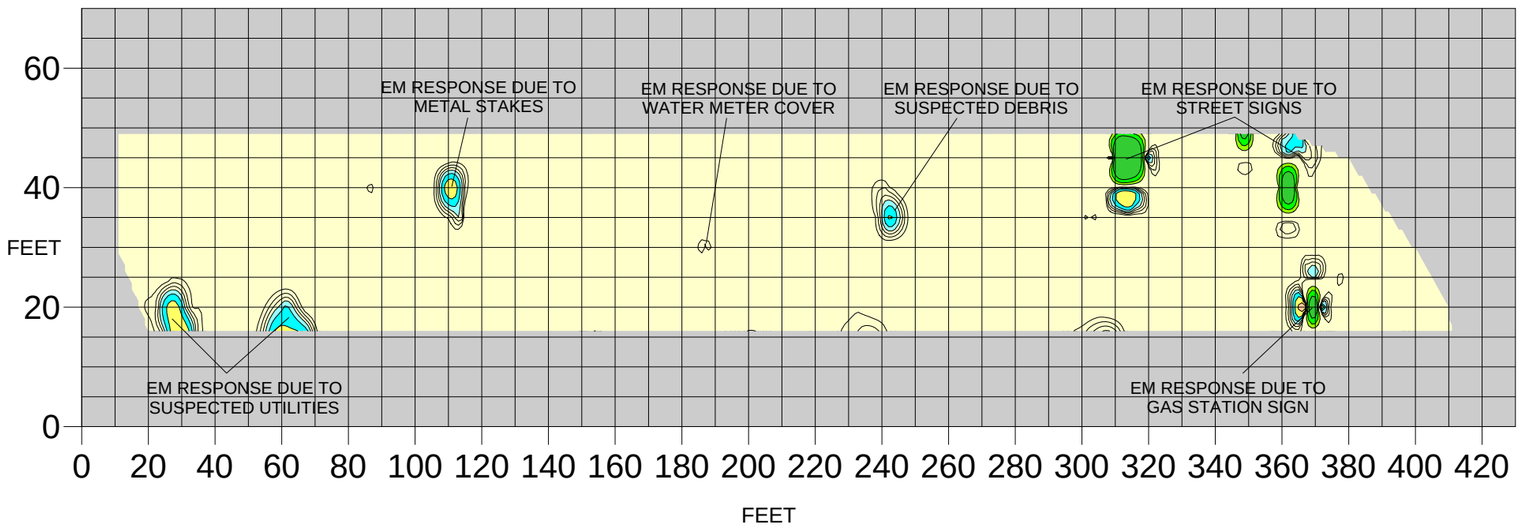
View of South Survey Area
(Facing Approximately West)

| | |
|---|---|
| TITLE | PARCEL 063:<br>GEOPHYSICAL SURVEY BOUNDARIES<br>AND SITE PHOTOGRAPHS |
| PROJECT | NCDOT PROJECT R-2501C (34437.1.1)<br>ROCKINGHAM, RICHMOND COUNTY, NC |
| PYRAMID ENVIRONMENTAL & ENGINEERING, P.C. | 503 INDUSTRIAL AVENUE<br>GREENSBORO, NC 27460<br>(336) 335-3174 (p) (336) 691-0648 (f)<br>License # C1251 Eng. / License # C257 Geology |
| DATE 1/6/2014 | CLIENT NCDOT |
| PYRAMID PROJECT #: 2013-278 | **FIGURE 1** |

## EM61 Bottom Coil Results (North Grid Area)



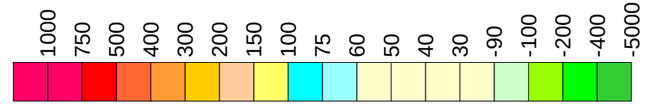

## EM61 Differential Results (North Grid Area)




## NO EVIDENCE OF METALLIC USTs OBSERVED

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 5, 2013 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on December 9, 2013, using aGSSI SIR 2000 unit coupled to a 400 MHz antennae.

EM61 Metal Detection Response (millivolts)




