PRELIMINARY SITE ASSESSMENT

PARCEL 4 – DONALD GOINS
217 NC-49
ASHEBORO, RANDOLPH COUNTY, NORTH CAROLINA
STATE PROJECT: U-5305
WBS ELEMENT: 47025.1.1
May 30, 2014

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PRELIMINARY SITE ASSESSMENT
PARCEL 4, DONALD GOINS
217 NC-49
ASHEBORO, RANDOLPH 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 4, Donald Goins. The Donald Goins property is currently an active tow truck facility (Lyda's Towing, Inc.) and towed vehicle lot located at 217 NC-49, Asheboro, NC. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's April 28, 2014, 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 across the entire subject property. Prior to this PSA, Pyramid performed a preliminary geophysical survey to identify possible metallic USTs at the property within the proposed ROW and/or easement and edge of pavement (State Project U-5305). Three known USTs were identified at the property, however, at the time these USTs were outside of the proposed ROW/easements depicted on the NCDOT engineering plans. Subsequently, the NCDOT requested that Pyramid extend the geophysical survey limits to include the entire parcel, and to perform a full PSA at the entire property.

The following statements summarize the results of the PSA:

- **Site History:** On May 12, 2014, Pyramid emailed the Federal Trust Fund ID# to Ms. Linda Blalock, the Raleigh Central Office Federal Trust Fund Manager for the DENR, with a request to investigate any environmental incidents associated with the parcels. Ms. Blalock responded to the email and verified that site address 217 NC-49 (Parcel 4) had an environmental incident (Trust Fund incident #3739) associated with the property. Pyramid staff performed a file review of the incident on May 14, 2014, at the DENR Raleigh Central office and made copies of appropriate materials associated with the incident.

    - Historical research indicates that a Shell station (the Agner Shell Station) was constructed at Parcel 4 in 1969.
    - The Agner Shell Station contained three gasoline USTs (two 10,000 gallon and one 6,000 gallon), and one kerosene UST (550 gallon). The

kerosene UST was later used to store waste oil. Since the early 1990's, the all four USTs have been inactive.

- A Pollution Incident was opened in 1988 at the Paul Barker residence, south of Parcel 4, based on the claim of the resident that a petroleum odor was evident in his drinking water. The claim was submitted to the Federal Trust Fund in November 1988 (#3739), and ultimately the Trust Fund Site included approximately 200 acres surrounding the Paul Baker residence, including Parcel 4.
- A number of supply wells surrounding the Paul Barker residence were sampled as part of the incident and found to be contaminated. Included in these wells was the supply well located at Parcel 4, the Agner Shell Station. The majority of the supply wells exhibited elevated concentrations of petroleum constituents.
- A variety of partial and incomplete investigations were performed in the area through the Trust Fund from the late 1980's through the 1990's. A number of monitor wells were installed throughout the area (including at Parcel 4) seeking a petroleum source.
- Petroleum contamination was recorded by Geophex at Parcel 4 (Agner shell Station) at the monitor well L54T7, located near the gasoline UST basin, in 1992. A Benzene concentration of 7.4 µg/L and an MTBE concentration of 170 µg/L were recorded in the groundwater. Other levels of groundwater petroleum contamination were recorded throughout the area, and a direct source of contamination was not determined.
- By September of 2000, all businesses and residences associated with the incident had been converted to city water supply, and all private water supply wells were closed.
- In December 2002, Mr. Stephen Williams of NC DENR informed Ms. Linda Blalock, the incident manager, that the incident #3739 had been re-classified to low risk and the incident was closed. No significant remediation was performed.

On May 6, 2014, Pyramid Project Manager Eric Cross performed a site visit at the property and interviewed the property tenants (Mr. Lyda and son). The site visit reaffirmed the presence of three known USTs on the north portion of the property adjacent to the canopy in front of the building. The layout of the facility and location of the three USTs was consistent with a former fuel service station, which correlated to the historical use of the parcel as a Shell gas station. Mr. Lyda indicated that a septic tank was present on the south side of the building, and directed Mr. Cross to the location, which was apparent by a partial excavation of the tank. Mr. Lyda also indicated that an in-ground hydraulic lift was located within the automobile service bays on the east side of the structure; however, it had not been used during his time as a tenant. Additionally, he indicated that a waste oil pit was present in the bay directly east of the hydraulic lift. This oil pit

had also not been used during his time as a tenant. A metal grate was visible in the ground at the location of the waste oil pit, and the in-ground hydraulic lift was visible in the adjacent bay. Vehicles in the bays prevented further access by investigative instruments. To his knowledge there were no open regulatory incidents associated with the parcel.

- **Geophysical Survey:** Three known USTs were identified during Pyramid's June 2013 investigation, and verified by this investigation to be located directly east of the canopy in front of the main building on site. One septic tank was identified on the south portion of the property by the EM survey. One probable UST was identified directly adjacent to the south side of the building. In summary, the geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, a septic tank was observed on the south side of the building.

- **Limited Soil Assessment:** The DENR action levels for both TPH-GRO and TPH-DRO are 10 milligrams per kilogram (mg/kg). The QED results for soil samples at boring locations 4-3, 4-4, 4-5, 4-6, 4-8, 4-9, 4-11, 4-12, 4-13, 4-14, 4-15, 4-16, 4-17, and 4-18 did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg. The QED results did detect DRO concentrations above 10 mg/kg at the locations of borings 4-1, 4-2, 4-7, 4-10, and 4-19. Specifically, DRO concentrations ranging from 10.94 mg/kg to 234.2 mg/kg were recorded in these borings. GRO concentrations in these five borings were all below 10 mg/kg.

- **Limited Groundwater Assessment:** Review of the Federal Trust Fund documents associated with Incident #3739 indicated at least one monitor well had been installed at the site, in the parking lot to the northeast of the building. Pyramid staff were able to locate and sample this well (4-MW). The well was determined to be 24 feet deep. The depth-to-groundwater was measured at 8.5 feet below land surface (BLS).

  The 6200B laboratory analysis detected concentrations of Benzene (3.4 µ/L), Methylene Chloride (15.9 µ/L), methyl tert-Butyl ether, or MTBE (351 µg/L), and 1,2 Dichloroethane (4 µg/l) above NCAC 2L groundwater standards. The 2L standards for Benzene, Methylene Chloride, MTBE and 1,2 Dichloroethane under the 6200B method are 1.0, 5.0, 20.0, and 0.4 µg/L, respectively.

- **Contaminated Soil Volumes:** Pyramid's PSA investigation resulted in an estimated area of 2,208 square feet of impacted soil in the area containing borings 4-1, 4-2 and 4-7. An estimated area of 908 square feet of impacted soil was calculated around boring 4-10, and an estimated area of 400 square feet was calculated around boring 4-19. **This results in a total estimated area of contamination of 3,516 square feet of impacted soil at the property**.

The greatest depth of contamination at the area containing borings 4-1, 4-2, and 4-7 was from 8-10 feet BLS. The greatest depth of contamination at the areas containing borings 4-10 and 4-19 was from 4 to 6 feet. For this reason, a maximum depth of 10 feet will be used to approximate total volumes of contaminated soil at borings 4-1, 4-2, and 4-7, and a maximum depth of 6 feet will be used at the locations of borings 4-10 and 4-19. It should be noted that this is a gross estimate based on the data available. Using the above designated thicknesses of contaminated soil, Pyramid estimates a total of approximately 29,928 cubic feet, or **1,108 cubic yards of impacted soils** in the three areas of contamination combined. The boundaries of the areas of contamination are approximate due to limited soil data.

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 4, Donald Goins. The Donald Goins property is currently an active tow truck facility (Lyda's Towing, Inc.) and towed vehicle lot located at 217 NC-49, Asheboro, NC. This preliminary site assessment was conducted on behalf of the North Carolina Department of Transportation (NCDOT) in accordance with Pyramid's April 28, 2014, 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 across the entire subject property. Prior to this PSA, Pyramid performed a preliminary geophysical survey to identify possible metallic USTs at the property within the proposed ROW and/or easement and edge of pavement (State Project U-5305). Three known USTs were identified at the property; however, at the time these USTs were outside of the proposed ROW/easements depicted on the NCDOT engineering plans. Subsequently, the NCDOT requested that Pyramid extend the geophysical survey limits to include the entire parcel, and to perform a full PSA at the entire property. The location of the subject site is shown on **Figure 1**.

1.1 Background Information

This PSA was performed as a supplemental investigation based on the NCDOT's March 31, 2014, *Request for Technical and Cost Proposal*. The PSA was conducted across all accessible portions of the parcel, with emphasis on the areas to be cut as indicated by slope stake lines and cross sections or to be excavated for the installation of drainage features and/or other utilities, in accordance with the CADD files provided to Pyramid by the NCDOT. Additionally, the results of Pyramid's initial June 2013 investigation were used to help direct the PSA investigation. The PSA included the following:

- Research the properties for past uses and possible releases.
- Conduct a preliminary geophysical site assessment and limited soil assessment across the entire parcel with emphasis on the areas to be cut as indicated by slope stake lines and cross sections or to be excavated for the installation of drainage features and/or other utilities.
- Should an existing monitor well be present at the property, report the depth to groundwater for that site and attempt to obtain one groundwater sample for laboratory analysis.

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

Pyramid completed a records review of the parcel, interviewed DENR personnel, interviewed the property owner, and reviewed readily available aerial photographs, and DENR incident files to assess past uses of the property. Pyramid reviewed historical aerial photographs dating back to 1993 available from Google Earth for past uses. The 1993, 1999, 2006, 2008, 2009, 2010, 2012, and 2013 aerial photographs are included in **Appendix A**. The property currently contains an active tow truck facility (Lyda's Towing, Inc.) consisting of a service station building and canopy. A large fenced area is present on the south side of the building that is used to store towed vehicles and other miscellaneous objects and debris. The historical aerials indicate that all of the current buildings and structures have been present since at least 1993. Historical research (see below) indicates that the building was constructed in 1969. Additionally, research of the area indicated that the property is associated with Federal Trust Incident #3739.

On May 12, 2014, Pyramid emailed the Federal Trust Fund ID# to Ms. Linda Blalock, the Raleigh Central Office Federal Trust Fund Manager for the DENR, with a request to investigate any environmental incidents associated with the parcels. Ms. Blalock responded to the email and verified that site address 217 NC-49 (Parcel 4) had an environmental incident (Trust Fund incident #3739) associated with the property. Pyramid staff performed a file review of the incident on May 14, 2014, at the DENR Raleigh Central office and made copies of appropriate materials associated with the incident.

The documents associated with the incident included a variety of environmental reports and correspondence associated with the Trust Fund Incident. Those of the most importance to this PSA (included in Appendix B) include: 1) A DENR Pollution Incident/UST Leak Reporting Form from 1988, 2) A November 2000 Summary of Investigations Report submitted to DENR by Geophex, Ltd., 3) A list of residences and businesses in the area that were ultimately connected to a city water line, and 4) DENR Closure letter correspondence. The following is a summary of these materials:

- Historical research indicates that a Shell station (the Agner Shell Station) was constructed at Parcel 4 in 1969.
- The Agner Shell Station contained three gasoline USTs (two 10,000 gallon and one 6,000 gallon), and one kerosene UST (550 gallon). The

kerosene UST was later used to store waste oil. Since the early 1990's, the four USTs have been inactive.

- A Pollution Incident was opened in 1988 at the Paul Barker residence, south of Parcel 4, based on the claim of the resident that a petroleum odor was evident in his drinking water. The claim was submitted to the Federal Trust Fund in November 1988 (#3739), and ultimately the Trust Fund Site included approximately 200 acres surrounding the Paul Baker residence, including Parcel 4.
- A number of supply wells surrounding the Paul Barker residence were sampled as part of the incident and found to be contaminated. Included in these wells was the supply well located at Parcel 4, the Agner Shell Station. The majority of the supply wells exhibited elevated concentrations of petroleum constituents.
- A variety of partial and incomplete investigations were performed in the area of the Paul Barker residence through the Trust Fund from the late 1980's through the 1990's. A number of monitor wells were installed throughout the area (including at Parcel 4) seeking a petroleum source. Full details of these investigations are included in the Geophex Report in **Appendix B.**
- Petroleum contamination was recorded by Geophex at Parcel 4 (Agner shell Station) at the monitor well L54T7, located near the gasoline UST basin, in 1992. A Benzene concentration of 7.4 µg/L and an MTBE concentration of 170 µg/L were recorded in the groundwater. Other levels of groundwater petroleum contamination were recorded throughout the area, and a direct source of contamination was not determined.
- By September of 2000, all businesses and residences associated with the incident had been converted to city water supply, and all private water supply wells were closed.
- In December 2002, Mr. Stephen Williams of NC DENR informed Ms. Linda Blalock, the incident manager, that the incident #3739 had been re-classified to low risk and the incident was closed. No significant remediation was performed.

The above information summarizes the documents reviewed at the DENR office for this site. Copies of portions of the appropriate correspondence and reports are included in **Appendix B**.

On May 6, 2014, Pyramid Project Manager Eric Cross performed a site visit at the property and interviewed the property tenants (Mr. Lyda and son). The site visit reaffirmed the presence of three known USTs on the north portion of the property adjacent to the canopy in front of the building. The layout of the facility and location of the three USTs was consistent with a former fuel service station, which correlated to the historical use of the parcel as a Shell gas station. Mr. Lyda indicated that a septic tank

was present on the south side of the building, and directed Mr. Cross to the location, which was apparent by a partial excavation of the tank. Mr. Lyda also indicated that an in-ground hydraulic lift was located within the automobile service bays on the east side of the structure; however, it had not been used during his time as a tenant. Additionally, he indicated that a waste oil pit was present in the bay directly east of the hydraulic lift. This oil pit had also not been used during his time as a tenant. A metal grate was visible in the ground at the location of the waste oil pit, and the in-ground hydraulic lift was visible in the adjacent bay. Vehicles in the bays prevented further access by investigative instruments. To his knowledge there were no open regulatory incidents associated with the parcel.

3.0 Geophysical Investigation

Pyramid performed electromagnetic (EM) and ground penetrating radar (GPR) surveys across the accessible portions of the Parcel. The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles and debris, or to suspected reinforced concrete. Areas of reinforced concrete were recorded as anomalies by the EM, and verified by the GPR. No structures were observed beneath the reinforcement that were indicative of USTs. Three known USTs were identified during Pyramid's June 2013 investigation, and verified by this investigation to be located directly east of the canopy in front of the main building on site.

One septic tank was identified on the south portion of the property by the EM survey. The septic tank was partially excavated, and the property tenant verified that this structure was a septic tank. One probable UST was identified directly adjacent to the south side of the building. The EM response in conjunction with a visible vent pipe and historical research resulted in its classification as a probable UST. The geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, a septic tank was observed on the south side of the building.

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

4.0 Soil Sampling Activities & Results

4.1 Soil Assessment Field Activities

On May 14, 2014, Pyramid mobilized to the site, drilled soil borings and collected the proposed soil samples for the PSA. The soil borings were completed using a track mounted Geoprobe® Direct-Push rig. Nineteen (19) soil borings (4-1 through 4-19) were advanced on the subject property. The selected locations were chosen to avoid public

utilities along the adjacent roads and private utilities associated with the business while remaining in the parcel boundaries.

The soil borings were installed at or adjacent to proposed drainage piping, as indicated by the NCDOT engineering plans, near the known UST field, adjacent to existing pump islands, adjacent to the septic tank, adjacent to the probable UST, or within the proposed ROW and/or easement to obtain additional information. 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 D**. 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. Possible to strong petroleum odors were detected in the majority of the borings during the field screening.

The soil samples selected for Total Petroleum Hydrocarbon (TPH) analyses were analyzed utilizing the QED UVF HC-1 Analyzer system from QROS-US. The NCDOT has indicated that this instrument is an acceptable method to provide total petroleum hydrocarbon (TPH) results for soil analysis for the PSA projects. Pyramid's QED-certified technician performed the soil analyses. The soil samples selected for analysis using the QED Analyzer were analyzed for TPH as diesel range organics (DRO) and TPH as gasoline range organics (GRO). The soil samples selected for analysis using the QED were preserved in the field with methanol and were analyzed at the end of each day or the following day using the QED.

4.2 Soil Sample Analytical Results

The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. The QED results for soil samples at boring locations 4-3, 4-4, 4-5, 4-6, 4-8, 4-9, 4-11, 4-12, 4-13, 4-14, 4-15, 4-16, 4-17, and 4-18 did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg. The QED results did detect DRO concentrations above 10 mg/kg at the locations of borings 4-1, 4-2, 4-7, 4-10, and 4-19. Specifically, DRO concentrations ranging from 10.94 mg/kg to 234.2 mg/kg were recorded in these borings. It should be noted that the QED Analyzer classified the petroleum in sample 4-10 as road tar rather than degraded fuel. It is possible that this sample exhibited an elevated DRO concentration due to road construction materials and not from a petroleum source,

however, for the purposes of this report it will be considered contaminated. GRO concentrations in these five borings were all below 10 mg/kg. The soil sample QED results are summarized in **Table 2**. A copy of the QED analysis report is included in **Appendix E**.

4.3 Temporary Monitoring Well Installation

The NCDOT RFP provided to Pyramid indicated to search for existing monitor wells on the property, and if one was located to obtain a groundwater sample. Review of the Federal Trust Fund documents associated with Incident #3739 indicated at least one monitor well had been installed at the site, to the northeast of the building in the parking lot. Pyramid staff were able to locate and sample this well (designated at 4-MW for the purposes of this report). The cap of the well was sealed or rusted in place, and it was necessary to drill a hole through it to access the well casing.

On May 15, 2014, the existing monitoring well 4-MW was gauged using a properly decontaminated electric water level probe. The well was determined to be 24 feet deep. The depth-to-groundwater was measured at 8.5 feet below land surface (BLS). The monitoring well was sampled using a new 0.5-inch diameter disposable bailer. Upon completion of the gauging and sampling, the cap of the monitoring well was placed back on the top of the casing and sealed in place with tape. The metal cover was placed back on the well.

4.4 Groundwater Analytical Results

The groundwater sample 4-MW was placed in laboratory prepared containers for analysis of volatile organic compounds (VOCs) using EPA Method 6200B. The sample was shipped to Pace Analytical in Huntersville, NC. The 6200B laboratory analysis detected concentrations of Benzene (3.4 µ/L), Methylene Chloride (15.9 µ/L), methyl tert-Butyl ether, or MTBE (351 µg/L), and 1,2 Dichloroethane (4 µg/l) above NCAC 2L groundwater standards. The 2L standards for Benzene, Methylene Chloride, MTBE and 1,2 Dichloroethane under the 6200B method are 1.0, 5.0, 20.0, and 0.4 µg/L, respectively. The groundwater results for sample 4-MW are summarized in **Table 3**. A copy of the laboratory report and chain-of-custody is included in **Appendix F**.

5.0 Conclusions and Recommendations

As requested by NCDOT, Pyramid has completed a PSA at the Donald Goins property located 217 NC-49, Asheboro, NC (Parcel 4). The following is a summary of the assessment activities and results. Personnel logs for all field work are included in **Appendix F.**

5.1 Geophysical Investigation

The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles and debris, or to suspected reinforced concrete. Areas of reinforced concrete were recorded as anomalies by the EM, and verified by the GPR. No structures were observed beneath the reinforcement that were indicative of USTs. Three known USTs were identified during Pyramid's June 2013 investigation, and verified by this investigation to be located directly east of the canopy in front of the main building on site.

One septic tank was identified on the south portion of the property by the EM survey. One probable UST was identified directly adjacent to the south side of the building. The geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, a septic tank was observed on the south side of the building.

5.2 Limited Soil Assessment

The DENR action levels for both TPH-GRO and TPH-DRO are 10 mg/kg. The QED results for soil samples at boring locations 4-3, 4-4, 4-5, 4-6, 4-8, 4-9, 4-11, 4-12, 4-13, 4-14, 4-15, 4-16, 4-17, and 4-18 did not detect TPH-GRO or TPH-DRO concentrations above 10 mg/kg. The QED results did detect DRO concentrations above 10 mg/kg at the locations of borings 4-1, 4-2, 4-7, 4-10, and 4-19. Specifically, DRO concentrations ranging from 10.94 mg/kg to 234.2 mg/kg were recorded in these borings. GRO concentrations in these five borings were all below 10 mg/kg.

5.3 Limited Groundwater Assessment

Review of the Federal Trust Fund documents associated with Incident #3739 indicated at least one monitor well had been installed at the site, to the northeast of the building in the parking lot. Pyramid staff were able to locate and sample this well (4-MW). The well was determined to be 24 feet deep. The depth-to-groundwater was measured at 8.5 feet below land surface (BLS).

The 6200B laboratory analysis detected concentrations of Benzene (3.4 µ/L), Methylene Chloride (15.9 µ/L), methyl tert-Butyl ether, or MTBE (351 µg/L), and 1,2 Dichloroethane (4 µg/l) above NCAC 2L groundwater standards. The 2L standards for

Benzene, Methylene Chloride, MTBE and 1,2 Dichloroethane under the 6200B method are 1.0, 5.0, 20.0, and 0.4 µg/L, respectively.

5.4 Recommendations

Petroleum-Impacted Soils

During road construction activities, it is possible the NCDOT may encounter petroleum impacted soil near soil borings 4-1, 4-2, 4-7, 4-10, and 4-19. The direct source of this petroleum is likely from the existing USTs and/or product lines/dispenser pumps associated with the former Shell gas station. Additionally, based on a shallow water table at 8.5 feet BLS and contamination evidenced in the groundwater sample collected by Pyramid, it is possible the NCDOT may encounter contaminated groundwater during construction activities. This possibility will depend on seasonal water table fluctuations and the final cut depths associated with road construction and drainage feature construction.

Estimating the Areas of Soil Contamination

The estimated areas of soil contamination are depicted on **Figure 2**. Three areas of soil contamination are identified. The boundaries of the areas of soil contamination are generally estimated by applying a circular area of contamination around a boring exhibiting DRO/GRO levels above 10 mg/kg with a radius equal to half the distance between that boring and the nearest "clean" boring. In cases where this approach is not feasible, such as near property boundaries or where data does not exist to provide a definitive boundary, the area of contamination is terminated using the distance to the property boundary as a radius, or an educated approximation is applied. For this parcel, the borings exhibiting DRO and GRO concentrations below 10 mg/kg were used as boundary markers to delineate the extent of contamination.

Pyramid's PSA investigation resulted in an estimated area of 2,208 square feet of impacted soil in the area containing borings 4-1, 4-2 and 4-7. An estimated area of 908 square feet of impacted soil was calculated around boring 4-10, and an estimated area of 400 square feet was calculated around boring 4-19. **This results in a total estimated area of contamination of 3,516 square feet of impacted soil at the property**.

The greatest depth of contamination at the area containing borings 4-1, 4-2, and 4-7 was from 8-10 feet BLS. The greatest depth of contamination at the areas containing borings 4-10 and 4-19 was from 4 to 6 feet. For this reason, a maximum depth of 10 feet will be used to approximate total volumes of contaminated soil at borings 4-1, 4-2, and 4-7, and a maximum depth of 6 feet will be used at the locations of borings 4-10 and 4-19. It should be noted that this is a gross estimate based on the data available. Using the above designated thicknesses of contaminated soil, Pyramid estimates a total of approximately 29,928 cubic feet, or **1,108 cubic yards of impacted soils** in the three areas of contamination combined. The boundaries of the areas of contamination are approximate due to limited soil data.

