Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina, 27699-1589

Preliminary Site Assessment Report

Z V Pate Inc. Property
Parcel # 54
709 N. JK Powell Blvd
Whiteville, Columbus County, North Carolina
US 701 Bypass from SR 1437 to US 74/76
TIP Number: R-5020B
WBS Element: 41499.1.3

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November 21, 2018 *not considered final unless all signatures are completed*

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1.0 INTRODUCTION

This report presents the results of a Preliminary Site Assessment (PSA) for the North Carolina Department of Transportation (NCDOT) Parcel 54 (Z. V. Pate Inc., Property) performed by Apex Companies, LLC (Apex) (dba Apex Engineering, PC) on behalf of the NCDOT. The subject site of this PSA report will be affected by the widening of the US 701 Bypass from SR 1437 to US 74/76. The Site is comprised of one parcel and is located at 709 N. J.K. Powell Boulevard and is identified as Parcel 54, Z. V. Pate Inc., Property, within the NCDOT R-5020B design project. The property is located southwest of the Washington Street and North J.K. Powell Boulevard intersection in Whiteville, Columbus County, North Carolina, as shown in the attached Site Location Map (**Figure 1**). The site investigation was conducted in accordance with Apex's Technical and Cost proposal dated May 15, 2018.

NCDOT contracted Apex to perform the PSA within the existing right-of-way (ROW) and/or easement of the Parcel 54 Property due to the potential presence of contamination at the site and because excavation and grading may occur within the area. The PSA was performed to evaluate if soils have been impacted as a result of past and present uses of the property within the proposed investigation area, if buried underground storage tanks (USTs) are present in the area of investigation, and if groundwater is impacted.

The following report presents the results of an electromagnetic (EM) and ground penetrating radar (GPR) geophysical survey to identify potential USTs in the investigation area, and it describes the subsurface field investigation at the site. The report includes the evaluation of field screening, as well as field and laboratory analyses with regards to the presence or absence of soil and groundwater contamination within the area of investigation across Z. V. Pate Inc., Property. **Appendix A** includes a Photograph log for the site.

1.1 Site History

The Parcel 54 Z. V. Pate Inc., property has been identified with the address of 709 North J.K. Powell Boulevard. Based on a search of the North Carolina Department of Environmental Quality (NCDEQ) UST database registry, no active tanks were identified for the subject parcel. Apex observed the site to be a vacant lot with concrete drive paths. Apex personnel also reviewed the NCDEQ Incident Management Database and found the property to be identified with Facility ID number 0-011628, Incident Number 32173 and to have historical soil and groundwater contamination. The following summarizes the regulatory file contents for this incident number:

- Tank Closure Letter from the NC Department of Environment and Natural Resources (now NCDEQ) was issued on June 10, 2004. This letter stated the owner's intent was to

remove or close in place an underground storage tank system on this property. Summary pages described three 8,000-gallon gasoline USTs were to be removed from the property.

- Notice of Regulatory Requirements from the NC Department of Environment and Natural Resources was issued to Whiteville Oil Company on September 7, 2004 regarding the Crossroads Amoco business operating at the subject parcel. The Notice Letter described the Owner was to comply with the release response and corrective action requirements of 15A NCAC 2L. 015 (c).

- A Groundwater Monitoring and Updated Receptor Survey Report was issued in January 2010 by Geological Resources Inc. Concentration of benzene, MTBE, naphthalene and C9-C10 aromatics exceeded the Maximum Allowable Concentrations (MACs) in the reported groundwater samples from MW-2 and MW-4. Lead concentrations exceeded the MAC reported in groundwater samples in MW-2, MW-3, MW-4. No reported concentrations exceeded the Gross Contamination Levels (GCLs). Geological Resources, Inc. stated the average depth to groundwater was 5.75 feet and the general groundwater flow direction is in the southeast direction.

- A Notice of No Further Action was issued on May 26, 2010 from the NC Department of Environment and Natural Resources. After review of historical documentation and testing, the groundwater contamination met the cleanup standards for a low-risk site but exceeds the groundwater quality standard established in Title 15 A NCAC 2L. 0202. A Notice of Residual Petroleum (NORP) was requested to be filed to confirm No Further Action to be put in place.

- A NORP was issued on June 18, 2010 via Geological Resources Inc.

Historical Records can be found in **Appendix B**.

1.2 Site Description

The site is located in a mixed commercial and residential area of Whiteville,Columbus County, North Carolina. The parcel currently consists of a vacant lot with drive paths. Washington Street followed by a commercial property is located to the north. A vacant lot followed by a restaurant is located to the south. Undeveloped land and residential properties are located to the west. North J.K. Powell Boulevard followed by a restaurant is located to the east. Parcel 54, Z. V. Pate Inc., Property, does not appear on the NCDEQ UST database registry. As discussed above, three 8,000-gallon gasoline USTs owned by Whiteville Oil Company were previously removed from the site. The geophysical surveyor, Pyramid Environmental & Engineering, PC, (Pyramid) identified ten EM anomalies. No evidence of larger structures such as USTs were observed beneath the reinforced concrete using GPR methods. Pyramid concluded the geophysical data did not record any evidence of metallic USTs on Parcel 54.

2.0 GEOLOGY

2.1 Regional Geology

Parcel 54, the Z. V. Pate property, is located within the Coastal Plain Physiographic Province. The Coastal Plain is the largest physiographic province in the state, covering about 45% of the land area. According to the US Geological Survey Hydrogeological framework of the North Carolina coastal plain, the geology consists of eastward-dipping and eastward-thickening series of sedimentary strata which range in age from Holocene to Cretaceous. The most common sediment types are sand and clay, although a significant amount of limestone occurs in the southern part of the Coastal Plain. The Site overlies surficial sediments (to approximately 30 to 40 feet below land surface), the PeeDee Confining Unit (approximately 10 feet thick in this area), and the Late Cretaceous age PeeDee Formation. The PeeDee Formation is named for exposures along the great Peedee River, it preserves belemnites and foraminifera fossils dating from the Late Cretaceous. It generally consists of marine sand, clayey sand and clay (M.D. Winner Jr. and R.W. Coble, 1996, *Hydrogeologic Framework of the North Carolina Coastal Plain, Regional Aquifer-System Analysis – Northern Atlantic Coastal Plain*, USGS Professional Paper 1404-1).

2.2 Site Geology

Site geology was observed through the drilling and sampling of 11 direct push technology (DPT) soil borings (SB) . **Figure 2** presents the boring locations and site layout. With the exception of one soil boring, the borings did not exceed a total depth of five feet below ground surface (bgs). One boring (P54-SB2) was advanced to fifteen feet bgs to install a temporary well.. Soil consisting predominantly of gray clayey fine sand was observed across the parcel. The soils were unconsolidated and as a result the borings often collapsed.

According to historical groundwater monitoring well documentation related to investigations of the former on-site USTs, the approximate direction of groundwater flow was determined to be from northwest to southeast towards a drainage ditch located south of the site. The drainage ditch flows west to Mollies Branch. The average depth to groundwater was reported to be 5.75 feet in the historical UST investigation consultant's documents. Soil borings advanced by Apex as part of this PSA encountered the water table at average depths of 3 feet bgs in the study area. Boring logs are presented in **Appendix C**.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was prepared to include the site-specific health and safety information necessary for the field activities. North Carolina-One Call was contacted on May 25, 2018 to report the proposed drilling activities and notify affected utilities. Apex subcontracted Pyramid to locate subsurface utilities and other subsurface drilling hazards as well as to perform a geophysical survey. Carolina Soil Investigations, LLC (CSI) of Olin, North Carolina was retained by Apex to perform the DPT borings for soil sampling. REDLAB, LLC (REDLAB) provided an ultraviolet fluorescence (UVF) Hydrocarbon Analyzer and Eastern Solutions provided a calibrated Flame Ionization/Photoionization Detector (FID/PID). Boring locations were strategically placed in a pattern within the area of investigation to maximize the opportunity to encounter potentially contaminated soil.

3.2 Site Reconnaissance

Apex personnel performed a site reconnaissance on June 5, 2018. During the site reconnaissance, the area was visually examined for the presence of potential USTs or areas/obstructions that could potentially affect the subsurface investigation. The proposed boring locations were marked based on the site inspection and geophysical survey results. Apex personnel also used the site visit as an opportunity to contact the property manager/owner to inform them of upcoming field activities.

3.3 Geophysics Survey Results

The geophysical survey of the site was conducted on June 5, 2018. Pyramid performed an EM induction metal survey followed by a GPR survey. A copy of the Geophysical Report is presented in **Appendix D**. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. GPR was

performed across the areas of reinforced concrete and verified the presence of metal reinforcement within the concrete. No evidence of larger structures such as USTs were observed beneath the reinforcement. Pyramid concluded the geophysical data did not indicate evidence of metallic USTs on Parcel 54.

3.4 Well Survey

No water supply wells were observed on site. Abandoned groundwater monitoring wells were noted on the parcel; however, they are not within the design area.

3.5 Soil Sampling

Apex conducted drilling activities at the site on June 5, 2018. The purpose of soil sampling was to determine if a release of petroleum or other volatile organic chemicals had occurred within the investigation area, and if so, to estimate the volume of impacted soil that might require special handling during construction activities. Apex drilling subcontractor, CSI, advanced 11 DPT soil borings within the proposed investigation area. These 11 boring locations were placed in a pattern to maximize the likelihood of identifying potential soil contamination that might exist in the area of future construction activities. **Figure 2** presents the Site Map with soil boring locations and site structures.

Soil sampling was performed utilizing hand auger and direct push methods accompanied by field screening of volatile organic vapors with the FID/PID unit and onsite quantitative analyses with the UVF Hydrocarbon Analyzer. One to two intervals of the soil boring, exhibiting the most elevated FID/PID readings, were selected for onsite quantitative analysis of total petroleum hydrocarbons (TPH) in soil using the REDLAB UVF Hydrocarbon Analyzer. The analysis was performed onsite by Mr. Troy Holzschuh, a certified REDLAB UVF technician with Apex. The UVF results were generated concurrent with soil boring activities so that rapid assessment could be utilized for strategic boring placement.

3.6 Groundwater Sampling

Apex personnel obtained a groundwater grab sample at the site on June 5, 2018. Groundwater grab sample locations were chosen based on data generated from the UVF analyzer and on-site conditions such as the likely groundwater gradient and historic UST system locations. The shallow soils encountered were sandy and unconsolidated, and as a result the borings would not stay open. Subsequently, CSI installed a temporary one-inch diameter monitoring well with 10-slot screen at the soil boring SB-2 location for the purposes of collecting a groundwater grab sample. Apex personnel collected groundwater samples from the P54-SB-2 temporary well and submitted them to Pace Analytical Services, a North Carolina-certified laboratory, for chemical specific analyses. The groundwater samples collected from P54-SB-2 was analyzed for the presence of volatile organic compounds (VOCs) in accordance with Method 8260, semi-volatile

organic compounds (SVOCs) in accordance with Method 8270, and extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) in accordance with the Massachusetts Department of Environmental Protection (MADEP) Methods.

4.0 SAMPLING RESULTS

4.1 Soil Sampling Results

Based on FID/PID field screening and onsite UVF hydrocarbon analysis from the June 2018 soil sampling. there is evidence of petroleum hydrocarbon contamination onsite within the area of investigation.

Elevated FID/PID readings, above ten parts per million (ppm), were observed in the borings conducted at the site both above the water table and in saturated soils 1-2 feet below the water table surface (presumably the 'smear zone'). The detectable FID readings ranged from 0.5 to 329 parts ppm above the water table, and up to 750 ppm in saturated zone samples. The PID readings ranged from <0.1 to 5,500 ppm in unsaturated soils above the water table, and up to 9,000 ppm in saturated soils 1-2 feet below the water table surface. The FID/PID field screening results are provided on the boring logs in **Appendix C**.

Soil samples which exhibited the highest PID and/or FID concentrations were field-analyzed using the UVF instrument for the presence of TPH gasoline range organics (GRO) and diesel range organics (DRO). The UVF analytical results for TPH-GRO and TPH-DRO are presented in **Table 1**. The UVF instrument generated tables and chromatographs are found in **Appendix E**. **Figure 3** presents the GRO and DRO results at each soil boring.

Based on the UVF analyses, TPH-GRO concentrations ranged from <0.46 to 261.5 milligrams per kilogram (mg/kg). TPH-DRO detected concentrations ranged from 0.60 to 677.9 mg/kg. Soil sample P54-SB-2 had the highest detections of both TPH-GRO and TPH-DRO. Due to the shallow groundwater table, Apex personnel collected samples from above the water table and in the saturated zone to analyze with the onsite UVF. TPH-GRO and TPH-DRO concentrations found in P54-SB-2 collected above the water table and 1-2 feet below the water table showed the highest TPH concentrations, The TPH-GRO and the TPH-DRO concentrations in sample P54-SB-2 exceeded their regulatory action levels of 50 mg/kg and 100 mg/kg respectively. Soil sample P54-SB-1 (4-5 feet) was the only other sample with an exceedance of the TPH-GRO regulatory action level; however, the TPH-DRO concentrations at P54-SB-1 were below the action levels. Although soil UVF analyses shows two distinct borings with TPH exceedances in soil surrounded by soil samples without TPH exceedances, it is possible that other soils within this general area are impacted. To address this uncertainty, the estimated area of soil contamination in the northeast portion of Parcel 54 is approximately 155 square feet or 14.35

cubic yards in the vicinity of sample P54-SB-1 and 161 square feet or 14.91 cubic yards in the vicinity of sample P54-SB-2. The estimated area of impact is presented in **Figure 4.**

4.2 Groundwater Sampling Results

Due to the elevated TPH-GRO and TPH-DRO values obtained in the saturated zone of P54-SB-2 using the UVF, Apex personnel collected groundwater grab samples from a temporary well installed at P54-SB-2 and had the samples analyzed by a North Carolina certified laboratory for the presence of VOCs (Method 8260), SVOCs (Method 8270), EPH and VPH (MADEP Method). As summarized in Table 2 the samples showed detectable concentrations of VOCs, SVOCs, and EPH and VPH.

The groundwater sample showed detections of twelve different VOCs at quantified or estimated (J-flagged) concentrations above the detection limits (see Table 2). Five of the detected VOCs were reported at concentrations above their respective 15A NCAC 2L Groundwater Standard (2L Standard): benzene, naphthalene, n-propylbenzene; 1,2,4-Trimethylbenzene; and total xylenes. Benzene was reported at an estimated (J-flagged) concentration of 1.7J μg/L, which is a slight exceedance of its 2L Standard of 1μg/L. With the exception of naphthalene, the remaining exceedances were within one order of magnitude of their respective 2L Standards. The naphthalene concentration was 113 μg/L, which exceeds its 2L Standard of 6 μg/L by two orders of magnitude.

The sample contained elevated concentrations of naphthalene under the 8270 Method of SVOCs. According to lab results, SB-2 had a concentration of 76.4 μg/L exceeding the 6 ug/L, in the 15 A NCAC 2l Standards and the 12 μg/L for the NCAC 2B Surface Water Standards.

The sample contained elevated concentrations of Aromatic (C11-C22), Aliphatic (C05-C08), Aliphatic (C09-C12) and Aromatic (C09-C10) under the MADEP EPH and VPH Method. Aromatic (C11-C22) resulted in concentrations of 361 μg/L which exceeded the 15A NCAC 2L Groundwater Standard of 200 μg/L. Aliphatic (C05-C08) resulted in concentrations of 1,500 μg/L which exceeded the 15A NCAC 2L Groundwater Standard of 4 μg/L and NCAC 2B Surface Water Standard of 125*S μg/L. Aliphatic (C09-C12) resulted in concentrations of 6,930 μg/L which exceeded the 15A NCAC 2L Groundwater Standards of 700 μg/L and NCAC 2B Surface Water Standards of 180*S μg/L. Aromatic (C09-C10) resulted in concentrations of 2,290 μg/L which exceeded the 15A NCAC 2L Groundwater Standard of 200 μg/L and NCAC 2B Surface Water Standard of 4,000*S μg/L.

The UVF results are tabulated in **Table 1**, the chemical specific analytical data is tabulated in **Table 2**. The instrument generated tables, chromatographs and the Laboratory Analytical Data Report are included in **Appendix E** and summarized in **Figures 3 and 4**. The estimated area of

groundwater impact in the eastern portion of Parcel 54 is approximately 8,625 square feet in size. The estimated area of impact is presented in **Figure 5.**

5.0 CONCLUSIONS

Based on site observations and onsite UVF analysis, TPH-GRO and TPH-DRO exceeding concentration level and contaminants found in groundwater samples, the following bulleted summary is based upon Apex's evaluation of field observations and onsite quantitative analyses of samples collected from the Site on June 7, 2018.

- Historical assessment results indicate that groundwater at the site has been impacted from the release of three former USTs. Groundwater concentrations exceeding the 2L Standards remains on the site, however the concentrations are below the GCLs. A letter of No Further Action was received from NCDEQ in May 2010, and a NORP was filed for the site in June 2010.

- Results of the geophysical survey did not produce anomalies characteristic of metallic USTs on Parcel 54.

- Eleven soil borings were advanced onsite. Soil samples collected from each boring were analyzed in the field using a REDLAB UVF Hydrocarbon Analyzer.

- Soil samples from P-54-SB-2 that were analyzed using the UVF contained TPH-DRO and TPH-GRO concentrations exceeded their respective NCDEQ Action levels of 100 mg/kg and 50 mg/kg. One groundwater grab sample was collected a submitted to a NC state certified laboratory for chemical specific analysis. The groundwater sample was analyzed for the presence of VOCs in accordance with Method 8260, SVOCs in accordance with Method 8270, and EPH and VPH in accordance with MADEP Method. The analysis resulted in exceedances for VOCs, SVOCs, EPH and VPH.

6.0 RECOMMENDATIONS

Based on these PSA results, NCDOT will need to manage any groundwater encountered during excavation activities to assure that the impacted water does not migrate from the Site and to prevent exposure to workers. The subject parcel is designed as a cut area. The drainage features are planned to be installed in multiple locations of Parcel 2. Soil and groundwater contamination was noted in the southeastern and central portion of the design area of Parcel 2. Due to shallow groundwater the drainage features will likely encounter groundwater. Groundwater could be encountered as shallow as three feet bgs. NCDOT should be prepared to

dewater and containerize contaminated groundwater if encountered during construction activities.