TITLE: PARCEL 063 - NORTH GRID AREA: EM61 BOTTOM COIL & DIFFERENTIAL RESULTS CONTOUR MAPS

PROJECT: NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

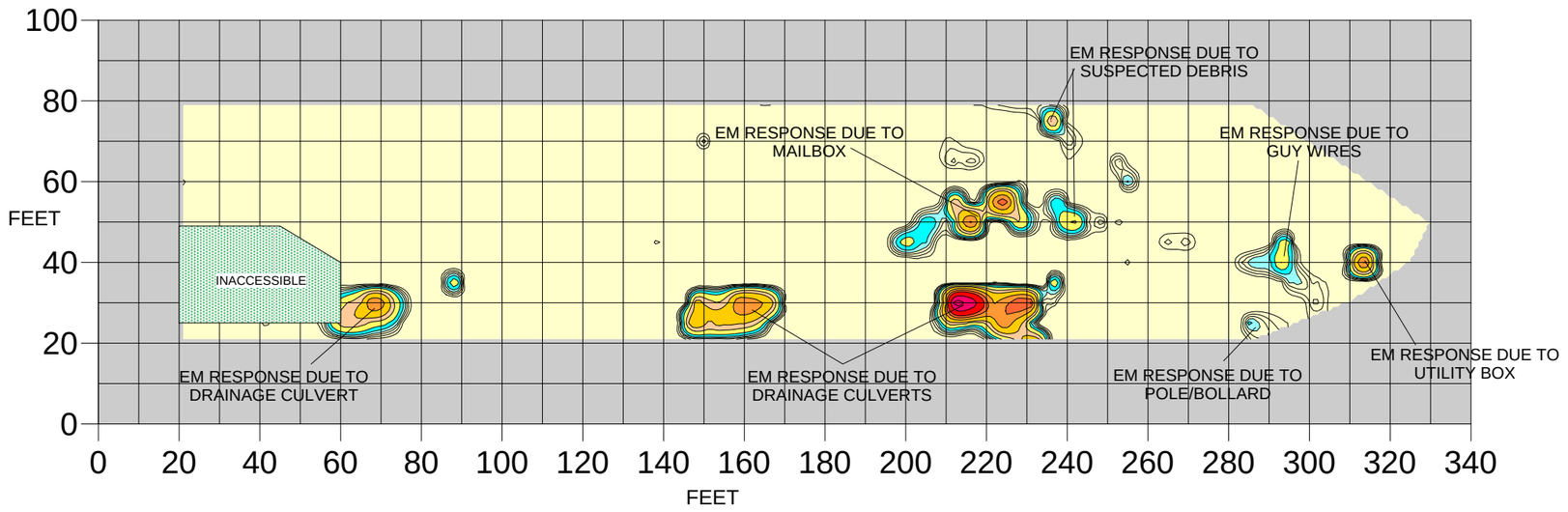
DATE: 1/6/2014

CLIENT: NCDOT

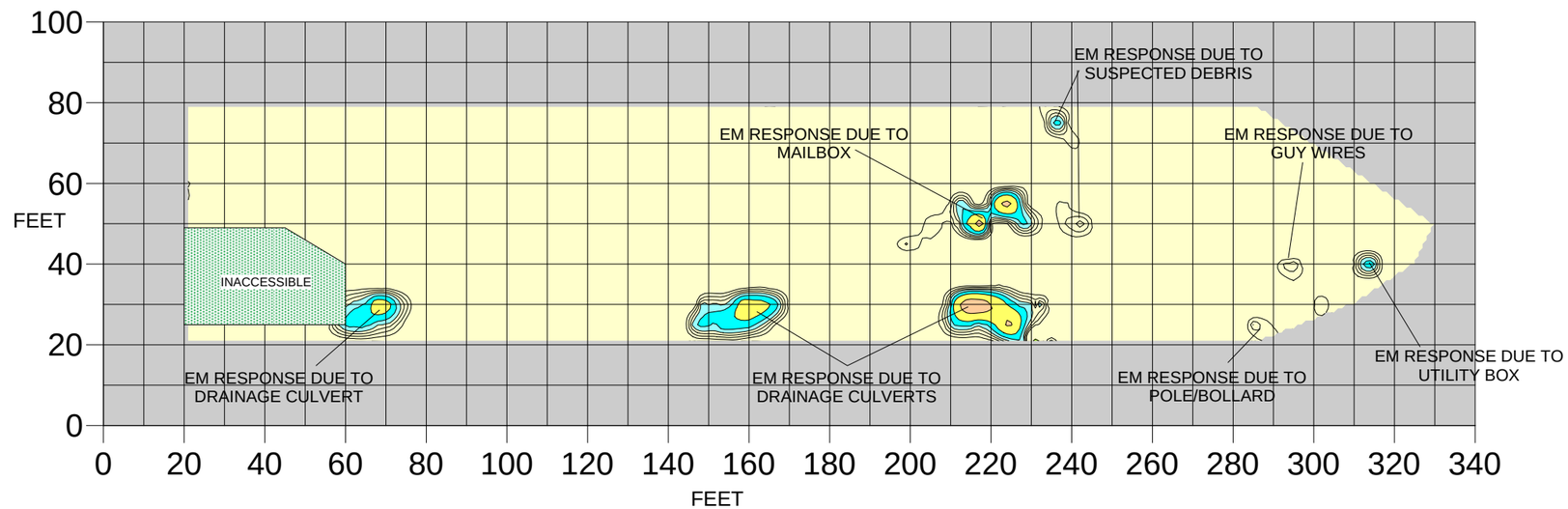
PYRAMID PROJECT #: 2013-278

**FIGURE 2**

## EM61 Bottom Coil Results (South Grid Area)



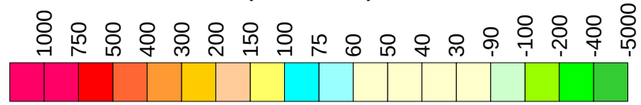

## EM61 Differential Results (South Grid Area)




## NO EVIDENCE OF METALLIC USTs OBSERVED

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 5, 2013 using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on December 9, 2013, using aGSSI SIR 2000 unit coupled to a 400 MHz antennae.

EM61 Metal Detection Response (millivolts)