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

6.0 Limitations

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

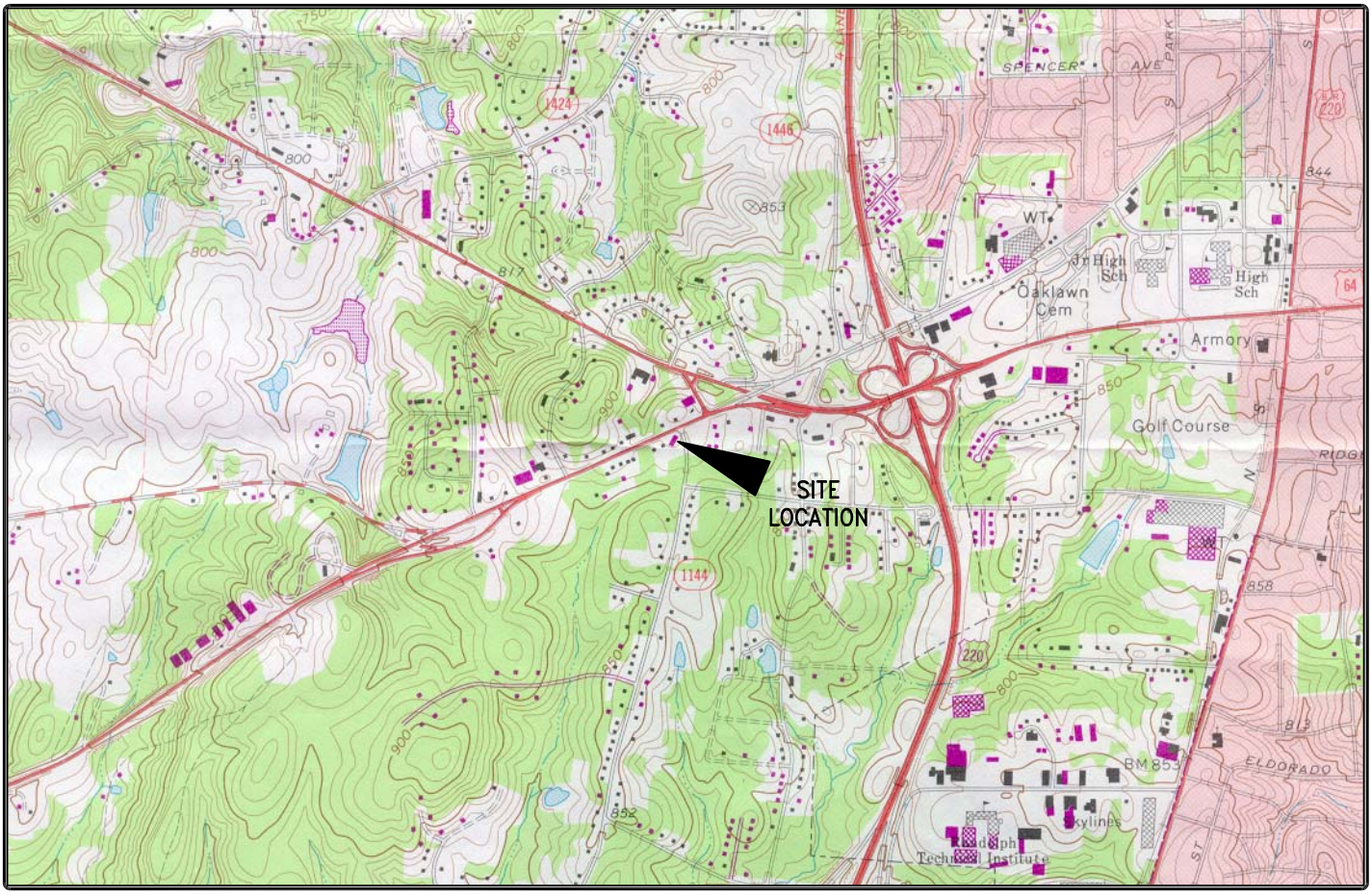
7.0 Closure

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

FIGURES

USGS TOPOGRAPHIC MAP

SITE: 217 NC HWY 49 LOCATION: ASHEBORO, NORTH CAROLINA



USGS IDENTIFICATION

USGS 7.5 MINUTE MAP	ASHEBORO, N.C.
ORIGINAL DATE:	1970
PHOTOREVISION DATE:	1981
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

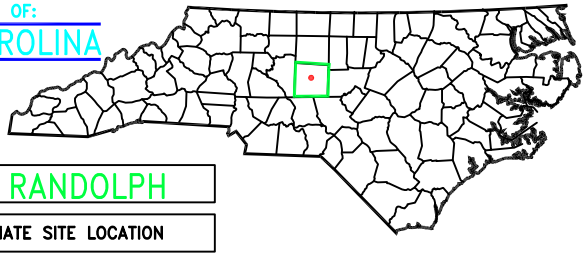
FEET: 1000 0 2000 4000 6000

1" = 2000'

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

MAGNETIC NORTH

COUNTY MAP OF: NORTH CAROLINA



COUNTY: RANDOLPH

APPROXIMATE SITE LOCATION

PYRAMID
ENVIRONMENTAL & ENGINEERING, P.C.

CLIENT: NC DOT U-5305
PROPERTY NAME: PARCEL #4 DONALD GOINS PROPERTY
CITY: ASHEBORO STATE: NORTH CAROLINA
TITLE: TOPOGRAPHIC MAP

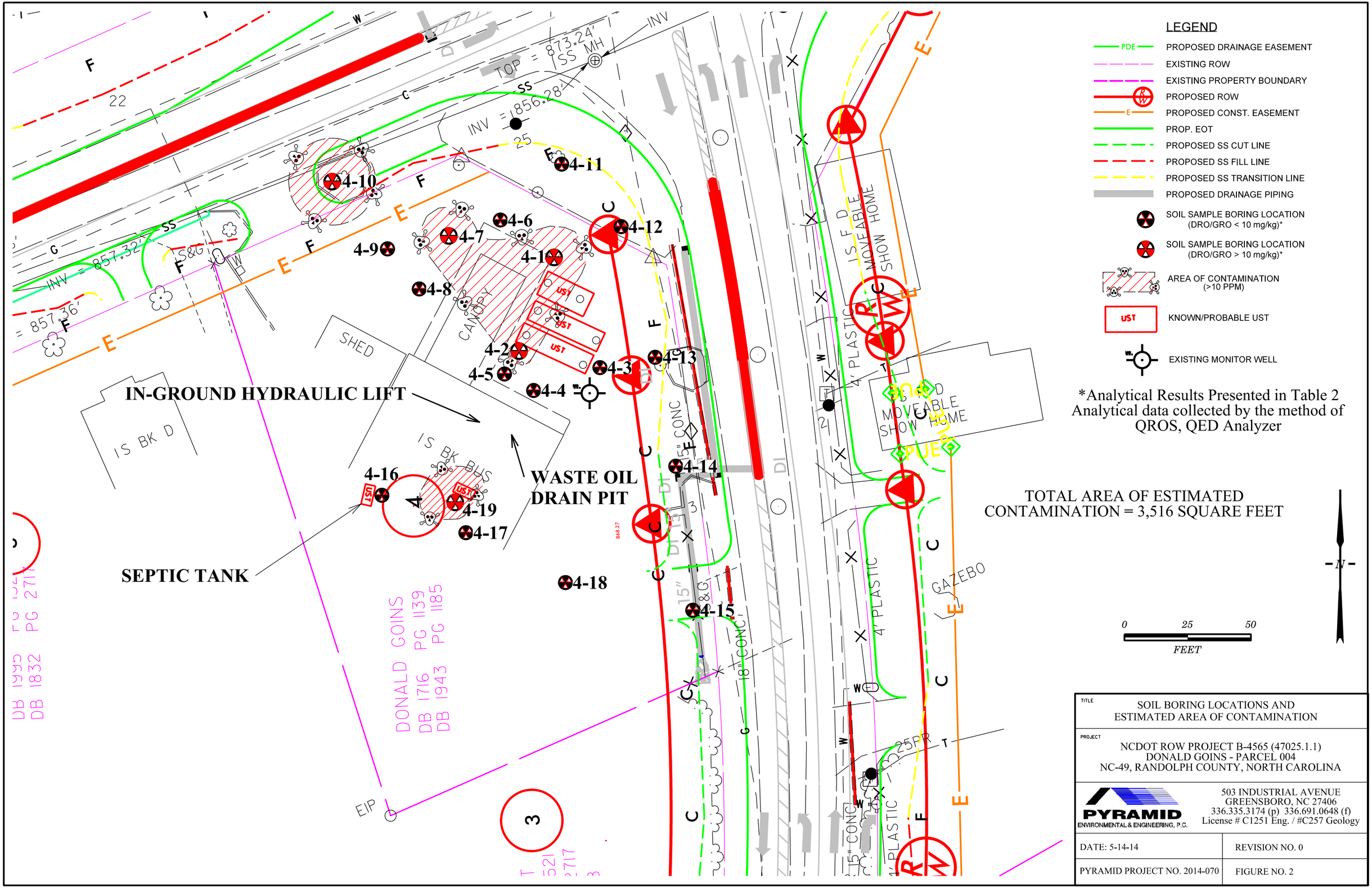
SCALE: 1"=2000'
DATE: 5/7/14
DRAWING NAME: USGSTOPO

DRAWN BY: KAM
CHECK BY: TDL
JOB NO.: 2014-070
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.



TITLE
SOIL BORING LOCATIONS AND ESTIMATED AREA OF CONTAMINATION

PROJECT
NCDOT ROW PROJECT B-4565 (47025.1.1)
DONALD GOINS - PARCEL 004
NC-49, RANDOLPH 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: 5-14-14	REVISION NO. 0
PYRAMID PROJECT NO. 2014-070	FIGURE NO. 2

TABLES

TABLE 1

Summary of Soil Field Screening Results

NCDOT Project U-5305
217 NC-49 - Parcel 4
Asheboro, Randolph County, North Carolina

SOIL BORING	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
4-1	4-1(0-2)	0 to 2	0.0
	4-1(2-4)	2 to 4	0.0
	4-1(4-6)	4 to 6	130.0
	4-1(6-8)	6 to 8	0.0
	4-1(8-10)	8 to 10	1200.0
	4-1(10-12)	10 to 12	0.0
4-2	4-2(0-2)	0 to 2	10.0
	4-2(2-4)	2 to 4	0.0
	4-2(4-6)	4 to 6	20.0
	4-2(6-8)	6 to 8	0.0
	4-2(8-10)	8 to 10	130.0
	4-2(10-12)	10 to 12	0.0
4-3	4-3(0-2)	0 to 2	110.0
	4-3(2-4)	2 to 4	45.0
	4-3(4-6)	4 to 6	40.0
	4-3(6-8)	6 to 8	100.0
	4-3(8-10)	8 to 10	65.0
	4-3(10-12)	10 to 12	55.0
4-4	4-4(0-2)	0 to 2	0.0
	4-4(2-4)	2 to 4	45.0
	4-4(4-6)	4 to 6	0.0
	4-4(6-8)	6 to 8	0.0
4-5	4-5(0-2)	0 to 2	15.0
	4-5(2-4)	2 to 4	0.0
	4-5(4-6)	4 to 6	85.0
	4-5(6-8)	6 to 8	15.0
4-6	4-6(0-2)	0 to 2	15.0
	4-6(2-4)	2 to 4	0.0
	4-6(4-6)	4 to 6	65.0
	4-6(6-8)	6 to 8	10.0
4-7	4-7(0-2)	0 to 2	0.0
	4-7(2-4)	2 to 4	0.0
	4-7(4-6)	4 to 6	85.0
	4-7(6-8)	6 to 8	0.0
4-8	4-8(0-2)	0 to 2	35.0
	4-8(2-4)	2 to 4	0.0
	4-8(4-6)	4 to 6	180.0
	4-8(6-8)	6 to 8	5.0

SOIL BORING	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
4-9	4-9(0-2)	0 to 2	55.0
	4-9(2-4)	2 to 4	5.0
	4-9(4-6)	4 to 6	230.0
	4-9(6-8)	6 to 8	45.0
4-10	4-10(0-2)	0 to 2	0.0
	4-10(2-4)	2 to 4	15.0
	4-10(4-6)	4 to 6	470.0
	4-10(6-8)	6 to 8	15.0
4-11	4-11(0-2)	0 to 2	35.0
	4-11(2-4)	2 to 4	15.0
	4-11(4-6)	4 to 6	65.0
	4-11(6-8)	6 to 8	25.0
4-12	4-12(0-2)	0 to 2	25.0
	4-12(2-4)	2 to 4	35.0
	4-12(4-6)	4 to 6	230.0
	4-12(6-8)	6 to 8	45.0
4-13	4-13(0-2)	0 to 2	50.0
	4-13(2-4)	2 to 4	120.0
	4-13(4-6)	4 to 6	80.0
	4-13(6-8)	6 to 8	60.0
4-14	4-14(0-2)	0 to 2	110.0
	4-14(2-4)	2 to 4	90.0
	4-14(4-6)	4 to 6	50.0
	4-14(6-8)	6 to 8	35.0
4-15	4-15(0-2)	0 to 2	150.0
	4-15(2-4)	2 to 4	5.0
	4-15(4-6)	4 to 6	15.0
	4-15(6-8)	6 to 8	0.0
4-16	4-16(0-2)	0 to 2	75.0
	4-16(2-4)	2 to 4	0.0
	4-16(4-6)	4 to 6	0.0
	4-16(6-8)	6 to 8	0.0

SOIL BORING	SAMPLE ID	DEPTH (feet bgs)	PID READINGS (PPM)
4-17	4-17(0-2)	0 to 2	55.0
	4-17(2-4)	2 to 4	55.0
	4-17(4-6)	4 to 6	30.0
	4-17(6-8)	6 to 8	0.0
4-18	4-18(0-2)	0 to 2	25.0
	4-18(2-4)	2 to 4	240.0
	4-18(4-6)	4 to 6	190.0
	4-18(6-8)	6 to 8	60.0
4-19	4-19(0-2)	1 to 2	0.0
	4-19(2-4)	2 to 4	0.0
	4-19(4-6)	4 to 6	170.0

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 QED Analytical Results for GRO/DRO

NCDOT State Project U-5305
217 NC-49 - Parcel 4
Asheville, Randolph County, North Carolina

				QROS - QED Analysis		
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**
4-1(4-6)	5/15/2014	4 to 6	130.0	<1.3	5.57	5.57
4-1(8-10)	5/15/2014	8 to 10	1200.0	<1.2	**15.42**	15.42
4-2(8-10)	5/15/2014	8 to 10	130.0	<1.2	**12.41**	21.41
4-3(6-8)	5/15/2014	6 to 8	100.0	<1.2	9.32	9.32
4-4(2-4)	5/15/2014	2 to 4	45	<0.7	0.83	0.83
4-5(4-6)	5/15/2014	4 to 6	85	1.11	1.82	2.93
4-6(4-6)	5/15/2014	4 to 6	65	<0.6	4.74	4.74
4-7(4-6)	5/15/2014	4 to 6	85	<0.5	**17.39**	17.39
4-8(4-6)	5/15/2014	4 to 6	180	<0.6	1.03	1.03
4-9(4-6)	5/15/2014	4 to 6	230	0.91	6.14	7.05
4-9(6-9)	5/15/2014	6 to 9	45	0.69	<0.11	0.69
4-10(4-6)	5/15/2014	4 to 6	470	<0.5	**10.94**	10.94
4-11(4-6)	5/15/2014	4 to 6	65	1.05	<0.13	1.05
4-12(4-6)	5/15/2014	4 to 6	230.0	<0.7	0.55	0.55
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				10	10	NA

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable
"------" = No Laboratory Analysis

*** Bold values indicate concentrations above initial action levels**

TABLE 2, Contd.

Summary of Soil Sample QED Analytical Results for GRO/DRO

NCDOT State Project U-5305
217 NC-49 - Parcel 4
Asheboro, Randolph County, North Carolina

				QROS - QED Analysis		
SAMPLE ID	**DATE**	**DEPTH (feet)**	**PID (ppm)**	**GRO (mg/kg) (C5-C10)**	**DRO (mg/kg) (C10-C35)**	**TPH (mg/kg) (C5-C35)**
4-13(2-4)	5/15/2014	2 to 4	120.0	1.26	0.26	1.52
4-14(2-4)	5/15/2014	2 to 4	90.0	<0.5	0.99	0.99
4-15(4-6)	5/15/2014	4 to 6	15.0	<0.5	0.91	0.91
4-16(6-8)	5/15/2014	6 to 8	0.0	0.77	<0.11	0.77
4-17(4-5)	5/15/2014	4 to 5	30	<0.6	<0.12	<0.12
4-18(4-6)	5/15/2014	4 to 6	190	<0.6	1.14	1.14
4-19(2-4)	5/15/2014	2 to 4	0	7.83	**234.2**	242.03
4-19(4-6)	5/15/2014	4 to 6	170	5.8	**102.1**	107.9
NC Initial Action Level - UST Section for 5035/5030-GRO; 3550-DRO				10	10	NA

PID= photo-ionizaton detector
PPM= parts-per-million
GRO= Gasoline Range Organics
DRO= Diesel Range Organics
mg/kg= milligrams-per-kilogram
TPH= Total Petroleum Hydrocarbons (GRO + DRO)
NA= Not Applicable
"------" = No Laboratory Analysis

*** Bold values indicate concentrations above initial action levels**

TABLE 3

Summary of Groundwater Analytical Results

NCDOT State Project U-5305
217 NC-49 - Parcel 4
Asheboro, Randolph County, North Carolina

PARAMETER	UNITS	SAMPLE ID	NCAC 2L GROUNDWATER STANDARD
		4-MW	
EPA Method 6200B VOCs; Sample Collection Date: 5/15/14			
Benzene	**ug/L**	**3.4**	**1**
Chloroform	ug/L	ND	70
Diisopropyl Ether (IPE)	ug/L	28	70
Ethyl Benzene	ug/L	ND	600
Isopropylbenzene (Cumene)	ug/L	2.6	70
Methylene Chloride	**ug/L**	**15.9**	**5**
Naphthalene	ug/L	ND	6
Styrene	ug/L	ND	70
Toluene	ug/L	5.5	600
Total Xylenes	ug/L	ND	500
n-Propylbenzene	ug/L	ND	70
sec-Butylbenzene	ug/L	ND	70
n-Butylbenzene	ug/L	ND	70
tert-Butyl methyl ether (MTBE)	**ug/L**	**351**	**20**
tert-Butylbenzene	ug/L	ND	70
1,2,4-Trimethylbenzene	ug/L	ND	400
1,2-Dichloroethane	**ug/L**	**4**	**0.4**
1,3,5-Trimethylbenzene	ug/L	2.4	400
4-Isopropyltoluene	ug/L	ND	25
All Other Parameters	ug/L	ND	NA

ug/L= micrograms-per-liter

ND= Not Detected at or above adjusted reporting limit.

NA= Not Applicable

Bold values above 2L

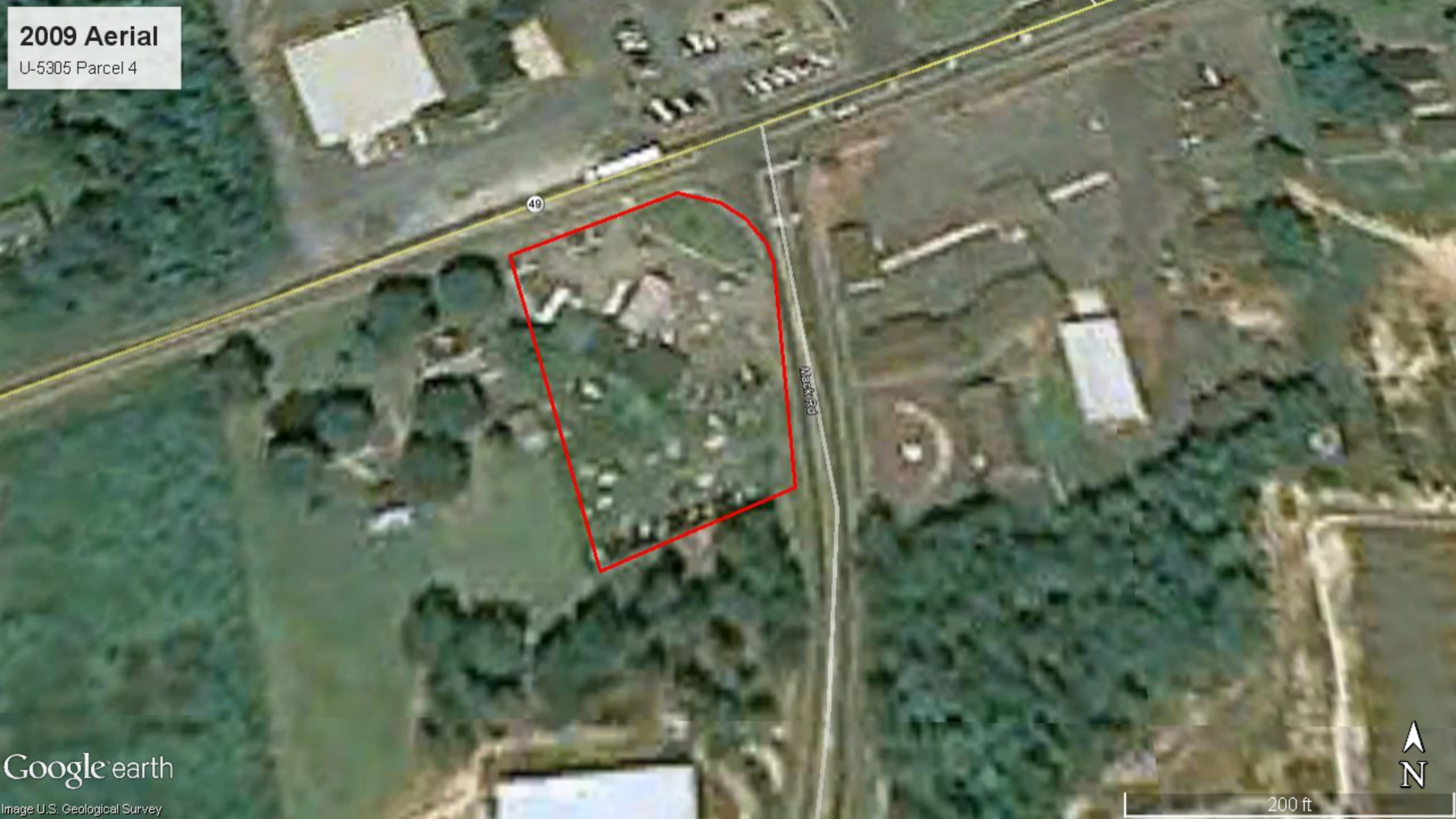
APPENDIX A


1993 Aerial
U-5305 Parcel 4
49
Mack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


1999 Aerial
U-5305 Parcel 4
49
Nack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2006 Aerial
U-5305 Parcel 4
49
Nack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2008 Aerial
U-5305 Parcel 4
49
Mack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2009 Aerial
U-5305 Parcel 4
49
Nack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2010 Aerial
U-5305 Parcel 4
49
Mack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2012 Aerial
U-5305 Parcel 4
49
Nack Rd
Google earth
Image U.S. Geological Survey
N
200 ft


2013 Aerial
U-5305 Parcel 4
49
Nack Rd
Google earth
Image U.S. Geological Survey
N
200 ft

APPENDIX B

POLLUTION INCIDENT/U.S.T. LEAK REPORTING FORM

Department of Environment, Health, Natural Resources
Division of Environmental Management
GROUNDWATER SECTION
UPDATE of OLD PIRF FORM

Confirm. GW Contamination (Y/N) Y
Major Soil Contamination (Y/N) ____
Minor Soil Contaminatin (Y/N) ____

Incident # 3739

Date Incident Occurred or Leak Detected 5-10-88

INCIDENT DESCRIPTION

Incident Location/Name: PAUL BARKER RESIDENCE

Address: RT. 7 BOX 2 (HWY 49 + MACK RD.)