TABLES

Table 1
UVF Onsite Hydrocarbon Analytical Soil Data from June 2018
R-5020B, Parcel 54, Z V Pate Inc. Property
Whiteville, Columbus County, North Carolina

Sample ID Number	Sample Date	Sample Depth (ft bgs)	GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)
SOIL				
NCDEQ Action Level in mg/kg			**50**	**100**
P-54-SB-1	6/4/2018	1.5 - 2	<1.9	<1.9
P-54-SB-1	6/4/2018	4-5	**113.6**	89.7
P-54-SB-1A	6/4/2018	2.5 - 3	<0.34	<0.34
P-54-SB1-B	6/5/2018	1.5 - 2	<1.8	<1.8
P-54-SB1-B	6/5/2018	2.5 - 3	<0.62	0.62
P-54-SB1-C	6/5/2018	1.5 - 2	<0.66	<0.66
P-54-SB1-C	6/5/2018	2 - 3	<0.67	<0.67
P-54-SB-2	6/4/2018	1.5 - 2	**261.5**	**677.9**
P-54-SB-2	6/4/2018	4 - 5	**241.2**	**224.6**
P-54-SB-2	6/5/2018	14.5 - 15	<0.68	<0.68
P-54-SB-2A	6/5/2018	1.5 - 2	<0.72	<0.72
P-54-SB-2A	6/5/2018	2 - 3	<0.46	8.1
P-54-SB2-B	6/5/2018	1 - 2	<0.64	<0.64
P-54-SB2-B	6/5/2018	2 - 3	<0.61	0.61
P-54-SB2-C	6/5/2018	1 - 2	<0.6	0.6
P-54-SB2-C	6/5/2018	2 - 3	<0.64	<0.64

NOTES:
(mg/kg) = Milligrams per kilogram
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ft bgs = feet below ground surface
TPH - GRO values in exceedance of NCDEQ Action Level of 50 mg/kg are shown in Bold
TPH - DRO values in exceedance of NCDEQ Action Level of 100 mg/kg are shown in Bold

Table 1
UVF Onsite Hydrocarbon Analytical Soil Data from June 2018
R-5020B, Parcel 54, Z V Pate Inc. Property
Whiteville, Columbus County, North Carolina

Sample ID Number	Sample Date	Sample Depth (ft bgs)	GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)
SOIL				
NCDEQ Action Level in mg/kg			**50**	**100**
P-54-SB-3	6/5/2018	1 - 2	<0.66	4.1
P-54-SB-3	6/5/2018	4 - 5	<0.66	<0.66
P-54-SB-4	6/5/2018	1 - 2	<1.6	<1.6
P-54-SB-4	6/5/2018	4 - 5	<1.6	<1.6
P-54-SB-5	6/5/2018	1 - 2	<0.73	1.5
P-54-SB-5	6/5/2018	4 - 5	<0.66	<0.66

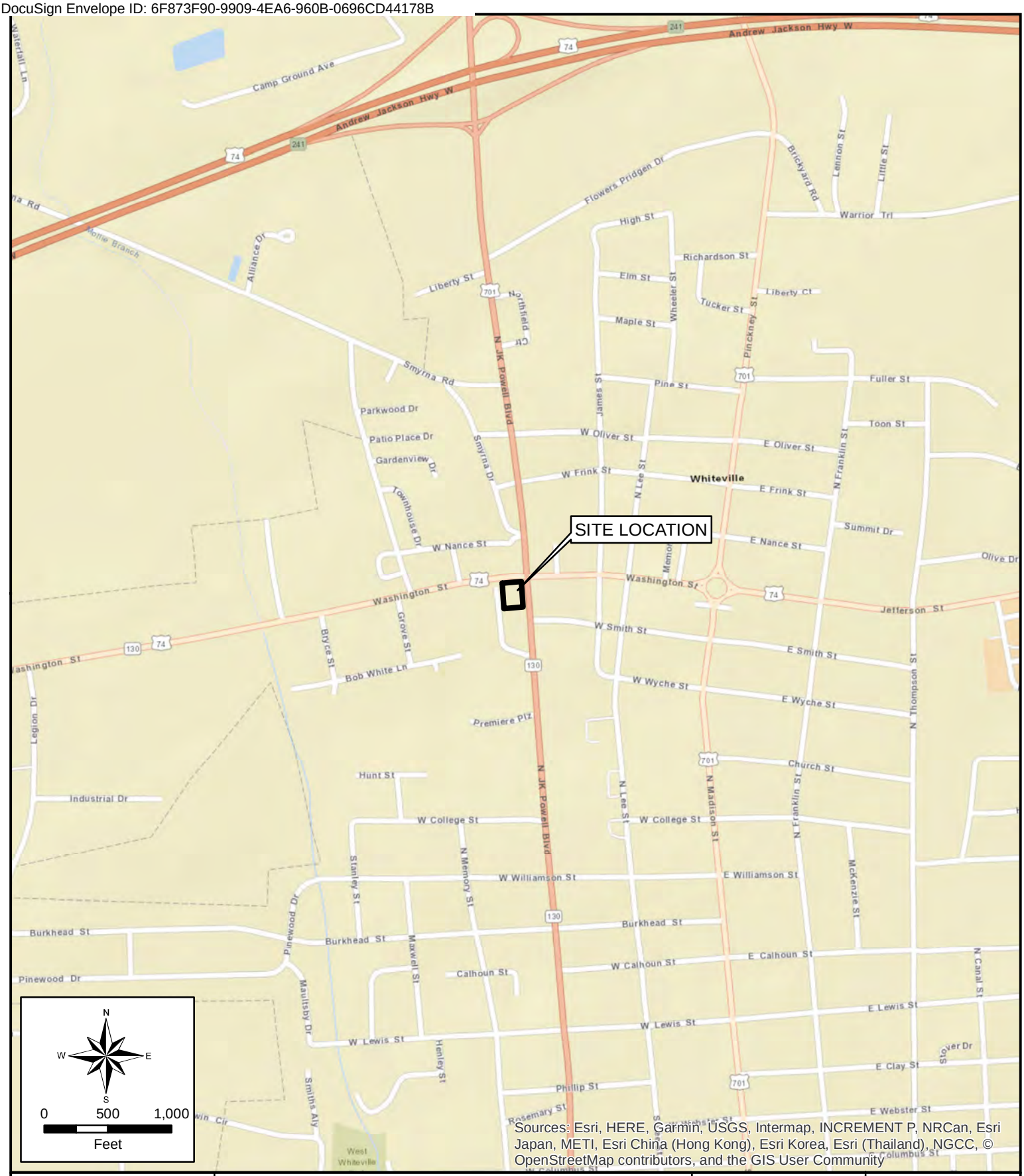
NOTES:
(mg/kg) = Milligrams per kilogram
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
ft bgs = feet below ground surface
TPH - GRO values in exceedance of NCDEQ Action Level of 50 mg/kg are shown in Bold
TPH - DRO values in exceedance of NCDEQ Action Level of 100 mg/kg are shown in Bold

Table 2
Analytical Groundwater Data (June 2018) - Detected Analytes
R-5020B, Parcel 54, Z V Pate Inc., Property
Whiteville, Columbus County, North Carolina

Analytical Method		EPA Method 8260												EPA Method 8270				MADEP EPH			MADEP VPH		
Sample ID Number	**Sample Date**	**Benzene**	**n-Butylbenzene**	**sec- Butylbenzene**	**Ethylbenzene**	**Isopropylbenzene (Cumene)**	**Methyl-tert-butyl ether**	**Naphthalene**	**n-Propylbenzene**	**Toluene**	**1,2,4-Trimethylbenzene**	**1,3,5-Trimethylbenzene**	**Xylene (Total)**	**2,4- Dimethylphenol**	**1-Methylnaphthalene**	**2-Methylnaphthalene**	**Naphthalene**	**Aliphatic (C09-C18)**	**Aliphatic (C19-C36)**	**Aromatic (C11-C22)**	**Aliphatic (C05-C08)**	**Aliphatic (C09-C12)**	**Aromatic (C09-C10)**
15A NCAC 02L.0202 Groundwater Standards µg/L		**1**	**70**	**70**	**600**	**70**	**20**	**6**	**70**	**600**	**400**	**400**	**500**	**100**	**NE**	**30**	**6**	**700**	**10,000**	**200**	**4**	**700**	**200**
P-54-SB-2	6/7/2018	**1.7J**	23	9.5	303	30.1	5.7	**113**	**96**	122	**511**	161	**1,460**	7.4J	11.5	21.9	**76.4**	ND	ND	**361**	**1,500**	**6,830**	**2,290**

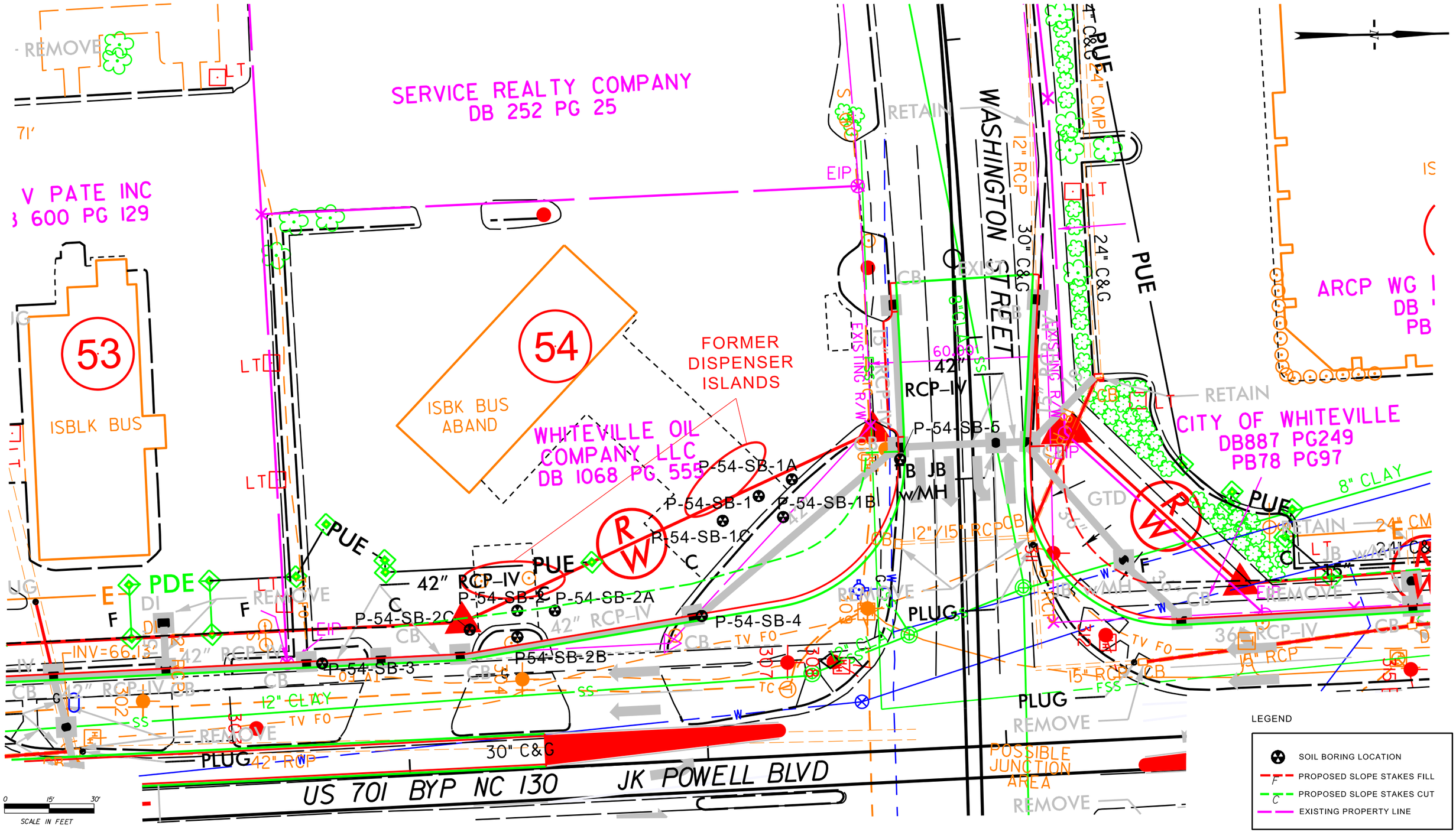
NOTES:
ug/L - micrograms per liter
US EPA 8260 - Volatile Organic Compounds
Samples collected on 6/7/2018 were analyzed for VOCs using method 8260 MSV Low Level
J - Estimated concentration above adjusted method detection limit and below adjusted reporting limit
B- Detected in the method blank
ND - Below laboratory practical quantitative limits
NA - Not Analyzed
NE - No standard established
NCAC - North Carolina Administrative Code
Concentrations in **BOLD** exceed the NCAC 2L Standards
Concentrations in [ ] exceed the NCAC 2B Standards
* - Value based on limited available data
MADEP EPH/VPH - Massachusetts Department of Protection Extractable Petroleum Hydrocarbon/Volatile Petroleum Hydrocarbon Fractions
US EPA 8270 - Semi-Volatile Organic Compounds

FIGURES



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

CHECK BY: TH	SITE LOCATION MAP PARCEL #54 709 N. JK POWELL BOULEVARD WHITEVILLE, NORTH CAROLINA	APEX	FIGURE 1
DRAWN BY: SP			
DATE: 7/6/2018			
SCALE: AS SHOWN			
CAD NO:. NCDOT-001			
PRJ NO.: NCDOT-001			



APEX COMPANIES, LLC
10610 METROMONT PARKWAY
SUITE 206
CHARLOTTE, NC 28117
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FIGURE 2
PARCEL 054
709 N. JK. POWELL BLVD
SITE MAP WITH SOIL BORING LOCATIONS

Date: 6/6/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. # NCDOT-001	
CAD File: pc__054__fig 2.dgn	Project Title:
Approx. Scale: 1" = 30'	Drawn by: MJO
	Client: NC DOT

Sample Identification	P-54-SB-2A
Sample Depth (Feet bgs)	1.5-2
TPH GRO (mg/kg)	<0.72
THP DRO (mg/kg)	<0.72
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	<0.46
THP DRO (mg/kg)	8.1

Sample Identification	P-54-SB-4
Sample Depth (Feet bgs)	1-2
TPH GRO (mg/kg)	<1.6
THP DRO (mg/kg)	<1.6
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	<1.6
THP DRO (mg/kg)	<1.6

Sample Identification	P-54-SB-1A
Sample Depth (Feet bgs)	2.5-3
TPH GRO (mg/kg)	<0.34
THP DRO (mg/kg)	<0.34

Sample Identification	P-54-SB-5
Sample Depth (Feet bgs)	1-2
TPH GRO (mg/kg)	<0.73
THP DRO (mg/kg)	1.5
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	<0.66
THP DRO (mg/kg)	<0.66

Sample Identification	P-54-SB-2
Sample Depth (Feet bgs)	1.5-2
TPH GRO (mg/kg)	261.5
THP DRO (mg/kg)	677.9
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	241.2
THP DRO (mg/kg)	224.6
Sample Depth (Feet bgs)	14.5-15
TPH GRO (mg/kg)	<0.68
THP DRO (mg/kg)	<0.68

Sample Identification	P-54-SB-1
Sample Depth (Feet bgs)	1.5-2
TPH GRO (mg/kg)	<1.9
THP DRO (mg/kg)	<1.9
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	113.6
THP DRO (mg/kg)	89.7

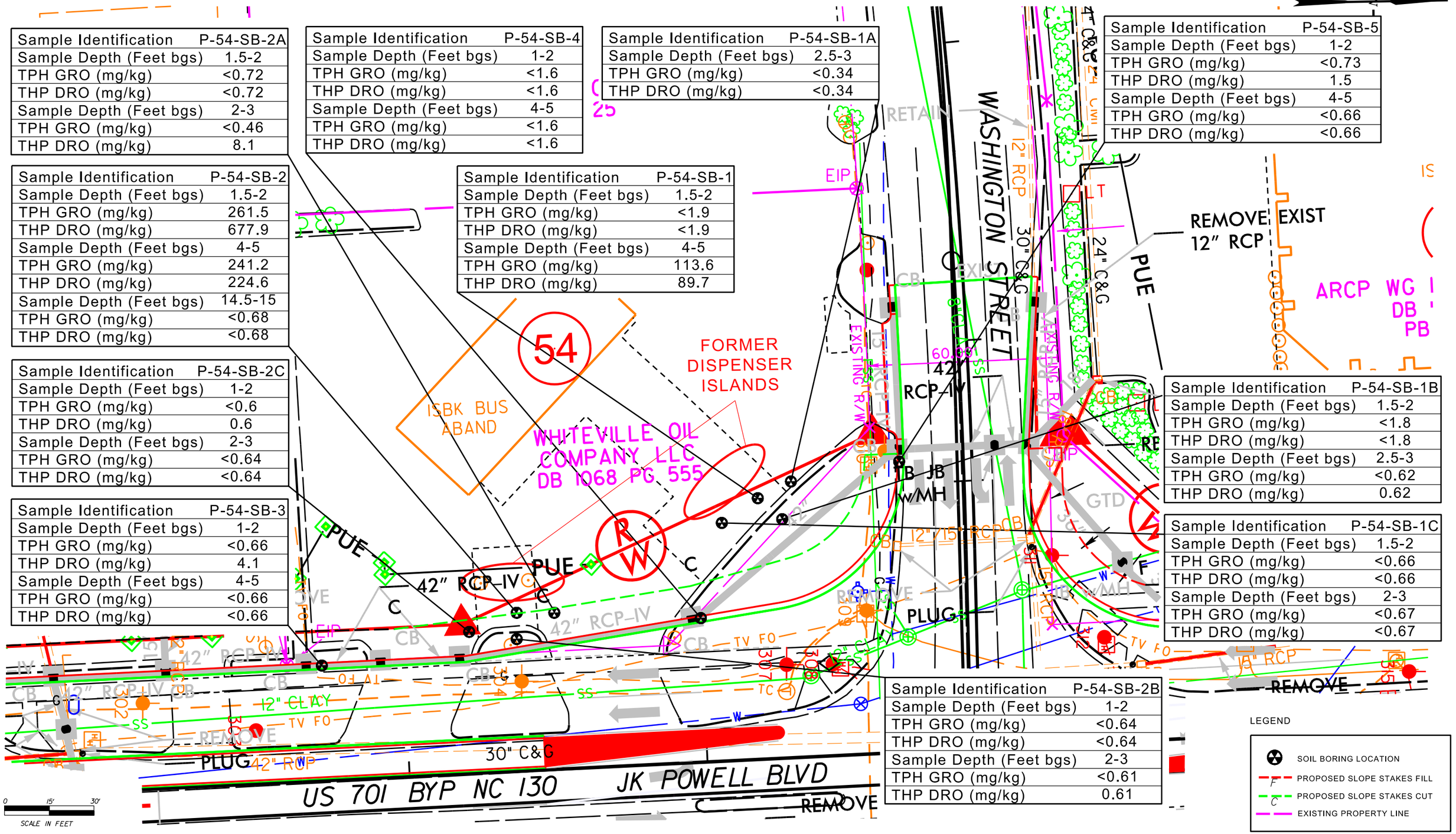
Sample Identification	P-54-SB-2C
Sample Depth (Feet bgs)	1-2
TPH GRO (mg/kg)	<0.6
THP DRO (mg/kg)	0.6
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	<0.64
THP DRO (mg/kg)	<0.64

Sample Identification	P-54-SB-3
Sample Depth (Feet bgs)	1-2
TPH GRO (mg/kg)	<0.66
THP DRO (mg/kg)	4.1
Sample Depth (Feet bgs)	4-5
TPH GRO (mg/kg)	<0.66
THP DRO (mg/kg)	<0.66

Sample Identification	P-54-SB-1B
Sample Depth (Feet bgs)	1.5-2
TPH GRO (mg/kg)	<1.8
THP DRO (mg/kg)	<1.8
Sample Depth (Feet bgs)	2.5-3
TPH GRO (mg/kg)	<0.62
THP DRO (mg/kg)	0.62

Sample Identification	P-54-SB-1C
Sample Depth (Feet bgs)	1.5-2
TPH GRO (mg/kg)	<0.66
THP DRO (mg/kg)	<0.66
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	<0.67
THP DRO (mg/kg)	<0.67

Sample Identification	P-54-SB-2B
Sample Depth (Feet bgs)	1-2
TPH GRO (mg/kg)	<0.64
THP DRO (mg/kg)	<0.64
Sample Depth (Feet bgs)	2-3
TPH GRO (mg/kg)	<0.61
THP DRO (mg/kg)	0.61