TITLE: PARCEL 063 - SOUTH GRID AREA: EM61 BOTTOM COIL & DIFFERENTIAL RESULTS CONTOUR MAPS

PROJECT: NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC

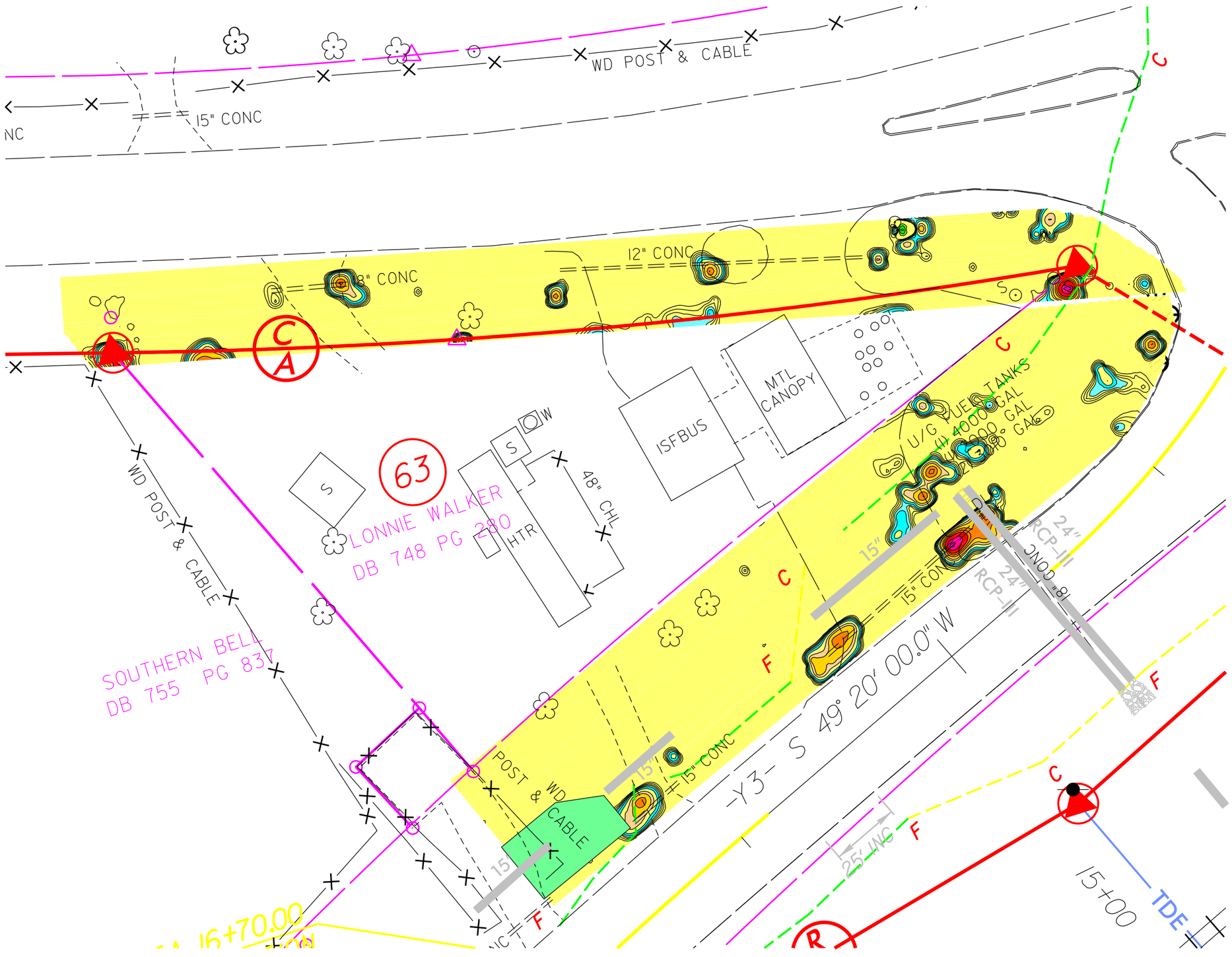
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27460
(336) 335-3174 (p) (336) 691-0648 (f)
License # C1251 Eng. / License # C257 Geology