City/Town: ASHEBORO | County: RANDOLPH | Region: WSRO

Briefly Describe Incident: Mr. Barker complained of bad-tasting water. Randolph County Health Dept. sampled it and detected petroleum contamination. 7 other wells subsequently showed contam. Submitted to Fed. Trust Fund 11-23-88

POTENTIAL SOURCE OWNER-OPERATOR

Potential Source Owner-Operator: UNKNOWN (ACCORDING TO WSRO RECORDS) | Telephone:

Company | Street Address

City | County | State | Zip Code

OWNERSHIP
0. N/A 1. Municipal 2. Military 3. Unknown 4.Private 5.Federal 6. County 7. State

OPERATION TYPE
0. N/A 1. Public Service 2. Agricultrural 3. Residential 4. Educational/Relig. 5. Industrial 6. Commercial 7. Mining

POLLUTANTS INVOLVED

MATERIALS INVOLVED	AMOUNT LOST	AMOUNT RECOVERED
GASOLINE	?	?

SOURCE OF POLLUTION

PRIMARY SOURCE OF POLLUTION (Select one)
1. Intentional dump
2. Pit, pond, lagoon
3. Leak-underground (circled)
4. Spray irrigation
5. Land application
6. Animal feedlot
7. Source unknown
8. Septic tank
9. Sewer line
10. Stockpile
11. Landfill
12. Spill-surface
13. Well
14. Above-ground Storage Tank
15. Nonpoint source

PRIMARY POLLUTANT TYPE (Select one)
1. Pesticide/herbicide
2. Radioactive waste
3. Gasoline/diesel (circled)
4. Heating oil
5. Other petroleum prod.
6. Sewage/septage
7. Fertilizers
8. Sludge
9. Solid waste leachate
10. Metals
11. Other inorganics
12. Other organics

LOCATION
1. Facility (circled)
2. Railroad
3. Waterway
4. Pipeline
5. Dumpsite
6. Highway
7. Residence
8. Other

SETTING
1. Residential
2. Industrial
3. Urban
4. Rural (circled)

UPDATED ✓

Site Priority Ranking: 350/A

D.E.M. Regional Contact: DON GEDDES

Signature: Don Geddes

Date: 6-18-96

GW-61 Revised 2/95

IMPACT ON DRINKING WATER SUPPLIES

WELLS AFFECTED (1.) YES 2. NO

NUMBER OF WELLS AFFECTED ≥8

Well(s) Contaminated: (Users Name)

1. TANK + TUMMY
2. BOBBY AGNER SHELL
3. BRILES OIL CO.
4. GEORGE DAGGETT
5. GARNER (2 HOMES W/ THIS NAME)
6. PAUL BARKER
7. FRY
8. COLE

Circle Appropriate Responses

Lab Samples Taken By: (1.) DEM 2. DHS 3. Responsible Party (4.) Other (COUNTY HEALTH DEPT.) 5. None

Samples Taken Include: (1.) Groundwater 2. Soil

LOCATION OF INCIDENT

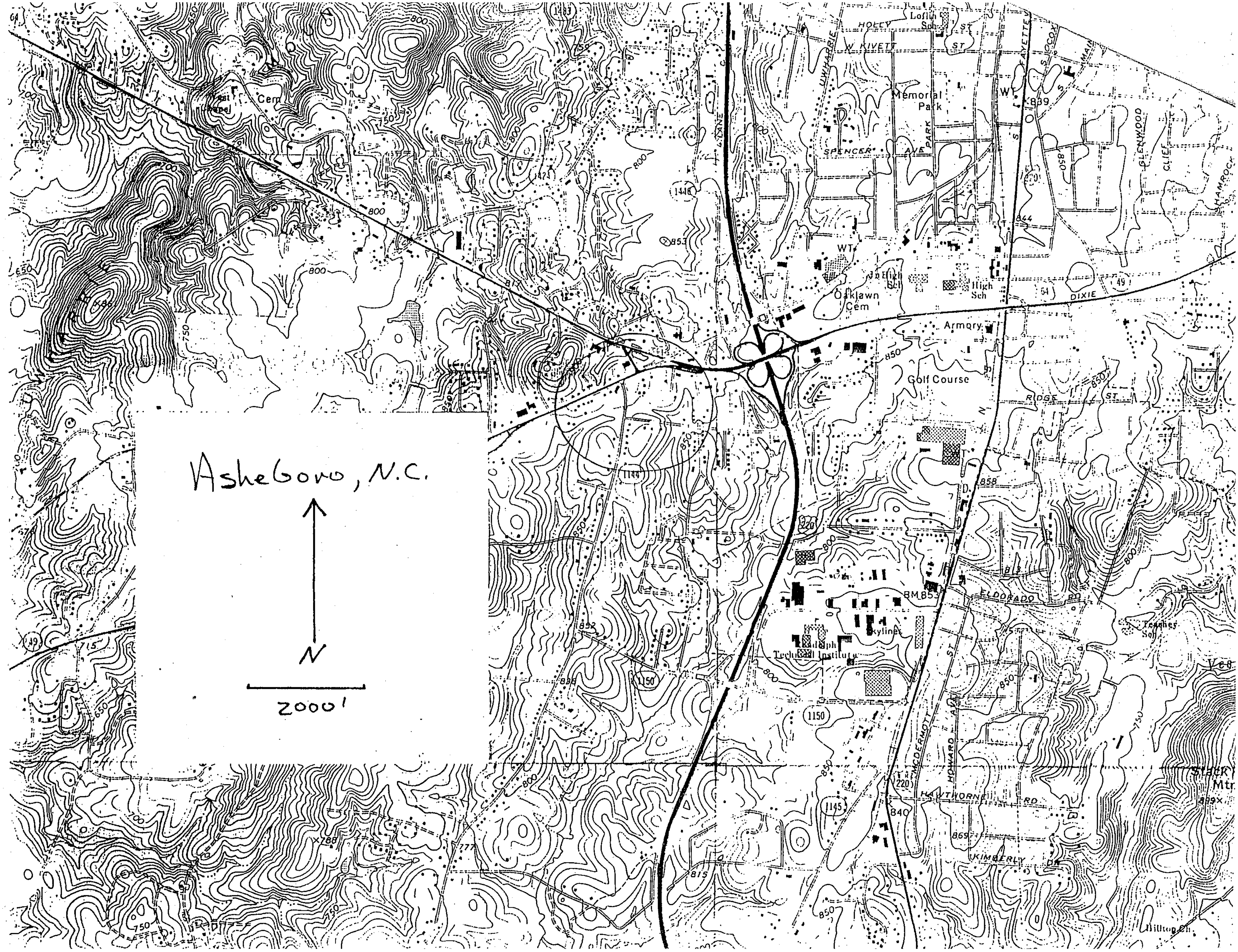
7 1/2 Min. Quad Name ASHEBORO, NC

5 Min. Quad Number L-54

Lat. : Deg : Min : Sec : 35° 40' 57"

Long. : Deg : Min : Sec : 79° 50' 19"

Draw Sketch of Area or Attach Additional Maps


Asheboro, N.C.
N
2000'
Memorial Park
Golf Course
Armory
Oaklawn Cem
High Sch
Loflin Sch
DIXIE
SPENCER AVE
HOLLY ST
W KIVETT ST
UWHARRIE
GLENWOOD
CLIFF
HAMROCK
RIDGE ST
ELDORADO RD
MCDERMOTT ST
HOWARD AVE
HAWTHORNE RD
KIMBERLY DR
Skyline
Randolph Technical Institute
Teachey Sch
Hilltop Ch
BM 853

Incident # _____

County _____

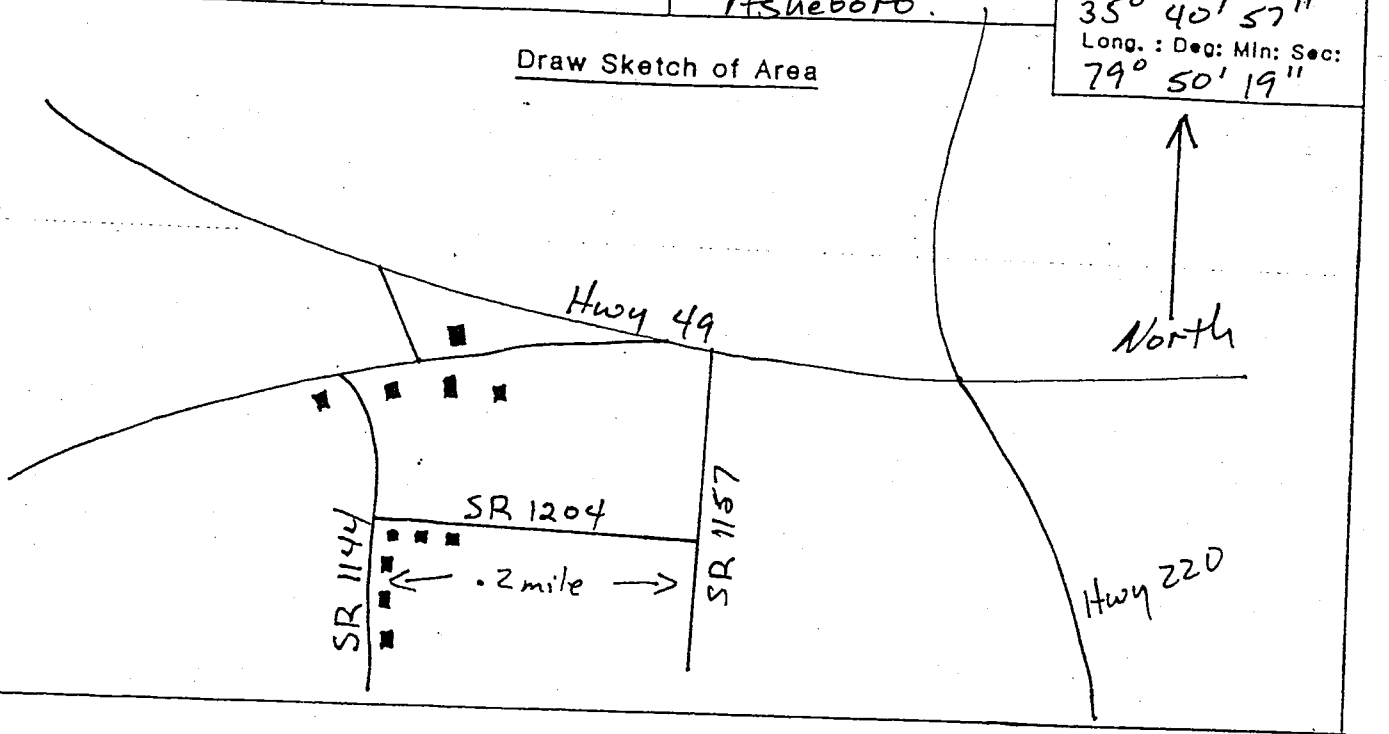
POLLUTION INCIDENT REPORTING FORM

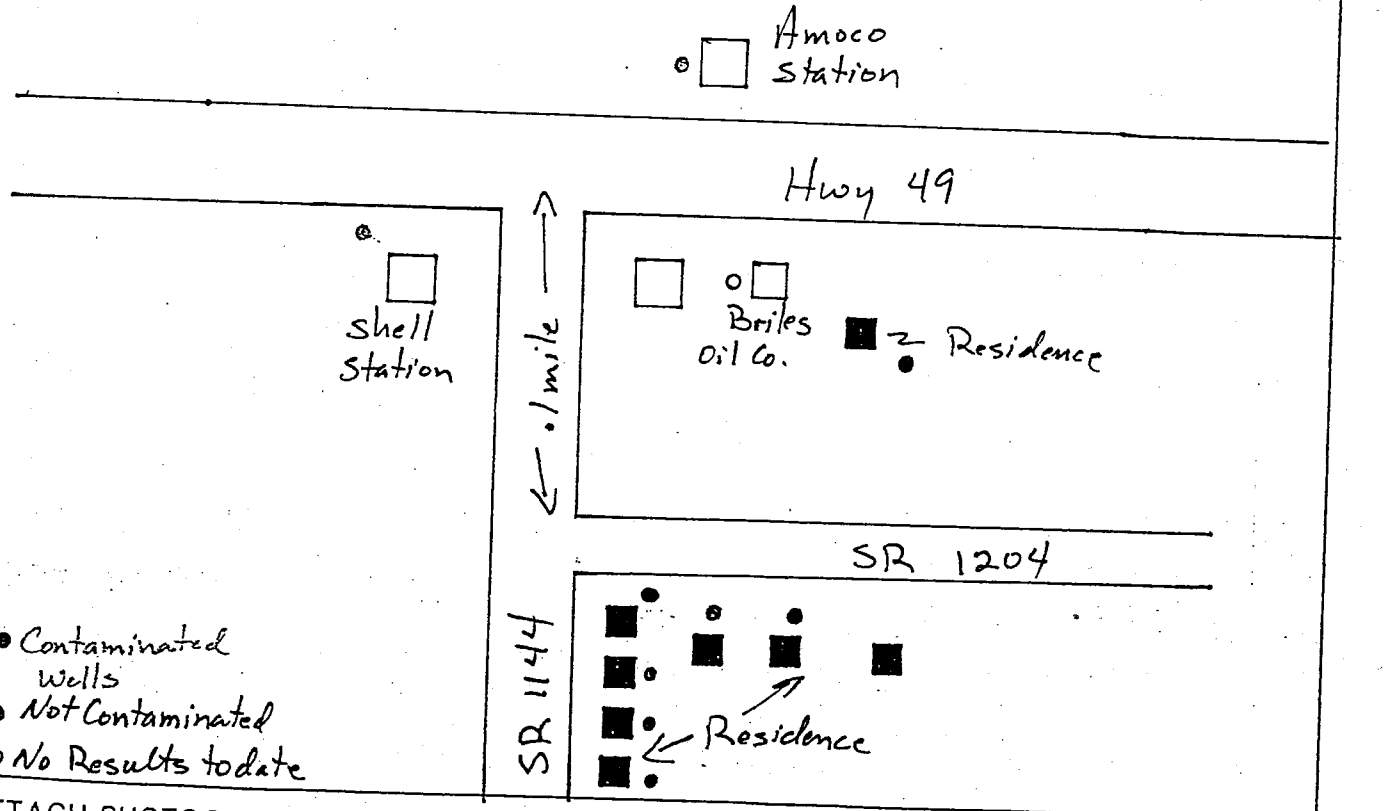
LOCATION OF INCIDENT

Street Address, Road	City/Town	County
Intersection of Hwy 49 & SR 1144	Asheboro	Randolph

Date Incident Occurred	Time Incident Occurred	7 1/2 Quad Name	Lat. : Deg: Min: Sec: / Long. : Deg: Min: Sec:
—	—	Asheboro.	35° 40' 57" / 79° 50' 19"

Draw Sketch of Area





ATTACH PHOTOCOPY OF MAP SHOWING: 1. Pollutant Source 2. Threatened Water Supplies 3. Direction of Overland Flow

Site Name: PAUL BARKER RESIDENCE Region/County: WSRO / RA

Groundwater Incident File #: 3739 Ranking Performed by: DJG

Date: 6-18-96 UPDATE of OLD RANKING FORM

NORTH CAROLINA
GROUNDWATER CONTAMINATION INCIDENT MANAGEMENT
SITE PRIORITY RANKING SYSTEM
(To be completed by Regional Office)

		Points Awarded
I.	IMMINENT HAZARD ASSESSMENT	
A.	Explosion - free product in confined areas or vapor phase product detected at or above 20% of the lower explosive limit or at health concern levels; award 50 points total	—
B.	Fire - free product subject to ignition in exposed areas such as surface water impoundments, streams, excavations, etc.; award 50 points total	—
II.	EXPOSURE ASSESSMENT	
A	Contaminated Drinking Water Supplies	
1.	Private, domestic water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 10 points per well	50
2.	Public or institutional water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 20 points per well	60
3.	Exceedances of Class WS- 1 surface water quality standards as a result of groundwater discharge; award 20 points per surface water body impacted	—
4.	If a water supply well identified in Items II. A 1 and II. A 2 cannot be replaced by an existing public water supply source requiring hookup only; award additional 10 points per irreplaceable well	80 (?)
B.	Threat to Uncontaminated Drinking Water Supplies	
1.	Private. domestic water supply well located within 1500 feet down gradient of contaminant source; award 10 points per well	60
2.	Public or institutional water supply well located within 1500 feet downgradient of contaminant source; award 15 points per well	30
3.	Raw surface water intake for public water supply located within 1/2 mile downgradient of contaminant source; award 5 points per water supply system	—
4.	If any well identified In Items II. B. 1 and II. B. 2 or an intake in item II. B. 3. are located within 250 feet of contaminant source; award additional 20 points total (not per well or intake)	?
C.	Vapor Phase Exposure	
1.	Product vapors detected in inhabitable building(s) below 20% of the lower explosive limit or heath concern levels: award 30 points total	—
2.	Product vapors detected in other confined areas (uninhabitable buildings, sewer lines, utility vaults, etc.) below 20% of the lower explosive limit; award 10 points total	—
III.	SOURCE ASSESSMENT	
A.	Uncontrolled or Unabated Primary Source including dumpsites, stockpiles, lagoons, land applications, septic tanks, landfills, underground and aboveground storage tanks, etc.)	

nt Name: PAUL BARKER RESIDENCE Region/County: WSRO / RA

undwater Incident File #: 3739 Ranking Performed by: DJG

ate: 6-18-96 UPDATE of OLD RANKING FORM

NORTH CAROLINA
GROUNDWATER CONTAMINATION INCIDENT MANAGEMENT
SITE PRIORITY RANKING SYSTEM
(To be completed by Regional Office)

		Points Awarded
I.	IMMINENT HAZARD ASSESSMENT	
A.	Explosion - free product in confined areas or vapor phase product detected at or above 20% of the lower explosive limit or at health concern levels; award 50 points total	—
B.	Fire - free product subject to ignition in exposed areas such as surface water impoundments, streams, excavations, etc.; award 50 points total	—
II.	EXPOSURE ASSESSMENT	
A	Contaminated Drinking Water Supplies	
1.	Private, domestic water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 10 points per well	50
2.	Public or institutional water supply well containing substances in concentrations exceeding 15A NCAC 2L groundwater quality standards; award 20 points per well	60
3.	Exceedances of Class WS- 1 surface water quality standards as a result of groundwater discharge; award 20 points per surface water body impacted	—
4.	If a water supply well identified in Items II. A 1 and II. A 2 cannot be replaced by an existing public water supply source requiring hookup only; award additional 10 points per irreplaceable well	80 (?)
B.	Threat to Uncontaminated Drinking Water Supplies	
1.	Private. domestic water supply well located within 1500 feet down gradient of contaminant source; award 10 points per well	60
2.	Public or institutional water supply well located within 1500 feet downgradient of contaminant source; award 15 points per well	30
3.	Raw surface water intake for public water supply located within 1/2 mile downgradient of contaminant source; award 5 points per water supply system	—
4.	If any well identified In Items II. B. 1 and II. B. 2 or an intake in item II. B. 3. are located within 250 feet of contaminant source; award additional 20 points total (not per well or intake)	?
C.	Vapor Phase Exposure	
1.	Product vapors detected in inhabitable building(s) below 20% of the lower explosive limit or heath concern levels: award 30 points total	—
2.	Product vapors detected in other confined areas (uninhabitable buildings, sewer lines, utility vaults, etc.) below 20% of the lower explosive limit; award 10 points total	—
III.	SOURCE ASSESSMENT	
A.	Uncontrolled or Unabated Primary Source including dumpsites, stockpiles, lagoons, land applications, septic tanks, landfills, underground and aboveground storage tanks, etc.)	

Page

Points Awarded

1. Suspected or confirmed source remains in active use and continues to receive raw product, wastewater or solid waste; award 30 points per source —

2. Active use of suspected or confirmed source has been discontinued or source was caused by a one-time release of product or waste, however, source continues to release product or contaminants into the environment; award 10 points per source 10

IV. ENVIRONMENTAL VULNERABILITY ASSESSMENT

A Vertical Contaminant Migration - Literature or well logs indicate that no confining layer is present above bedrock or within twenty feet of land surface; award 10 points total 10

B. Horizontal Contaminant Migration - Data or observations indicate that no discharge points or aquifer discontinuities exist between the source and the nearest downgradient drinking water supply; award 10 points total 10

C. Existing Groundwater Quality - The worst case monitor or supply well contains contaminant levels:

1. At less than 10 tines the 2L groundwater standards; award 5 points —

2. Between 10 and 100 times the 2L groundwater standards; award 20 points —

3. Greater than 100 tines the 2L groundwater standards; award 40 points 40

V. REGIONIONAL OFFICE RESPONSE (LETTER RANK)

Priority A - (Site meets any <u>one</u> of the criteria)

1. Water supply well(s) contaminated and no alternate water supplies available.

2. Vapors present in confined areas at explosive or health concern levels.

3. Treated surface water supply in violation of the safe drinking standards.

Priority B - (Any One)

1. Water supply well(s) contaminated, but alternate water supplies available.

2. Water supply well(s) within 1500 feet of site, but not contaminated and no alternate water supplies available.

3. Vapors present in confined areas but not at explosive or health concern levels.

Priority C - (Both)

1. No water supply well(s) contaminated.

2. Water supply well(s) greater than 1500 feet from site, no alternate water supply available.

Priority D - (Both)

1. No water supply well(s) contaminated.

2. Water supply well(s) within 1500 feet of site but alternate water supplies available.

Priority E - (Both)

1. No water supply well(s) contaminated or within 1500 feet of site.

2. Area served by alternate water supply.

TOTAL POINTS AWARDED 350/A

#/LETTER

POLLUTION INCIDENT REPORTING FORM

913

1. Incident # _____
2. Tabulate only _____

Division of Environmental Management
GROUNDWATER SECTION

TYPE OF ACTION

A

1. Emergency response
2. Compliance investigation
3. Complaint investigation
4. Routine inventory
5. Re-evaluation : # _____
6. Other : _____

POTENTIAL HAZARDS : 1. Toxic chemicals 2. Radioactivity 3. Air emissons 4. Explosives 5. Fire

INCIDENT

B

Incident Name: Paul Barker

Address: Rt. 7 Box 2 | City/Town: Asheboro

County: Randolph | Region: WSRO | DEM Regional Contact: John M. Stewart

PERSON REPORTING INCIDENT

C

Name: Randolph County Health | Date: June 14, 1988 | Time: pm.

Company/Agency: County Health Department | Telephone: 919-629-2131

Briefly Describe Incident:
Mr. Barker complained of bad tasting water. The health dept. sampled his water well and found petroleum constituents.