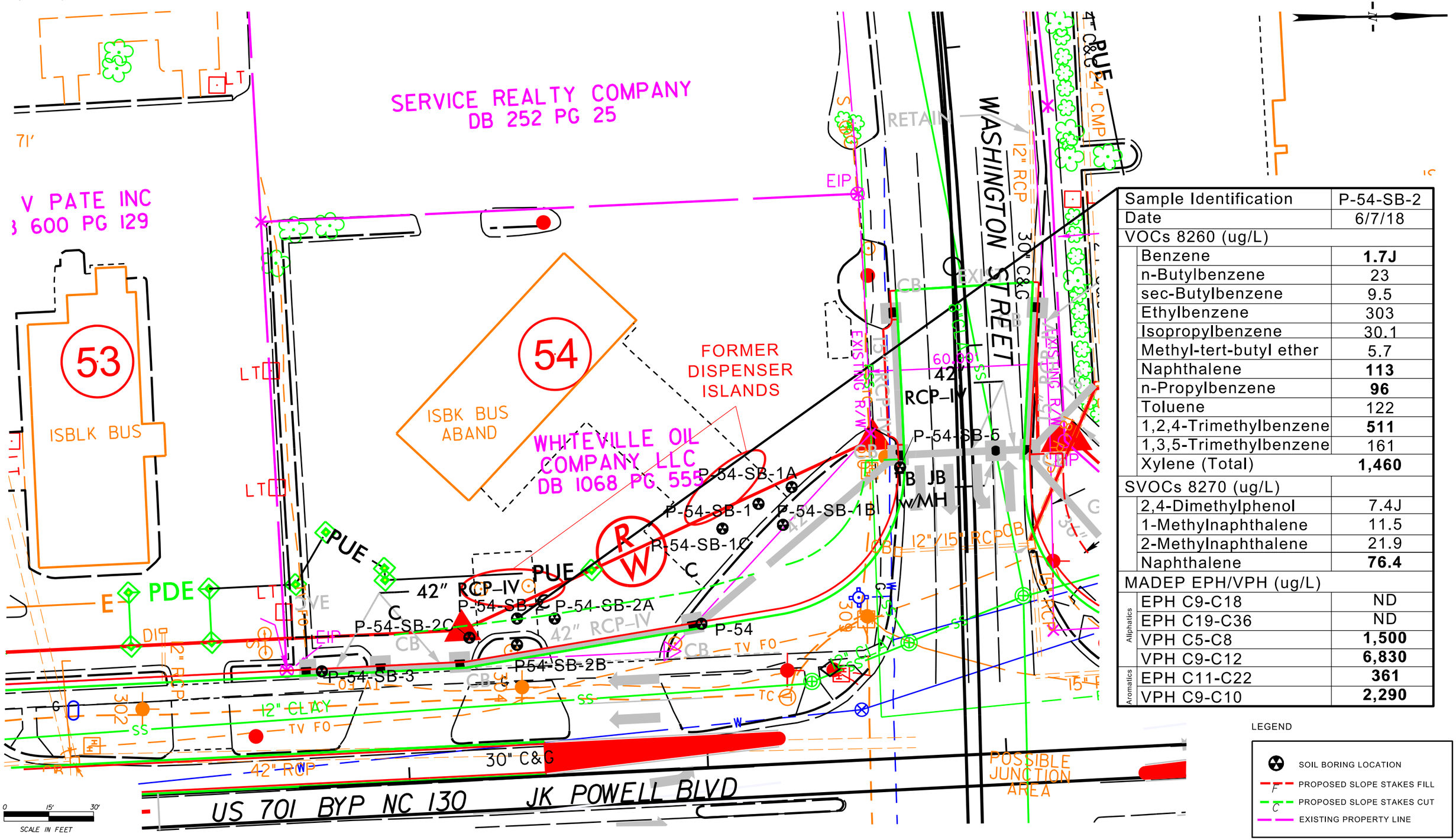
LEGEND

- SOIL BORING LOCATION
- PROPOSED SLOPE STAKES FILL
- PROPOSED SLOPE STAKES CUT
- EXISTING PROPERTY LINE

APEX COMPANIES, LLC
10610 METROMONT PARKWAY
SUITE 206
CHARLOTTE, NC 28117
PHONE: (704) 799-6390

FIGURE 3
PARCEL 054
709 N. JK. POWELL BLVD
ONSITE UVF HYDROCARBON ANALYSIS RESULTS - SOIL
6/5/18

Date: 6/6/18	
Proj. # NCDOT-001	R-5020B US 701 BYPASS COLUMBUS COUNTY
CAD File: pc_054_fig 2.dgn	Project Title:
Approx. Scale: 1" = 30'	Drawn by: MJO
	Client: NC DOT



Sample Identification		P-54-SB-2
Date		6/7/18
VOCs 8260 (ug/L)		
	Benzene	**1.7J**
	n-Butylbenzene	23
	sec-Butylbenzene	9.5
	Ethylbenzene	303
	Isopropylbenzene	30.1
	Methyl-tert-butyl ether	5.7
	Naphthalene	**113**
	n-Propylbenzene	**96**
	Toluene	122
	1,2,4-Trimethylbenzene	**511**
	1,3,5-Trimethylbenzene	161
	Xylene (Total)	**1,460**
SVOCs 8270 (ug/L)		
	2,4-Dimethylphenol	7.4J
	1-Methylnaphthalene	11.5
	2-Methylnaphthalene	21.9
	Naphthalene	**76.4**
MADEP EPH/VPH (ug/L)		
Aliphatics	EPH C9-C18	ND
Aliphatics	EPH C19-C36	ND
Aliphatics	VPH C5-C8	**1,500**
Aliphatics	VPH C9-C12	**6,830**
Aromatics	EPH C11-C22	**361**
Aromatics	VPH C9-C10	**2,290**

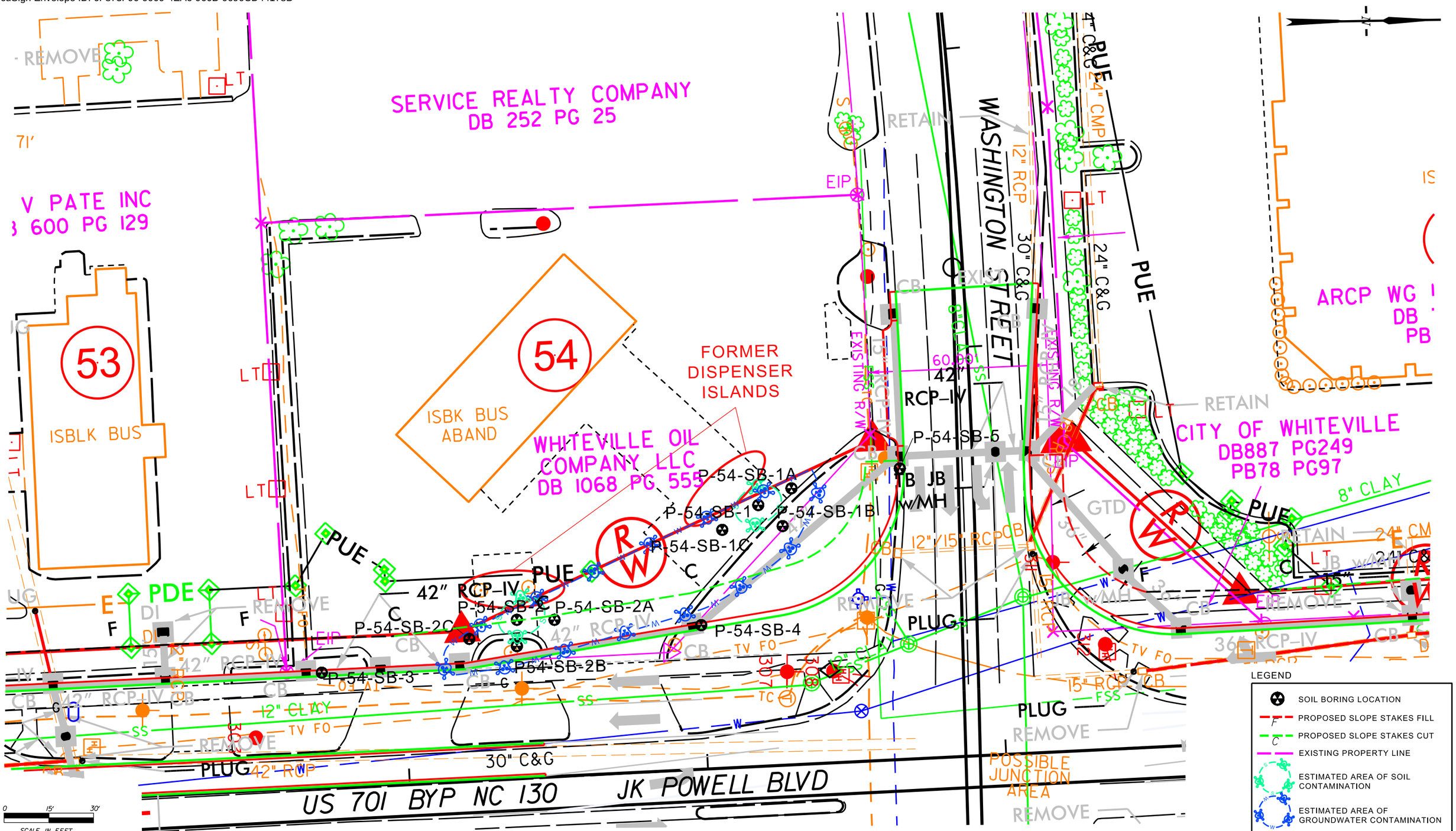
LEGEND

- SOIL BORING LOCATION
- PROPOSED SLOPE STAKES FILL
- PROPOSED SLOPE STAKES CUT
- EXISTING PROPERTY LINE

APEX COMPANIES, LLC
10610 METROMONT PARKWAY
SUITE 206
CHARLOTTE, NC 28117
PHONE: (704) 799-6390

FIGURE 4
PARCEL 054
709 N. JK. POWELL BLVD
GROUNDWATER ANALYTICAL RESULTS - DETECTED ANALYTES

Date: 6/6/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. # NCDOT-001	
CAD File: pc_054_fig 4.dgn	Project Title:
Approx. Scale: 1" = 30'	Drawn by: MJO
	Client: NC DOT



LEGEND

- SOIL BORING LOCATION
- PROPOSED SLOPE STAKES FILL
- PROPOSED SLOPE STAKES CUT
- EXISTING PROPERTY LINE
- ESTIMATED AREA OF SOIL CONTAMINATION
- ESTIMATED AREA OF GROUNDWATER CONTAMINATION

APEX COMPANIES, LLC
10610 METROMONT PARKWAY
SUITE 206
CHARLOTTE, NC 28117
PHONE: (704) 799-6390

FIGURE 5
PARCEL 054
709 N. JK. POWELL BLVD
SITE MAP WITH ESTIMATED AREAS OF SOIL AND GROUNDWATER CONTAMINATION

Date: 7/30/18	R-5020B US 701 BYPASS COLUMBUS COUNTY
Proj. # NCDOT-001	
CAD File: pc_054_fig 5.dgn	Project Title:
Approx. Scale: 1" = 30'	Drawn by: MJO
	Client: NC DOT

APPENDIX A

PHOTOGRAPH LOG

Photo 1

Overview of site prior to preliminary site assessment activities.

Photo 2

Photo of CSI personnel operating a hand auger to clear for utilities.

10610 Metromont Pkwy
Suite 206
Charlotte, NC 28269

APEX

WBS	41499.1.3
PROCESSED	TLH
DATE	June 2018

PHOTOGRAPHIC LOG
PSA Field Activities
Parcel 54
Z V Pate Inc. Property
Whiteville, NC

Photo 3

Photo of CSI personnel operating a direct push rig adjacent to a former dispenser island.

Photo 4

Photo former dispenser island locations located onsite.

10610 Metromont Pkwy
Suite 206
Charlotte, NC 28269

APEX

WBS	41499.1.3
PROCESSED	TLH
DATE	June 2018

PHOTOGRAPHIC LOG
PSA Field Activities
Parcel 54
Z V Pate Inc. Property
Whiteville, NC

APPENDIX B
HISTORICAL RECORDS

North Carolina
Department of Environment and Natural Resources
Wilmington Regional Office
Division of Waste Management
UST Section
Michael F. Easley, Governor
William G. Ross Jr., Secretary
Dexter R. Matthews, Director

NCDENR

September 7, 2004

Ms. Tomie Benton
Whiteville Oil Company
P.O. Box 48
North Myrtle Beach, SC 29597

Re: Notice of Regulatory Requirements
15A NCAC 2L .0115(c)
Risk-based Assessment and Corrective Action for Petroleum Underground Storage Tanks
Crossroads Amoco, Facility I.D. # 0-011628
709 North J.K. Powell Dr., Whiteville
Columbus County
Incident # 32173

Dear Ms. Benton:

Information received by this office on August 31, 2004 confirms a release or discharge from a petroleum underground storage tank (UST) system at the above-referenced location. Records indicate that Whiteville Oil Company is the owner and operator of this UST system. This letter is a standard notice explaining the actions you Whiteville Oil Company must take as a result of the release or discharge in accordance with North Carolina statutes and rules. The UST Section of the Division of Waste Management administers the state's rules for USTs and the required response for petroleum releases. Those rules are located in Title 15A, Subchapter 2L and Title 15A, Subchapter 2N of the North Carolina Administrative Code (NCAC).

As a responsible party, Whiteville Oil Company is required to comply with the release response and corrective action requirements of 15A NCAC 2L .0115(c), which include the requirements established in 15A NCAC 2N. Listed is a general description of actions Whiteville Oil Company must take to comply with State rules. For a detailed description of your requirements please refer to the enclosed rules and the most recent version of the UST Section guidelines for assessment and corrective action. The guidelines are available on the Internet at http://ust.ehnr.state.nc.us/guidance.html or may be purchased from the UST Section for a fee of $8.50. To purchase a copy of the guidelines, please send a check made payable to DENR to:

DENR/DWM/UST Section
1637 Mail Service Center
Raleigh, NC 27699-1637

Required Actions:

1) If you have not already done so, you must take immediate action to prevent any further release of the regulated substance into the environment and to identify and mitigate any fire, explosion and vapor hazards; remove any free product; and comply with the requirements of Rules .0601 through .0604 and .0701 through .0703 and .0705 of Subchapter 2N;

2) Incorporate the requirements of 15A NCAC 2N .0704 into the report to be submitted in accordance with 15A NCAC 2L .0115 (c)(3) or (c)(4), whichever is applicable (see Item #3 below). This shall constitute compliance with the reporting requirements of 15A NCAC 2N .0704(b);

3) If it can be demonstrated that localized soil contamination was cleaned up at the time of tank removal, you may submit a Soil Contamination Report in accordance with 15A NCAC 2L.0115(c)(3). The Soil Contamination Report must demonstrate that the soil remaining in the sidewalls and at the base of the excavation is located in the unsaturated zone and does not exceed either the soil-to-groundwater or the residential maximum soil contaminant concentrations, whichever are lower. A Soil Contamination Report is not appropriate for sites where contamination is situated directly on top of bedrock or once a tank closure excavation has been back-filled. In both cases, a Limited Site Assessment Report is required. A Soil Contamination Report, if applicable, is due in this office **within 90 days** of the date of this letter. Upon approval of this report, the Department may issue a letter indicating that no further action related to this incident is required; or,

4) If the requirements of 15A NCAC .0115(c)(3) cannot be met as described in Item #3 above, submit a Limited Site Assessment (LSA) Report in accordance with 15A NCAC 2L .0115(c)(4), containing information needed by the Department to classify the level of risk to human health and the environment posed by the discharge or release. The LSA Report is due in this office **within 120 days** of the date of this letter. Based on a review of the information submitted in the LSA, the Department will classify the risk of the discharge or release as high, intermediate or low. At that time, the Department will also classify the land use of the site as either residential or industrial/commercial. You will be notified of the risk and land use classifications once review of your LSA Report is completed.

5) Please note that before you sell or request a "No Further Action" determination for a property that has not been remediated to below "unrestricted use" standards, you must file a Notice of Residual Petroleum ("Notice") with the Register of Deeds in the county where the property is located (NCGS 143B-279.9 and 143B-279.11). Unrestricted use standards for groundwater and soil are the groundwater quality standards and interim

standards contained in 15A NCAC 2L .0202 and the residential maximum soil contaminant concentrations established in 15A NCAC 2L .0115, respectively. The Notice must first be approved and notarized by the UST Section prior to conveyance of a property or prior to receiving a "No Further Action" determination, whichever occurs first. The Notice must contain a legal description of the property containing the source of contamination and legal descriptions of any other properties that you own (or control) that are contaminated by the release. The Notice must include appropriate land use restrictions for these properties. In addition, the Notice must identify all other properties (adjacent, adjoining, downgradient, etc.) on which contamination is known to exist at the time the Notice is prepared. If contamination is located on more than one parcel or tract, the UST Section may require that a composite map or plat be prepared. After the Notice is filed with the Register of Deeds, a certified copy of the filed Notice must be submitted to the UST Section. Additional guidance including the language and format of the Notice is available by calling this regional office or visiting the UST Section web site at http://ust.enr.state.nc.us.

If you believe that any of the information requested above has already been submitted, please notify me of the date, title, and content of the documents that contain the information.

Your prompt attention to the items described herein is required. Failure to comply with the State's rules in the manner and time specified, may result in the assessment of civil penalties and /or the use of other enforcement mechanisms available to the State. Each day that a violation continues may be considered a separate violation. If you believe you are not the responsible party notify the UST Section **within 15 days** of the date of this letter.

Please note that performing assessment and cleanup work that is not required under 15A NCAC 2L.0115 is not reimbursable from the Commercial or Noncommercial Leaking Petroleum Underground Storage Tank Cleanup Funds.

If you have any questions regarding the actions that must be taken or the rules mentioned in this letter, please contact me at the Wilmington Regional Office at the letterhead address and at (910)395-3900. If you have any questions regarding trust fund eligibility or reimbursement, please contact the UST Section Trust Fund Branch at (919) 733-8486.

Sincerely,

David Peacock
Hydrogeological Tech II

Enclosures: 15A NCAC 2L .0115
cc: Rae Brown, CBM – Greenville, NC
WiRO-UST
S:\ust\peacock\norr letters\crossroads amoco.doc

State of North Carolina
Department of Environment
and Natural Resources
Wilmington Regional Office
Division of Waste Management
UST Section

Michael F. Easley, Governor
William G. Ross, Jr., Secretary
Dexter R. Matthews, Director

NCDENR
NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

June 10, 2004

Ms. Tomie Benton
Whiteville Oil Company
P.O. Box 48
Myrtle Beach, SC 29597

Subject: Tank Closure
Cross Roads Amoco
Whiteville
Columbus County

Dear Ms. Benton:

The Wilmington Regional Office has received notice of your intent to remove (or close in place) an underground storage tank. Because the tank owner, not the contractor, is held responsible for proper tank closure, enclosed are several documents for your information. If you have any questions please call us at (910) 395-3900. After tank closure, return the enclosed GW/UST-2, GW/UST-12 and supporting written report of tank closure and soil sample results.

If you have contaminated soil during a tank closure that necessitates removal of soil from the site before a soil remediation permit can be issued, you must obtain a Certificate of Approval from the Wilmington Regional Office (WiRO) staff prior to moving the contaminated soil. The soil must be properly disposed of or an application for a permit to land apply contaminated soils must be received by this office within 45 days of the tank closure.

As of August 3, 1996, the requirement for a professional engineer (PE) or licensed geologist (LG) signature and seal on tank closure reports for clean closures that occur after a minimum of 30 days notification to the WiRO was suspended. All other closures **must** be signed and sealed by a PE/LG including all closures conducted with a 5 day notification and contaminated closures conducted after 30 days of notification.

Please contact our office two days before you begin work so that a representative of the Division may be present.

Sincerely,
Underground Storage Tank Section
Wilmington Regional Office

cc: Columbus County Manager
Justin Radford, CBM Environmental
WiRO-UST

Enclosures: GW/UST-2; GW/UST-12 Tank Closure Guidelines

s:\ust\close\cross roads amoco.june04

CBM Environmental Services, Inc.

[redacted]

To:	Steve Kay	From:	Rae Brown
Company:	NCDENR-WiRO	Date:	6/3/04
Fax No.	910-350-2004	No. Pages:	2 (including cover)
Phone No.	910-395-3900	Regarding:	GW/UST-3

___ Urgent X For Review ___ Please Comment ___ Please Reply

Notes/Comments:

Fax Number: 252-830-9216 Phone Number: 252-752-0200

GW/UST-3 Notice of Intent: UST Permanent Closure or Change-In-Service

FOR TANKS IN **NC**

Return Completed Form To:
The appropriate DWQ Regional Office according to the county of the facility's location. [SEE REVERSE SIDE OF OWNER'S COPY (PINK) FOR REGIONAL OFFICE ADDRESS].

State Use Only
I. D. Number _____
Date Received 6-3-04

INSTRUCTIONS
Complete and return at least five (5) working days prior to closure or change-in-service if a Professional Engineer (P.E.) or a Licensed Geologist (L.G.) provides supervision for closure or change-in-service site assessment activities and signs and seals all closure reports. Otherwise, thirty (30) days notice is required.

I. OWNERSHIP OF TANK(S)

Tank Owner Name: Whiteville Oil Company
(Corporation, Individual, Public Agency, or Other Entity)
Street Address: Post Office Box 48
County: Horry
City: Myrtle Beach State: SC Zip Code: 29597
Tele. No. (Area Code): 843-399-4800

II. LOCATION OF TANK(S)

Facility Name or Company: Cross Roads Amoco
Facility ID # (If available): 0-011628
Street Address or State Road: Washington Street
County: Columbus City: Whiteville Zip Code: 28472
Tele. No. (Area Code): N/A

III. CONTACT PERSON

Name: Tomie Benton Job Title: _____ Telephone Number: (843) 399-4800

IV. TANK REMOVAL, CLOSURE IN PLACE, CHANGE-IN-SERVICE

1. Contact Local Fire Marshall.
2. Plan the entire closure event.
3. Conduct Site Soil Assessments.
4. If Removing Tanks or Closing in Place refer to API Publications 2015 "Cleaning Petroleum Storage Tanks" & 1604 "Removal & Disposal of Used Underground Petroleum Storage Tanks".
5. Provide a sketch locating piping, tanks and soil sampling locations.
6. Submit a closure report in the format of GW/UST-12 and include the form GW/UST-2 within 30 days following the site investigation.
7. If a release from the tank(s) has occurred, the site assessment portion of the tank closure must be conducted under the supervision of a P.E. or L.G., with all closure site assessment reports bearing signature and seal of the P.E. or L.G. If a release has not occurred, the supervision, signature, or seal of a P.E. or L.G. is not required.
8. Keep closure records for 3 years.