DATE: 1/6/2014

CLIENT: NCDOT

PYRAMID PROJECT #: 2013-278

**FIGURE 3**




## LEGEND

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

N

0 50 100

FEET

TITLE
OVERLAY OF EM61 CONTOUR MAPS
ON ENGINEERING PLANS

PROJECT
NCDOT ROW PROJECT R-2501C (34437.1.1)
LONNIE WALKER - PARCEL 063
U.S. 1, RICHMOND COUNTY, NORTH CAROLINA

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
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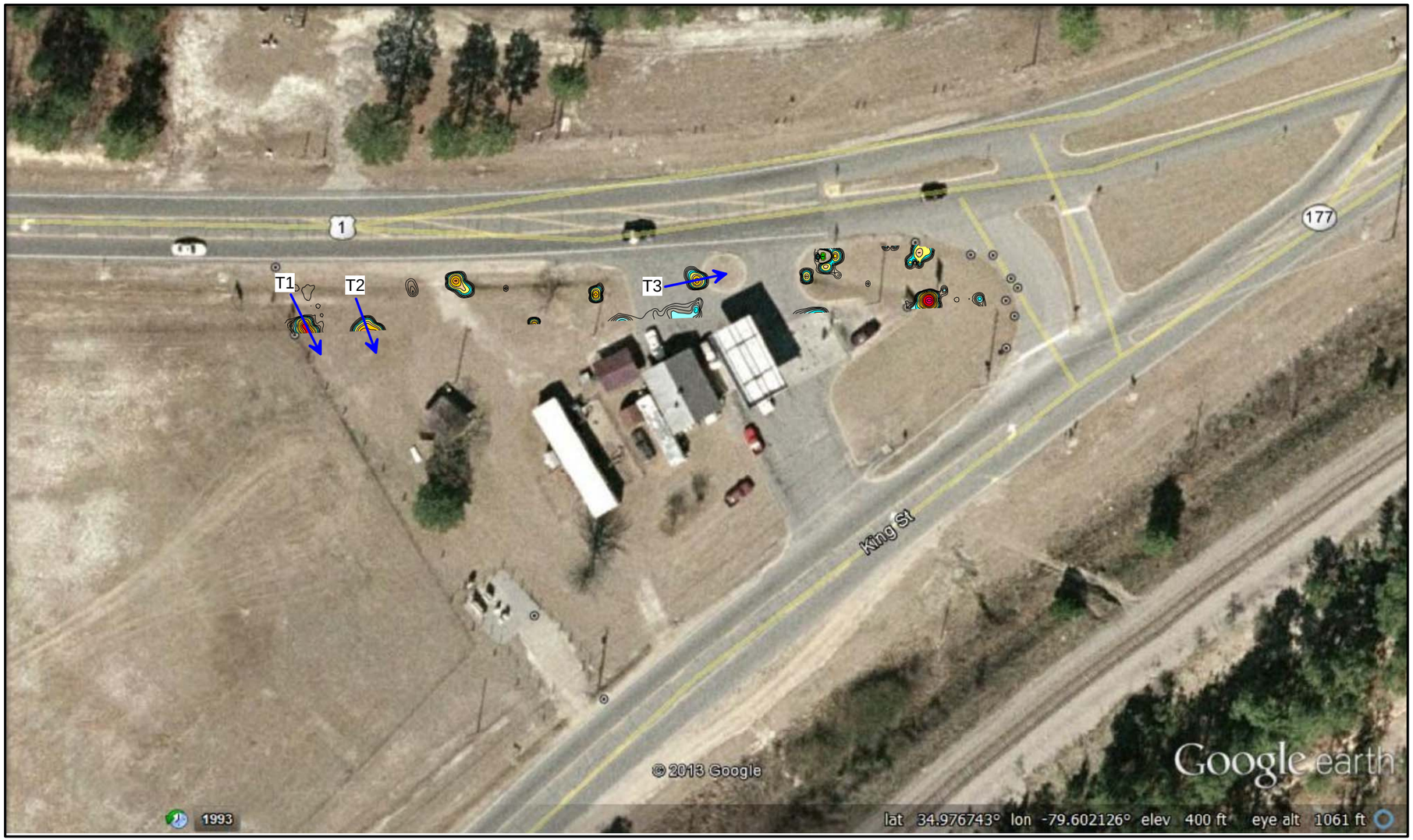
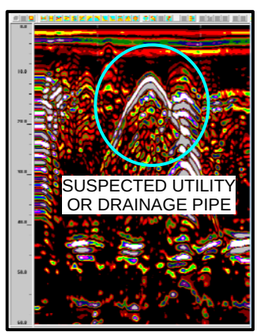
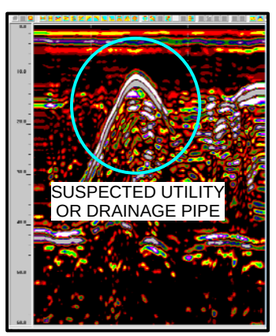
| | |
|---|---|
| DATE: 12-19-13 | REVISION NO. 0 |
| PYRAMID PROJECT NO. 2012-278 | FIGURE NO. 4 |



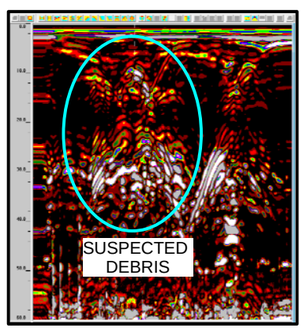

Approximate Boundaries of the Geophysical Survey Area




GPR Transect 1




GPR Transect 2




GPR Transect 3

N

TITLE: PARCEL 063: GPR TRANSECT LOCATIONS AND IMAGES

PROJECT: NCDOT PROJECT R-2501C (34437.1.1) ROCKINGHAM, RICHMOND COUNTY, NC

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.
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 5**

# APPENDIX C

# Pyramid Environmental & Engineering, P.C.

## FIELD DRILLING RECORD

| | | | |
|---|---|---|---|
| **PROJECT NAME: PROJECT NUMBER:** | NC DOT R-2501C, Parcel 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-1 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, Western Edge of Property Near U.S. 1 |
| **START DATE:** | 12/17/13 | **COMPLETED:** | 12/17/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Landscape Surface | |
| 2.5-7.5' | Brown to tan, fine to medium grain sand (SP), moist, no odor | PID=63-1(2.5-5): 0.2 PPM |
| | | PID=63-1(6-7.5): 0.0 PPM |
| 7.5-10' | Brown to tan, fine to medium grain sand (SP) to clayey-sand (SC), | PID=63-1(7.5-10): 0.6 PPM |
| | moist , no odor | |
| | | |
| | | |
| | | |
| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
| | | |
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| | | |
| | | |

## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-2 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, North of Store Near U.S. 1 |
| **START DATE:** | 12/17/13 | **COMPLETED:** | 12/17/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Landscape Surface | |
| 2.5-5' | Brown to tan, fine to medium grain sand (SP), moist, no odor | PID=63-2(2.5-5): 0.0 PPM |
| 6-7.5' | Tan, sand (SP), moist, no odor | PID=63-2(6-7.5): 0.2 PPM |
| 7.5-10' | Brown to tan, fine to medium grain clayey-sand (SC), moist, no odor | PID=63-2(7.5-10): 0.2 PPM |
| | | |
| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-3 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, Southwest Corner of Property Near Drainage Feature |
| **START DATE:** | 12/17/13 | **COMPLETED:** | 12/17/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Landscape Surface | |
| 2.5-5' | Brown to tan, fine to medium grain sand (SP), moist, no odor | PID=63-3(2.5-5): 0.3 PPM |
| 5-7.5' | Brown to tan, clayey-sand (SC) to sand (SP), moist, no odor | PID=63-3(5-7.5): 0.2 PPM |
| 7.5-10' | Brown, clayey-sand (SC) to sandy-clay (CL), moist, no odor | PID=63-3(7.5-10): 0.0 PPM |
| | | |
| | No recovery from 0 to 2.5 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-4 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, Southern Edge of Property Near Drainage Feature |
| **START DATE:** | 12/17/13 | **COMPLETED:** | 12/17/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Landscape Surface | |
| 2.5-5' | Brown to tan, silty-sand (ML) to sand (SP), moist to very moist, no odor | PID=63-4(2.5-5): 0.1 PPM |
| 5-7.5' | Tan, sand (SP), moist, no odor | PID=63-4(5-7.5): 0.3 PPM |
| 7.5-10' | Brown to tan, clayey-sand (SC) to sandy-clay (CL), moist, no odor | PID=63-4(7.5-10): 0.5 PPM |
| | | |
| | No recovery from 0 to 2.5 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-5 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, South of Store Near Drainage Feature |
| **START DATE:** | 12/17/13 | **COMPLETED:** | 12/17/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
|---|---|---|
| | Depths correspond to soil type transitions | Core Sample Depths |
| | Landscape Surface | |
| 2.5-5' | Brown to tan, sand (SP), moist, no odor | PID=63-5(2.5-5): 0.1 PPM |
| 5-7.5' | Brown, sandy-clayey (SC) to sand (SP), moist, no odor | PID=63-5(5-7.5): 0.3 PPM |
| 7.5-10' | Brown, sandy-clay to clay (CL), firm, moist, no odor | PID=63-5(7.5-10): 1.1 PPM |
| | | |
| | No recovery from 0 to 2.5 feet. | |
| | Set temporary well 63-5(TW) at 20 feet with 10 feet of screen. | |
| | On December 18th, gauged temporary well 63-5(TW) with water level | |
| | indicator. Temporary well was Dry - no water. | |
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## 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 4 BENTONITE USED ___ BAGS OF CEMENT USED 0.

# Pyramid Environmental & Engineering, P.C.

## FIELD DRILLING RECORD

| | | | |
|---|---|---|---|
| **PROJECT NAME: PROJECT NUMBER:** | NC DOT R-2501C, Parcel 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-6 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, North of Pump Island South of U.S. 1 |
| **START DATE:** | 12/18/13 | **COMPLETED:** | 12/18/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Asphalt Surface | |
| 2.5-5' | Brown, sand (SP), moist, no odor | PID=63-6(2.5-5): 0.0 PPM |
| 6-7.5' | Brown, sand (SP) to clayey-sand (SC), moist, no odor | PID=63-6(6-7.5): 0.0 PPM |
| 7.5-10' | Brown to tan, sandy-silty-clay (CL to ML), firm, moist, petroleum odor | PID=63-6(7.5-10): 46 PPM |
| | | |
| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-7 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, South/Down-gradient of UST System |
| **START DATE:** | 12/18/13 | **COMPLETED:** | 12/18/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Asphalt Surface | |
| 2.5-5' | Brown, sand (SP), moist, petroleum odor | PID=63-7(2.5-5): 200 PPM |
| 6-7.5' | Gray to tan, clayey-sand (SC) to sand (SP), petroleum odor | PID=63-7(6-7.5): 185 PPM |
| 7.5-10' | Tan, sandy-silty-clay (CL to ML), moist to very moist, petroleum odor | PID=63-7(7.5-10): 1300 PPM |
| | | |
| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-8 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, South/Down-gradient of UST System/Pump Island |
| **START DATE:** | 12/18/13 | **COMPLETED:** | 12/18/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Asphalt Surface | |
| 2.5-5' | Brown to tan, sand (SP), moist, petroleum odor | PID=63-8(2.5-5): 215 PPM |
| 6-7.5' | Brown to tan, clayey-silty-sand (SC to SP), moist, petroleum odor | PID=63-8(6-7.5): 1381 PPM |
| 7.5-10' | Brown to tan, sandy-silty-clay (CL to ML), moist to very moist, | PID=63-8(7.5-10): 1100 PPM |
| | petroleum odor | |
| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
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## 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 063, Lonnie Walker Property, Rockingham, NC / 2013-278 | **BORING/WELL NO:** | 63-9 |
| **SITE LOCATION:** | Richmond County, NC | **BORING/WELL LOCATION:** | Parcel 063, Lonnie Walker Property, South of Boring 63-7 Near Drainage Feature |
| **START DATE:** | 12/18/13 | **COMPLETED:** | 12/18/13 |
| **GEOLOGIST:** | Tim Leatherman | **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 |
| | Asphalt Surface | |
| 2.5-5' | Tan, sand (SP), moist, petroleum odor | PID=63-9(2.5-5): 9.0 PPM |
| 6-7.5' | Tan, clayey-sand (SC) to sand (SP), moist to very moist, petroleum odor | PID=63-9(6-7.5): 38 PPM |
| 7.5-10' | Brown to tan, sand (SP) to clayey-sand (SC), moist, petroleum odor | PID=63-9(7.5-10): 450 PPM |
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| | No recovery from 0 to 2.5 feet and 5 to 6 feet. | |
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## 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

AQROS

## Hydrocarbon Analysis Results

**Client:** NCDOT Richmond County R-2501C
**Address:** PARCEL 063
2210 US Highway 1 North
Rockingham, NC

**Contact:**

**Project:** NCDOT Richmond County R-2501C

**Samples taken** Nine (9) Samples Taken
**Samples extracted** 63-1 through 63-7
**Samples analysed** Nine (9) Samples Analysed