REPORTED BY: 1. Responsible party 2. Government agency 3. Private party

RECOMMENDED ACTION

D

1. Investigation complete
2. Continue investigation
3. Initiate/complete cleanup
4. Long-term remedial action
5. Technical support
6. Drill crew
7. Enforcement action
8. Monitoring plan

Comments:
The WSRO has sampled the neighborhood wells to determine extent of problem. Begin drill plan to locate possible source

LAB SAMPLES: 1. Yes 2. No | Signature: John M. Stewart | Date: 8-4-88

Incident # _____
County: _____

POLLUTION INCIDENT REPORTING FORM

POLLUTANTS INVOLVED

E

MATERIALS INVOLVED	AMOUNT STORED	AMOUNT LOST	AMOUNT RECOVERED
Petroleum (most likely gasoline)	unknown	unknown	none

IMPACT ON SURFACE WATERS

F

WATERS EFFECTED 1. Yes (2) No No 3. Potentially | Distance to Stream (ft) _____ | Amount in Water (gal) _____

FISH KILL: 1. Yes (2.) No | Name of Stream _____ | Stream Class _____

RISK ASSESSMENT

G

Use these Codes: High = 3 Moderate = 2 Low = 1 None = 0

Resource Threat	GROUNDWATER	Amount Infiltrating Land	SURFACE WATER	AIR
Vertical Migration of Contaminant	3	unknown		
Horizontal Migration of Contaminant	3			
Areal Extent of Contamination	3			
Probability of Violations	3			
Remedial Action Priority	3			
Potential Hazard of Substance	3			
Threat to Drinking Water	3			
Seriousness of Threat	3			
Overall Regional Concern	3			

Please Circle the Appropriate Response(s):

1. This incident poses additional threat to human health by: (1) inhalation (2) absorption (3) ingestion
2. This incident poses additional threat to the environment by potential adverse effects on :
   (1) sensitive areas (2) wildlife (3) fish

POTENTIAL SOURCE OF POLLUTION

H

SOURCE OF POTENTIAL POLLUTION

1. Intentional dump
2. Pit, pond, lagoon
3. Leak--underground
4. Spray irrigation
5. Land application
6. Animal feedlot
7. Source unknown
8. Septic tank
9. Sewer line
10. Stockpile
11. Landfill
12. Spill--surface
13. Well
14. Dredge Spoil
15. Nonpoint source

MULTIPLE SOURCES AT SITE: (1.) Yes 2. No

TYPE OF POLLUTANT

1. Pesticide/herbicide
2. Radioactive waste
3. Gasoline/diesel
4. Other petroleum prod.
5. Sewage/septage
6. Fertilizers
7. Sludge
8. Solid waste leachate
9. Metals
10. Other inorganics
11. Other organics

LOCATION

(1.) Facility
2. Railroad
3. Waterway
4. Pipeline
5. Dumpsite
6. Highway
7. Residence
8. Other

SETTING

1. Residential
2. Industrial
3. Urban
(4.) Rural

POLLUTION CONFIRMED (1.) Yes 2. No

Summary of Investigations through April 1996

NC DEM Federal Trust Fund Site (TF-3739)
Paul Barker Site, Asheboro, Randolph County, North Carolina

Submitted to:

Division of Waste Management
UST Section
NC Department of Environment and Natural Resources
P.O. Box 29578
Raleigh, NC 27626-0578

Submitted by:

Geophex, Ltd.
605 Mercury Street
Raleigh, NC 27603-2343
Telephone (919) 839-8515
Fax (919) 839-8528

Geophex Job Number 855

Summary

This summary presents preliminary results of Geophex's assessment of the North Carolina Division of Environmental and Natural Resources (DENR), Paul Barker Federal Trust Fund Site, TF-3739. Geophex initiated the assessment in June of 1992 at the request of NC DEM under Department of Environment, Health and Natural Resources (DEHNR) Contract No. C-20013, dated February 13, 1991, Task Orders 1 through 5. Investigations at the various contaminated sites identified during early phases of the study were not completed due to a lack of funding. This summary compiles the results of these partially finished investigations into a single document for ease of reference when reviewing the site history, geology, and status. Two sections containing summary maps and analytical data follow the summary. Specific text and site maps for each of the individual properties investigated are also attached as individual separate sections.

The reader is also referred to a letter report [Review of Paul Barker Federal Trust Fund Site, TF-3739, Asheboro, Randolph County, North Carolina, Geophex, Ltd. letter report to NC DENR Underground Storage Tank (UST) Section, September 20, 2000] for an overview of site changes since the data presented in this summary were gathered.

The Paul Barker site includes approximately 200 acres around the intersection of US Highway 64 and NC Highway 49 on the western border of the city of Asheboro, Randolph County, North Carolina. Both commercial and residential properties are present in the area with the former concentrated around US Hwy 64 and NC Hwy 49 and the latter on the periphery of the site.

Geophex reviewed all available records and site investigation reports by the Randolph County Health Department, the Winston-Salem Regional Office of NC DEM, Camp, Dresser, and McKee, Delta Environmental, Inc., T.R. Edgerton Environmental, and Bain, Palmer & Associates, Inc. Geophex site investigations included personal interviews with owners and residents, geophysical surveys of commercial facilities in the area, water sampling of 26 monitor wells and key domestic supply wells, and extensive soil borings and analysis of soil around areas of suspected releases.

Domestic supply wells along Mack and Sherwood roads have shown contamination with dissolved petroleum constituents since 1988. Many of the affected households were connected to the Asheboro municipal water system in 1988. Petroleum contamination will threaten the supply wells southwest of the Mack-Sherwood road intersection. Residential water supply wells to the north of the site along Fisher Circle and the spring that supplies water for the Keeling household south of the West Side Video are also threatened.

History and Status of Petroleum Dispensing Facilities

Geophex has identified ten facilities as potential responsible parties for contamination within the Paul Barker Federal Trust Fund Site. An "*" indicates confirmed release of petroleum product.

Site	Status
Agner Shell Station	Closed, USTs in place, investigation incomplete
Asheboro Well Company	UST removed, no evidence of contamination
Brueilly Auto Repair	One waste oil UST, investigation incomplete
Briles Oil Company*	USTs removed, contaminated soil remains
Econo Oil/Citgo facility*	Operating, contaminated, investigation incomplete
Harvey's Tank & Tummy*	Operating, contaminated, investigation incomplete
Quik Chek Mart*	Demolished, remediation incomplete
Schwartz Rental Properties	Unknown, investigation incomplete
West Site Video Site*	Closed, 3 USTs and heavy soil contamination
Whitley Estate Properties*	Station closed, some USTs removed, incomplete

These facilities have operated 41 USTs and nine aboveground storage tanks (ASTs) since the early 1960s. The Harvey's Exxon Tank & Tummy currently operates six gasoline USTs, two diesel USTs and one, kerosene AST. The Econo Oil Company operates one fuel oil UST, one kerosene UST, and eight ASTs containing various grades of gasoline, fuel oil, and kerosene. The Agner Shell Station operated three gasoline USTs and had one waste-oil tank. The facility is no longer dispensing fuels, but the tanks are in place. Three gasoline USTs were once used at the West Side Video site. These tanks are still in place. Operators had removed a total of 22 USTs from their sites from 1989 through 1993.

Three retail petroleum facilities and one construction company operated underground storage tanks (USTs) in the study area before February 4, 1962 based on Geophex's interpretation of North Carolina Department of Transportation (NC DOT) aerial photography. These facilities were: 1) the former Farlow Grocery (West Side Video, now Randolph Bingo Parlor, and the Shear Magic Salon); 2) the former Willey's store (now the demolished Quik Chek Mart); 3) the former Whitley Esso Station (now a U-Haul Dealer); and the former Whitley Construction Company (now occupied by Future Truckers of America). A fourth retail facility, occupied by the Brueilly Auto Service Center was also present, but the installation date of the UST is unknown.

By February 19, 1976, the Econo Oil/Citgo bulk/retail facility, the Briles Oil Company bulk and Stop-n-Shop retail facilities (abandoned); and the Agner Shell Station (now occupied by DG Motor Sports) facilities were present. On May 5, 1978, Harvey's Tank and Tummy installed eight 10,000-gallon USTs and was operating by the summer of 1978, based on interpretation of NC DOT aerial photography and the NC DEM UST registry.

Geophex established that six of the ten facilities have released petroleum products contaminating soil and ground water in the area. The West Side Video, Whitley Esso, Quik Chek Mart, Briles Oil Company/Stop-n-Shop, Econo Oil/Citgo and the Harvey's Exxon Tank & Tummy facilities have contaminated soils and the local aquifer. The WSRO has taken regulatory action against one operator, the Quik Chek Mart.

Leaks from USTs at the West Side Video site have severely contaminated surrounding soils and groundwater. Approximately 23,000 yards of soil at the West Side Video site should be remediated. The three USTs should also be removed. There should be adequate space to spread excavated soil on the northeast corner of the property. The petroleum contaminants are probably migrating along the same fracture set that controls groundwater flow from the Quik Chek site. This release had not affected the Keeling supply well (as of 1993), which is 150 feet south of the West Side Video site.

Releases from leaking USTs and delivery lines have contaminated soils and possibly groundwater at the Econo Oil facility. The most severe contamination is in front of the ASTs at the rear of the property. Leaks from delivery lines are probably the source. Econo Oil removed two USTs in January of 1993 and excavated approximately 50 cubic yards of contaminated soil and stock piled it on site. Econo Oil removed approximately 50 cubic yards of soil from the UST basin. Geophex found additional petroleum contamination below the area of excavation. Additional soil borings are needed to estimate the extent of contamination and the volume of soil to be removed.

Laboratory analysis of soil samples taken from the Briles Oil Co. property suggest little or no contamination despite high field screening results using the HNU and the obvious smell of petroleum hydrocarbons in the soils. Analysis of water samples taken from monitor wells indicates very high concentrations of contamination. Geophex recommends additional soil borings to define the extent of contamination and submission of duplicate samples to laboratories. If reanalysis of samples from the hand augering confirms earlier field observations, up to 2,000 cubic-yards of soil may need to be remediated at the Briles site.

As of September 13, 2000, only Harvey's Exxon Tank & Tummy and the Econo Oil/Citgo facility were still in operation as retail petroleum product dispensers.

Chronology of Investigations

During the spring of 1988, Mr. Paul C. Barker of Route 7, Box 2, Asheboro, NC (Mack Road) contacted the Randolph County Health Department (RCHD) and complained that his well water was contaminated. On May 10, 1988 the RCHD sampled the supply well. This sample contained 7.2 ppb benzene. The Barkers were contacted by the RCHD on June 8, 1988 and told that consumption of their well water was not recommended.

On June 17, 1988 the RCHD sampled wells at the Wilson Garner residence and an adjacent duplex owned by Garner. The Garner residential well contained 4.7 ppb benzene through a carbon filter and the well for the rental property (the duplex) contained 157 ppb benzene. The RCHD sampled the supply well of the Ricky Hicks residence on June 29, 1988. No benzene was detected. The RCHD reported the ground water contamination to the DEM WSRO who initiated sampling on July 19, 1988.

Steve Kay of the DEM WSRO sampled supply wells at the following residences on July 19, 1988:

Residence	Benzene Concentration
Wilson Garner Residence	no benzene
William Cole Residence	no benzene
Lloyd Frye Residence	no benzene
Ricky Hicks Residence	no benzene
Climeth Yates Residence	no benzene
Bobby Agner Shell Abandoned Well	no benzene
Bobby Agner Shell Supply Well	44 ppb benzene
Harvey's Tank and Tummy Supply Well	240 ppb benzene
Briles Oil Company Supply Well	4,600ppb benzene

During August of 1988 some residents of Sherwood Road (including the Barker's and Garners) connected to Asheboro city water at their own expense. On September 4, 1988 RCHD sampled the supply well at Hunt's # 2 rental house (Daggett residence) and found 87.8 ppb benzene.

On September 4, 1988, the RCHD sampled the supply well at the Hunt's rental house #2/Daggett residence. Laboratory results showed benzene concentrations of 87.8 µg/L. The RCHD sampled the Hunt's #1 rental house on November 29, 1988 but found no detectable petroleum contamination.

On September 11, 1988 the DEM WSRO received a report of a UST excavation at the Quick Chek Mart at the intersection of US 64 and NC 49. Steve Williams of the DEM WSRO investigated the complaint on September 12, 1988 and arrived on site as three gasoline USTs were being tightness tested. At this time, a hole was discovered just above the threading in a check valve of the regular unleaded tank. A strong gasoline odor was evident and a sample taken 5 feet from the center of the tank at 4 feet of depth was scanned with a HNU PID giving readings of 30 to 50 ppm.

On November 18, 1988 a Notice of Noncompliance was issued to Mr. R.W. Dozier of Quick Chek, Inc. 220 West Spring Street, Troy, N.C. 27371. He was ordered to determine the horizontal and vertical extent of contamination and submit a proposed remedial action plan by March 18, 1989.

Quik Chek, Inc. contracted T.R. Edgerton Environmental, Inc. (TRE) to conduct site investigations and answer the Notice of Noncompliance. TRE performed some remediation at the site but was unable to fully assess the extent of contamination. TRE installed and sampled three monitors wells in conjunction with their site assessment. They reported (Preliminary Ground Water Assessment Quik Chek, Asheboro, NC, 1989) over one foot of free-phase hydrocarbons in monitor well QCA-2 and high concentrations of dissolved petroleum constituents in monitor wells QCA-1 (1,200 µg/L benzene) and QCA-3 (1,400 µg/L benzene).

The RCHD sampled the supply well at Hunt's # 1 rental house on November 29, 1988; no benzene was detected.

On December 15, 1988 the RCHD sampled supply wells at the Todd McKenzie residence, the Fay Shaw residence, the Arthur Hartsell residence, the Jewelry Outlet, Harvey's Tank and Tummy, J & S Fashions and the Econo Oil Company. No benzene was detected in any of these wells during this round of sampling. Copies of the analytical results were forwarded to Mr. John Stewart of the NC DEM WSRO.

In March 1989, the NC DEM began a monitor well program in the area. Intermittent drilling and well installation continued through 1991.

On August 24, 1990, Larry Lucas of the WSRO sampled the supply wells at the Garner, Frye, and Gallimore residences. The analysis of the Garner well showed petroleum contamination (25 µg/L benzene). The latter two wells contained no detectable contamination.

On February 4, 1991, CDM sampled the supply wells at the Frye and McKenzie residences and the Agner Shell Station. The Frye supply well contained no detectable petroleum constituents. Both the McKenzie (18 µg/L benzene) and Agner Shell Station (296 µg/L benzene) supply wells were contaminated.

On October 2, 1991, Brian Ball of the NC DEM WSRO sampled NC DEM monitor wells L54T6, L54T7, L54T9, L54T10, L54T11, L54T12, L54T13, L54T15, L54T16, L54T17, and L54T18. Four of eleven samples contained detectable concentrations of dissolved petroleum constituents. These included L54T6 (13 µg/L benzene), L54T7 (10 µg/L benzene), L54T9 (68 µg/L benzene), and L54T12 (3 µg/L benzene).

On September 23, 29, and 30, 1992 Geophex personnel sampled monitor wells L54T6, L54T7, L54T9, L54T10, L54T11, L54T12, L54T13, L54T14, L54T15, L54T16, L54T17, L54T18, QCA-1, QCA-2, QCA-3, QCA-6, and QCA-7. Monitor well QCA-5 contained over one foot of free-product. Analyses of these samples by EPA method 602 and MTBE showed moderate levels of contamination in monitor wells L54T6 (6.1 µg/L benzene), L54T7 (7.4 µg/L benzene), L54T12 (49 µg/L benzene); QCA-3 (300 µg/L benzene), and L54T9 (910 µg/L benzene). Severe petroleum contamination was found in L54T14 (5,800 µg/L benzene), QCA-1 (3,500 µg/L benzene), and QCA-2 (16,000 µg/L benzene). Geophex personnel observed over one foot of free-product in monitor well QCA-5 on September 29, 1992 and one-eighth inch of free product in monitor wells QCA-2 and L54T14 on September 30, 1992. No sample was obtained from monitor well QCA-4 because recent paving covered the well.

From January 22 through 26, 1993, Geophex personnel installed monitor wells WSVB1, BOB3, BOB4, DOT1, DOT2, and DOT4. On February 3, 1993 Geophex sampled these wells and submitted the samples for analysis by EPA Methods 602 and MTBE. All wells were severely contaminated with dissolved petroleum constituents. Sample WSVB1 contained 9,190 µg/L benzene, but no detectable concentrations of MTBE. Sample BOB3 contained 3,980 µg/L benzene and BOB4 contained 32,500 µg/L benzene; neither BOB3 nor BOB4 contained detectable concentrations of MTBE. Sample DOT1 contained 10,000 µg/L benzene (6,470µg/L MTBE), DOT2 contained 20,000 µg/L benzene (6,610 µg/L MTBE), and DOT4 contained 5,720

µg/L benzene (1,000 µg/L MTBE). On February 10, 1993, only six inches of free-product were present in monitor well QCA-5.

During September 2000, Geophex, Ltd. personnel conducted a site visit and researched water supply records to update activities at the various sites. Results of this survey indicated that all known affected domestic water supplies had been replaced by municipal water. However, no additional sampling was conducted to determine if other water supplies (Keeling residence and homes on Fisher Circle might have been impacted since 1993).

Site Geology

The Paul Barker site is located in the Central Piedmont physiographic province of North Carolina. Broad, northeast-southwest oriented monadnocks, in excess of 1,000 feet above sea level, are surrounded by rolling hills and valleys. There is 150 to 200 feet of total relief within the Paul Barker site. Hills tend to have flat tops with relatively steep slopes that give way to broad alluvium filled drainages. An east-northeast to west-southwest oriented topographic divide roughly parallels NC Hwy 49. All but three of the petroleum dispensing facilities (i.e. Econo/Citgo, Brueilly Auto, and the Asheboro Well Co.) are located along this topographic divide.

Rocks in this area are typical of the Carolina Slate Belt geologic province consisting of mildly deformed and metamorphosed volcanic, volcanoclastic, and sedimentary units. Open folds plunging to the southwest are the dominant structures (Butler and Secor, 1991) and pervasive northeast-southwest near-vertical cleavage is common in outcrops in the Asheboro area.

The North Carolina Geological Survey geologic map of Region G (1982) describes dense medium to light gray rhyolitic to dacitic flow rocks (Felsic Flows) and interbedded fine-grained felsic and felsic crystal tuffs (Felsic Volcanic Rocks) as well as a thinly laminated argillite unit interbedded with volcanic and volcanoclastic units (Argillite).

Outcrops in the area are sparse. However, a single road cut along US Hwy 64 exposes a moderately silicified, epiclastic, rhyolitic, lithic crystal tuff with interbedded metasiltstone. The fabric of the rock is dominated by a strong N50^{o}E near vertical foliation that is subparallel to ghosts of original siltstone bedding. Minor conjugate fractures are also present with an attitude of N50^{o}W; 80^{o}SW. A similar outcrop is present at the intersection of US Hwy 64 and SR 1448 in the bottom of a ditch and the north side of the ditch bank.

The USGS 15 minute Asheboro quadrangle geologic map notes a potentially significant structure that could serve as major conduits for fluid movements. This is an east-north-east, west-south-west oriented strike-slip fault through the center of the site. Vegetation, soil cover, and urbanization preclude field verification of this structure. However, the strong foliation and mineralization of rocks outcropping along US Hwy 64 and the distribution of petroleum contaminants is consistent with a groundwater flow regime dominated by a large fracture or fault with numerous splays.

The USGS geologic map places the fault from the Keeling residence at the eastern side of the site through the intersection of Lambert Road and US Hwy 64, under the Southern side of the Clothing Outlet warehouse, to just south of the Briles Oil Company property and intersecting Mack Road 150 feet north of the Sherwood Road Mack Road Intersection.

Surface Waters

Streams in the area are intermittent with gradients ranging from 150 to 350 feet/mile. Geophex has divided the Paul Barker site into four drainage basins (I - IV) based on geomorphological

interpretations of Randolph County topographic maps. A surface water divide occurs through the middle of the site entering the area from a hill to the northwest. 500 feet west of the intersection of NC Hwy 49 and Mack Road (SR 1144) the divide turns east following the trend of NC Hwy 49 to the US Hwy 64/NC Hwy 49 interchange and the intersection of the headwaters of watersheds II, III, and IV (Quik Chek property). Here it turns north and runs about 100 feet east of the West End United Methodist Church parallel to SR 1448 and out of the study area. Overland flow of free-product from surface spills associated with the facilities in the area will follow the direction of movement indicated on the watershed map.

Groundwater

Flow of groundwater in the soils and regolith (saprolite) is derived from Geophex field measurements of water levels in monitor wells on September 30, 1992 and topographic interpretations from maps provided by the Randolph County Engineering Office. A groundwater divide extends from just south of NC Hwy 49 to the east through the Agner Shell Station property to the former Briles Oil Company Facility then across US Hwy 64 through the Quik Chek property where it turns northeast and extends off site. This map can be considered a reasonable approximation of the migration paths for groundwater contaminants that have not reached the irregular conduits of the fractured bedrock.

All of the contaminated supply wells and many of the monitor wells also produce water from the underlying bedrock where topographic interpretations and contouring of static water levels may not provide an accurate illustration of potential migration paths. No aquifer testing has been performed in this area to date.

Interpretations of drillers' logs suggest a partially confined aquifer within the more fractured and weathered zones of the bedrock. These zones have higher hydraulic conductivities than the overlying soils and regolith and could serve as conduits that transmit contaminants large distances in short periods of time. A panel diagram of the Paul Barker site has been compiled from lithologic descriptions from drillers' logs. This map illustrates the variation in the thickness of soil cover, relief of the bedrock, and conduits in the lower semi-confined aquifer.

Domestic Water Supplies

Detectable concentrations of petroleum contaminants have appeared intermittently in domestic supply wells along Lambert and Mack Roads. Residential water supply wells located southwest of the Barker home are also endangered.

Residences along Fisher Circle are at risk from releases associated with the Briles, Tank & Tummy, and Econo Oil plumes. Geophex personnel sampled the supply wells at 1435 Fisher Circle and at 1423 Fisher Circle on September 29, 1992. The laboratory analyses reported no detectable dissolved petroleum constituents. However, topography and static water level measurements from monitor wells suggest that ground water from part of the site may flow toward Fisher Circle.

The spring used by the Keeling residence spring may also be threatened by petroleum released from the West Side Video site. Geophex sampled the Keeling spring on February 3, 1993. The laboratory analysis reported no detectable dissolved petroleum constituents.

The Asheboro Municipal water system has extended 12-inch water lines along NC Hwy 49 and Lambert Drive. Businesses along US Hwy 64 and NC Hwy 49 residences along Sherwood Road and two on Mack Road are connected to Asheboro city water.

Road Improvements Planned by NC DOT

Free-product is present in the US Hwy 64 right-of-way south of the Quik Chek Mart site. Geophex personnel observed over one-foot of gasoline in a monitor well during a site visit in September of 1992. By February of 1993, the level had decreased to six inches. We believe the free-product at this location was released from the Quik Chek property and has migrated south along a fracture zone that serves as both a conduit to the southwest and a baffle against flow to the southeast. Petroleum contamination has probably migrated under the Schwarz rental properties. Geophex personnel observed one-eighth inch of free-product on the Quik Chek Property in September of 1992. T.R. Edgerton reported over one-foot of free-product at this site in April of 1989.

A map shows proposed improvements for the US Hwy 64, US Hwy 220, and NC Hwy 49 interchange. The interchange may markedly change the dynamics of the groundwater system and surficial drainage. Construction will probably encounter free-phase petroleum products at shallow depths between the Quik Chek and Schwartz rental properties. Mr. Greg Smith of the Geotechnical Unit is the principal NC Department of Transportation contact for this project.

Agner Shell Station (ID# 0-019967)

Station History

The Agner Shell Station is located on the southwest corner of the intersection of NC Hwy 49 and Mack Road/SR 1144. The facility is at the northeast headwaters of watershed I. Overland flow from this property is to the southwest. The station was constructed in 1969 and has been operated as a retail petroleum/automotive repair facility.

The business occupies a single building facing the northeast. There are two bay doors on the front southeast side of the building. The parking area is paved with asphalt except for a concrete slab. A canopy covers two sets of dispenser pumps. The lot at the rear of the building is grassy and enclosed by a chain-link fence.

As of September 13, 2000, the Agner Shell Station is no longer dispensing fuels, but the USTs are still in place. The site is now occupied by DG Motor Sports, a repair facility for water craft.