V. WORK TO BE PERFORMED BY:

(Contractor) Name: CBM Environmental Services
Address: 1411-B South Evans Street State: Greenville, NC Zip Code: 27834
Contact: Justin Radford Phone: 252 752 0200
Primary Consultant: CBM Phone: 252 752 0200

VI. TANK(S) SCHEDULED FOR CLOSURE OR CHANGE-IN-SERVICE

TANK ID#	TANK CAPACITY	LAST CONTENTS	PROPOSED ACTIVITY: CLOSURE – Removal	CLOSURE – Abandonment In Place	CHANGE-IN-SERVICE – New Contents Stored
1	8,000	Gasoline	☑	☐	
2	8,000	Gasoline	☑	☐	
3	8,000	Gasoline	☑	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	
			☐	☐	

VII. OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE

Print name and official title Rae Troiano Brown PG
Justin Radford Project Manager
*Scheduled Removal Date: 6/8/04
Signature: Justin Radford Rae Troiano Brown Date Submitted: 6/1/04

*If scheduled work date changes, notify your appropriate DWQ Regional Office 48 hours prior to originally scheduled date.

Geological Resources, Inc.

January 20, 2010

REC'D JAN 22 2010

Ms. Liz Berg
NCDENR-DWM-UST Section
127 Cardinal Drive Extension
Wilmington, NC 28405

Re: Ground Water Monitoring and
Updated Receptor Survey Report
Crossroads Amoco
709 North J.K. Powell Boulevard
Whiteville, Columbus County, NC
Incident Number: ~~32193~~ 32173

Dear Ms. Berg:

Please find enclosed the referenced report for the above mentioned site. If you have any questions, please do not hesitate to contact William Regenthal. at (704) 845-4010.

We appreciate the opportunity to provide these services to you.

Sincerely,
Geological Resources, Inc.

Faith W. Levering
Administrative Assistant

enclosure

cc: Mr. Sammy Black, Whiteville Oil Company
file

2301 Crown Point Executive Drive Suite F Charlotte, NC 28227
Phone: (704) 845-4010 / (888) 870-4133 Fax: (704) 845-4012

GROUND WATER MONITORING AND UPDATED RECEPTOR SURVEY REPORT
CROSSROADS AMOCO
709 NORTH J.K. POWELL BOULEVARD
WHITEVILLE, COLUMBUS COUNTY
NORTH CAROLINA
INCIDENT NO. 32193

Prepared for:

Whiteville Oil Company, Inc.
Post Office Box 689
Whiteville, North Carolina 28472

Prepared by:

Geological Resources, Inc.
2301-F Crown Point Executive Drive
Charlotte, North Carolina 28227
(704) 845-4010

January 20, 2010

Rae S Brown for
William Regenthal
Project Manager

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

The purpose of this report is to present the results of ground water sampling and receptor survey update activities conducted on December 28, 2009 at the Crossroads Amoco Site, located at 709 North J.K. Powell Boulevard, Whiteville, Columbus County, North Carolina (**Figure 1**). The purpose of the activities was to obtain current ground water quality data and update receptor survey information for the site.

According to the November 12, 2004 Phase II Limited Site Assessment submitted by CBM Environmental Services, Inc., three 6,000-gallon gasoline USTs and product piping were removed from the site in June 2004. A total of four Type II monitoring wells (MW-1 through MW-4) and one Type III monitoring well (TW-1) were installed at the site during Limited Site Assessment (LSA) activities in July and October 2004. Previous activities were conducted by CBM Environmental Services, Inc. (CBM), although Geological Resources, Inc. (GRI) cannot verify the accuracy of information obtained from previous reports, for the purposes of this report, it is assumed to be correct. Please refer to previous submittals for further historical information regarding the site.

2.0 FACILITY INFORMATION

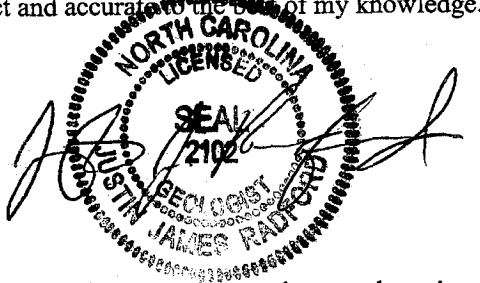
• **Facility Name:**	Crossroads Amoco
• **Location:**	709 North J.K. Powell Boulevard Whiteville, Columbus County (**Figure 1**)
• **Ground Water Incident No.:**	32193
• **Facility ID No:**	0-011628
• **Risk Classification:**	~~H75R~~ H125D
• **Land Use Classification:**	Commercial
• **Property Owner:**	Whiteville Oil Company, Inc. Post Office Box 689 Whiteville, North Carolina 28472
• **UST Owner/Operator:**	Whiteville Oil Company, Inc. Post Office Box 689 Whiteville, North Carolina 28472
• **Consultant:**	Geological Resources, Inc. 2301-F Crown Point Executive Drive Charlotte, North Carolina 28227 (704) 845-4010
• **Laboratory:**	Empirical Laboratories, LLC 621 Mainstream Drive, Suite 270 Nashville, Tennessee 37228 (615) 345-1115

State Certification Number: 643

- **Release Information**
- **Date Discovered:** July 2, 2004
- **Estimated Quantity of Release:** Unknown
- **Cause of Release:** Leaking UST System
- **Source of Release:** UST System
- **UST System Size/Contents:** Three 6,000-gallon gasoline USTs and product piping
- **Latitude/Longitude:** 34.338583° North / 78.709333° West

Certification

I, Justin J. Radford, a Licensed Geologist for Geological Resources, Inc., do certify that the information contained in this report is correct and accurate to the best of my knowledge.



Geological Resources, Inc. is licensed to practice geology and engineering in North Carolina. The certification numbers of the company are C-127 and C-2727, respectively.

3.0 RECEPTOR SURVEY UPDATE

GRI personnel conducted a receptor survey update on December 28, 2009. The site previously operated as a petroleum retail facility and convenience store. Currently, the site is vacant and no business operations are in progress. The site is surrounded by a mix of commercial and residentially developed properties. Two municipal water supply wells (Municipal Well #1 and Municipal Well #3) were identified within a 1,500-foot radius of the site. Municipal Well #3 was identified within a 1,000-foot radius of the site. No private water supply wells were identified within a 1,500-foot radius of the site. Based on information obtained from Mr. Jim Parker with the City of Whiteville Water System Department, both Municipal Well #1 and Municipal Well #3 have been abandoned and water has not been pumped from them in over a year. Mr. Parker stated that both wells were producing sand and thus, have not been suitable water sources for some time. Mr. Parker also stated that a replacement well is being installed on Martin Luther King Drive, which is located over a ½ mile from the subject property. Municipal water is available to the site and surrounding properties. Water use questionnaires were distributed to all properties within a 500-foot radius of the site. Copies of the returned water use questionnaires have been included as **Appendix A.** GRI personnel accessed the website: http://swap.deh.enr.state.nc.us/swap_app/viewer.htm on January 17, 2010 and determined that the site does not lie within a designated wellhead protection area. The site lies inside the city limits of Whiteville.

The zoning status of the property is B-3, which is a highway serving business zoning district. No surface water bodies were identified within a 500-foot radius of the site. A Site Vicinity Map showing properties within a 1,500-foot radius of the site is included as **Figure 2**. Adjacent property owner information is presented in **Table 1**. Water supply well owner information is presented in **Table 2**.

4.0 GROUND WATER QUALITY

Three Type II monitoring wells (MW-2 through MW-4) and one Type III monitoring well (TW-1) were gauged, purged and sampled on December 28, 2009. Please note, MW-1 has been damaged and could not be sampled. The depths to ground water in the Type II monitoring wells during the December 2009 sampling event ranged from 4.24 to 8.76 feet below the tops of well casings. Ground water elevations in the Type II monitoring wells relative to a temporary benchmark assumed by the previous consultant ranged from 90.23 to 95.80 feet. Based on this data, the general ground water flow direction appears to be toward the southeast. The average horizontal hydraulic gradient across the northwestern portion of the site was less than 0.01 feet per foot. However, the average horizontal hydraulic gradient across the southeastern portion of the site was approximately 0.07 feet per foot.

A Site Map showing the structures on-site and the locations of the monitoring wells is included as **Figure 3**. A Ground Water Flow Map for the December 28, 2009 sampling event has been included as **Figure 4**. A summary of well construction information including ground water elevation data is presented in **Table 3**. A historical summary of ground water gauging data is included as **Appendix B**.

Laboratory analyses were performed on the ground water samples collected from the monitoring wells during the December 2009 sampling event for volatile organic compounds (VOCs) using EPA Method 6200B, lead by EPA Method 6010/3030C as well as VPH by the MADEP Method.

Concentrations of benzene, MTBE, naphthalene and/or C9-C10 aromatics that exceeded the maximum allowable concentrations (MACs) specified in T15A NCAC 2L.0202 were reported in the ground water samples collected from MW-2 and MW-4. Concentrations of lead that exceeded the MAC were reported in the ground water samples collected from MW-2, MW-3, MW-4 and TW-1. None of the reported concentrations exceeded the gross contamination levels (GCLs). A Ground Water Quality Map based on data from the December 28, 2009 sampling event has been included as **Figure 5**. A summary of ground water sampling analytical results is presented in **Table 4**. A summary of historical ground water quality data is included as **Appendix C**. A complete laboratory analytical report has been included in **Appendix D**.

5.0 CONCLUSIONS AND RECOMMENDATIONS

- Two municipal water supply wells (Municipal Well #1 and Municipal Well #3) were identified within a 1,500-foot radius of the site. Furthermore, Municipal Well #3 was identified within a 1,000-foot radius of the site. Municipal water is available to the site and surrounding properties.
- Both Municipal Wells #1 and #3 have been abandoned and the city of Whiteville is in the process of installing a replacement well on Martin Luther King Boulevard, which is located over ½ mile away from the subject property.
- The average depth to ground water in the Type II monitoring wells in December 2009 was 5.75 feet. The general ground water flow direction is toward the southeast with an average horizontal hydraulic gradient of less than 0.01 feet per foot toward the northwest. However, the average horizontal hydraulic gradient towards the southeast is approximately 0.07 feet per foot.
- Concentrations of benzene, MTBE, naphthalene and/or C9-C10 aromatics that exceeded the MACs were reported in the ground water samples collected from MW-2 and MW-4. Concentrations of lead that exceeded the MAC were reported in the ground water samples collected from MW-2, MW-3, MW-4 and TW-1. None of the reported concentrations exceeded the GCLs.
- Based on this information and the ground water sampling results collected from MW-1 during LSA activities, the site risk classification should be lowered to low risk. A Notice of Residual Petroleum (NRP) for ground water should be filed at the Columbus County Register of Deeds. Upon completion of the NRP, a No Further Action status should be granted and public notice and monitoring well abandonment activities should be conducted.

6.0 LIMITATIONS

This report has been prepared for the exclusive use of Whiteville Oil Company, Inc., for specific application to the referenced site in Columbus County, North Carolina. The assessment was conducted based on the scope of work and level of effort desired by the NCDENR and with resources adequate only for that scope of work. Our findings have been developed in accordance with generally accepted standards of environmental practices in the State of North Carolina, available information, and our professional judgment. No other warranty is expressed or implied.

The data that is presented in this report is indicative of conditions that existed at the precise locations sampled and at the time the samples were collected. In addition, the data obtained from samples would be

North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue, Governor

Division of Waste Management
UST Section

Dee Freeman, Secretary
Dexter R. Matthews, Director

May 26, 2010

William Regenthal
Geological Resources
113 W. Firetower Road, Suite G
Winterville, NC 28590

Re: Notice of No Further Action
15A NCAC 2L .0407(d)
Risk-based Assessment and Corrective Action
for Petroleum Underground Storage Tanks

Crossroads Amoco
709 North J.K. Powell Drive
Whiteville, Columbus County
Incident Number: **32173**
Risk Classification: Low
Ranking: L125D

Dear Mr. Black:

The Groundwater Monitoring Reports received by the UST Section, Wilmington Regional Office on January 22, 2010 and February 25, 2010 along with the Notice of Residual Petroleum received on May 24, 2010 have been reviewed. The review indicates that groundwater contamination meets the cleanup requirements for a low-risk site but exceeds the groundwater quality standards established in Title 15 A NCAC 2L .0202.

The UST Section determines that no further action is warranted for this incident. This determination shall apply unless the UST Section later finds that the discharge or release poses an unacceptable risk or a potentially unacceptable risk to human health or the environment. Pursuant to Title 15A NCAC 2L .0407(a) you have a continuing obligation to notify the Department of any changes that might affect the risk or land use classifications that have been assigned.

Be advised that as groundwater contamination exceeds the groundwater quality standards established in Title 15A NCAC 2L .0202, groundwater within the area of contamination or within the area where groundwater contamination is expected to migrate is not suitable for use as a water supply.

As groundwater contamination exceeds the groundwater quality standards established in Title 15 A NCAC 2L .0202, pursuant to NCGS 143B-279.9 and 143B-279.11, you must file the approved Notice of Residual Petroleum (attached) with the Register of Deeds in the county in which the release is located and submit a certified copy to the UST Section within 30 days of receipt of this letter. This No Further Action determination will not become valid until the UST Section receives a certified copy of the Notice of Residual Petroleum which is filed with the Register of Deeds.

As groundwater contamination exceeds the groundwater quality standards established in Title 15A NCAC 2L .0202 and soil contamination exceeds the lower of the soil-to-groundwater or residential MSCCs, public notice in accordance with 15A NCAC 2L .0409(b) also is required. Thus, within 30 days of receipt of this letter, a copy of the letter must be provided by certified mail, or by posting in a prominent place, if certified mail is impractical, to the local health director, the chief administrative officer of each political jurisdiction in which the contamination occurs, all property owners and occupants within or contiguous to the area containing contamination, and all property owners and occupants within or contiguous to the area where the contamination is expected to migrate. Within 60 days of receiving this no further action letter, this office must be provided with proof of receipt of the copy of the letter or of refusal by the addressee to accept delivery of the copy of the letter or with a description of the manner in which the letter was posted. This No Further Action determination will not become valid until public notice requirements are completed. Interested parties may examine the Soil Cleanup Report/ Site Closure Request by contacting this regional office and may submit comments on the site to the regional office at the address or telephone number listed below.

This No Further Action determination applies only to the subject incident; for any other incidents at the subject site, the responsible party must continue to address contamination as required.

If you have any questions regarding this notice, please contact me at the address or telephone number listed below.

Sincerely,

Liz Berg

Liz Berg
Hydrogeologist
Wilmington Regional Office

Attachments: Notice of Residual Petroleum

cc: Liz Berg- WiRO/UST

Mr. Sammy Black (w/ attachments) Whiteville Oil Company
PO Box 689
Whiteville, NC 28472

Kimberly Smith, Columbus County Health Department

UST Regional Office:

Wilmington (WIL) – 127 Cardinal Drive Extension, Wilmington, NC 28405 **(910) 796-7215**

NOTICE OF RESIDUAL PETROLEUM

Crossroads Amoco, Columbus County, North Carolina

The property that is the subject of this Notice (hereinafter referred to as the "Site") contains residual petroleum and is an Underground Storage Tank (UST) incident under North Carolina's Statutes and Regulations, which consist of N.C.G.S. 143-215.94 and regulations adopted thereunder. This Notice is part of a remedial action for the Site that has been approved by the Secretary (or his/her delegate) of the North Carolina Department of Environment and Natural Resources (or its successor in function), as authorized by N.C.G.S. Section 143B-279.9 and 143B-279.11. The North Carolina Department of Environment and Natural Resources shall hereinafter be referred to as "DENR".

NOTICE

Petroleum product was released and/or discharged at the Site. **Petroleum constituents remain on the site, but are not a danger to public health and the environment, provided that the restrictions described herein, and any other measures required by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, are strictly complied with.** This "Notice of Residual Petroleum" is composed of a description of the property, the location of the residual petroleum and the land use restrictions on the Site. The Notice has been approved and notarized by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11 and has/shall be recorded at the Columbus County Register of Deeds' office Book ____, Page ____.

Any map or plat required by DENR has been/shall be recorded at the Columbus County Register of Deeds' office Book ____, Page ____, and has been/shall be incorporated into the Notice by this reference.

Source Property

Whiteville Oil Company of Whiteville, North Carolina is the owner in fee simple of all or a portion of the Site, which is located in the County of Columbus, State of North Carolina, and is known and legally described as:

Beginning at a point where the West edge of Powell Boulevard intersects with the South edge of Washington Street and runs thence along the edge of Powell Boulevard South 01° 31' West 200 feet; thence parallel with Washington Street North 88° 54' West 150 feet; thence parallel with Powell Boulevard North 01° 31' East 200 feet to the South edge of Washington Street; thence along the South edge of Washington Street South 88° 54' East 150 feet to the beginning.

For protection of public health and the environment, the following land use restrictions required by N.C.G.S. Section 143B-279.9(b) shall apply to all of the above-described real property. These restrictions shall continue in effect as long as residual petroleum remains on the site in excess of unrestricted use standards and cannot be amended or cancelled unless and until the Columbus County Register of Deed receives and records the written concurrence of the Secretary (or his/her delegate) of DENR (or its successor in function).

PERPETUAL LAND USE RESTRICTIONS

Groundwater: Groundwater from the site is prohibited from use as a water supply. Water supply wells of any kind shall not be installed or operated on the site.

ENFORCEMENT

The above land use restriction(s) shall be enforced by any owner, operator, or other party responsible for the Site. The above land use restriction(s) may also be enforced by DENR through any of the remedies provided by law or by means of a civil action, and may also be enforced by any unit of local government having jurisdiction over any part of the Site. Any attempt to cancel this Notice without the approval of DENR (or its successor in function) shall be subject to enforcement by DENR to the full extent of the law. Failure by any party required or authorized to enforce any of the above restriction(s) shall in no event be deemed a waiver of the right to do so thereafter as to the same violation or as to one occurring prior or subsequent thereto.

IN WITNESS WHEREOF, _____ has caused this Notice to be executed pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, this _____ day of _____,200_.

_____
(name of responsible party if agent is signing)

By: _____
(signature of responsible party, attorney or other agent if there is one)

_____
(Title of agent for responsible party if there is one)

Signatory's name typed or printed: W S Black

Sign Here

NORTH CAROLINA
Columbus COUNTY

I certify that the following person personally appeared before me this day, acknowledging to me that he or she signed the foregoing document: W. S. Black.

Revised September 28, 2007

Date: 5-18-2010

Amanda S. Sernigan
Notary's printed or typed name
Notary Public

(Official Seal)

My commission expires:
October 18, 2010

Approved for the purposes of N.C.G.S. 143B-279.11

Gene Jackson
(signature of Regional Supervisor)
Gene Jackson, Regional Supervisor
(printed name of Regional Supervisor)

Wilmington Regional Office
UST Section
Division of Waste Management
Department of Environment and Natural Resources

NORTH CAROLINA
Pender COUNTY

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Gene Jackson *(full printed name of Regional Supervisor)*

Date: 5-26-10

Beverly A. Rivenbark
Notary Public

(Official Seal)

BEVERLY A. RIVENBARK NOTARY PUBLIC PENDER COUNTY, N.C.

My commission expires:
4-15-2014

Geological Resources, Inc.

June 18, 2010

Ms. Liz Berg
North Carolina Department of
Environment and Natural Resources
Wilmington Regional Office
127 Cardinal Drive Extension
Wilmington, North Carolina 28405

Re: Notice of Residual Petroleum,
Well Abandonment and Public Notice
Crossroads Amoco
Whiteville, Columbus County
Incident No. 32173

Dear Ms. Berg

Please find enclosed the certified copy of the Notice of Residual Petroleum (NRP), well abandonment records and certified mail receipts for public notice for the above referenced site.