**Operator** Tim Leatherman

| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | 63-3(2.5-5) | 9.2 | <0.5 | <0.5 | #DIV/0! | #DIV/0! | < 0.46 | < 0.05 | < 0.023 | 0 | 0 | 100 | Match not possible |
| s | (63-3(2.5-5) R | 9.2 | <0.5 | <0.5 | <0.5 | <0.5 | < 0.46 | < 0.05 | < 0.023 | 0 | 0 | 100 | Match not possible |
| s | 63-5(5-7.5) | 8.5 | <0.4 | <0.4 | <0.4 | <0.4 | < 0.42 | < 0.04 | < 0.021 | 0 | 0 | 100 | Match not possible |
| s | 63-1(7.5-10) | 10.3 | <0.5 | <0.5 | <0.5 | <0.5 | < 0.52 | < 0.05 | < 0.026 | 0 | 0 | 100 | Match not possible |
| s | 63-2(6-7.5) | 7.8 | <0.4 | <0.4 | <0.4 | <0.4 | < 0.39 | < 0.04 | < 0.019 | 0 | 100 | 0 | Match not possible |
| s | 63-4(7.5-10) | 9.3 | <0.5 | <0.5 | <0.5 | <0.5 | < 0.47 | < 0.05 | < 0.023 | 0 | 0 | 100 | #DIV/0! |
| s | 63-6(7.5-10) | 9.9 | <0.5 | <0.5 | 1.4 | 1.4 | 0.92 | 0.09 | < 0.025 | 89.6 | 9 | 1.5 | Deg.Fuel 1.6% |
| s | 63-5(7.5-10) | 9.6 | <0.5 | <0.5 | <0.5 | <0.5 | < 0.48 | < 0.05 | < 0.024 | 0 | 0 | 100 | Deg.Diesel (est) 16.8% |
| s | 63-7(7.5-10) | 7699.0 | 6501 | 15968 | 7045 | 23013 | 4281 | 510 | <8 | 99.3 | 0.6 | 0.1 | V.Deg.Petrol (est) (PFM) |
| s | 63-7(2.5-5) | 6027.8 | <151 | <151 | 678 | 678 | 460 | <30 | 8 | 73 | 20.5 | 6.5 | Deg Fuel, (est) (PFM) |

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 subracted (LBS)= Library background subtracted % = match confidence

QED

QROS

## Hydrocarbon Analysis Results

**Client:** NCDOT Richmond County R-2501C
**Address:** PARCEL 063
2210 US Highway 1 North
Rockingham, NC

**Contact:**

**Project:** NCDOT Richmond County R-2501C

| | |
|---|---|
| **Samples taken** | Three (3) Samples Taken |
| **Samples extracted** | 63-8 through 63-9 |
| **Samples analysed** | Three (3) Samples Analysed |
| **Operator** | Tim Leatherman |

| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | Ratios | | | HC Fingerprint Match |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | % light | % mid | % heavy | |
| s | 63-8(6-7.5) | 352.8 | <17.6 | 1714.3 | #DIV/0! | #DIV/0! | 737.9 | 44.8 | <0.88 | 98 | 1.4 | 0.6 | #DIV/0! |
| s | 63-8(6-7.5) R | 50.4 | <2.5 | 200.4 | 77.8 | 278.2 | 64.89 | 0.53 | < 0.126 | 98.6 | 1 | 0.4 | Deg.Fuel (PFM) |
| s | 63-9(6-7.5) | 1880.9 | <47 | <47 | 160 | 160 | < 94 | <9 | <2 | 91.6 | 6.1 | 2.2 | Deg.Fuel Residue (PFM) |
| s | 63-9(7.5-10) | 60.8 | <3 | 64.6 | 55 | 119.6 | 33.52 | 0.71 | < 0.152 | 98.8 | 0.9 | 0.3 | Deg.Fuel Residue (PFM) |
| | | | | | | | | | | | | | |
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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 subracted (LBS)= Library background subtracted % = match confidence

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

Page: 1 of 1

**Pyramid Environmental & Engineering, P.C.**

Company:
Pyramid Environmental & Engineering, P.C.
Address: 503 Industrial Ave.
Greensboro, NC 27406

Purchase Order No.: WBS #34437.1.1
Project Name: NCDOT Richmond County Parcel 063
Project Number: 2013-278

Requested Analysis

| ITEM | SAMPLE ID | Matrix | C=Comp. G=Grab | COLLECTED Date | COLLECTED Time | Containers | Un-preserved | Methanol | GRO | DRO | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 63-1(7.5-10) | Soil | G | 12/17/13 | 14:00 | 1 | 9.7g | 20ml | X | X | |
| | 63-2(6-7.5) | | G | | 14:30 | 1 | 12.9g | | X | X | |
| | 63-3(2.5-5) | | G | | 14:45 | 1 | 10.8g | | X | X | |
| | 63-4(7.5-10) | | G | | 15:10 | 1 | 10.7g | | X | X | |
| | 63-5(5-7.5) | | G | | 15:27 | 1 | 11.8g | | X | X | |
| | 63-5(7.5-10) | | G | | 15:30 | 1 | 10.4g | | X | X | |
| | 63-6(7.5-10) | | G | 12/18/13 | 8:35 | 1 | 10.1g | | X | X | |
| | 63-7(2.5-5) | | G | | 8:50 | 1 | 10.8g | | X | X | |
| | 63-7(7.5-10) | | G | | 8:55 | 1 | 10.3g | | X | X | |
| | 63-8(6-7.5) | | G | | 9:15 | 1 | 12.3g | | X | X | |
| | 63-9(6-7.5) | | G | | 9:30 | 1 | 13.1g | | X | X | |
| | 63-9(7.5-10) | Soil | G | | 9:35 | 1 | 10.8g | | X | X | |

| Relinquished By / Affiliation | Date | Time | Accepted By / Affiliation | Date | Time |
|---|---|---|---|---|---|
| | | | | | |