Tank Inventory

The NC DEM UST registry lists four UST's on site. There are two tank basins on the property. One is located five-to-ten feet southeast of the dispenser area and contains three USTs (T1 - T3). The second basin is in the back lot against the foundation of the building and contains one UST (T4). Geophex confirmed the information from the registry with magnetic gradient surveys, ground-penetrating radar profiles, and by visual inspection during site visits. No unexplained anomalies in the magnetic gradient were found, and no other USTs are present within the area surveyed.

USTs T1 - T3 were used to store regular (10,000 gallon), mid-grade (10,000 gallon), and premium unleaded (6,000 gallon) gasoline. UST T4, an abandoned 550-gallon tank, was originally used to store kerosene but was used most recently to store waste motor oil.

Contamination

The first evidence of contamination on the Agner Shell Station property was from water samples collected by Steve Kay of the WSRO (benzene 44 µg/L) on July 19, 1988. NC DEM drillers' records from the installation of monitor well L54T7 on March 28, 1989 report an "odor" from six inches to four feet below ground surface. Subsequent samples from the Agner Shell Station supply well by CDM (benzene 296 µg/L) on February 4, 1991, and of monitor well L54T7 by Brian Ball of the WSRO (benzene 10 µg/L) on October 2, 1991, further documented groundwater contamination. Brian Ball also sampled monitor well L54T15 on October 2, 1991, but no contamination was detected.

Geophex sampled monitor wells L54T7 and L54T15 on September 29, 1992. Laboratory analysis with EPA Method 602 and MTBE detected minor petroleum contamination, with total BTEX

concentrations of 8.5 µg/L (benzene 7.4 µg/L) and MTBE concentrations at 170 µg/L. No contamination was found in monitor well L54T15.

The level of contamination of the aquifer (fractured rock) feeding the Agner Shell supply well increased between sampling events. Contaminant levels in monitor well L54T7 (screened above bedrock) remained essentially constant, but significantly lower than the supply well, suggesting that the contaminants may be coming from different sources.

Monitor well L54T15 has not shown contamination during any sampling event. All but the upper two feet of this well is in bedrock. NC DEM drillers' records report a "dry blue rock" from two to seventeen feet and "soft layers in rock" and "fractures-soft-rock-moisture... Brown quartzite" to a total depth of 24 feet.

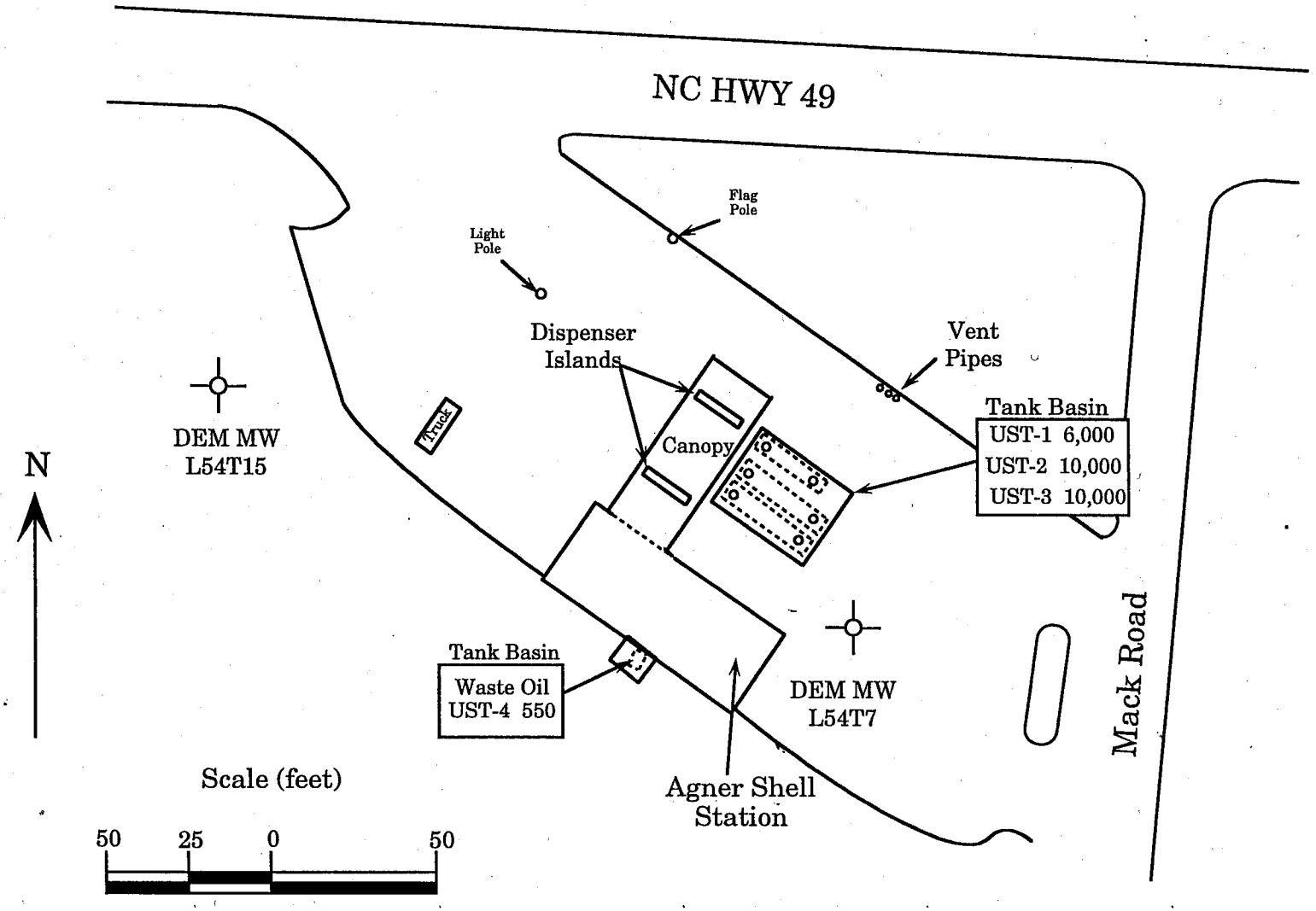
Geophex personnel have observed outcrops in the area of silicified, rhyolitic tuffs that are dark blue to black. These rocks weather to a tan-to-brown soil and could have been mistaken for quartzite.

Geophex interprets the aquifer below the site as a water table aquifer that is confined from below by dense unweathered rhyolites. There are zones within the rhyolitic bedrock that have higher fracture densities, greater hydraulic conductivities, and are more rapidly weathering. The rocks in these zones tend to look like brown quartzites as described by NC DEM drillers and serve as a lower confined aquifer.

These water-bearing zones are in communication with off-site recharge areas. Therefore, the contamination that appears in the Agner Shell and adjacent supply wells is probably entering the groundwater regime from another location. Further investigations are needed to confirm this hypothosis and to fully assess the contribution from the Agner Shell Station to local groundwater problems.

Further investigations should include five soil borings to bedrock around the tank basins as outlined in Geophex's task proposal dated October 22, 1992.

TF-3739, Paul Barker
Asheboro, Randolph Co., N.C.
Geophex, Ltd. (March, 1993)



Geophex

Agner Shell Station

Tank No.	Date Ins	Date Rem.	Capacity	Product	Type	
1	5/5/69	N/A	10,000	Gasoline	Steel	
2	5/5/69	N/A	10,000	Gasoline	Steel	
3	5/5/70	N/A	6,000	Gasoline	Steel	
4	5/5/70	N/A	550	Kerosene*	Steel	
Inventory of USTs at the Agner Shell Station						
Owner: Bobby Agner			Contact Bobby Agner @ (919) 629-9857			
Route 7, Asheboro N.C. 27203						
N/A = Not Applicable						
Data from the NCDEHNR-DEM Tank Registrations						
* Currently Used to Store Spent Motor Oil						

Connections to Municipal Water

1. A. Todd McKenzie
   Rt. 7 Box 7A
   Asheboro, NC 27203

2. 49 Shell Service
   Rt. 7 Box 1
   Asheboro, NC 27203

3. Tanning Salon (Sue Allen)
   N.C. 49
   Asheboro, NC 27203

4. William Lassiter (Kim Wizebroad)
   Rt. 9 Box 20
   Asheboro, NC 27203

5. William Lassiter (Bobby Shirley)
   Rt. 9 Box 22
   Asheboro, NC 27203

6. Arthur Hartsell
   Rt. 9 Box 21
   Asheboro, NC 27203

7. William Raeford Farlow
   Rt. 9 Box 19
   Asheboro, NC 27203

8. Jerry Trotter (T.J. Pizza - N.C. 49)
   Rt. 8 Box 38
   Asheboro, NC 27203

9. Harvey's Tank & Tummy
   P.O. Box 2511 (N.C. 49 & US 64)
   Asheboro, NC 27203

10. Climeth Yates
    1309 Sherwood Road (Bldg @ S.E. Corner Mack Rd. and N.C. 49)
    Asheboro, NC 27203

11. Kent T. Lewis
    1317 Sherwood Road
    Asheboro, NC 27203

12. Rachel Gilmore
    1315 Sherwood Road
    Asheboro, NC 27203

13. Eric M. Hicks
    1313 Sherwood Road
    Asheboro, NC 27203

14. B.D. Greene
    1305 Sherwood Road
    Asheboro, NC 27203

15. Wilson Garner
Rt. 7 Box 3 (Sherwood Road)
Asheboro, NC 27203

16. David Lewallen
1201 Sherwood Road
Asheboro, NC 27203

17. Mozelle Miller
1818 Lambert Drive
Asheboro, NC 27203

18. Robert Beane
1826 Lambert Drive
Asheboro, NC 27203

19. Charles Copple
1832 Lambert Drive
Asheboro, NC 27203

20. Rev. R.L. Hughes
1827 Lambert Drive
Asheboro, NC 27203

21. Eddie Stout
1819 Lambert Drive
Asheboro, NC 27203

22. Dorothy Michael
1811 Lambert Drive
Asheboro, NC 27203

23. Patty Trotter
1805 Lambert Drive
Asheboro, NC 27203

24. Gary B. Strider
1733 Lambert Drive
Asheboro, NC 27203

25. Athel Cox
1110 & 1112 Sherwood Rd. (Duplex)
Asheboro, NC 27203

26. Athel Cox
1106 & 1108 Sherwood Rd. (Duplex)
Asheboro, NC 27203

27. Athel Cox
1102 & 1104 Lambert Dr. (Duplex)
Asheboro, NC 27203

28. Roy Kearns
1719 Whitley St.
Asheboro, NC 27203

29. Butcher Shop
P.O. Box 2011 (Hwy 64 West)
Asheboro, NC 27204

30. Artistic Beauty Salon
Rt. 1 Box 247 (Hwy 64 West @ Village Inn)
Bennett, NC 27208

31. Village Inn
Rt. 7 Box 96A (Hwy 64 West)
Asheboro, NC 27203

32. Auto Clean
P.O. Box 302 (Old Exxon Station)
Sophia, NC 27350

33. Richard Hammons
1615 Lambert Drive
Asheboro, NC 27203

34. Howard Luther
1713 Lambert Drive
Asheboro, NC 27203

35. Paul C. Barker
Rt. 7 box 2
Asheboro, NC 27203

36. Linda Callicutt
1734 Lambert Drive
Asheboro, NC 27203

37. W.I. Walker
1726 Lambert Drive
Asheboro, NC 27203

38. Ken McMasters
1714 Lambert Drive
Asheboro, NC 27203

39. George Coble
1638 Lambert Drive
Asheboro, NC 27203

40. J & S Rentals
N.C. 49 West
Asheboro, NC 27203

41. Shana Knitweat
N.C. 49 West
Asheboro, NC 27203

42. William Lassiter
P.O. Box 1344 (Access Rd - S.R. 1450)
Asheboro, NC 27203

43. Clarence McGill
Albemarle Road
Asheboro, NC 27203

44. Econon Travel Motor Hotel
Albemarle Road
Asheboro, NC 27203

45. Glenda K. Joyce
1007 Lewallen St.
Asheboro, NC 27203

46. Clarence McGill
1106 Lewallen St.
Asheboro, NC 27203

47. Grady Auman
1110 Lewallen st.
Asheboro, NC 27203

48. Mona H. Stout
1114 Lewallen St.
Asheboro, NC 27203

49. Pamelia Miller
Rt. 9 Box 5
Asheboro, NC 27203

50. Dock Stout
Rt. 9 Box 7 (Mobile Home)
Asheboro, NC 27203

Subject: Mack Road
Date: Thu, 19 Dec 2002 10:30:06 -0500
From: Stephen Williams <stephen.williams@ncmail.net>
Organization: NC DENR UST
To: Linda Blalock <Linda.Blalock@ncmail.net>

Upon receipt of your December 3, 2002 memorandum, the incident identified as Mack Road incident 3739 has been re-classified to a low risk and has been closed.

December 3, 2002

MEMORANDUM

TO: Steve Williams
UST Section
Winston-Salem Regional Office

FROM: Linda Blalock
Federal Trust Fund

RE: Mack Road Incident (aka Paul Barker)
TF-3739, Asheboro, Randolph County

In memos to me dated February 25 and March 20, 2002, you requested that the Federal Trust Fund connect nine remaining locations that are within 1,000 feet of the Highway 49/Mack Road intersection in an effort to eliminate the health risk and reclassify the incident from high to low risk. This memo summarizes those efforts.

In March, I sent letters to the nine locations listed in your memo informing them that the Federal Trust Fund was prepared to pay all costs associated with connecting the homes/businesses to the City of Asheboro waterline and that they would be responsible for the monthly water bills. All agreed.

The first three connected were Frye (335 Mack Rd), Cole (339 Mack Rd), and Mabe (353 Mack Rd). Then, Schwartz (214 Hwy 49 and 283 Hwy 49), McKenzie (367 Mack Rd), Moffit (342 Mack Rd), Nance (373 Mack Rd), and Hartsell/Thomas [264 Hwy 49; meter already installed; just paid for plumber. (Note: As co-owner of property and executor for Arthur Lee Hartsell, Virginia Edith Hartsell Hall sold property to Paul & Sandra Thomas)]. I have attached copies of the Water & Sewer Connections Applications on all but 264 Hwy 49, because the meter was already there, and copies of the plumbers' invoices for all nine connections. Hence, I'm reporting that **the nine locations you listed in your February 25 and March 20 memos are now connected to the City of Asheboro waterline.**

Also, at the request of Larry Bowman who lives at 930 Sherwood Ave, we sampled his water supply well on July 11, 2002 and had the sample analyzed using EPA methods 601/602. All compounds were <1.0 ug/L. You should have a copy in your file but, for convenience, I'm attaching another copy. Although 930 Sherwood Avenue is outside the 1,000-ft radius, I felt that sampling the well would provide some peace of mind to Mr. Bowman and his neighbors.

Therefore, I am requesting that this incident be re-classified from high risk to low risk. Please let me know what you decide to do. Feel free to call me (919-733-1314) if you need any additional information or if something in this memo is unclear.

Thanks—

llb

Attachments

APPENDIX C

PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

PYRAMID ENVIRONMENTAL & ENGINEERING
(PROJECT 2014-070)

GEOPHYSICAL SURVEY

PARCEL 4 – DONALD GOINS
217 NC-49, ASHEBORO, NC
NCDOT PROJECT U-5305 (WBS 47025.1.1)

ASHEVILLE, RANDOLPH COUNTY, NC

MAY 27, 2014

Report prepared for: **Mr. Craig Haden**
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 4, 217 NC-49
Asheboro, Randolph County, North Carolina

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Discussion of Results 3
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Figure 3 – Parcel 4 – Overlay of EM61 Contour Map On Engineering Plans
Figure 4 – Parcel 4 – GPR Transect Locations and Select Images
Figure 5 – Parcel 4 – Locations of Probable and Known Metallic USTs

Appendices

Appendix A – GPR Transect Images

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Donald Goins property, Parcel 4, 217 NC-49, Asheboro, Randolph County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5305). Pyramid originally performed a geophysical survey at this Parcel in June of 2013 between the existing edge of pavement and the proposed ROW and/or easements along the north and east portions of the property. The NCDOT is now proposing to acquire the entire parcel, and the limits of the geophysical survey were extended to include all accessible areas of Parcel 4. The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys.

Geophysical Results: The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles and debris, or to suspected reinforced concrete. Areas of reinforced concrete were recorded as anomalies by the EM, and verified by the GPR. No structures were observed beneath the reinforcement that were indicative of USTs. Three known USTs were identified during Pyramid's June 2013 investigation, and verified by this investigation to be located directly east of the canopy in front of the main building on site.
One septic tank was identified on the south portion of the property by the EM survey. The septic tank was partially excavated, and the property tenant verified that this structure was a septic tank. One probable UST was identified directly adjacent to the south side of the building. The EM response in conjunction with a visible vent pipe and historical research resulted in its classification as a probable UST. The geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, one septic tank was observed on the south side of the building.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for the North Carolina Department of Transportation (NCDOT), at the Donald Goins property, Parcel 4, 217 NC-49, Asheboro, Randolph County, NC. The survey was part of an NCDOT Right-of-Way (ROW) investigation (NCDOT Project U-5305). Pyramid originally performed a geophysical survey at this Parcel in June of 2013 between the existing edge of pavement and the proposed ROW and/or easements along the north and east portions of the property. The NCDOT is now proposing to acquire the entire parcel, and the limits of the geophysical survey were extended to include all accessible areas of Parcel 4. The survey grid spanned approximately 150 feet from west to east and approximately 220 feet from north to south. Conducted on May 8, 2014, 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 tow truck facility on the north side of the property that was a former Shell gasoline service station. Three known metallic USTs were identified in Pyramid's June 2013 geophysical survey at the property near the former pump islands. The south side of the property was predominantly open grass and bare ground, with multiple vehicles and metallic debris scattered throughout the area. The geophysical survey encompassed all accessible areas of the property, with the exclusion of locations where parked vehicles or large debris were present. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. The EM survey was performed on May 8, 2014, using a Geonics EM61 metal detection instrument integrated with a Trimble AG-114 GPS antennae. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the

site and at select interior locations with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8 foot intervals generally 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 NAV61 and Surfer for Windows Version 11.0 software programs.

GPR data were acquired across select EM differential anomalies and areas of reinforced concrete on May 8, 2014, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit with a dual frequency 300 MHz/800MHz 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 6 feet, based on an estimated two-way travel time of 8 nanoseconds per foot. GPR Transects across specific anomalies or reinforced concrete were saved to the hard drive of the DF unit for post-processing and figure generation.

DISCUSSION OF RESULTS

A contour plot of the EM61 differential results obtained across survey area at the property is presented in **Figure 2**. The differential results are obtained from the difference between the top and bottom coils of the EM61 instrument. The differential results focus on the larger metal objects such as drum and UST-size objects and ignore the smaller insignificant metal objects.

Discussion of EM Anomalies: Reinforced concrete created high amplitude EM responses across the north side of the canopy in front of the building, as well at the location of the sidewalk concrete adjacent to the north side of the main structure (see **Figure 2**). Multiple vehicles and large pieces of metallic debris were present behind the building on the south half of the property that resulted in high amplitude EM responses. Vehicles were also present directly to the east and west of the main structure. The EM response at the northwest corner of the survey area was the

result of a water meter cover and former supply well cover at this location. The EM response along the majority of the south wall of the main building was the result of the metal siding and foundation of the building itself.

The large EM response directly to the east of the canopy was associated with the three known metallic USTs that were identified in Pyramid's June 2013 geophysical report (see discussion below). In addition to these three USTs, the EM survey provided evidence of one additional metallic UST and one septic tank at the site. The septic tank is located approximately 25 feet south-southwest of the center of the south side of the building. This tank was verified by the property tenant to be a septic tank, and was partially excavated at the time of our site visit. The remaining UST is a probable UST, and is located directly adjacent to the south side of the building. Historical research of the site (see main PSA report) provided evidence of a former kerosene UST at this location that was converted to a waste oil UST. An EM response was observed at the location, and a vent pipe was observed at the ground surface.

Figure 3 provides an overlay of the EM61 survey boundary on the NCDOT engineering plans as a reference to the proposed ROW, easements, and drainage features relative to the area surveyed.

A GPR survey was performed across all areas containing reinforced concrete to verify that no structures were present beneath the reinforcement. The septic tank was not surveyed by the GPR due to irregular ground surface associated with the partially excavated septic tank preventing access. The probable UST adjacent to the building was not surveyed by the GPR due to significant vegetative cover and debris in that area, as well as proximity to the building.

Discussion of GPR Survey: **Figure 4** presents the locations and images of the formal GPR transects performed at the property. GPR Transects 1-4 were performed across the area of reinforced concrete to the north of and beneath the metal canopy in front of the former service station. These transects all verified the presence of reinforcement within the concrete at the locations discussed in the previous section. No evidence of any USTs was observed in these GPR transects.

Figure 5 presents the approximate locations of the 4 known and 1 probable USTs at the property. As discussed earlier, three known USTs were identified to the east of the canopy in Pyramid's June 2013 geophysical survey. The EM61 survey performed for this investigation also verified the presence of these three tanks. Historical research indicates that these tanks contained fuel in the past associated with the former Shell gas station. A discussion of these three USTs is presented below, obtained from the June 2013 Pyramid report:

"*The GPR indicated that the two southern tanks were approximately 8 feet wide x 30 feet long, and that the northern tank was approximately 10 feet wide x 20 feet long. The two southern tanks were observed to be at a depth of approximately 3.5 to 4 feet below the ground surface (bgs), and the northern tank was observed to be at a depth of approximately 2.5-3 feet bgs.*"

The UST located directly adjacent to the south side of the building was not accessible by the GPR instrument. However, the combination of EM response, a visible vent pipe, and historical research indicate it is likely that a UST is present at this location. For this reason, this UST is classified as a probable UST by NCDOT standards.

The septic tank was not surveyed by the GPR instrument due to the excavated soil surrounding it. However, the verbal verification of its location by the property tenant, combined with the partial excavation of the tank and the EM response, result in a verifiable septic tank.

The geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, one septic tank was observed on the south side of the building.

SUMMARY & CONCLUSIONS

Our evaluation of the EM61 and GPR data collected across Parcel 4 in Asheboro, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.

- The majority of the EM61 anomalies detected could be attributed to visible objects at the ground surface such as vehicles and debris, or to suspected reinforced concrete.
- Areas of reinforced concrete were recorded as anomalies by the EM, and verified by the GPR. No structures were observed beneath the reinforcement that were indicative of USTs.
- Three known USTs were identified during Pyramid's June 2013 investigation, and verified by this investigation to be located directly east of the canopy in front of the main building on site.
- One septic UST was identified on the south portion of the property by the EM survey. The septic tank was partially excavated, and the property tenant verified that this structure was a septic tank.
- One probable UST was identified directly adjacent to the south side of the building. The EM response in conjunction with a visible vent pipe and historical research resulted in its classification as a probable UST.
- The geophysical investigation recorded evidence of 3 known metallic USTs and 1 probable metallic UST at the property within the survey area limits. Additionally, one septic tank was observed on the south side of the building.

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.