Please do not hesitate to contact the undersigned at (704) 815-0653 if you have any questions or require additional information.

Sincerely,
Geological Resources, Inc.

William Regenthal, GIT
Project Manager

enclosure

cc: file
Mr. Sammy Black, Whiteville Oil Company, Post Office Box 689, Whiteville, NC 28472

2301 Crown Point Executive Drive Suite F Charlotte, NC 28227
Phone: (704) 845-4010 / (888) 870-4133 Fax: (704) 845-4012

2010002732
COLUMBUS CO, NC FEE $20.00
PRESENTED & RECORDED:
06-08-2010 02:28:38 PM
KANDANCE H WHITEHEAD
REGISTER OF DEEDS
BY: ROBIN DAVIS
DEPUTY
BK: RB 986
PG: 342-344

NOTICE OF RESIDUAL PETROLEUM

Crossroads Amoco, Columbus County, North Carolina

The property that is the subject of this Notice (hereinafter referred to as the "Site") contains residual petroleum and is an Underground Storage Tank (UST) incident under North Carolina's Statutes and Regulations, which consist of N.C.G.S. 143-215.94 and regulations adopted thereunder. This Notice is part of a remedial action for the Site that has been approved by the Secretary (or his/her delegate) of the North Carolina Department of Environment and Natural Resources (or its successor in function), as authorized by N.C.G.S. Section 143B-279.9 and 143B-279.11. The North Carolina Department of Environment and Natural Resources shall hereinafter be referred to as "DENR".

NOTICE

Petroleum product was released and/or discharged at the Site. **Petroleum constituents remain on the site, but are not a danger to public health and the environment, provided that the restrictions described herein, and any other measures required by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, are strictly complied with.** This "Notice of Residual Petroleum" is composed of a description of the property, the location of the residual petroleum and the land use restrictions on the Site. The Notice has been approved and notarized by DENR pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11 and has/shall be recorded at the Columbus County Register of Deeds' office Book ____, Page ____.

Any map or plat required by DENR has been/shall be recorded at the Columbus County Register of Deeds' office Book ____, Page ____, and has been/shall be incorporated into the Notice by this reference.

Source Property

Whiteville Oil Company of Whiteville, North Carolina is the owner in fee simple of all or a portion of the Site, which is located in the County of Columbus, State of North Carolina, and is known and legally described as:

Beginning at a point where the West edge of Powell Boulevard intersects with the South edge of Washington Street and runs thence along the edge of Powell Boulevard South 01° 31' West 200 feet; thence parallel with Washington Street North 88° 54' West 150 feet; thence parallel with Powell Boulevard North 01° 31' East 200 feet to the South edge of Washington Street; thence along the South edge of Washington Street South 88° 54' East 150 feet to the beginning.

For protection of public health and the environment, the following land use restrictions required by N.C.G.S. Section 143B-279.9(b) shall apply to all of the above-described real property. These restrictions shall continue in effect as long as residual petroleum remains on the site in excess of unrestricted use standards and cannot be amended or cancelled unless and until the Columbus County Register of Deed receives and records the written concurrence of the Secretary (or his/her delegate) of DENR (or its successor in function).

PERPETUAL LAND USE RESTRICTIONS

Groundwater: Groundwater from the site is prohibited from use as a water supply. Water supply wells of any kind shall not be installed or operated on the site.

ENFORCEMENT

The above land use restriction(s) shall be enforced by any owner, operator, or other party responsible for the Site. The above land use restriction(s) may also be enforced by DENR through any of the remedies provided by law or by means of a civil action, and may also be enforced by any unit of local government having jurisdiction over any part of the Site. Any attempt to cancel this Notice without the approval of DENR (or its successor in function) shall be subject to enforcement by DENR to the full extent of the law. Failure by any party required or authorized to enforce any of the above restriction(s) shall in no event be deemed a waiver of the right to do so thereafter as to the same violation or as to one occurring prior or subsequent thereto.

IN WITNESS WHEREOF, _____ has caused this Notice to be executed pursuant to N.C.G.S. Sections 143B-279.9 and 143B-279.11, this _____ day of _____,200_.

_____
(name of responsible party if agent is signing)

By: _____
(signature of responsible party, attorney or other agent if there is one)

_____
(Title of agent for responsible party if there is one)

Signatory's name typed or printed: W S Black

NORTH CAROLINA
Columbus COUNTY

I certify that the following person personally appeared before me this day, acknowledging to me that he or she signed the foregoing document: W. S. Black.

Revised September 28, 2007

Date: 5-18-2010

Amanda J. Jernigan
Notary's printed or typed name
Notary Public

(Official Seal)

My commission expires:
October 18, 2010

Approved for the purposes of N.C.G.S. 143B-279.11

Gene Jackson
(signature of Regional Supervisor)
Gene Jackson, Regional Supervisor
(printed name of Regional Supervisor)

Wilmington Regional Office
UST Section
Division of Waste Management
Department of Environment and Natural Resources

NORTH CAROLINA
Pender COUNTY

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Gene Jackson *(full printed name of Regional Supervisor)*

Date: 5-26-10

Beverly A. Rivenbark
Notary Public

(Official Seal)

My commission expires:
4-15-2014

NORTH CAROLINA COLUMBUS COUNTY
The foregoing or annexed certificate(s) of
Beverly A. Rivenbark
Notary(y) (ies) Public (has) (have) been verified to have a Signature, seal or stamp, and an expiration date. This Instrument and this certificate are duly registered at the Date and time and in the book and page shown on the First page thereof
Candace H. Whitehead
Register of Deeds
By: Asst. Deputy Register of Deeds

Ret: Hollis Keech

WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION #3160-A

1. WELL CONTRACTOR:

Hollis Keech
Well Contractor (Individual) Name

Geological Resources, Inc.
Well Contractor Company Name

STREET ADDRESS 2301 F Crown Point Ex. Drive

Charlotte | NC | 28227
City or Town | State | Zip Code

(704) - 845-4010
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW-1

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Check applicable use): ☑ Monitoring ☐ Residential ☐ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation ☐ Other (list use)

3. WELL LOCATION:

COUNTY Columbus QUADRANGLE NAME Whiteville

NEAREST TOWN: Whiteville

709 N JK Powell Boulevard
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☑ Flat ☐ Ridge ☐ Other
(Check appropriate setting)

LATITUDE 34.338583
LONGITUDE 78.709333

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☐ GPS ☑ Topographic map

(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) 0-011628

NAME OF FACILITY Crossroads Amoco

STREET ADDRESS 709 N JK Powell Boulevard

Whiteville | NC | 28472
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Whiteville Oil Company, Inc

STREET ADDRESS PO Box 689, Whiteville, NC 28472

5. WELL DETAILS:

a. Total Depth: 12 ft. Diameter: 2 in.
b. Water Level (Below Measuring Point): ~5 ft.
Measuring point is 0 ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	2 ft.	2 in.
b. Casing Removed:	0 ft.	0 in.

7. DISINFECTION:

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement	Sand Cement
Cement 94 lb.	Cement ____ lb.
Water 6.25 gal.	Water ____ gal.

Bentonite

Bentonite lb.
Type: ☐ Slurry ☐ Pellets
Water ____ gal.

Other

Type material
Amount

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremmie Grout

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 6/8/10

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 6/8/10

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL — DATE
(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

PRINTED NAME OF PERSON ABANDONING THE WELL

Submit a copy to the owner and the original to the Division of Water Quality within 30 days.
Attn: Information Management, 1617 Mail Service Center – Raleigh, NC 27699-1617, Phone No. (919) 733-7015 ext 568.

Form GW-30
Rev. 5/06

WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3160-A

1. WELL CONTRACTOR:

Hollis Keech
Well Contractor (Individual) Name

Geological Resources, Inc.
Well Contractor Company Name

STREET ADDRESS 2301 F Crown Point Ex. Drive

Charlotte | NC | 28227
City or Town | State | Zip Code

(704) - 845-4010
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW-2

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Check applicable use): ☑ Monitoring ☐ Residential ☐ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation

☐ Other (list use)

3. WELL LOCATION:

COUNTY Columbus QUADRANGLE NAME Whiteville

NEAREST TOWN: Whiteville

709 N JK Powell Boulevard
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☑ Flat ☐ Ridge ☐ Other
(Check appropriate setting)

LATITUDE 34.338583
LONGITUDE 78.709333

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☐ GPS ☑ Topographic map

(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) 0-011628

NAME OF FACILITY Crossroads Amoco

STREET ADDRESS 709 N JK Powell Boulevard

Whiteville | NC | 28472
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Whiteville Oil Company, Inc

STREET ADDRESS PO Box 689, Whiteville, NC 28472

5. WELL DETAILS:

a. Total Depth: 15 ft. Diameter: 2 in.
b. Water Level (Below Measuring Point): ~5 ft.
Measuring point is 0 ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	3 ft.	2 in.
b. Casing Removed:	0 ft.	0 in.

7. DISINFECTION:

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement: Cement 94 lb. Water 6.25 gal.

Sand Cement: Cement lb. Water gal.

Bentonite: Bentonite lb.
Type: ☐ Slurry ☐ Pellets
Water gal.

Other:
Type material
Amount

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremmie Grout

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 6/8/10

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 6/8/10

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL — DATE
(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

Hollis Keech
PRINTED NAME OF PERSON ABANDONING THE WELL

Submit a copy to the owner and the original to the Division of Water Quality within 30 days.
Attn: Information Management, 1617 Mail Service Center – Raleigh, NC 27699-1617, Phone No. (919) 733-7015 ext 568.

Form GW-30
Rev. 5/06

WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3160-A

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Hollis Keech
Well Contractor (Individual) Name

Geological Resources, Inc.
Well Contractor Company Name

STREET ADDRESS 2301 F Crown Point Ex. Drive

Charlotte | NC | 28227
City or Town | State | Zip Code

(704) - 845-4010
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW-3

STATE WELL PERMIT # (if applicable) _____

COUNTY WELL PERMIT # (if applicable) _____

DWQ or OTHER PERMIT # (if applicable) _____

WELL USE (Check applicable use): ☑ Monitoring ☐ Residential
☐ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural
☐ Recovery ☐ Injection ☐ Irrigation
☐ Other (list use) _____

3. WELL LOCATION:

COUNTY Columbus QUADRANGLE NAME Whiteville

NEAREST TOWN: Whiteville

709 N JK Powell Boulevard
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☑ Flat ☐ Ridge ☐ Other _____
(Check appropriate setting)

LATITUDE 34.338583
LONGITUDE 78.709333
May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☐ GPS ☑ Topographic map
(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY- The name of the business where the well is located. Complete 4a and4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) 0-011628

NAME OF FACILITY Crossroads Amoco

STREET ADDRESS 709 N JK Powell Boulevard

Whiteville | NC | 28472
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Whiteville Oil Company, Inc

STREET ADDRESS PO Box 689, Whiteville, NC 28472

5. WELL DETAILS:

a. Total Depth: 15 ft. Diameter: 2 in.
b. Water Level (Below Measuring Point): ~5 ft.
Measuring point is 0 ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	3 ft.	2 in.
b. Casing Removed:	0 ft.	0 in.

7. DISINFECTION: _____
(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement
Cement 94 lb.
Water 6.25 gal.

Sand Cement
Cement _____ lb.
Water _____ gal.

Bentonite
Bentonite _____ lb.
Type: ☐ Slurry ☐ Pellets
Water _____ gal.

Other
Type material _____
Amount _____

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremmie Grout

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

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(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

Hollis Keech
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Form GW-30
Rev. 5/06

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North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3160-A

1. WELL CONTRACTOR:

Hollis Keech
Well Contractor (Individual) Name

Geological Resources, Inc.
Well Contractor Company Name

STREET ADDRESS 2301 F Crown Point Ex. Drive

Charlotte | NC | 28227
City or Town | State | Zip Code

(704) - 845-4010
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) MW-4

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Check applicable use): ☑ Monitoring ☐ Residential ☐ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural ☐ Recovery ☐ Injection ☐ Irrigation

☐ Other (list use)

3. WELL LOCATION:

COUNTY Columbus QUADRANGLE NAME Whiteville

NEAREST TOWN: Whiteville

709 N JK Powell Boulevard
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

☐ Slope ☐ Valley ☑ Flat ☐ Ridge ☐ Other
(Check appropriate setting)

LATITUDE 34.338583
LONGITUDE 78.709333

May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☐ GPS ☑ Topographic map

(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) 0-011628

NAME OF FACILITY Crossroads Amoco

STREET ADDRESS 709 N JK Powell Boulevard

Whiteville | NC | 28472
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Whiteville Oil Company, Inc

STREET ADDRESS PO Box 689, Whiteville, NC 28472

5. WELL DETAILS:

a. Total Depth: 15 ft. Diameter: 2 in.
b. Water Level (Below Measuring Point): ~5 ft.
Measuring point is 0 ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	3 ft.	2 in.
b. Casing Removed:	0 ft.	0 in.

7. DISINFECTION:

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement
Cement 94 lb.
Water 6.25 gal.

Sand Cement
Cement lb.
Water gal.

Bentonite
Bentonite lb.
Type: ☐ Slurry ☐ Pellets
Water gal.

Other
Type material
Amount

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremmie Grout

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 6/8/10

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 6/8/10

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL — DATE
(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

Hollis Keech
PRINTED NAME OF PERSON ABANDONING THE WELL

Submit a copy to the owner and the original to the Division of Water Quality within 30 days.
Attn: Information Management, 1617 Mail Service Center – Raleigh, NC 27699-1617, Phone No. (919) 733-7015 ext 568.

Form GW-30
Rev. 5/06

WELL ABANDONMENT RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 3160-A

1. WELL CONTRACTOR:

Hollis Keech
Well Contractor (Individual) Name

Geological Resources, Inc.
Well Contractor Company Name

STREET ADDRESS 2301 F Crown Point Ex. Drive

Charlotte | NC | 28227
City or Town | State | Zip Code

(704) 845-4010
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID # (if applicable) TW-1

STATE WELL PERMIT # (if applicable)

COUNTY WELL PERMIT # (if applicable)

DWQ or OTHER PERMIT # (if applicable)

WELL USE (Check applicable use): ☑ Monitoring ☐ Residential
☐ Municipal/Public ☐ Industrial/Commercial ☐ Agricultural
☐ Recovery ☐ Injection ☐ Irrigation
☐ Other (list use)

3. WELL LOCATION:

COUNTY Columbus QUADRANGLE NAME Whiteville

NEAREST TOWN: Whiteville

709 N JK Powell Boulevard
(Street/Road Name, Number, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:
☐ Slope ☐ Valley ☑ Flat ☐ Ridge ☐ Other
(Check appropriate setting)

LATITUDE 34.338583
LONGITUDE 78.709333
May be in degrees, minutes, seconds, or in a decimal format

Latitude/longitude source: ☐ GPS ☑ Topographic map
(Location of well must be shown on a USGS topo map and attached to this form if not using GPS.)

4a. FACILITY - The name of the business where the well is located. Complete 4a and 4b. (If a residential well, skip 4a; complete 4b, well owner information only.)

FACILITY ID #(if applicable) 0-011628
NAME OF FACILITY Crossroads Amoco
STREET ADDRESS 709 N JK Powell Boulevard
Whiteville | NC | 28472
City or Town | State | Zip Code

4b. CONTACT PERSON/WELL OWNER:

NAME Whiteville Oil Company, Inc
STREET ADDRESS PO Box 689, Whiteville, NC 28472

5. WELL DETAILS:

a. Total Depth: 33 ft. Diameter: 2 in.
b. Water Level (Below Measuring Point): ~8 ft.
Measuring point is 0 ft. above land surface.

6. CASING:

	Length	Diameter
a. Casing Depth (if known):	28 ft.	2 in.
b. Casing Removed:	0 ft.	0 in.

7. DISINFECTION:

(Amount of 65%-75% calcium hypochlorite used)

8. SEALING MATERIAL:

Neat Cement: Cement 94 lb. Water 6.25 gal.
Sand Cement: Cement ____ lb. Water ____ gal.
Bentonite: Bentonite ____ lb. Type: ☐ Slurry ☐ Pellets Water ____ gal.
Other: Type material ____ Amount ____

9. EXPLAIN METHOD OF EMPLACEMENT OF MATERIAL:

Tremmie Grout

10. WELL DIAGRAM: Draw a detailed sketch of the well on the back of this form showing total depth, depth and diameter of screens (if any) remaining in the well, gravel interval, intervals of casing perforations, and depths and types of fill materials used.

11. DATE WELL ABANDONED 6/8/10

I DO HEREBY CERTIFY THAT THIS WELL WAS ABANDONED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR — DATE 6/9/10

SIGNATURE OF PRIVATE WELL OWNER ABANDONING THE WELL — DATE
(The private well owner must be an individual who personally abandons his/her residential well in accordance with 15A NCAC 2C .0113.)

Hollis Keech
PRINTED NAME OF PERSON ABANDONING THE WELL

Submit a copy to the owner and the original to the Division of Water Quality within 30 days.
Attn: Information Management, 1617 Mail Service Center – Raleigh, NC 27699-1617, Phone No. (919) 733-7015 ext 568.

Form GW-30
Rev. 5/06

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Search Results

Label/Receipt Number: **7009 0820 0001 1905 6369**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 9:22 AM on June 10, 2010 in LAUREL HILL, NC 28351.

Track & Confirm

Enter Label/Receipt Number.

Go >

Detailed Results:

- **Delivered, June 10, 2010, 9:22 am, LAUREL HILL, NC 28351**
- **Notice Left, June 09, 2010, 8:42 am, LAUREL HILL, NC 28351**

Notification Options

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CERTIFIED MAIL™ RECEIPT
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OFFICIAL USE

Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To ZV Pate Inc.
Street, Apt. No.; or PO Box No. PO Box 159
City, State, ZIP+4 Laurel Hill, NC 28351

PS Form 3800, August 2006 See Reverse for Instructions

UNITED STATES POSTAL SERVICE®

Track & Confirm

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Label/Receipt Number: **7009 0820 0001 1905 6352**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 9:22 AM on June 10, 2010 in LAUREL HILL, NC 28351.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 10, 2010, 9:22 am, LAUREL HILL, NC 28351**
- **Notice Left, June 09, 2010, 8:42 am, LAUREL HILL, NC 28351**

Notification Options

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For delivery information visit our website at www.usps.com®

OFFICIAL USE

Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To: Service Realty Company
Street, Apt. No.; or PO Box No.: PO Box 159
City, State, ZIP+4: Laurel Hill, NC 28351

PS Form 3800, August 2006 See Reverse for Instructions

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UNITED STATES POSTAL SERVICE®

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Label/Receipt Number: **7009 0820 0001 1905 6345**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 8:13 AM on June 11, 2010 in DEERFIELD, IL 60015.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 11, 2010, 8:13 am, DEERFIELD, IL 60015**
- **Arrival at Unit, June 11, 2010, 7:12 am, DEERFIELD, IL 60015**

Notification Options

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Postage	$ .44
Certified Fee	2 80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3 24

Postmark Here

Sent To: Wood 1031, LLC Attn Tax Dept Suite #3898
Street, Apt. No.; or PO Box No.: 104 Wilmot Rd. 3rd Floor
City, State, ZIP+4: Deerfield, IL 60015

PS Form 3800, August 2006 See Reverse for Instructions

7009 0820 0001 1905 6345

UNITED STATES POSTAL SERVICE®

Track & Confirm

Search Results

Label/Receipt Number: **7009 0820 0001 1905 6338**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 10:19 AM on June 9, 2010 in TABOR CITY, NC 28463.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 09, 2010, 10:19 am, TABOR CITY, NC 28463**
- **Notice Left, June 09, 2010, 10:08 am, TABOR CITY, NC 28463**
- **Arrival at Unit, June 09, 2010, 9:17 am, TABOR CITY, NC 28463**

Notification Options

Track & Confirm by email

Get current event information or updates for your item sent to you or others by email. Go >

7009 0820 0001 1905 6338

7009 0820 0001 1905 6338

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Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To: Yam City Oil Company, Inc.
Street, Apt. No.; or PO Box No.: PO Box 715
City, State, ZIP+4: Tabor City, NC 28463

PS Form 3800, August 2006 See Reverse for Instructions

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Search Results

Label/Receipt Number: **7009 0820 0001 1905 6321**
Service(s): **Certified Mail™**
Status: **Arrival at Unit**

Your item arrived at 7:08 AM on June 12, 2010 in ANAHEIM, CA 92803.
Information, if available, is updated periodically throughout the day.
Please check again later.