**SAMPLER NAME AND SIGNATURE**

Print Name of Sampler: Timothy D. Leathermon
Signature of Sampler: Timothy D. Leathermon
Date Signed: 12/18/13

# APPENDIX E

**Pace Analytical Services, Inc.**
205 East Meadow Road - Suite A
Eden, NC 27288
(336)623-8921

**Pace Analytical Services, Inc.**
2225 Riverside Dr.
Asheville, NC 28804
(828)254-7176

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

December 31, 2013

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

RE: Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

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

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Huntersville, NC 28078
(704)875-9092

## CERTIFICATIONS

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

**Charlotte Certification IDs**
9800 Kincey 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

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **92184283001** | **63-5 (7.5-10)** | EPA 8015 Modified | NU1 | 2 | PASI-C |
| | | EPA 8015 Modified | GAW | 2 | PASI-C |
| | | ASTM D2974-87 | TNM | 1 | PASI-C |
| **92184283002** | **63-8 (6-7.5)** | EPA 8015 Modified | NU1 | 2 | PASI-C |
| | | EPA 8015 Modified | GAW | 2 | PASI-C |
| | | ASTM D2974-87 | TNM | 1 | PASI-C |

## REPORT OF LABORATORY ANALYSIS

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# PROJECT NARRATIVE

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

**Method:** **EPA 8015 Modified**
**Description:** 8015 GCS THC-Diesel
**Client:** NCDOT East Central
**Date:** December 31, 2013

**General Information:**
2 samples were 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:**

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# PROJECT NARRATIVE

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

**Method:** **EPA 8015 Modified**
**Description:** Gasoline Range Organics
**Client:** NCDOT East Central
**Date:** December 31, 2013

**General Information:**
2 samples were 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.

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## ANALYTICAL RESULTS

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

**Sample: 63-5 (7.5-10)** **Lab ID: 92184283001** Collected: 12/17/13 15:30 Received: 12/20/13 14:15 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 15:54 | 68334-30-5 | |
| ***Surrogates*** | | | | | | | | |
| n-Pentacosane (S) | 68 | % | 41-119 | 1 | 12/20/13 18:42 | 12/23/13 15:54 | 629-99-2 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | |
| Gasoline Range Organics | ND | mg/kg | 4.2 | 1 | 12/30/13 14:50 | 12/30/13 21:57 | 8006-61-9 | |
| ***Surrogates*** | | | | | | | | |
| 4-Bromofluorobenzene (S) | 101 | % | 70-167 | 1 | 12/30/13 14:50 | 12/30/13 21:57 | 460-00-4 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | |
| Percent Moisture | **12.4** | % | 0.10 | 1 | | 12/28/13 10:38 | | |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

**Sample: 63-8 (6-7.5)** **Lab ID: 92184283002** Collected: 12/18/13 09:15 Received: 12/20/13 14:15 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 | **227** | mg/kg | 5.4 | 1 | 12/20/13 18:42 | 12/23/13 16:17 | 68334-30-5 | |
| ***Surrogates*** | | | | | | | | |
| n-Pentacosane (S) | 111 | % | 41-119 | 1 | 12/20/13 18:42 | 12/23/13 16:17 | 629-99-2 | |
| **Gasoline Range Organics** | Analytical Method: EPA 8015 Modified Preparation Method: EPA 5035A/5030B | | | | | | | |
| Gasoline Range Organics | **102** | mg/kg | 5.0 | 1 | 12/30/13 14:50 | 12/31/13 02:35 | 8006-61-9 | |
| ***Surrogates*** | | | | | | | | |
| 4-Bromofluorobenzene (S) | 130 | % | 70-167 | 1 | 12/30/13 14:50 | 12/31/13 02:35 | 460-00-4 | |
| **Percent Moisture** | Analytical Method: ASTM D2974-87 | | | | | | | |
| Percent Moisture | **6.7** | % | 0.10 | 1 | | 12/28/13 10:38 | | |

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

QC Batch: GCV/7658
QC Batch Method: EPA 5035A/5030B
Analysis Method: EPA 8015 Modified
Analysis Description: Gasoline Range Organics
Associated Lab Samples: 92184283001, 92184283002

METHOD BLANK: 1114325 Matrix: Solid
Associated Lab Samples: 92184283001, 92184283002

| 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 Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 63 WSB #34437.1.1
Pace Project No.: 92184283

QC Batch: OEXT/25303
QC Batch Method: EPA 3546
Analysis Method: EPA 8015 Modified
Analysis Description: 8015 Solid GCSV
Associated Lab Samples: 92184283001, 92184283002

METHOD BLANK: 1111061 Matrix: Solid
Associated Lab Samples: 92184283001, 92184283002

| 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 Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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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205 East Meadow Road - Suite A
Eden, NC 27288
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## QUALITY CONTROL DATA

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

QC Batch: PMST/6122
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92184283001, 92184283002

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 63 WSB #34437.1.1
Pace Project No.: 92184283

## 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

**Pace Analytical Services, Inc.**
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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: RICHMOND 63 WSB #34437.1.1
Pace Project No.: 92184283