Red Line Indicates Path of EM61 Across Survey Area

View of Northeast Geophysical Survey Area
and Known UST Basin
(Facing Approximately North)

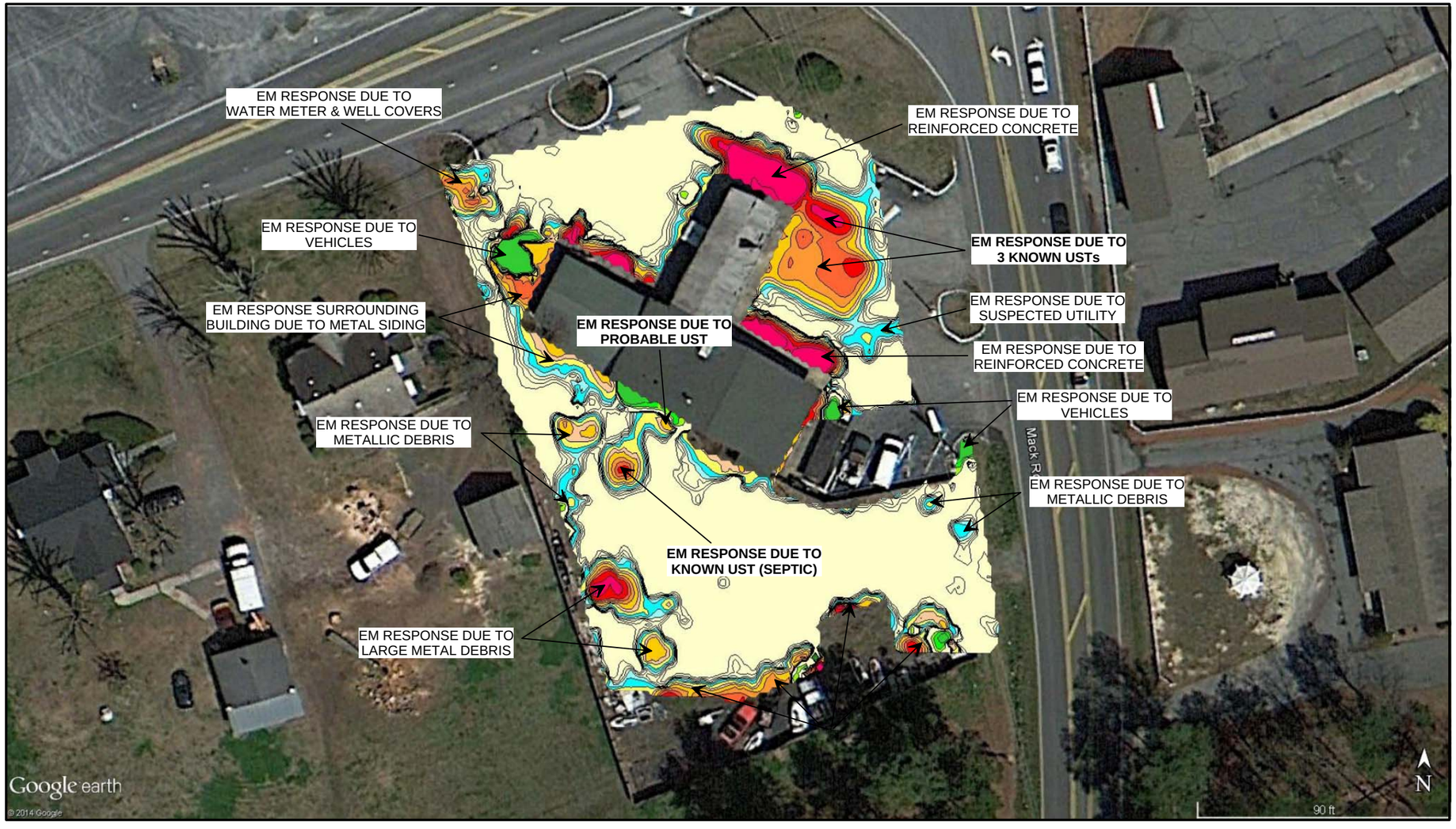
View of South Portion of Survey Area
(Facing Approximately South)

TITLE	PARCEL 004: EM61 GEOPHYSICAL SURVEY PATH AND SITE PHOTOGRAPHS
PROJECT	NCDOT PROJECT U-5305 (47025.1.1) ASHEBORO, RANDOLPH 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	5/26/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2014-070		**FIGURE 1**

EM61 Differential Results



EVIDENCE OF FIVE METALLIC USTs OBSERVED

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). 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 May 8, 2014, using a Geonics EM61 instrument. Ground penetrating radar (GPR) data were collected on May 8, 2014, using a GSSI DF 300/800 unit with a combined 300 & 800 MHz anttenae.

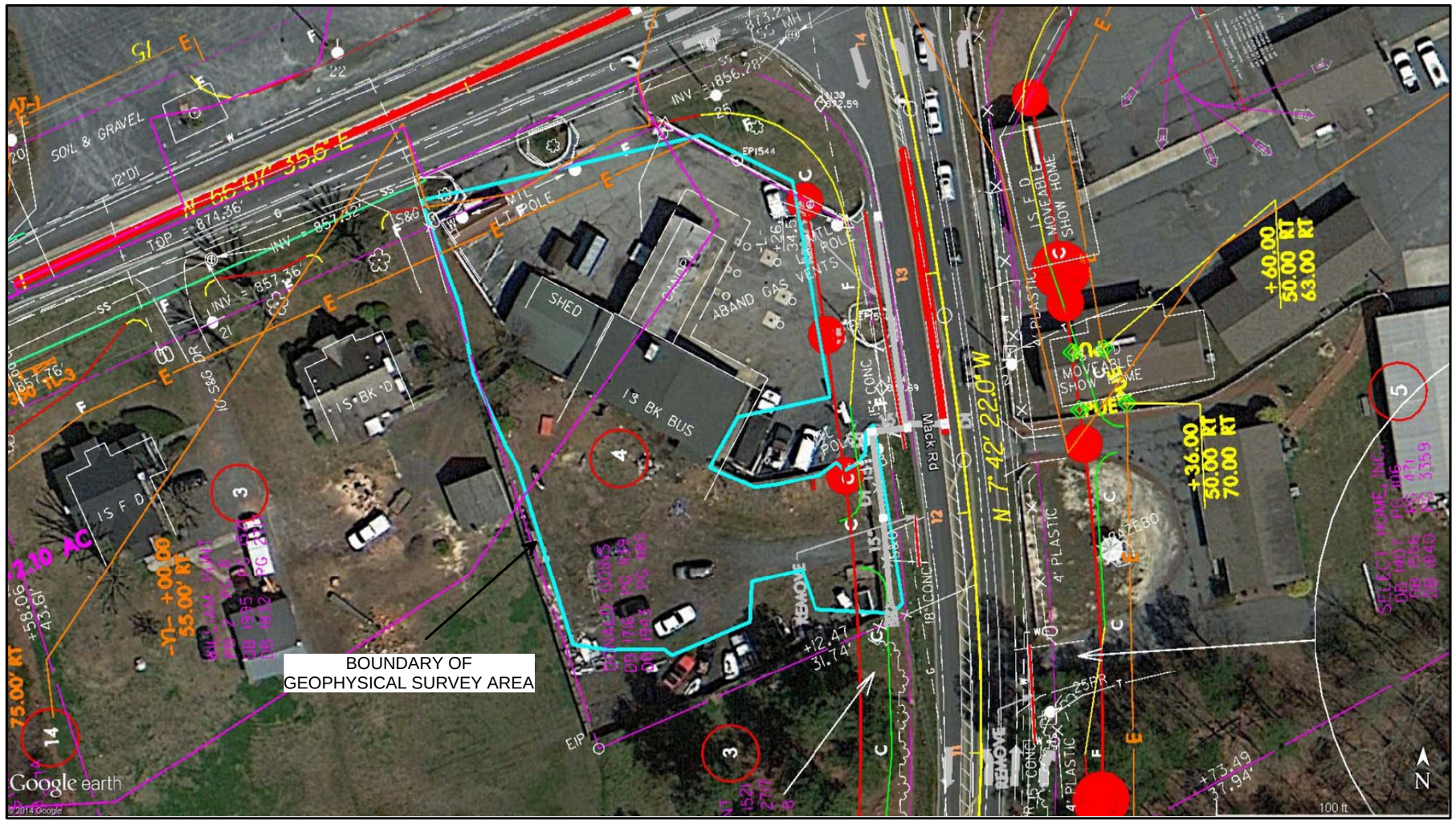
EM61 Metal Detection Response (millivolts)

50 FEET

TITLE	PARCEL 004: EM61 DIFFERENTIAL RESULTS CONTOUR MAP
PROJECT	NCDOT PROJECT U-5305 (47025.1.1) ASHEBORO, RANDOLPH 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	5/26/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2014-070		**FIGURE 2**



Overlay of Geophysical Survey Boundaries on NCDOT Engineering Plans

TITLE	PARCEL 004: OVERLAY OF GEOPHYSICAL SURVEY BOUNDARY ON NCDOT PLANS
PROJECT	NCDOT PROJECT U-5305 (47025.1.1) ASHEBORO, RANDOLPH COUNTY, NC

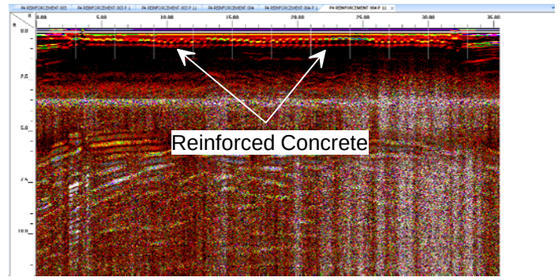
PYRAMID ENVIRONMENTAL & ENGINEERING, P.C.

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

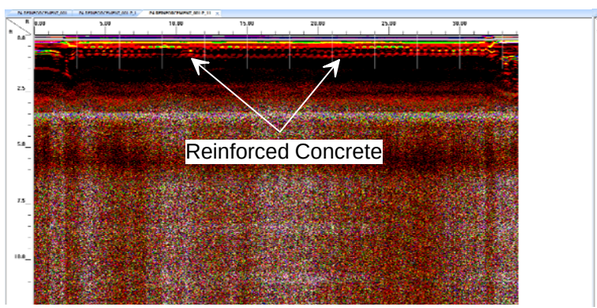
DATE	5/26/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2014-070		**FIGURE 3**

GPR Transect Locations

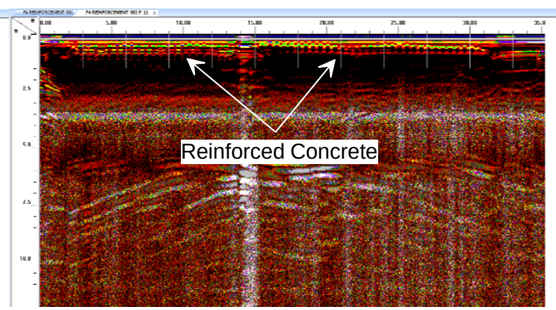
Four GPR Transects were performed across the area of reinforced concrete at the locaiton of the canopy in front of the service station to verify the presence or absence of structures such as USTs beneath the reinforcement. No USTs were observed in this area.



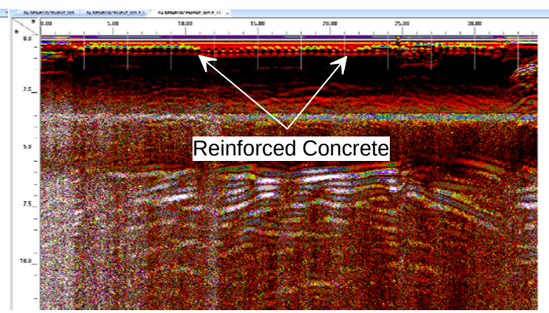
GPR Transect 4



GPR Transect 1



GPR Transect 2



GPR Transect 3

TITLE: PARCEL 004: GPR TRANSECT LOCATIONS AND SELECT IMAGES

PROJECT: NCDOT PROJECT U-5305 (47025.1.1) ASHEBORO, RANDOLPH 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

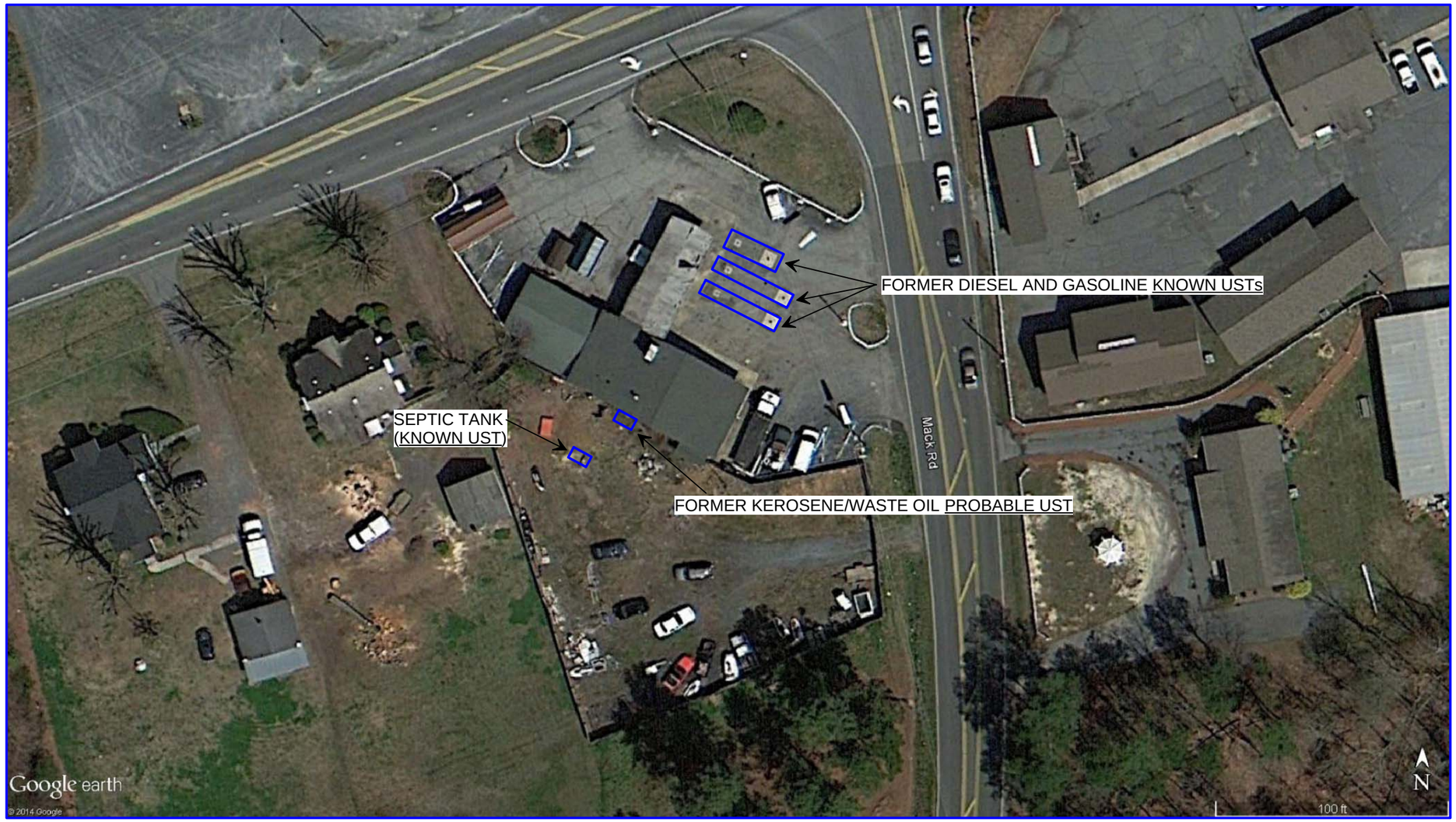
DATE: 5/26/2014

CLIENT: NCDOT

PYRAMID PROJECT #: 2014-070

FIGURE 4

Locations of Probable and Known Metallic USTs



Approximate locations of 3 former gasoline/diesel known USTs

Known septic tank

Vent pipe observed at location og probable kerosene/waste oil UST

TITLE	PARCEL 004: LOCATIONS OF PROBABLE AND KNOWN USTs
PROJECT	NCDOT PROJECT U-5305 (47025.1.1) ASHEBORO, RANDOLPH 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	5/26/2014	CLIENT	NCDOT
PYRAMID PROJECT #:	2014-070		**FIGURE 5**

APPENDIX D

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-1
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, in tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	12 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-1(0-2): 0 PPM
0.5' - 8.5'	Orange silty clay (OL) - dry, no odor	OVA= 4-1(2-4): 0 PPM
8.5' - 9'	Black gravel layer - dry, no odor	OVA= 4-1(4-6): 130 PPM
9' - 12'	Orange/Red silty clay (OL) - dry, no odor	OVA= 4-1(6-8): 0 PPM
		OVA= 4-1(8-10): 1200 PPM
		OVA= 4-1(10-12): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-2
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, in tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	12 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-2(0-2): 10 PPM
0.5' - 8.5'	Orange silty clay (OL) - dry, slight petroleum odor	OVA= 4-2(2-4): 0 PPM
8.5' - 9'	Black gravel layer - dry, no odor	OVA= 4-2(4-6): 20 PPM
9' - 12'	Gray silty clay (OL) - dry, slight petroleum odor	OVA= 4-2(6-8): 0 PPM
		OVA= 4-2(8-10): 150 PPM
		OVA= 4-2(10-12): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-3
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, in tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	12 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-3(0-2): 110 PPM
0.5' - 5'	Orange silty clay (OL) - dry, slight petroleum odor	OVA= 4-3(2-4): 45PPM
5' - 8.5'	Gray silty clay (OL) - dry, sweet degraded petroleum odor	OVA= 4-3(4-6): 40 PPM
8.5' - 9.0'	Black gravel layer - dry, no odor	OVA= 4-3(6-8): 100 PPM
9' - 12'	Gray silty clay (OL) - dry, sweet degraded petroleum odor	OVA= 4-3(8-10): 65 PPM
		OVA= 4-3(10-12): 55 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-4
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-4(0-2): 0 PPM
0.5' - 2'	Orange silty clay (OL) - dry, no odor	OVA= 4-4(2-4): 45 PPM
2' - 6'	Gray silty clay (OL)- dry, no odor	OVA= 4-4(4-6): 0 PPM
6' - 8'	Orange silty clay (OL) - dry, no odor	OVA= 4-4(6-8): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-5
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-5(0-2): 15 PPM
0.5' - 2'	Orange silty clay (OL) - dry, no odor	OVA= 4-5(2-4): 0 PPM
2' - 6'	Gray silty clay (OL)- dry, no odor	OVA= 4-5(4-6): 85 PPM
6' - 8'	Orange silty clay (OL) - dry, no odor	OVA= 4-5(6-8): 15 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-6
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-6(0-2): 15 PPM
0.5' - 2'	Orange silty clay (OL) - dry, no odor	OVA= 4-6(2-4): 0 PPM
2' - 6'	Gray silty clay (OL)- dry, no odor	OVA= 4-6(4-6): 65 PPM
6' - 8'	Orange silty clay (OL) - dry, no odor	OVA= 4-6(6-8): 10 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-7
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-7(0-2): 0 PPM
0.5' - 5'	Orange silty clay (OL) - dry, no odor	OVA= 4-7(2-4): 0 PPM
5' - 8'	Gray silty clay (OL)- dry, no odor	OVA= 4-7(4-6): 85 PPM
		OVA= 4-7(6-8): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-8
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-8(0-2): 35 PPM
0.5' - 6'	Orange silty clay (OL) - dry, no odor	OVA= 4-8(2-4): 0 PPM
6' - 8'	Gray silty clay (OL)- dry, no odor	OVA= 4-8(4-6): 180 PPM
		OVA= 4-8(6-8): 5 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-9
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, just outside tank pit
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Asphalt / Gravel	OVA= 4-9(0-2): 55 PPM
0.5' - 6'	Orange silty clay (OL) - dry, no odor	OVA= 4-9(2-4): 5 PPM
6' - 8'	Gray silty clay (OL)- dry, no odor	OVA= 4-9(4-6): 230 PPM
		OVA= 4-9(6-8): 45 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-10
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-10(0-2): 0 PPM
0.5' - 6'	Orange silty clay (OL) - dry, no odor	OVA= 4-10(2-4): 15 PPM
6' - 8'	Gray silty clay (OL)- dry, no odor	OVA= 4-10(4-6): 470 PPM
		OVA= 4-10(6-8): 15 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-11
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-11(0-2): 35 PPM
0.5' - 2'	Orange silty clay (OL) - dry, no odor	OVA= 4-11(2-4): 15 PPM
2' - 6'	Gray silty clay (OL) - dry, dry	OVA= 4-11(4-6): 65 PPM
6' - 8'	Gray silty clay (OL) - dry, wet inside the end of core - no odor	OVA= 4-11(6-8): 25 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-12
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-12(0-2): 25 PPM
0.5' - 6'	Orange silty clay (OL) - dry, no odor	OVA= 4-12(2-4): 35 PPM
6' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-12(4-6): 230 PPM
		OVA= 4-12(6-8): 45 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-13
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-13(0-2): 50 PPM
0.5' - 4'	Orange silty clay (OL) - dry, no odor	OVA= 4-13(2-4): 120 PPM
4' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-13(4-6): 80 PPM
		OVA= 4-13(6-8): 60 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-14
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-14(0-2): 110 PPM
0.5' - 1.5'	Gray silty clay (OL) - dry, no odor	OVA= 4-14(2-4): 90 PPM
1.5' - 4'	Orange silty clay (OL) - dry, no odor	OVA= 4-14(4-6): 50 PPM
4' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-14(6-8): 35 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-15
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, grass area near road
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-15(0-2): 150 PPM
0.5' - 1'	Orange silty clay (OL) - dry, no odor	OVA= 4-15(2-4): 5 PPM
1' - 2'	Gray silty clay (OL) - spoon was wet, no odor	OVA= 4-15(4-6): 15 PPM
2' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-15(6-8): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

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FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-16
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, inside fenced area behind building
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-16(0-2): 75 PPM
0.5' - 4'	Orange silty clay (OL) - dry, no odor	OVA= 4-16(2-4): 0 PPM
4' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-16(4-6): 0 PPM
		OVA= 4-16(6-8): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-17
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, inside fenced area behind building
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	7 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-17(0-1): 55 PPM
0.5' - 2'	Orange silty clay (OL) - dry, no odor	OVA= 4-17(3-4): 55 PPM
2' - 7'	Gray silty clay (OL) - dry, no odor	OVA= 4-17(4-5): 30 PPM
		OVA= 4-17(6-7): 0 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-18
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, inside fenced area behind building
START DATE:	5/14/14	**COMPLETED:**	5/14/14
GEOLOGIST:	Ryan Kramer	**DRILLER:**	Solutions-IES
DRILL METHOD:	Geoprobe	**SAMPLE METHOD:**	Macro-core
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	8 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-18(0-2): 25 PPM
0.5' - 4'	Orange silty clay (OL) - dry, no odor	OVA= 4-18(2-4): 240 PPM
4' - 8'	Gray silty clay (OL) - dry, no odor	OVA= 4-18(4-6): 190 PPM
		OVA= 4-18(6-8): 60 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

Pyramid Environmental & Engineering, P.C.