Track & Confirm

Enter Label/Receipt Number.

Go >

Notification Options

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Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To Dawgy's Investment
Street, Apt. No.; or PO Box No. PO Box 4349
City, State, ZIP+4 Anaheim, CA 92803

PS Form 3800, August 2006 See Reverse for Instructions

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UNITED STATES POSTAL SERVICE®

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Label/Receipt Number: **7009 0820 0001 1905 6314**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 9:41 AM on June 10, 2010 in WHITEVILLE, NC 28472.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 10, 2010, 9:41 am, WHITEVILLE, NC 28472**
- **Notice Left, June 09, 2010, 8:13 am, WHITEVILLE, NC 28472**
- **Arrival at Unit, June 09, 2010, 8:10 am, WHITEVILLE, NC 28472**

Notification Options

Track & Confirm by email

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7009 0820 0001 1905 6314

CERTIFIED MAIL™ RECEIPT
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OFFICIAL USE

Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To E.L. Frison - Whiteville City Manager
Street, Apt. No.; or PO Box No. PO Box 607
City, State, ZIP+4 Whiteville, NC 28472

PS Form 3800, August 2006 See Reverse for Instructions

UNITED STATES POSTAL SERVICE®

Track & Confirm

Search Results

Label/Receipt Number: **7009 0820 0001 1905 6307**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 11:47 AM on June 9, 2010 in WHITEVILLE, NC 28472.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 09, 2010, 11:47 am, WHITEVILLE, NC 28472**
- **Arrival at Unit, June 09, 2010, 8:10 am, WHITEVILLE, NC 28472**

Notification Options

Track & Confirm by email

Get current event information or updates for your item sent to you or others by email. Go >

7009 0820 0001 1905 6307

7009 0820 0001 1905 6307

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For delivery information visit our website at www.usps.com®

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Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To William Clark - County Manager
Street, Apt. No.; or PO Box No. 111 Washington St.
City, State, ZIP+4 Whiteville, NC 28472

PS Form 3800, August 2006 See Reverse for Instructions

UNITED STATES POSTAL SERVICE®

Track & Confirm

Search Results

Label/Receipt Number: **7009 0820 0001 1905 6291**
Service(s): **Certified Mail™**
Status: **Delivered**

Your item was delivered at 9:01 AM on June 14, 2010 in WHITEVILLE, NC 28472.

Track & Confirm
Enter Label/Receipt Number.
Go >

Detailed Results:

- **Delivered, June 14, 2010, 9:01 am, WHITEVILLE, NC 28472**
- **Notice Left, June 09, 2010, 8:13 am, WHITEVILLE, NC 28472**
- **Arrival at Unit, June 09, 2010, 8:10 am, WHITEVILLE, NC 28472**

Notification Options

Track & Confirm by email

Get current event information or updates for your item sent to you or others by email. Go >

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Postage	$ .44
Certified Fee	2.80
Return Receipt Fee (Endorsement Required)	—
Restricted Delivery Fee (Endorsement Required)	—
Total Postage & Fees	$ 3.24

Postmark Here

Sent To: Ms. Kim Smith-Director Columbus Co. Health Dept
Street, Apt. No., or PO Box No.: PO Box 810
City, State, ZIP+4: Whiteville, NC 28472

PS Form 3800, August 2006 See Reverse for Instructions

7009 0820 0001 1905 6291

APPENDIX C

BORING LOGS

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-1	**Site Name: Parcel 54**
Date: 6/4/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	17	117		0-0.5' Concrete
1				0.5'-2' Tan clayey fine **SAND**
2				
	362	352		2'-5' Gray clayey fine **SAND** saturated at 3'.
3				
4				
5				
				Boring terminated at 5 feet
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-1a	**Site Name: Parcel 54**
Date: 6/4/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
				0-0.5' Concrete
1	26	35		0.5'-3' Tan clayey fine **SAND**
2				
3				
				Boring terminated at 3 feet
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-1b	**Site Name: Parcel 54**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
				0-0.5' Concrete
1	26	35		0.5'-1.5' Tan fine **SAND**
2	220	17.5		1.5'-3' Tan and orange clayey **SILT**.
3				
				Boring terminated at 3 feet.
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-1c	**Site Name: Parcel 54**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
				0-0.5' Concrete
1	11.6	2.9		0.5'-2' Tan sandy clayey **SILT**.
2				
	15.1	3.2		2'-3' Tan and gray mottled clayey **SILT**.
3				
				Boring terminated at 3 feet.
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-2	**Site Name: Parcel 54**
Date: 6/4/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	329	5,500		0-0.5' Concrete
1				0.5'-2' Tan fine **SAND**
2				
	750	9,000		2'-5' Gray clayey fine **SAND** saturated at 3'.
3				
4				
5				
				5'-12' Gray **SAND**, saturated.
6				
7				
8				
9				
10				
11				
12				
				12'-15' Gray clayey **SAND**.
13				
14				
				Boring terminated at 15' bgs and temporary well installed.

WELL CONSTRUCTION DETAILS (If Applicable)	
Well Type/Diameter: 1"	Outer Casing Interval: NA
Total Depth: 15	Outer Casing Diameter: NA
Screen Interval: 5'-10'	Bentonite Interval: NA
Sand Interval: NA	Slot Size: 0.010" slot
Grout Interval: NA	Static Water Level: 5'

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-2a	**Site Name: Parcel 54**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	85	18		0-0.5' Concrete
1				0.5'-2' Tan sandy **SILT**.
2				
	--	--		
3				
				Boring terminated at 3 feet
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-2b	**Site Name: Parcel 54**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	6.2	1.8		0-0.5' Concrete
1				0.5'-2' Tan sandy **SILT**.
2				
	0.5	2.3		
3				
				Boring terminated at 3 feet
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-2c	**Site Name: Parcel 54**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	8.2	20.1		0-0.5' Concrete
1				0.5'-2' Tan sandy **SILT**.
2				
	0.5	2.3		
3				
				Boring terminated at 3 feet
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P54-SB-3	**Site Name: Parcel 71**
Date: 6/5/2018	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	8.3	1.5		0-0.5' Asphalt
1				0.5'-2' Tan clayey sandy **SILT,**
2				
	9.6	2.5		2'-5' Tan clayey **SILT**.
3				
4				
5				
				Boring terminated at 5 feet
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-4	**Site Name: Parcel 71**
Date: 06/05/18	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
	209	56.6		0-0.5' Asphalt
1				0.5'-2' Orange and gray marbled clayey **SILT**.
2				
	219	39.8		2'-5' Yellow clayey **SILT**.
3				
4				
5				
				Boring terminated at 5 feet.
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

Apex Companies, LLC

Boring Log

Boring/Well No.: P-54-SB-5	**Site Name: Parcel 54**
Date: 06/05/18	**Location: Whiteville, Columbus County, NC**
Job No.: NCDOT-001	**Sample Method: Hand Auger and Direct Push**
Apex Rep: Troy Holzschuh	**Drilling Method: Hand Auger and Direct Push**
Drilling Company: Carolina Soil Investigations	**Driller Name/Cert #: Danny Summers/2579**
Remarks:	

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	3.2	<0.1		0-2' Orange and tan marbled clayey **SILT**.
2				
3	4.2	1.3		2'-5' Brown sandy **SILT**.
4				
5				
				Boring terminated at 5 feet
6				
7				
8				
9				
10				
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

APPENDIX D

GEOPHYSICAL REPORT

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2018-139)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 54
NCDOT PROJECT R-5020B (41499.1.3)

709 N. JK POWELL BLVD., WHITEVILLE, NC

JUNE 21, 2018

Report prepared for: Katie Lippard
Apex Companies, LLC
1071 Pemberton Hill Rd., Suite 203
Apex, NC 27502

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

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

GEOPHYSICAL INVESTIGATION REPORT
Parcel 54 – 709 N. JK Powell Blvd.
Whiteville, Columbus County, North Carolina

Table of Contents

Figures

Appendices

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Apex Companies, LLC at Parcel 54, located at 709 N. JK Powell Blvd., in Whiteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5020B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from May 29 – June 1, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of ten EM anomalies were identified. The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. Several EM anomalies were associated with suspected reinforced concrete and were investigated further with GPR. GPR was performed across the areas of suspected reinforced concrete (Anomalies 4, 5, 6, and 9) and verified the presence of metal reinforcement within the concrete. No evidence of larger structures such as USTs was observed beneath the reinforcement. Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 54.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Apex Companies, LLC at Parcel 54, located at 709 N. JK Powell Blvd., in Whiteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-5020B). The survey was designed to extend from the existing edge of pavement into the proposed ROW and/or easements, whichever distance was greater. Conducted from May 29 – June 1, 2018, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site was an apparent former service station with concrete/asphalt surfaces and grass medians. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending, generally parallel survey lines, spaced five feet apart. The data were downloaded to a

computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 15.0 software programs.

GPR data were acquired across select EM anomalies on June 1, 2018, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Utilities	
2	Trailer	
3	Utilities/Signs	
4	Reinforced Concrete	☑
5	Reinforced Concrete	☑
6	Reinforced Concrete	☑
7	Utility Pole/Light	
8	Utility	
9	Reinforced Concrete	☑
10	Curb/Lights	

The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface, including utilities, a trailer, signs, suspected reinforced concrete, a utility pole, a light, and the curb. GPR scans were performed in a grid-like fashion across the suspected reinforced concrete (Anomalies 4, 5, 6, and 9) to verify the presence of metal reinforcement and confirm that no other metal structures were present beneath the reinforcement.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, as well as select transect images. A total of twenty-four GPR transects were performed at the site. All of the transect images are included in **Appendix A**. GPR Transects 1 – 24 were performed across the reinforced concrete (Anomalies 4, 5, 6, and 9). These transects verified the presence of metal reinforcement in the concrete. No evidence of larger structures such as USTs was observed.

Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 54. **Figure 4** provides an overlay of the geophysical survey onto the NCDOT MicroStation engineering plans for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 54 in Whiteville, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- Several EM anomalies were associated with suspected reinforced concrete and were investigated further with GPR.
- GPR was performed across areas of suspected reinforced concrete (Anomalies 4, 5, 6, and 9) and verified the presence of metal reinforcement within the concrete. No evidence of larger structures such as USTs was observed beneath the reinforcement.
- Collectively, the geophysical data did not record any evidence of metallic USTs at Parcel 54.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Apex Companies, LLC in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

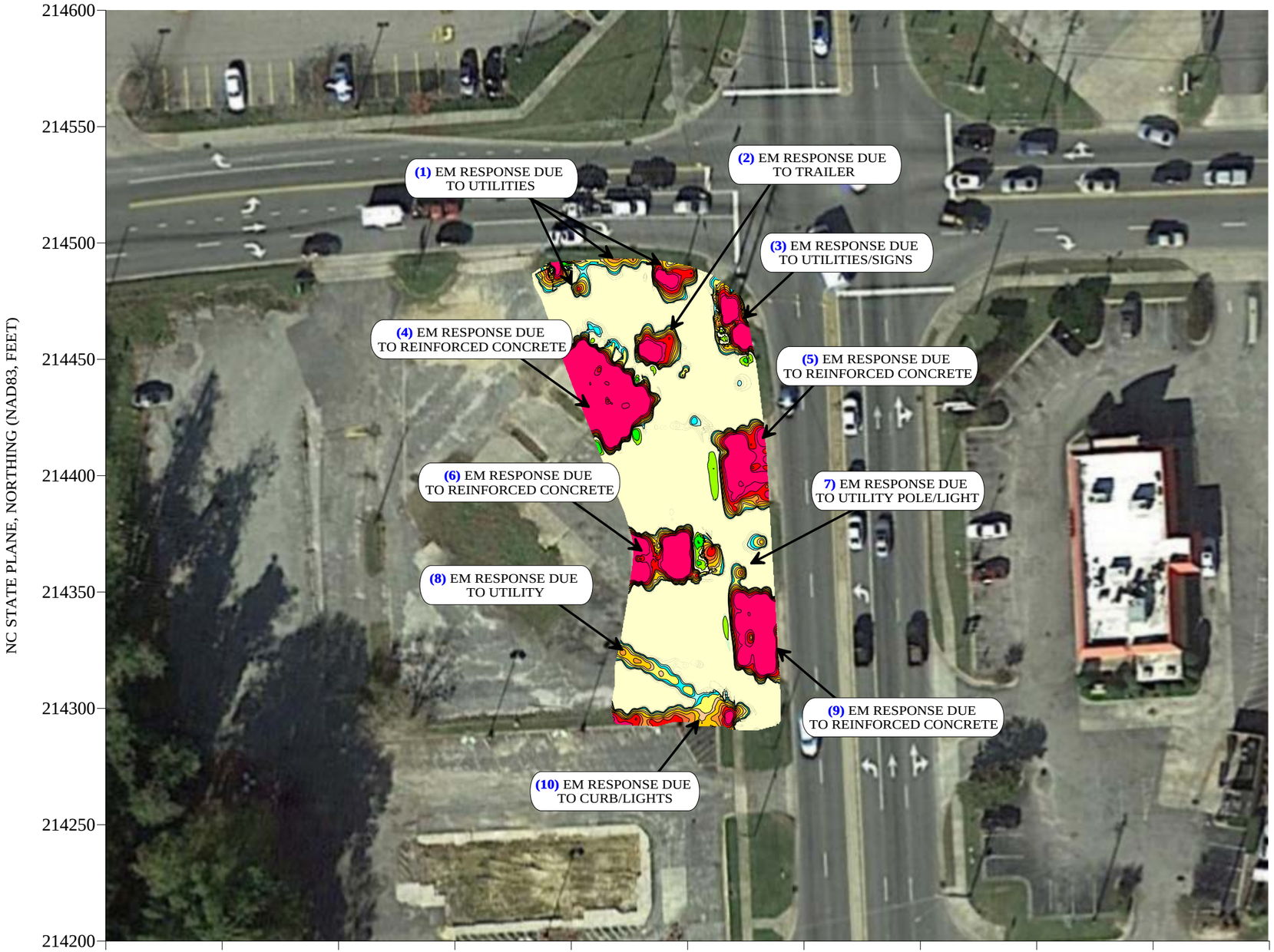
View of Survey Area
(Facing Approximately North)

View of Survey Area
(Facing Approximately South)

N

PYRAMID GEOPHYSICS 503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	PROJECT PARCEL 54 WHITEVILLE, NORTH CAROLINA NCDOT PROJECT R-5020B	TITLE PARCEL 54 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	DATE 5/29/2018 PYRAMID PROJECT #: 2018-139	CLIENT Apex Companies, LLC **FIGURE 1**

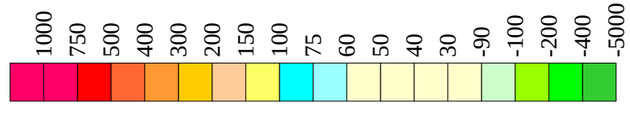
EM61 METAL DETECTION RESULTS



NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED.

The contour plot shows the bottom coil data results of the EM61 instrument in millivolts (mV), which provide a stronger metallic response of the instrument and do not incorporate the top coil. Differential data (difference between top and bottom coils) were not used for this parcel due to interference. The EM61 data were collected on May 29, 2018, using a Geonics EM61 instrument.Verification GPR data were collected using a GSSI UtilityScan DF instrument with a dual frequency300/800 MHz antenna on June 1, 2018.

EM61 Metal Detection Response (millivolts)



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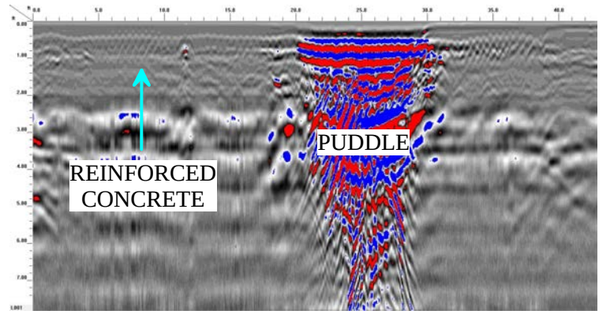
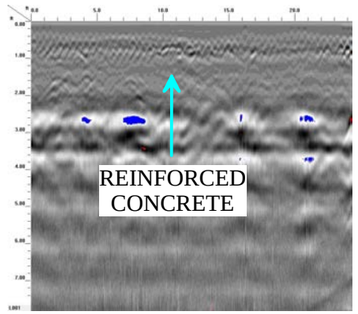
License # C1251 Eng. / License # C257 Geology

PROJECT	PARCEL 54 WHITEVILLE, NORTH CAROLINA NCDOT PROJECT R-5020B
TITLE	PARCEL 54 - EM61 METAL DETECTION CONTOUR MAP
DATE	5/29/2018
CLIENT	Apex Companies, LLC
PYRAMID PROJECT #:	2018-139
	FIGURE 2

LOCATIONS OF GPR TRANSECTS



GPR TRANSECT 4 (T4)



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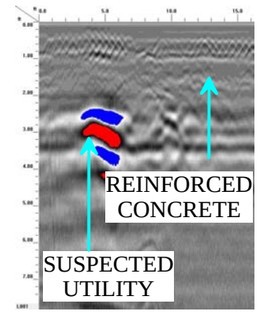
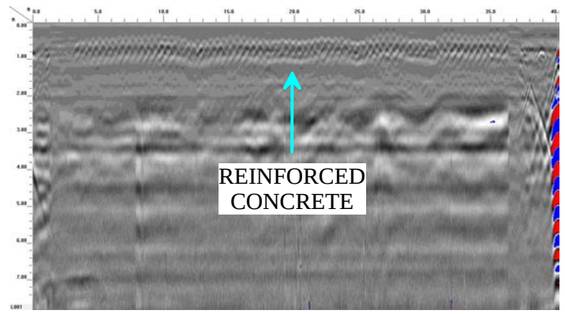


GPR TRANSECT 11 (T11)



GPR TRANSECT 19 (T19)

N

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License # C1251 Eng. / License # C257 Geology

PROJECT
PARCEL 54
WHITEVILLE, NORTH CAROLINA
NCDOT PROJECT R-5020B

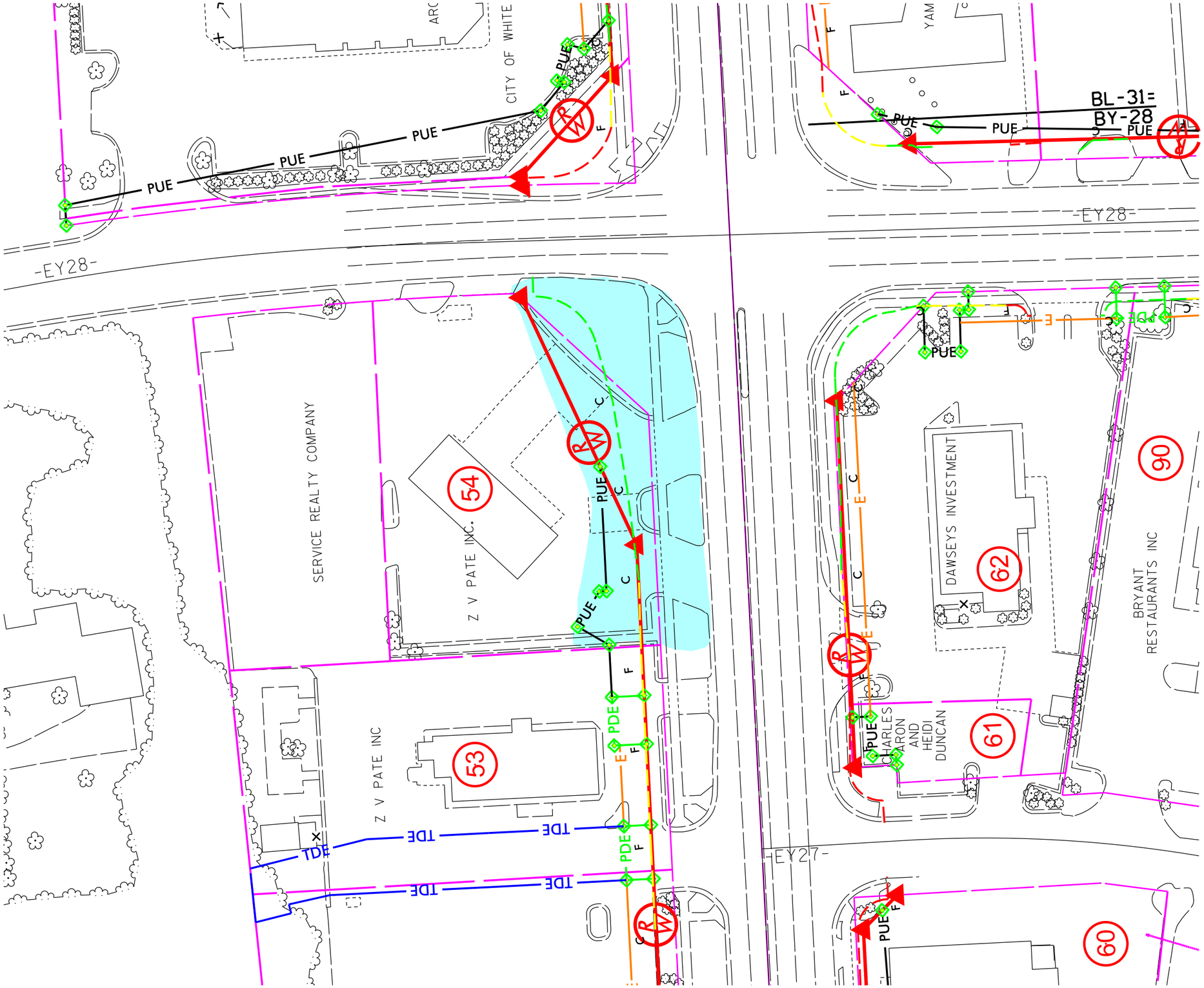
TITLE
PARCEL 54 - GPR TRANSECT LOCATIONS AND SELECT IMAGES