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **92184283001** | **63-5 (7.5-10)** | EPA 3546 | OEXT/25303 | EPA 8015 Modified | GCSV/16310 |
| **92184283002** | **63-8 (6-7.5)** | EPA 3546 | OEXT/25303 | EPA 8015 Modified | GCSV/16310 |
| **92184283001** | **63-5 (7.5-10)** | EPA 5035A/5030B | GCV/7658 | EPA 8015 Modified | GCV/7661 |
| **92184283002** | **63-8 (6-7.5)** | EPA 5035A/5030B | GCV/7658 | EPA 8015 Modified | GCV/7661 |
| **92184283001** | **63-5 (7.5-10)** | ASTM D2974-87 | PMST/6122 | | |
| **92184283002** | **63-8 (6-7.5)** | ASTM D2974-87 | PMST/6122 | | |

| Pace Analytical | Sample Condition Upon Receipt (SCUR) | Page 1 of 2 |
|---|---|---|
| | 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.:** 2.3 °C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C

**Date and Initials of person examining contents:** EJD 12/20/13

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

Place label here

Pace Analytical®
www.pacelabs.com

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1667366

**Section A** — **Required** Client Information:

Company: Pyramid Environmental
Address: P.O. Box 16265, Greensboro, NC 27416
Email To: Tim
Phone: 336.335.3174 Fax:
Requested Due Date/TAT: Normal

**Section B** — **Required** Project Information:

Report To: Tim Leatherman - Pyramid
Copy To: NCDOT
Purchase Order No.: WBS#34437.1.1
Project Name: NCDOT Richmond County Parcel 163
Project Number: 2013-278 / #34437.1.1

**Section C** — Invoice Information:

Attention: NCDOT
Company Name: NCDOT
Address:
Pace Quote Reference: WBS#34437.1.1
Pace Project Manager: Jon Bradley
Pace Profile #:

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☑ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: NC

**Section D** — **Required** Client Information

**SAMPLE ID**
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

**Matrix Codes** — MATRIX / CODE

| | |
|---|---|
| Drinking Water | DW |
| Water | WT |
| Waste Water | WW |
| Product | P |
| Soil/Solid | SL |
| Oil | OL |
| Wipe | WP |
| Air | AR |
| Tissue | TS |
| Other | OT |

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED: COMPOSITE START DATE | COMPOSITE START TIME | COMPOSITE END/GRAB DATE | COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N: 5035-GRO | 3550-DRO | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 63-5 (7.5-10) | SL | G | | | 12/17/13 | 15:30 | | 4 | X | | | | | | X | | X | X | | 92184283 |
| 2 | 63-8 (6-7.5) | SL | G | | | 12/18/13 | 9:15 | | 4 | X | | | | | | X | | X | X | | 002 |
| 3 | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | |
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| 11 | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS: Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Timothy D Leatherman / Pyramid | 12/20 | 1120 | Rebecca Lynn / Pace | 12/20 | 1120 | | | | |
| | Rebecca Lynn / Pace | 12/20 | 1415 | Zack Hamilton | 12/20/13 | 1415 | 2.3 | Y | N | Y |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: Timothy D. Leatherman
SIGNATURE of SAMPLER: Timothy D Leatherman
DATE Signed (MM/DD/YY): 12/20/13

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

# APPENDIX F

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross **Date:** 11/26/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cros:*
On site: 8AM
Mobilize to site. Performed site visits and owner interviews.
Leave site: 3PM (additional processing performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross & Mika Trifunovic **Date:** 12/3/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross & M. Trifunovic:*
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 5:30PM (additional processing performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross & Mika Trifunovic **Date:** 12/4/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross & M. Trifunovic:*
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 5:30PM (additional processing performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross & Mika Trifunovic **Date:** 12/5/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross & M. Trifunovic:*
On site: 8AM
Mobilize to site. Performed geophysical surveys.
Leave site: 6:00PM (additional processing performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross **Date:** 12/6/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross:*
On site: 8AM
Mobilize to site. Performed geophysical surveys. Demobilize.
Leave site: 5:00PM

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross & Tim Leatherman **Date:** 12/9/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross:*
On site: 8AM
Mobilize to site. Performed geophysical surveys & boring location selection. Demobilize.
Leave site: 5:30PM

*T. Leatherman:*
On site: 9AM
Mobilize to site. Assisted with geophysics, boring location selection and site research. Demobilize.
Leave site: 4:00PM

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

**Name:** Tim Leatherman **Date:** 12/13/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*T. Leatherman:*
On site: 8AM
Mobilize to site. Geophysics (private locating) and site research. Demobilize.
Leave site: 3:30PM

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Eric Cross &Tim Leatherman **Date:** 12/16/13 **Mon** **Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*E. Cross & T. Leatherman:*
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 5:30PM (additional QED analysis performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

**Name:** Tim Leatherman **Date:** 12/17/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*T. Leatherman:*
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 4:00PM (additional QED analysis performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW PARCELS 11, 27, 33, 42, 45, 49 and 63 **PROJECT NO.:** R-2501C

**Name:** Tim Leatherman **Date:** 12/18/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*T. Leatherman:*
On site: 8AM
Mobilize to site. Supervision of geoprobe sampling, classifications, QED prep & analysis.
Leave site: 3:00PM (additional QED analysis performed in evening)

**FIELD PERSONNEL LOG**

**PROJECT NAME**: NCDOT Richmond County ROW **PROJECT NO.:** R-2501C
PARCELS 11, 27, 33, 42, 45, 49 and 63

**Name:** Tim Leatherman **Date:** 12/19/13 **Mon Tue Wed Th Fri Sat Sun**

**TASKS PERFORMED:**

*T. Leatherman:*
On site: 8AM
Mobilize to site. QED prep & analysis, photos, dispose of samples. Demobilize.
Leave site: 4:30PM