FIELD DRILLING RECORD

PROJECT NAME: PROJECT NUMBER:	NC DOT U-5305, Parcel 4, Asheboro, NC / 2014-070	**BORING/WELL NO:**	4-19
SITE LOCATION:	Asheboro, NC	**BORING/WELL LOCATION:**	Parcel 4, inside fenced area near 550-gallon UST
START DATE:	5/15/14	**COMPLETED:**	5/15/14
GEOLOGIST:	Tim Leatherman	**DRILLER:**	Tim Leatherman
DRILL METHOD:	Hand Auger	**SAMPLE METHOD:**	Aluminum Spoon
BORING DIA:	2-inch	**CASING DIA:**	N/A
TOTAL DEPTH:	6 feet	**CASING DEPTH:**	N/A

DEPTH (ft.)	**VISUAL MANUAL SOIL CLASSIFICATION COLOR, TEXTURE, STRUCTURE, CONSISTENCY, ODOR, ETC.**	**OVA RESULTS PERCENT RECOVERY BLOW COUNTS**
		Core Sample Depths
0 - 0.5'	Grass / topsoil	OVA= 4-19(0-2): 0 PPM
0.5' - 4'	Orange silty clay (OL) - dry, slight petro odor	OVA= 4-19(2-4): 0 PPM
4' - 6'	Gray silty clay (OL) - dry, strong petro odor	OVA= 4-19(4-6): 170 PPM

MONITORING WELL INFORMATION (IF APPLICABLE)

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

APPENDIX E

QED

AQROS

Hydrocarbon Analysis Results

Client: NCDOT Asheboro U-5305 Parcel 4
Address: 217 US Hwy 49 - Parcel 4
Asheboro, NC

Samples taken
Samples extracted
Samples analysed

Contact:

Operator Ryan Kramer

Project: NCDOT Asheboro U-5305 - Parcel 4

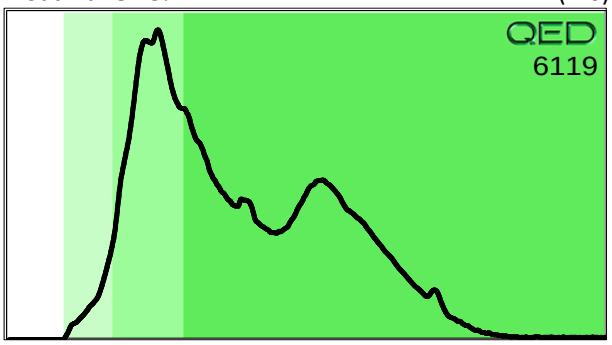
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	4-1 (4-6)	26.0	<1.3	<1.3	5.57	5.57	4.46	1.15	<0.026	52.2	34.5	13.3	Road Tar 87.3%
s	4-1 (8-10)	24.0	<1.2	<1.2	15.42	15.42	12.71	2.18	<0.024	46.6	39.6	13.8	Road Tar 88.8%
s	4-2 (8-10)	24.0	<1.2	<1.2	12.41	12.41	4.17	0.33	<0.024	57	35.7	7.3	Deg.Fuel (FCM) 94.8%
s	4-3 (6-8)	23.0	<1.2	<1.2	9.32	9.32	8	0.53	<0.023	52.7	39.9	7.3	Road Tar 98.8%
s	4-4 (2-4)	13.0	<0.7	<0.7	0.83	0.83	0.75	0.06	<0.013	62.4	27.7	9.9	V.Deg.PHC 89.9%
s	4-5 (4-6)	12.0	0.95	1.11	1.82	2.93	0.35	0.06	<0.012	82	13.4	4.6	Deg.Fuel (FCM) 71.7%
s	4-6 (4-6)	11.0	<0.6	<0.6	4.74	4.74	4.31	0.27	<0.011	49.6	39.1	11.2	V.Deg.PHC 98.5%
s	4-7 (4-6)	11.0	<0.5	<0.5	17.39	17.39	5.39	0.35	<0.011	50.3	41.9	7.8	Deg.Fuel (FCM) 96.3%
s	4-8 (4-6)	12.0	<0.6	<0.6	1.03	1.03	0.94	0.07	<0.012	59.4	30.7	9.8	V.Deg.PHC 98.8%
s	4-9 (4-6)	12.0	<0.6	0.91	6.14	7.05	5.6	0.62	<0.012	57	32.9	10.1	V.Deg.PHC 90.6%
	Initial Calibrator QC check	OK											

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

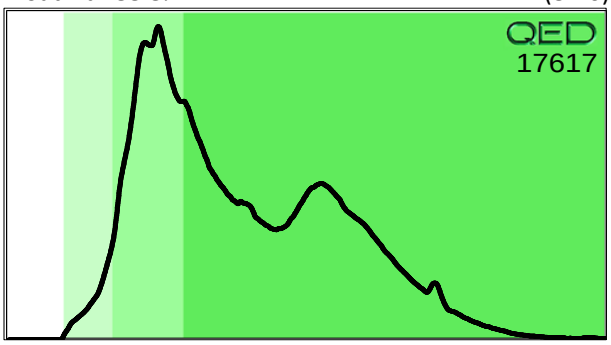
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

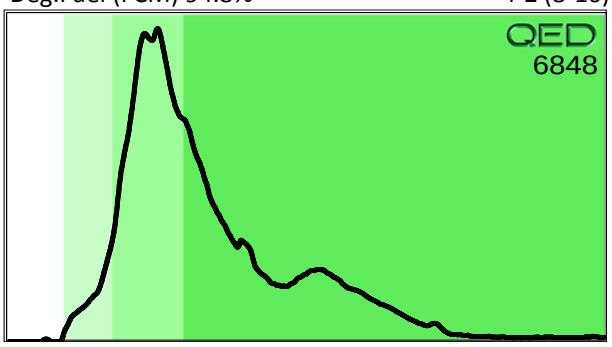
Road Tar 87.3% 4-1 (4-6)



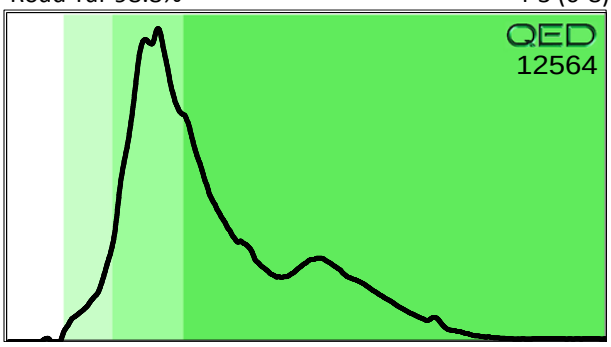
Road Tar 88.8% 4-1 (8-10)



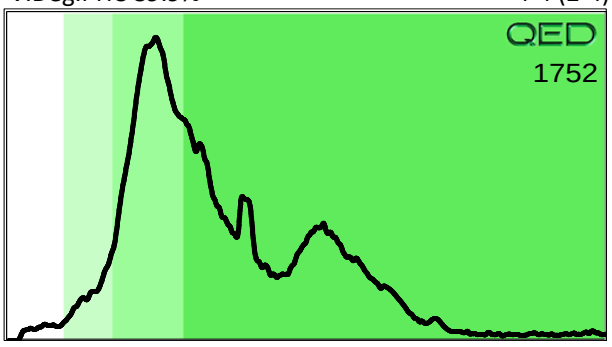
Deg.Fuel (FCM) 94.8% 4-2 (8-10)



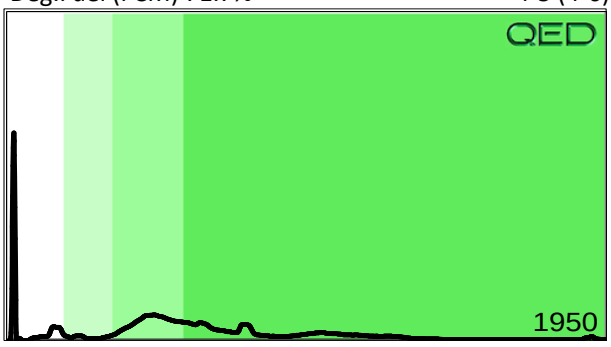
Road Tar 98.8% 4-3 (6-8)



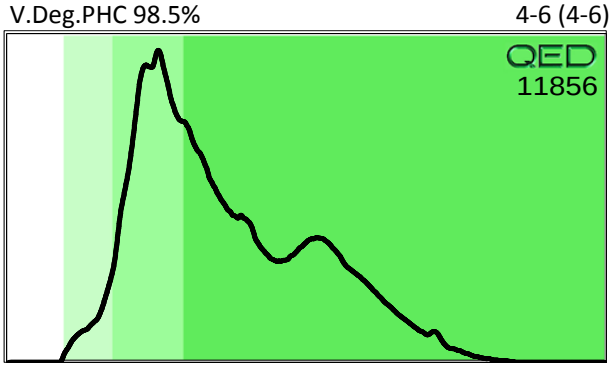
V.Deg.PHC 89.9% 4-4 (2-4)



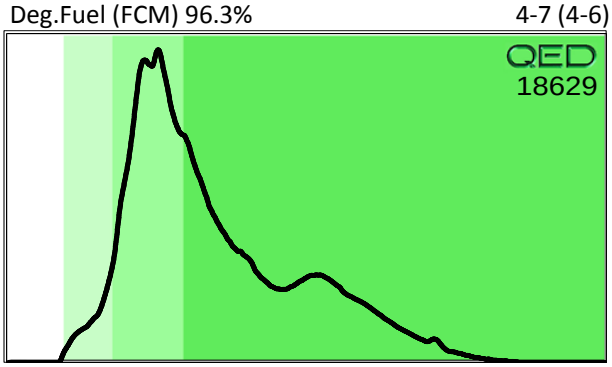
Deg.Fuel (FCM) 71.7% 4-5 (4-6)



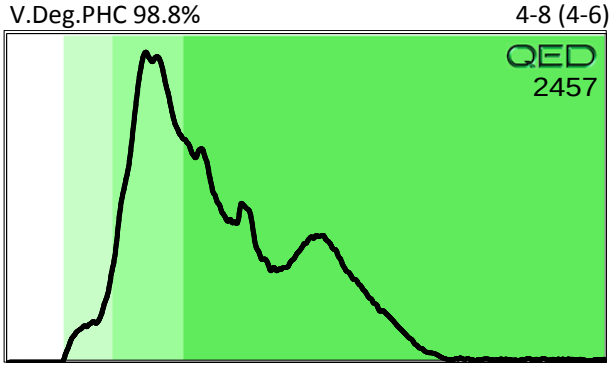
V.Deg.PHC 98.5% 4-6 (4-6)



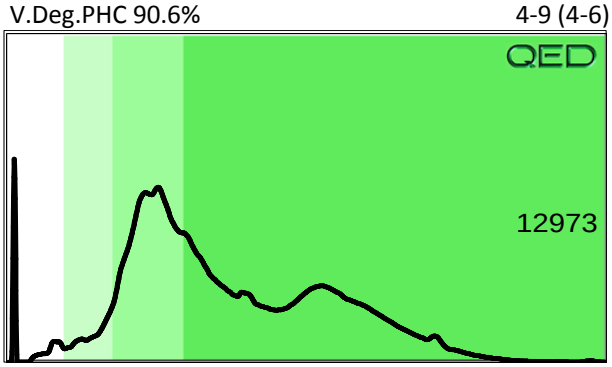
Deg.Fuel (FCM) 96.3% 4-7 (4-6)



V.Deg.PHC 98.8% 4-8 (4-6)



V.Deg.PHC 90.6% 4-9 (4-6)



Hydrocarbon Analysis Results

Client: NCDOT Asheboro U-5305 Parcel 4
Address: 217 US Hwy 49 - Parcel 4
Asheboro, NC

Samples taken
Samples extracted
Samples analysed

Contact:

Operator Ryan Kramer

Project: NCDOT Asheboro U-5305 - Parcel 4

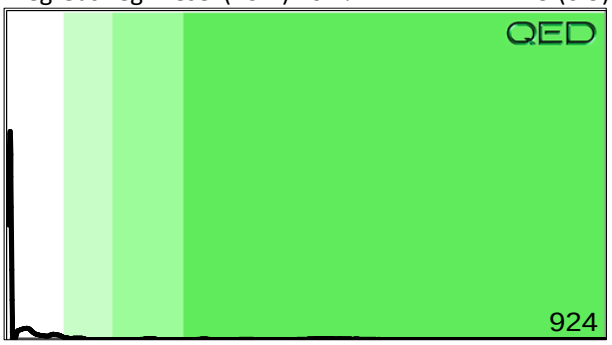
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	4-9 (6-9)	11.0	0.69	0.69	<0.11	0.69	<0.11	<0.01	<0.011	99.6	0.4	0	Deg.GasDeg.Diesel (FCM) 16.1%
s	4-10 (4-6)	11.0	<0.5	<0.5	10.94	10.94	8.4	1.21	<0.011	39.1	46.1	14.7	Road Tar 90.1%
s	4-11 (4-6)	13.0	1.05	1.05	<0.13	1.05	<0.13	<0.01	<0.013	100	0	0	Deg.GasDeg.Diesel (FCM) 18.7%
s	4-12 (4-6)	14.0	<0.7	<0.7	0.55	0.55	0.5	0.03	<0.014	68.5	21.1	10.4	V.Deg.PHC 82%
s	4-13 (2-4)	13.0	1.26	1.26	0.26	1.52	0.2	0.02	<0.013	87.4	8.6	4	V.Deg.PHC 77.7%
s	4-14 (2-4)	10.0	<0.5	<0.5	0.99	0.99	0.9	0.11	<0.01	48.2	37.5	14.3	V.Deg.PHC 93.5%
s	4-15 (4-6)	10.0	<0.5	<0.5	0.91	0.91	<0.1	<0.01	<0.01	98.1	1.9	0	Deg.Diesel (FCM) (P) 25.9%
s	4-16 (6-8)	11.0	0.77	0.77	<0.11	0.77	<0.11	<0.01	<0.011	100	0	0	Deg.Gas (FCM) 24.8%
s	4-17 (4-5)	12.0	<0.6	<0.6	<0.12	<0.6	<0.12	<0.01	<0.012	0	0	0	Match not possible (P)
s	4-18 (4-6)	11.0	<0.6	<0.6	1.14	1.14	1.09	0.88	<0.011	54.2	29.5	16.4	PAH (PFM) 100%
	Initial Calibrator QC check			OK									

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

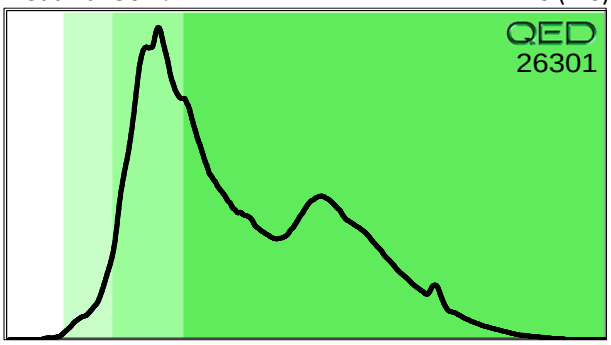
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

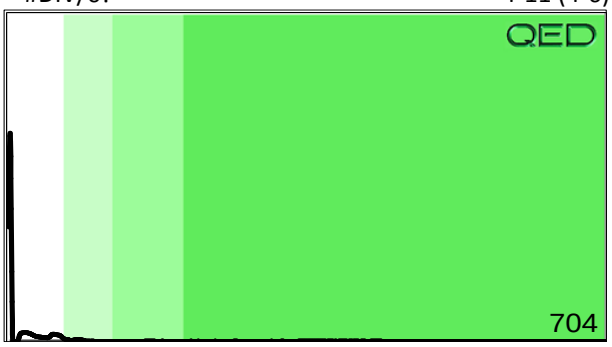
Deg.GasDeg.Diesel (FCM) 16.1% 4-9 (6-9)



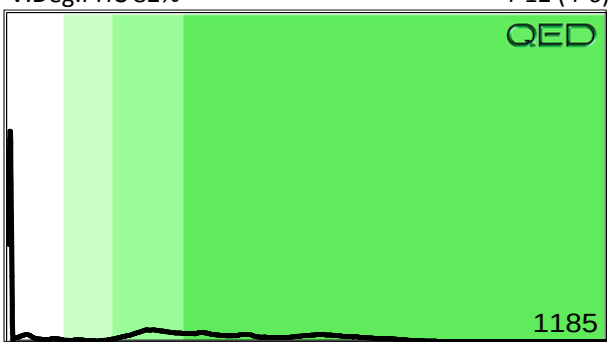
Road Tar 90.1% 4-10 (4-6)



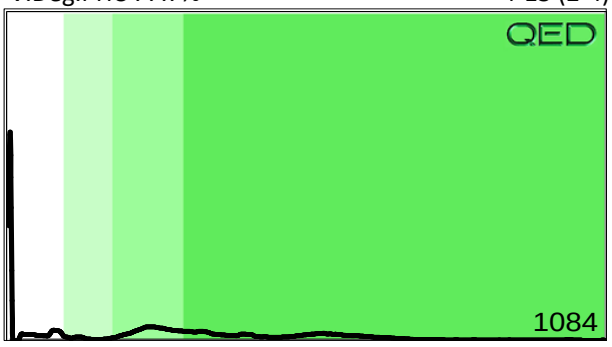
#DIV/0! 4-11 (4-6)



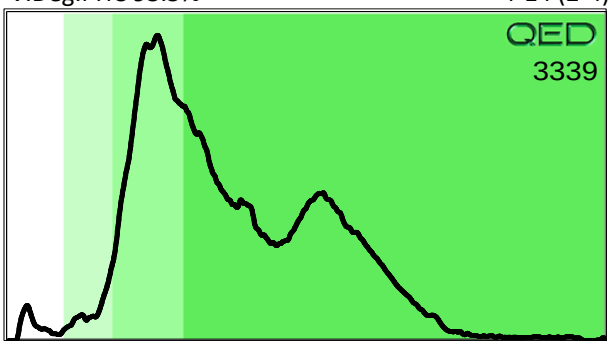
V.Deg.PHC 82% 4-12 (4-6)



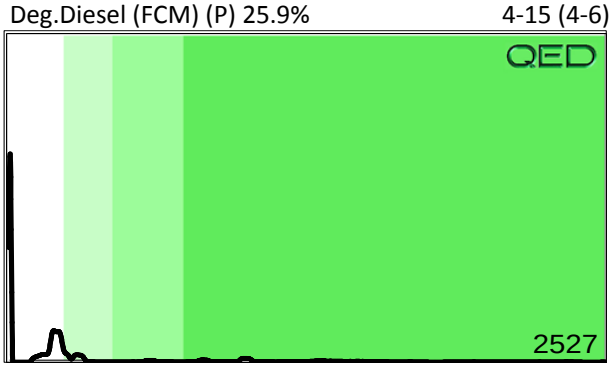
V.Deg.PHC 77.7% 4-13 (2-4)



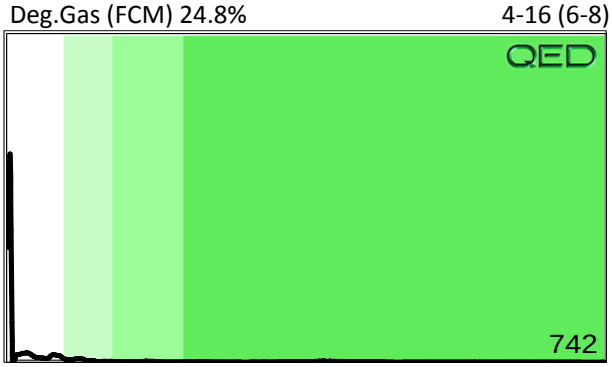
V.Deg.PHC 93.5% 4-14 (2-4)



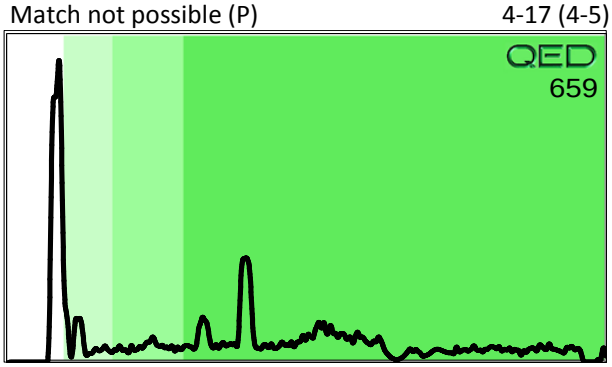
Deg.Diesel (FCM) (P) 25.9% 4-15 (4-6)



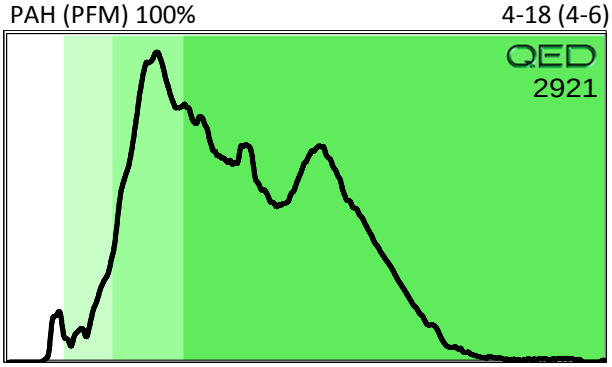
Deg.Gas (FCM) 24.8% 4-16 (6-8)



Match not possible (P) 4-17 (4-5)



PAH (PFM) 100% 4-18 (4-6)



QED

AQROS

Hydrocarbon Analysis Results

Client: NCDOT Asheboro U-5305 Parcel 4
Address: 217 US Hwy 49 - Parcel 4
Asheboro, NC

Samples taken
Samples extracted
Samples analysed

Contact:

Operator Ryan Kramer

Project: NCDOT Asheboro U-5305 - Parcel 4

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	4-19 (2-4)	24.0	<1.2	7.83	234.2	242.03	73.71	18.06	0.052	71.7	20	8.4	Deg.Fuel (FCM) 61.3%
s	4-19 (4-6)	20.0	<1	5.8	102.1	107.9	51.82	2.54	<0.02	78.3	18.3	3.4	Deg.Fuel (FCM) 91.2%

Initial Calibrator QC check OK

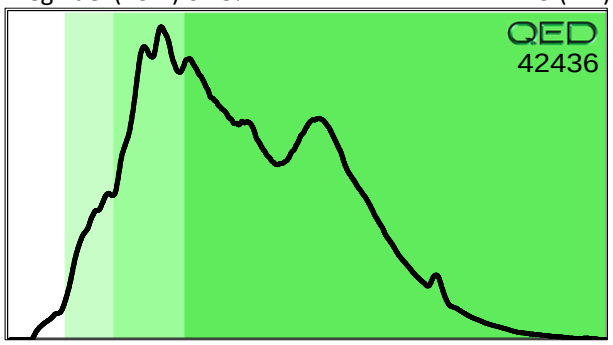
Final FCM QC Check OK 97.7%

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

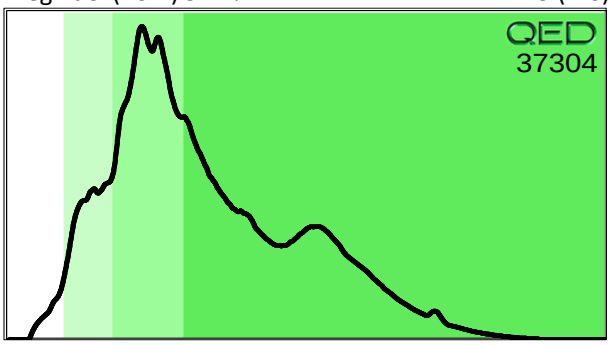
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

Deg.Fuel (FCM) 61.3% 4-19 (2-4)



Deg.Fuel (FCM) 91.2% 4-19 (4-6)



APPENDIX F

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

May 21, 2014

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

RE: Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Dear Chemical Engineer:
Enclosed are the analytical results for sample(s) received by the laboratory on May 15, 2014. 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

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

CERTIFICATIONS

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

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

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

SAMPLE ANALYTE COUNT

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92201623001	**MW Parcel #4**	SM 6200B	CAH	63	PASI-C

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

PROJECT NARRATIVE

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Method: **SM 6200B**
Description: 6200B MSV
Client: NCDOT East Central
Date: May 21, 2014

General Information:
1 sample was analyzed for SM 6200B. 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.

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.