DATE 6/1/2018

CLIENT Apex Companies, LLC

PYRAMID PROJECT #: 2018-139

FIGURE 3



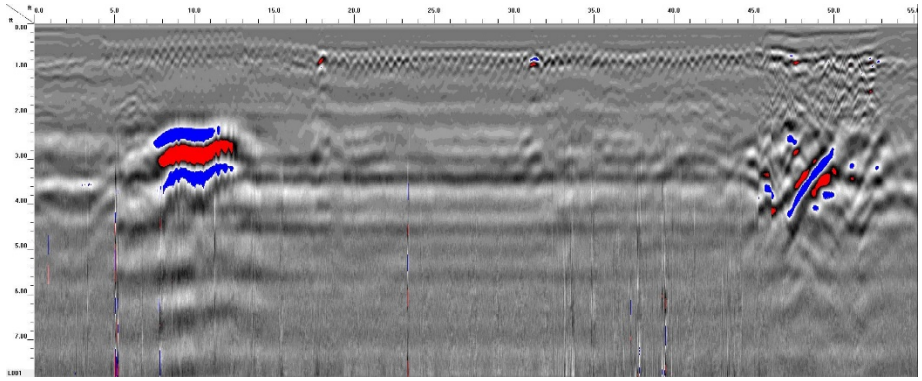
TITLE
OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 54
WHITEVILLE, NORTH CAROLINA
NCDOT PROJECT W-5020B

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

DATE: 06-26-2018	REVISION NO. 0
PYRAMID PROJECT NO. 2018-139	FIGURE NO. 4

Appendix A – GPR Transect Images



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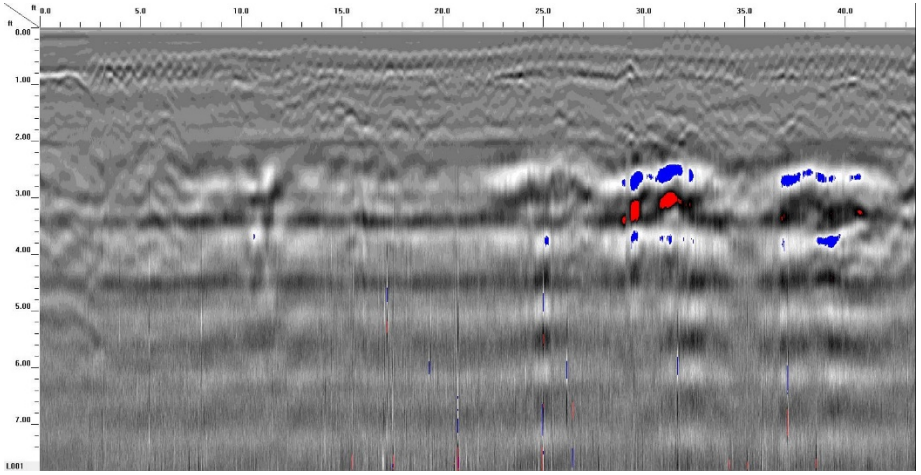

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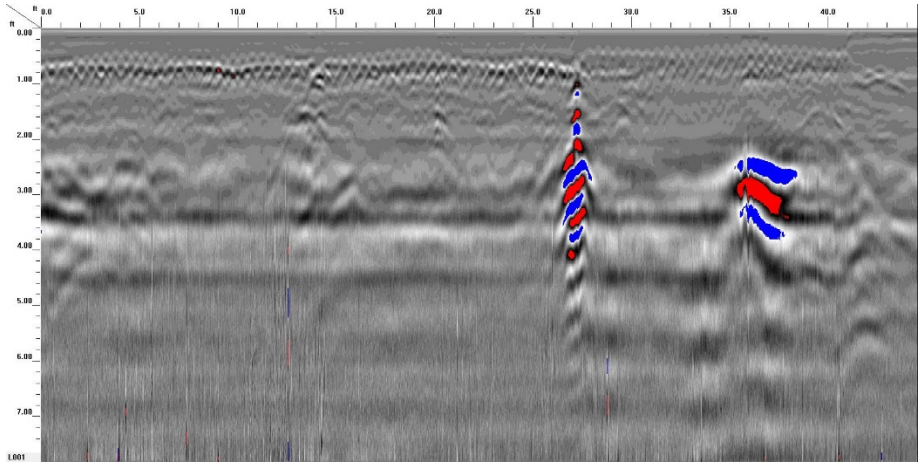

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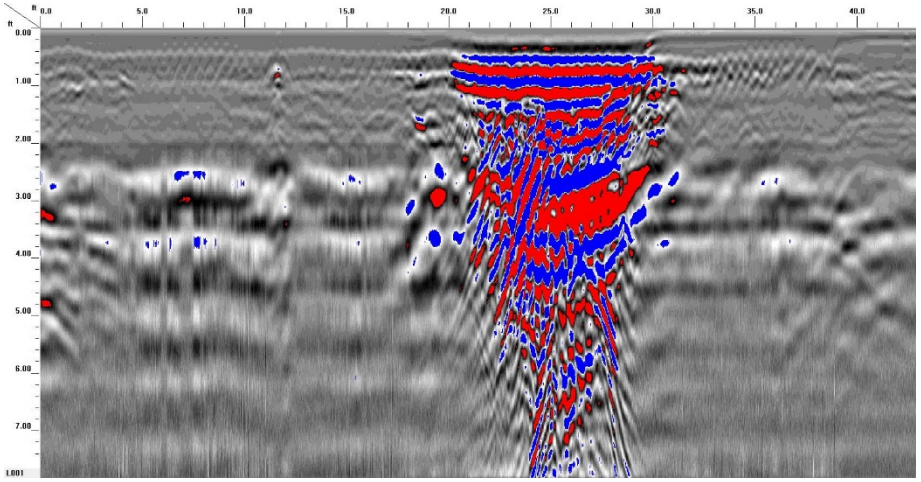

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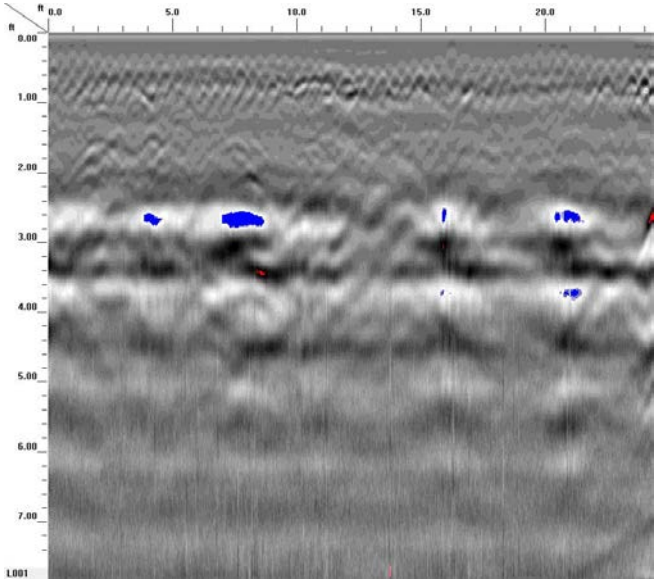

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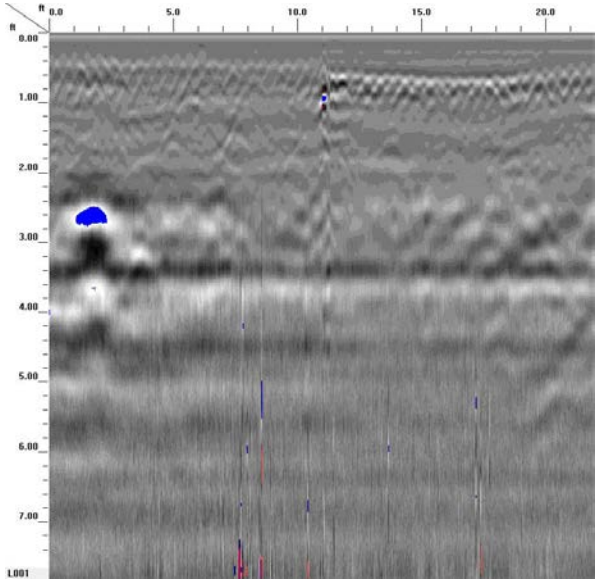

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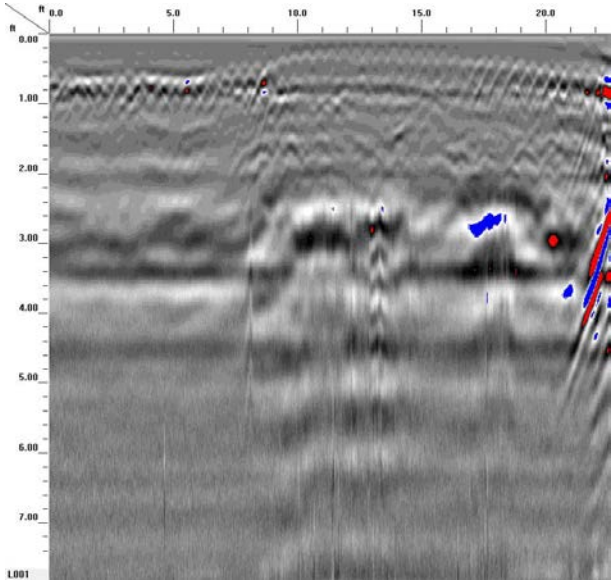

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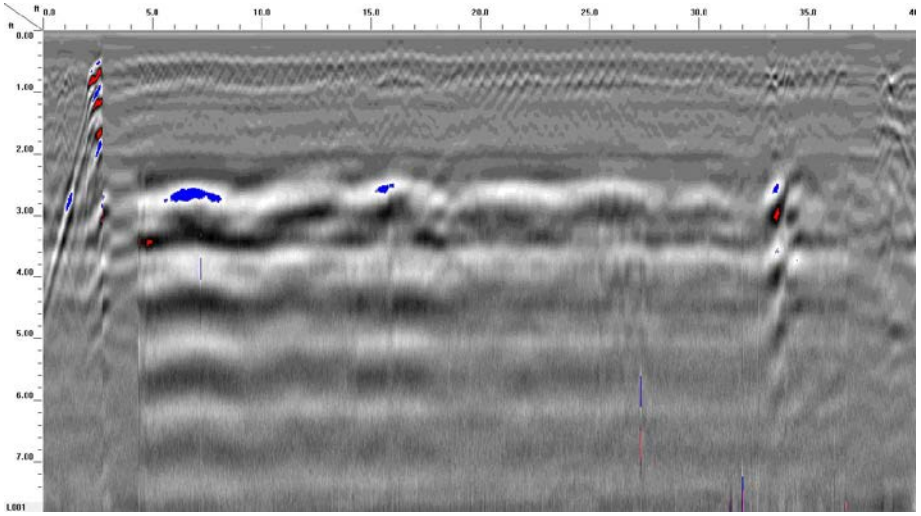

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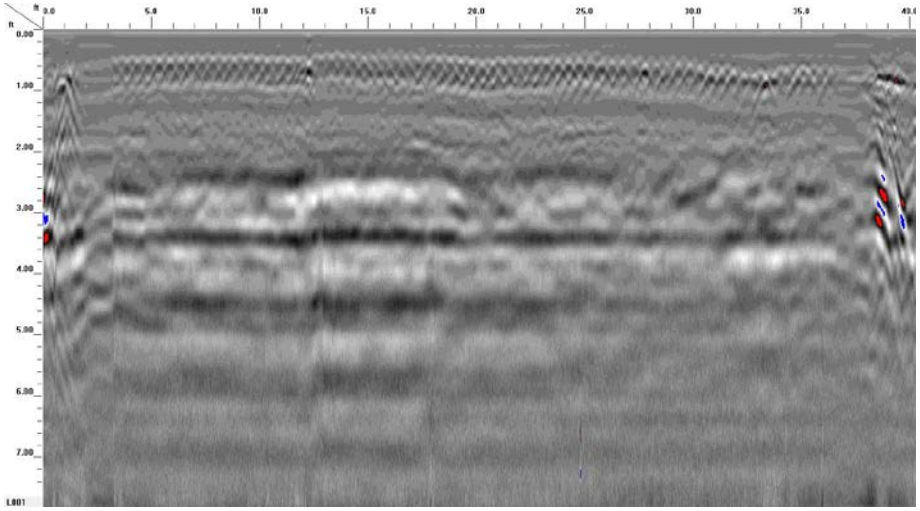

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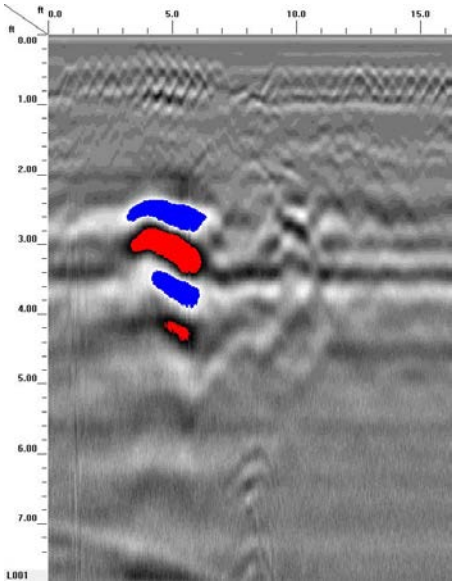

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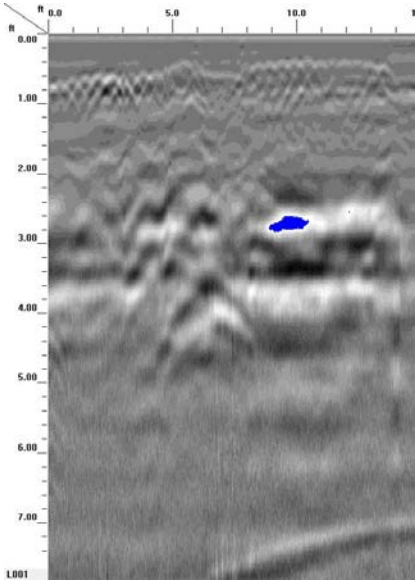

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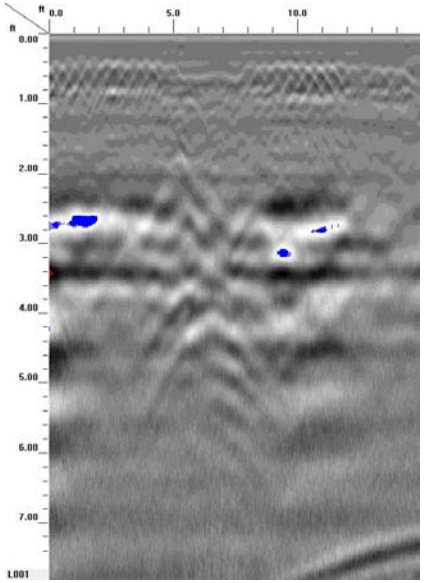

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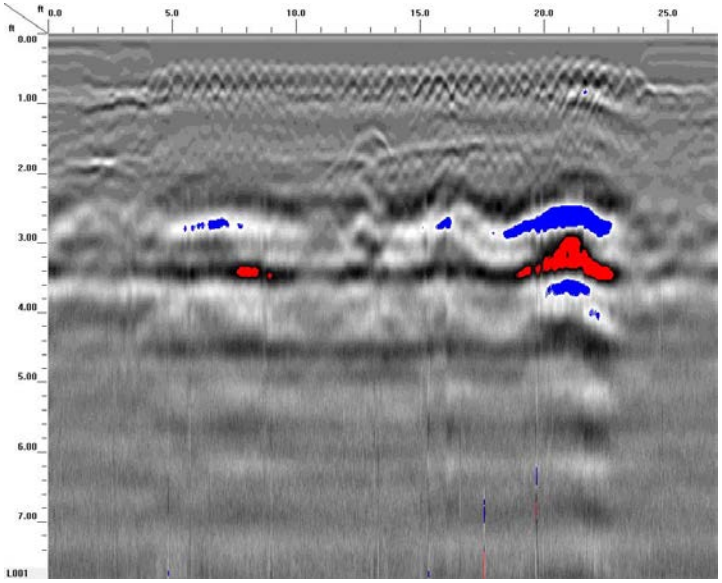

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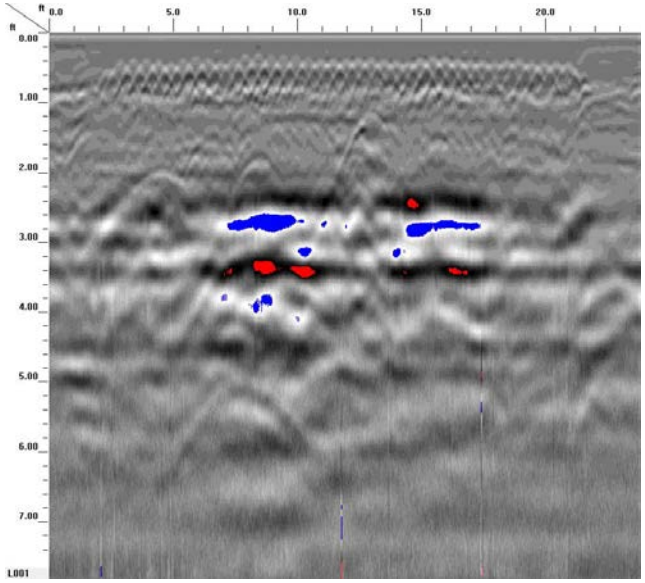

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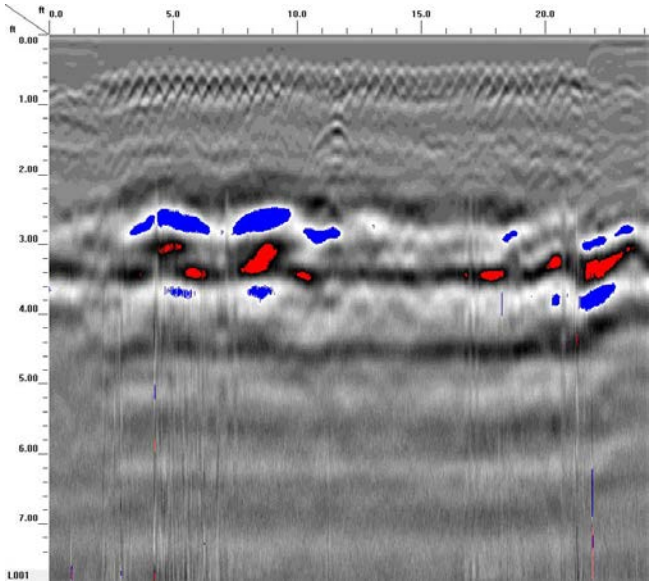