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

ANALYTICAL RESULTS

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Sample: MW Parcel #4 **Lab ID: 92201623001** Collected: 05/15/14 10:00 Received: 05/15/14 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6200B MSV	Analytical Method: SM 6200B							
Benzene	**3.4**	ug/L	2.0	4		05/20/14 22:06	71-43-2	
Bromobenzene	ND	ug/L	2.0	4		05/20/14 22:06	108-86-1	
Bromochloromethane	ND	ug/L	2.0	4		05/20/14 22:06	74-97-5	
Bromodichloromethane	ND	ug/L	2.0	4		05/20/14 22:06	75-27-4	
Bromoform	ND	ug/L	2.0	4		05/20/14 22:06	75-25-2	
Bromomethane	ND	ug/L	20.0	4		05/20/14 22:06	74-83-9	
n-Butylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	104-51-8	
sec-Butylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	135-98-8	
tert-Butylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	98-06-6	
Carbon tetrachloride	ND	ug/L	2.0	4		05/20/14 22:06	56-23-5	
Chlorobenzene	ND	ug/L	2.0	4		05/20/14 22:06	108-90-7	
Chloroethane	ND	ug/L	4.0	4		05/20/14 22:06	75-00-3	
Chloroform	ND	ug/L	2.0	4		05/20/14 22:06	67-66-3	
Chloromethane	ND	ug/L	4.0	4		05/20/14 22:06	74-87-3	
2-Chlorotoluene	ND	ug/L	2.0	4		05/20/14 22:06	95-49-8	
4-Chlorotoluene	ND	ug/L	2.0	4		05/20/14 22:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	4.0	4		05/20/14 22:06	96-12-8	
Dibromochloromethane	ND	ug/L	2.0	4		05/20/14 22:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	2.0	4		05/20/14 22:06	106-93-4	
Dibromomethane	ND	ug/L	2.0	4		05/20/14 22:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	2.0	4		05/20/14 22:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	2.0	4		05/20/14 22:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	2.0	4		05/20/14 22:06	106-46-7	
Dichlorodifluoromethane	ND	ug/L	2.0	4		05/20/14 22:06	75-71-8	
1,1-Dichloroethane	ND	ug/L	2.0	4		05/20/14 22:06	75-34-3	
1,2-Dichloroethane	**4.0**	ug/L	2.0	4		05/20/14 22:06	107-06-2	
1,1-Dichloroethene	ND	ug/L	2.0	4		05/20/14 22:06	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	2.0	4		05/20/14 22:06	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	2.0	4		05/20/14 22:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	2.0	4		05/20/14 22:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	2.0	4		05/20/14 22:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	2.0	4		05/20/14 22:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	2.0	4		05/20/14 22:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	2.0	4		05/20/14 22:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	2.0	4		05/20/14 22:06	10061-02-6	
Diisopropyl ether	**28.0**	ug/L	2.0	4		05/20/14 22:06	108-20-3	
Ethylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	8.0	4		05/20/14 22:06	87-68-3	
Isopropylbenzene (Cumene)	**2.6**	ug/L	2.0	4		05/20/14 22:06	98-82-8	
Methylene Chloride	**15.9**	ug/L	8.0	4		05/20/14 22:06	75-09-2	
Methyl-tert-butyl ether	**351**	ug/L	2.0	4		05/20/14 22:06	1634-04-4	
Naphthalene	ND	ug/L	8.0	4		05/20/14 22:06	91-20-3	
n-Propylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	103-65-1	
Styrene	ND	ug/L	2.0	4		05/20/14 22:06	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	2.0	4		05/20/14 22:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	2.0	4		05/20/14 22:06	79-34-5	
Tetrachloroethene	ND	ug/L	2.0	4		05/20/14 22:06	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
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ANALYTICAL RESULTS

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Sample: MW Parcel #4 **Lab ID: 92201623001** Collected: 05/15/14 10:00 Received: 05/15/14 17:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6200B MSV	Analytical Method: SM 6200B							
Toluene	**5.5**	ug/L	2.0	4		05/20/14 22:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	8.0	4		05/20/14 22:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	8.0	4		05/20/14 22:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	2.0	4		05/20/14 22:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	2.0	4		05/20/14 22:06	79-00-5	
Trichloroethene	ND	ug/L	2.0	4		05/20/14 22:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	4		05/20/14 22:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	2.0	4		05/20/14 22:06	96-18-4	
1,2,4-Trimethylbenzene	ND	ug/L	2.0	4		05/20/14 22:06	95-63-6	
1,3,5-Trimethylbenzene	**2.4**	ug/L	2.0	4		05/20/14 22:06	108-67-8	
Vinyl chloride	ND	ug/L	4.0	4		05/20/14 22:06	75-01-4	
m&p-Xylene	ND	ug/L	4.0	4		05/20/14 22:06	179601-23-1	
o-Xylene	ND	ug/L	2.0	4		05/20/14 22:06	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	103	%	70-130	4		05/20/14 22:06	17060-07-0	
4-Bromofluorobenzene (S)	97	%	70-130	4		05/20/14 22:06	460-00-4	
Toluene-d8 (S)	103	%	70-130	4		05/20/14 22:06	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

QC Batch: MSV/26851 Analysis Method: SM 6200B
QC Batch Method: SM 6200B Analysis Description: 6200B MSV
Associated Lab Samples: 92201623001

METHOD BLANK: 1201636 Matrix: Water
Associated Lab Samples: 92201623001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,1,1-Trichloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,1,2,2-Tetrachloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,1,2-Trichloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,1-Dichloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,1-Dichloroethene	ug/L	ND	0.50	05/20/14 17:25	
1,1-Dichloropropene	ug/L	ND	0.50	05/20/14 17:25	
1,2,3-Trichlorobenzene	ug/L	ND	2.0	05/20/14 17:25	
1,2,3-Trichloropropane	ug/L	ND	0.50	05/20/14 17:25	
1,2,4-Trichlorobenzene	ug/L	ND	2.0	05/20/14 17:25	
1,2,4-Trimethylbenzene	ug/L	ND	0.50	05/20/14 17:25	
1,2-Dibromo-3-chloropropane	ug/L	ND	1.0	05/20/14 17:25	
1,2-Dibromoethane (EDB)	ug/L	ND	0.50	05/20/14 17:25	
1,2-Dichlorobenzene	ug/L	ND	0.50	05/20/14 17:25	
1,2-Dichloroethane	ug/L	ND	0.50	05/20/14 17:25	
1,2-Dichloropropane	ug/L	ND	0.50	05/20/14 17:25	
1,3,5-Trimethylbenzene	ug/L	ND	0.50	05/20/14 17:25	
1,3-Dichlorobenzene	ug/L	ND	0.50	05/20/14 17:25	
1,3-Dichloropropane	ug/L	ND	0.50	05/20/14 17:25	
1,4-Dichlorobenzene	ug/L	ND	0.50	05/20/14 17:25	
2,2-Dichloropropane	ug/L	ND	0.50	05/20/14 17:25	
2-Chlorotoluene	ug/L	ND	0.50	05/20/14 17:25	
4-Chlorotoluene	ug/L	ND	0.50	05/20/14 17:25	
Benzene	ug/L	ND	0.50	05/20/14 17:25	
Bromobenzene	ug/L	ND	0.50	05/20/14 17:25	
Bromochloromethane	ug/L	ND	0.50	05/20/14 17:25	
Bromodichloromethane	ug/L	ND	0.50	05/20/14 17:25	
Bromoform	ug/L	ND	0.50	05/20/14 17:25	
Bromomethane	ug/L	ND	5.0	05/20/14 17:25	
Carbon tetrachloride	ug/L	ND	0.50	05/20/14 17:25	
Chlorobenzene	ug/L	ND	0.50	05/20/14 17:25	
Chloroethane	ug/L	ND	1.0	05/20/14 17:25	
Chloroform	ug/L	ND	0.50	05/20/14 17:25	
Chloromethane	ug/L	ND	1.0	05/20/14 17:25	
cis-1,2-Dichloroethene	ug/L	ND	0.50	05/20/14 17:25	
cis-1,3-Dichloropropene	ug/L	ND	0.50	05/20/14 17:25	
Dibromochloromethane	ug/L	ND	0.50	05/20/14 17:25	
Dibromomethane	ug/L	ND	0.50	05/20/14 17:25	
Dichlorodifluoromethane	ug/L	ND	0.50	05/20/14 17:25	
Diisopropyl ether	ug/L	ND	0.50	05/20/14 17:25	
Ethylbenzene	ug/L	ND	0.50	05/20/14 17:25	
Hexachloro-1,3-butadiene	ug/L	ND	2.0	05/20/14 17:25	
Isopropylbenzene (Cumene)	ug/L	ND	0.50	05/20/14 17:25	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

METHOD BLANK: 1201636 Matrix: Water
Associated Lab Samples: 92201623001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/L	ND	1.0	05/20/14 17:25	
Methyl-tert-butyl ether	ug/L	ND	0.50	05/20/14 17:25	
Methylene Chloride	ug/L	ND	2.0	05/20/14 17:25	
n-Butylbenzene	ug/L	ND	0.50	05/20/14 17:25	
n-Propylbenzene	ug/L	ND	0.50	05/20/14 17:25	
Naphthalene	ug/L	ND	2.0	05/20/14 17:25	
o-Xylene	ug/L	ND	0.50	05/20/14 17:25	
sec-Butylbenzene	ug/L	ND	0.50	05/20/14 17:25	
Styrene	ug/L	ND	0.50	05/20/14 17:25	
tert-Butylbenzene	ug/L	ND	0.50	05/20/14 17:25	
Tetrachloroethene	ug/L	ND	0.50	05/20/14 17:25	
Toluene	ug/L	ND	0.50	05/20/14 17:25	
trans-1,2-Dichloroethene	ug/L	ND	0.50	05/20/14 17:25	
trans-1,3-Dichloropropene	ug/L	ND	0.50	05/20/14 17:25	
Trichloroethene	ug/L	ND	0.50	05/20/14 17:25	
Trichlorofluoromethane	ug/L	ND	1.0	05/20/14 17:25	
Vinyl chloride	ug/L	ND	1.0	05/20/14 17:25	
1,2-Dichloroethane-d4 (S)	%	96	70-130	05/20/14 17:25	
4-Bromofluorobenzene (S)	%	96	70-130	05/20/14 17:25	
Toluene-d8 (S)	%	100	70-130	05/20/14 17:25	

LABORATORY CONTROL SAMPLE: 1201637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	60.8	122	60-140	
1,1,1-Trichloroethane	ug/L	50	56.6	113	60-140	
1,1,2,2-Tetrachloroethane	ug/L	50	56.7	113	60-140	
1,1,2-Trichloroethane	ug/L	50	56.8	114	60-140	
1,1-Dichloroethane	ug/L	50	54.0	108	60-140	
1,1-Dichloroethene	ug/L	50	55.8	112	60-140	
1,1-Dichloropropene	ug/L	50	59.4	119	60-140	
1,2,3-Trichlorobenzene	ug/L	50	59.1	118	60-140	
1,2,3-Trichloropropane	ug/L	50	53.9	108	60-140	
1,2,4-Trichlorobenzene	ug/L	50	59.2	118	60-140	
1,2,4-Trimethylbenzene	ug/L	50	58.3	117	60-140	
1,2-Dibromo-3-chloropropane	ug/L	50	53.1	106	60-140	
1,2-Dibromoethane (EDB)	ug/L	50	57.0	114	60-140	
1,2-Dichlorobenzene	ug/L	50	56.2	112	60-140	
1,2-Dichloroethane	ug/L	50	55.0	110	60-140	
1,2-Dichloropropane	ug/L	50	54.7	109	60-140	
1,3,5-Trimethylbenzene	ug/L	50	55.7	111	60-140	
1,3-Dichlorobenzene	ug/L	50	54.9	110	60-140	
1,3-Dichloropropane	ug/L	50	56.6	113	60-140	
1,4-Dichlorobenzene	ug/L	50	54.4	109	60-140	
2,2-Dichloropropane	ug/L	50	57.4	115	60-140	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

LABORATORY CONTROL SAMPLE: 1201637

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
2-Chlorotoluene	ug/L	50	53.8	108	60-140	
4-Chlorotoluene	ug/L	50	55.0	110	60-140	
Benzene	ug/L	50	60.3	121	60-140	
Bromobenzene	ug/L	50	54.5	109	60-140	
Bromochloromethane	ug/L	50	60.0	120	60-140	
Bromodichloromethane	ug/L	50	56.9	114	60-140	
Bromoform	ug/L	50	50.3	101	60-140	
Bromomethane	ug/L	50	57.6	115	60-140	
Carbon tetrachloride	ug/L	50	60.2	120	60-140	
Chlorobenzene	ug/L	50	53.9	108	60-140	
Chloroethane	ug/L	50	51.5	103	60-140	
Chloroform	ug/L	50	54.1	108	60-140	
Chloromethane	ug/L	50	47.4	95	60-140	
cis-1,2-Dichloroethene	ug/L	50	55.2	110	60-140	
cis-1,3-Dichloropropene	ug/L	50	52.0	104	60-140	
Dibromochloromethane	ug/L	50	48.8	98	60-140	
Dibromomethane	ug/L	50	58.6	117	60-140	
Dichlorodifluoromethane	ug/L	50	59.3	119	60-140	
Diisopropyl ether	ug/L	50	46.5	93	60-140	
Ethylbenzene	ug/L	50	54.4	109	60-140	
Hexachloro-1,3-butadiene	ug/L	50	56.9	114	60-140	
Isopropylbenzene (Cumene)	ug/L	50	58.7	117	60-140	
m&p-Xylene	ug/L	100	110	110	60-140	
Methyl-tert-butyl ether	ug/L	50	47.1	94	60-140	
Methylene Chloride	ug/L	50	54.5	109	60-140	
n-Butylbenzene	ug/L	50	58.5	117	60-140	
n-Propylbenzene	ug/L	50	55.1	110	60-140	
Naphthalene	ug/L	50	60.5	121	60-140	
o-Xylene	ug/L	50	57.0	114	60-140	
sec-Butylbenzene	ug/L	50	56.7	113	60-140	
Styrene	ug/L	50	62.4	125	60-140	
tert-Butylbenzene	ug/L	50	56.9	114	60-140	
Tetrachloroethene	ug/L	50	58.8	118	60-140	
Toluene	ug/L	50	55.1	110	60-140	
trans-1,2-Dichloroethene	ug/L	50	55.8	112	60-140	
trans-1,3-Dichloropropene	ug/L	50	50.4	101	60-140	
Trichloroethene	ug/L	50	59.9	120	60-140	
Trichlorofluoromethane	ug/L	50	50.0	100	60-140	
Vinyl chloride	ug/L	50	65.8	132	60-140	
1,2-Dichloroethane-d4 (S)	%			92	70-130	
4-Bromofluorobenzene (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

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QUALITY CONTROL DATA

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1201638 1201639

Parameter	Units	92201501006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	22.0	23.5	110	118	60-140	7	
1,1,1-Trichloroethane	ug/L	ND	20	20	22.4	23.2	112	116	60-140	3	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	22.2	22.9	111	115	60-140	3	
1,1,2-Trichloroethane	ug/L	ND	20	20	21.5	23.3	108	116	60-140	8	
1,1-Dichloroethane	ug/L	ND	20	20	20.9	22.1	104	111	60-140	6	
1,1-Dichloroethene	ug/L	ND	20	20	22.5	22.9	113	114	60-140	1	
1,1-Dichloropropene	ug/L	ND	20	20	23.7	24.2	119	121	60-140	2	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	20.3	21.4	102	107	60-140	5	
1,2,3-Trichloropropane	ug/L	ND	20	20	21.6	22.4	108	112	60-140	4	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	20.2	21.0	101	105	60-140	4	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	21.7	22.8	109	114	60-140	5	
1,2-Dibromo-3-chloropropane	ug/L	ND	20	20	18.8	19.9	94	99	60-140	6	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	21.8	22.7	109	114	60-140	4	
1,2-Dichlorobenzene	ug/L	ND	20	20	21.0	22.0	105	110	60-140	5	
1,2-Dichloroethane	ug/L	ND	20	20	21.5	22.5	108	113	60-140	5	
1,2-Dichloropropane	ug/L	ND	20	20	21.3	22.5	106	113	60-140	6	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	21.3	22.3	107	112	60-140	4	
1,3-Dichlorobenzene	ug/L	ND	20	20	20.3	21.1	102	105	60-140	4	
1,3-Dichloropropane	ug/L	ND	20	20	21.8	23.4	109	117	60-140	7	
1,4-Dichlorobenzene	ug/L	ND	20	20	20.3	21.5	102	108	60-140	6	
2,2-Dichloropropane	ug/L	ND	20	20	20.3	21.7	101	108	60-140	7	
2-Chlorotoluene	ug/L	ND	20	20	20.9	21.8	105	109	60-140	4	
4-Chlorotoluene	ug/L	ND	20	20	20.6	21.2	103	106	60-140	3	
Benzene	ug/L	ND	20	20	23.7	24.7	119	124	60-140	4	
Bromobenzene	ug/L	ND	20	20	21.1	21.6	106	108	60-140	2	
Bromochloromethane	ug/L	ND	20	20	23.0	24.2	115	121	60-140	5	
Bromodichloromethane	ug/L	ND	20	20	21.1	22.2	106	111	60-140	5	
Bromoform	ug/L	ND	20	20	17.0	18.2	85	91	60-140	7	
Bromomethane	ug/L	ND	20	20	18.7	20.6	94	103	60-140	10	
Carbon tetrachloride	ug/L	ND	20	20	22.2	24.3	111	122	60-140	9	
Chlorobenzene	ug/L	ND	20	20	20.7	22.2	103	111	60-140	7	
Chloroethane	ug/L	ND	20	20	19.9	21.6	99	108	60-140	8	
Chloroform	ug/L	ND	20	20	21.1	22.2	106	111	60-140	5	
Chloromethane	ug/L	ND	20	20	18.3	18.3	91	92	60-140	0	
cis-1,2-Dichloroethene	ug/L	ND	20	20	21.6	22.2	108	111	60-140	3	
cis-1,3-Dichloropropene	ug/L	ND	20	20	18.2	19.7	91	99	60-140	8	
Dibromochloromethane	ug/L	ND	20	20	17.7	19.2	88	96	60-140	8	
Dibromomethane	ug/L	ND	20	20	22.4	22.9	112	115	60-140	2	
Dichlorodifluoromethane	ug/L	ND	20	20	25.3	25.6	127	128	60-140	1	
Diisopropyl ether	ug/L	ND	20	20	17.7	18.5	89	92	60-140	4	
Ethylbenzene	ug/L	ND	20	20	21.3	22.8	107	114	60-140	7	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	20.6	21.4	103	107	60-140	4	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	22.9	24.1	114	121	60-140	5	
m&p-Xylene	ug/L	ND	40	40	43.8	46.7	109	117	60-140	6	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.0	18.5	90	92	60-140	2	
Methylene Chloride	ug/L	ND	20	20	19.1	20.3	96	102	60-140	6	
n-Butylbenzene	ug/L	ND	20	20	20.8	22.4	104	112	60-140	8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1201638 1201639

Parameter	Units	92201501006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Qual
n-Propylbenzene	ug/L	ND	20	20	21.2	22.3	106	112	60-140	5	
Naphthalene	ug/L	ND	20	20	21.0	22.1	105	110	60-140	5	
o-Xylene	ug/L	ND	20	20	22.2	23.2	111	116	60-140	5	
sec-Butylbenzene	ug/L	ND	20	20	21.4	22.6	107	113	60-140	5	
Styrene	ug/L	ND	20	20	23.6	24.4	118	122	60-140	4	
tert-Butylbenzene	ug/L	ND	20	20	21.5	22.6	108	113	60-140	5	
Tetrachloroethene	ug/L	ND	20	20	23.0	24.2	113	119	60-140	5	
Toluene	ug/L	ND	20	20	21.7	22.8	108	114	60-140	5	
trans-1,2-Dichloroethene	ug/L	ND	20	20	21.9	22.3	110	111	60-140	2	
trans-1,3-Dichloropropene	ug/L	ND	20	20	17.9	19.7	90	98	60-140	9	
Trichloroethene	ug/L	ND	20	20	23.3	24.6	117	123	60-140	6	
Trichlorofluoromethane	ug/L	ND	20	20	21.5	22.3	107	111	60-140	4	
Vinyl chloride	ug/L	ND	20	20	26.7	27.4	134	137	60-140	2	
1,2-Dichloroethane-d4 (S)	%						95	95	70-130		
4-Bromofluorobenzene (S)	%						102	101	70-130		
Toluene-d8 (S)	%						100	100	70-130		

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

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.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: WBS #47025.1.1 U-5305
Pace Project No.: 92201623

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92201623001	**MW Parcel #4**	SM 6200B	MSV/26851		

Client Name: Pyramid

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other_____

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun T1102 T1401 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.: 4.8 °C Biological Tissue is Frozen: Yes No N/A

Temp should be above freezing to 6°C

Comments:

Optional
Proj. Due Date:
Proj. Name:

Date and Initials of person examining contents: CL

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: 5/15/14

SRF Review: [signature] Date: 5/15/14

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

WO#: 92201623

92201623

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

1667368

Section A Required Client Information:

Company: Pyramid Environmental
Address: P.O. Box 16265, Greensboro, NC 27416
Email To: Eric
Phone: 336.335.3174 Fax:
Requested Due Date/TAT: Normal 5-DAY TAT

Section B Required Project Information:

Report To: Eric Cross / Pyramid
Copy To:
Purchase Order No.: P.O.#4300233486 / WBS#47025.1.1
Project Name: NCDOT U-5305 Parcel #4
Project Number: 2014-070

Section C Invoice Information:

Attention: NCDOT
Company Name: NCDOT
Address:
Pace Quote Reference: WBS#47025.1.1
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	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED 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	Requested Analysis Filtered (Y/N) Y/N	Analysis Test: 6200B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW Parcel #4	WT	G			5/15/14	1000		4				X					X	X		01
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Timothy D. Leatherman / Pyramid	5/15/14	1355	Pace	5/14	1355	
		5/15/14	1715		05/15/14	1715	4.8

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Timothy D. Leatherman
SIGNATURE of SAMPLER: Timothy D. Leatherman
DATE Signed (MM/DD/YY): 5/15/14

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

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.

APPENDIX G

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Randolph County PSA PARCEL 4 **PROJECT NO.:** U-5305

Name: Eric Cross **Date:** 5/6/14 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross:
Mobilize to site. Performed site visit and interviewed property tenants.
Leave site ~ 3:30PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Randolph County PSA PARCEL 4 **PROJECT NO.:** U-5305

Name: Eric Cross & Alan McFadden **Date:** 5/8/14 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

E. Cross & A. McFadden:
Mobilize to site. Performed EM61 geophysical surveys.
Leave site: ~5:00PM

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Randolph County PSA PARCEL 4 **PROJECT NO.:** U-5305

Name: Tim Leatherman **Date:** 5/13/14 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman:
Mobilize to site. Placed proposed boring locations and supervised utility locating.

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Randolph County PSA PARCEL 4 **PROJECT NO.:** U-5305

Name: Ryan Kramer and Mika Trifunovic **Date:** 5/14/14 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

R. Kramer and T. Leatherman:
Mobilize to site. Supervised soil borings, collected samples, performed QED analysis.

FIELD PERSONNEL LOG

PROJECT NAME: NCDOT Randolph County PSA PARCEL 4 **PROJECT NO.:** U-5305

Name: Tim Leatherman and Alan McFadden D**ate:** 5/15/14 **Mon Tue Wed Th Fri Sat Sun**

TASKS PERFORMED:

T. Leatherman & Alan McFadden:
Mobilize to site. Performed hand auger boring and collected groundwater sample from monitor well.