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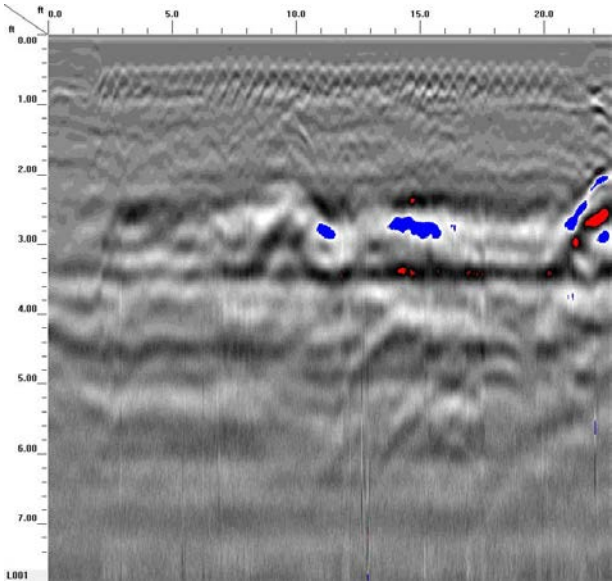

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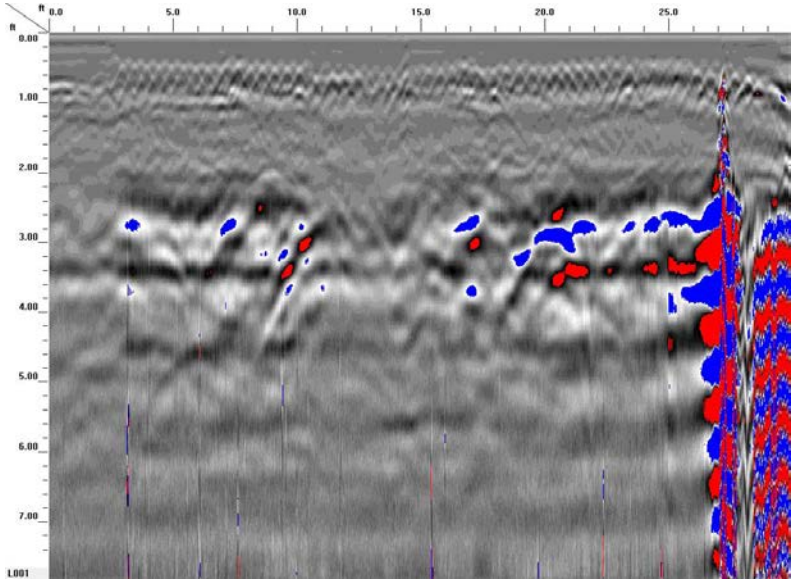

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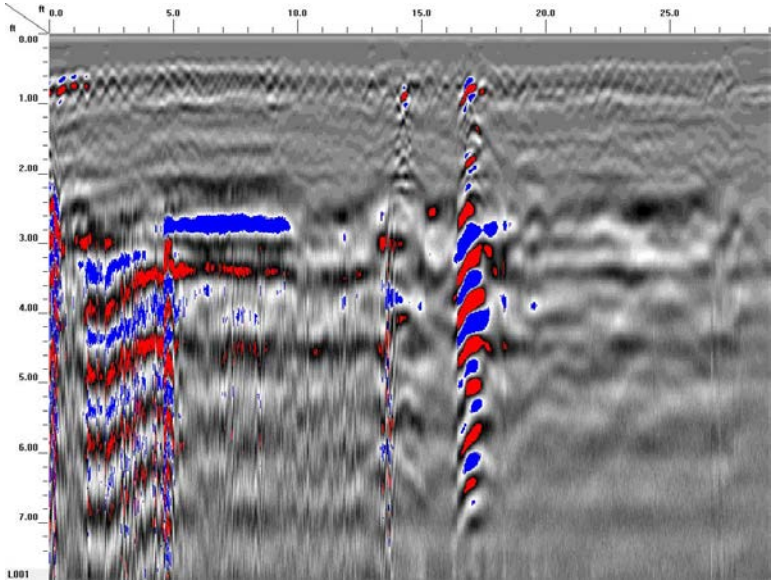

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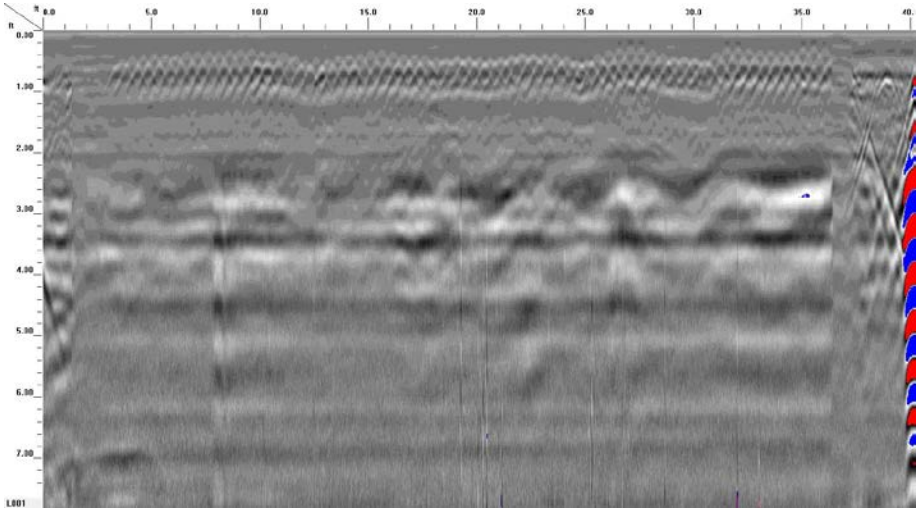

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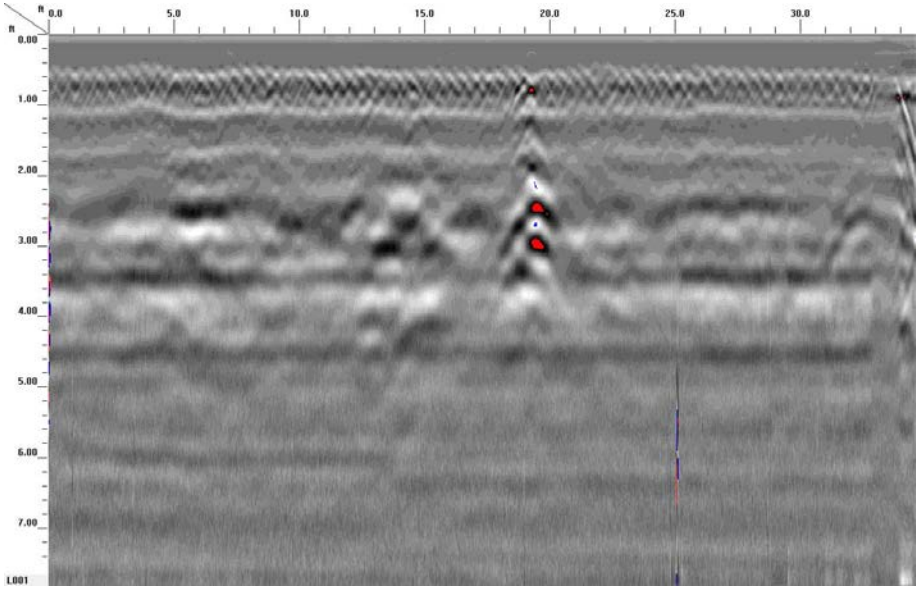

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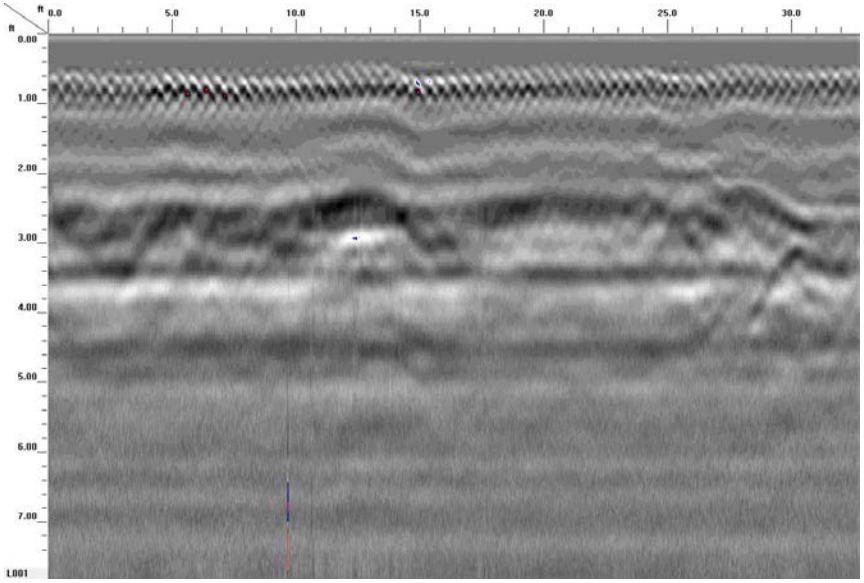
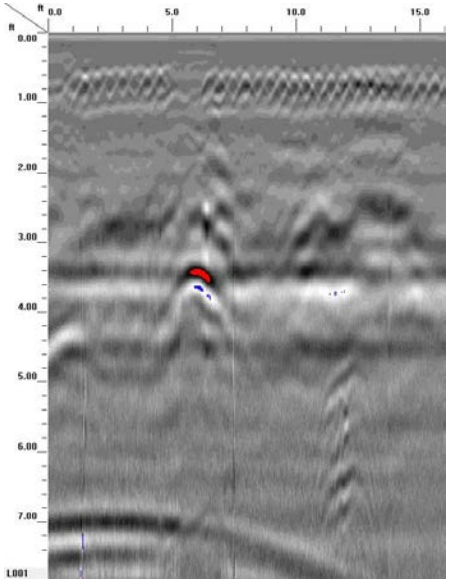
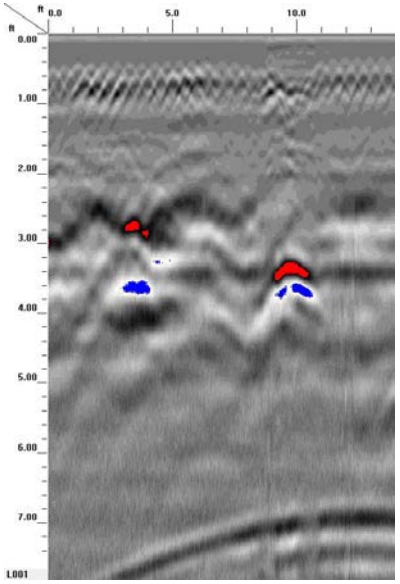


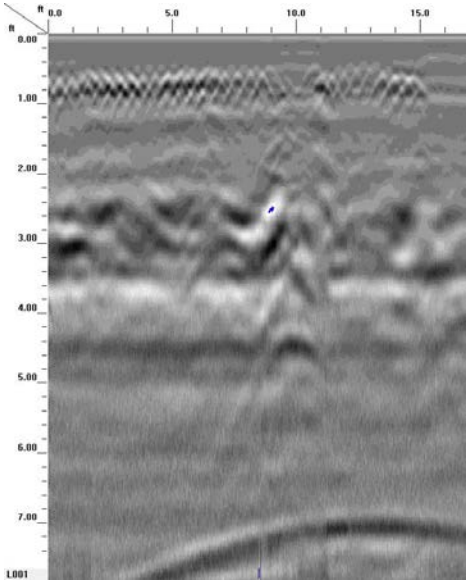
Transect 21



Transect 23



Transect 22



Transect 24

APPENDIX E

UVF HYDROCARBON ANALYSIS RESULTS AND PACE ANALYTICAL LABORATORY REPORT

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: NCDOT
Address: Parcel 54

Samples taken Monday, June 4, 2018
Samples extracted Monday, June 4, 2018
Samples analysed Monday, June 4, 2018

Contact: Craig Haden

Operator Thomas Fisher

Project: R-5020B Whiteville

F03640

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	P-54-SB-1 (1.5-2)	74.7	<1.9	<1.9	<1.9	<1.9	<0.37	<0.6	<0.075	0	0	0	Residual HC,(P)
s	P-54-SB-1 (4-5)	48.4	<1.2	113.6	89.7	203.3	35.6	1.6	<0.048	94.5	4.5	1	No Match found
s	P-54-SB-2 (1.5-2)	103.0	<2.6	261.5	677.9	939.4	72.2	2.8	<0.1	99.2	0.7	0.2	Deg.Gas 83.4%,(FCM)
s	P-54-SB-2 (4-5)	77.2	<1.9	241.2	224.6	465.8	15.7	<0.62	<0.077	99.9	0.1	0	No Match found
s	P-54-SB-1A (2.5-3)	136.0	<3.4	<3.4	<3.4	1.7	1.7	<1.1	<0.14	0	100	0	Residual HC,(P)

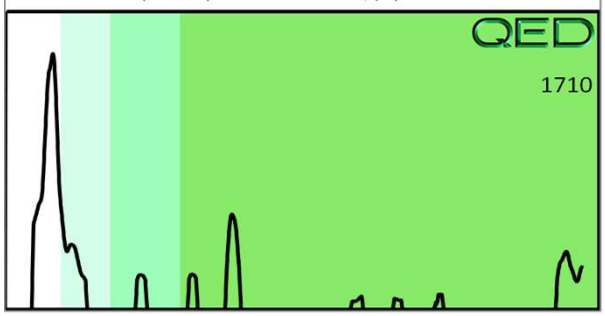
Initial Calibrator QC check OK Final FCM QC Check OK 91.2 %

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

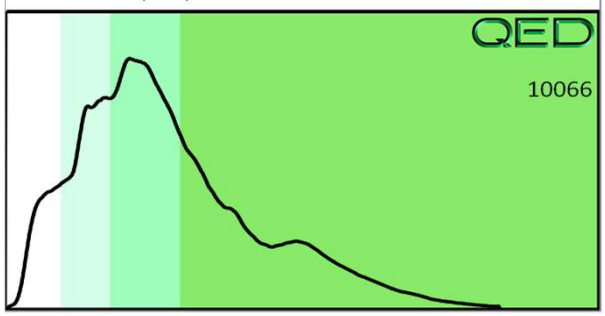
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

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

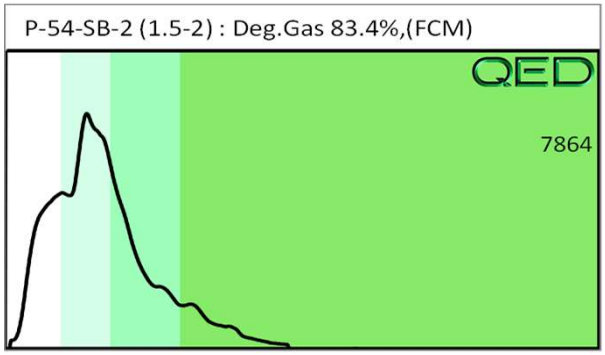
P-54-SB-1 (1.5-2) : Residual HC,(P)



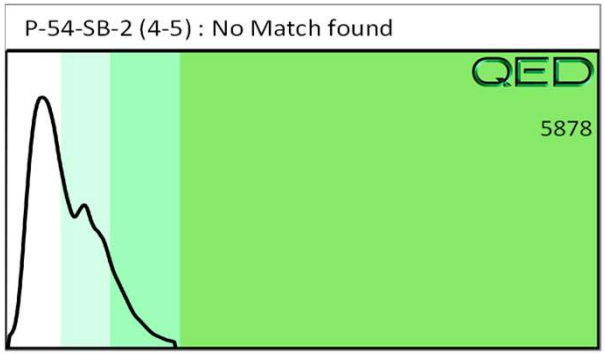
P-54-SB-1 (4-5) : No Match found



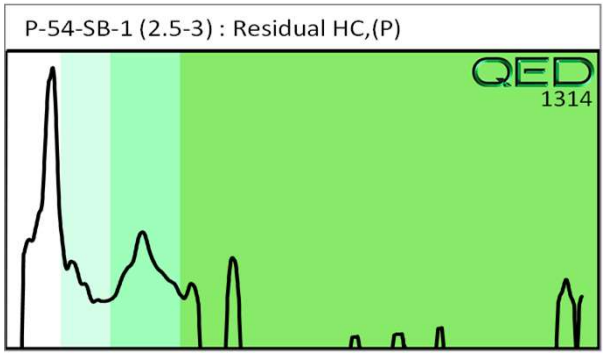
P-54-SB-2 (1.5-2) : Deg.Gas 83.4%,(FCM)



P-54-SB-2 (4-5) : No Match found



P-54-SB-1 (2.5-3) : Residual HC,(P)



QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS QROS

Hydrocarbon Analysis Results

Client: NCDOT
Address: Parcel 54

Samples taken Tuesday, June 5, 2018
Samples extracted Thursday, June 5, 2008
Samples analysed Tuesday, June 5, 2018

Contact: Craig Haden

Operator Thomas Fisher

Project: R-5020B Whiteville

F03640

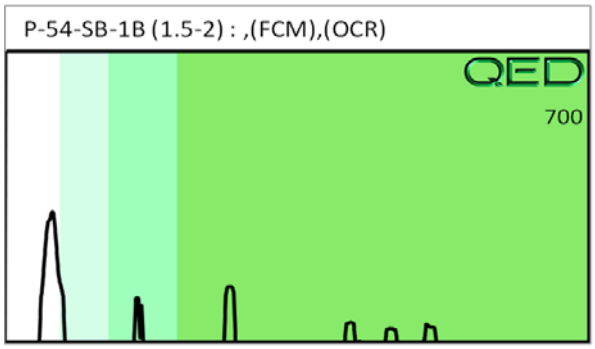
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	P-54-SB-1B (1.5-2)	70.6	<1.8	<1.8	<1.8	<1.8	<0.35	<0.56	<0.071	0	0	0	,(FCM),(OCR)
s	P-54-SB-1B (2.5-3)	25.0	<0.62	<0.62	0.62	0.62	0.64	<0.2	<0.025	0	71.3	28.7	Road Tar 57.3%,(FCM),(BO),(P)
s	P-54-SB-1C (1.5-2)	26.5	<0.66	<0.66	<0.66	<0.66	<0.13	<0.21	<0.027	0	0	100	PHC not detected,(P)
s	P-54-SB-1C (2-3)	26.8	<0.67	<0.67	<0.67	<0.67	<0.13	<0.21	<0.027	0	100	0	PHC not detected,(P)
s	P-54-SB-2A (1.5-2)	28.9	<0.72	<0.72	<0.72	0.48	0.48	<0.23	<0.029	0	72.4	27.6	Residual HC
s	P-54-SB-2A (2-3)	18.6	<0.46	<0.46	8.1	8.1	0.78	<0.15	<0.019	0	94.6	5.4	Deg.Hydr.Oil 66.1%,(FCM)
s	P-54-SB-2B (1-2)	25.7	<0.64	<0.64	<0.64	<0.64	<0.13	<0.21	<0.026	0	0	0	PHC not detected,(BO)
s	P-54-SB-2B (2-3)	24.3	<0.61	<0.61	0.61	0.61	0.3	<0.19	<0.024	0	81.5	18.5	Road Tar 74.1%,(FCM)
s	P-54-SB-2C (1-2)	24.1	<0.6	<0.6	0.6	0.6	0.49	<0.19	<0.024	0	0	100	Residual HC,(BO),(P)
s	P-54-SB-2C (2-3)	25.7	<0.64	<0.64	<0.64	<0.64	<0.13	<0.21	<0.026	0	91.5	8.5	Residual HC,(P)

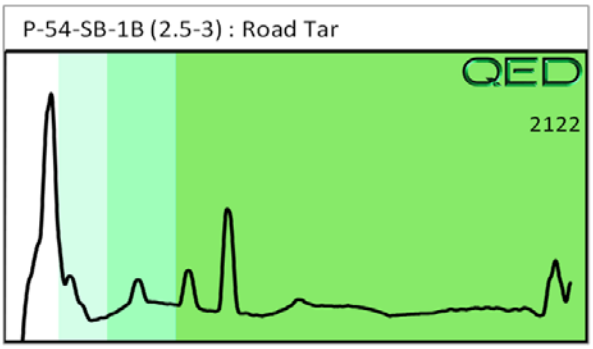
Initial Calibrator QC check OK Final FCM QC Check OK 92 %

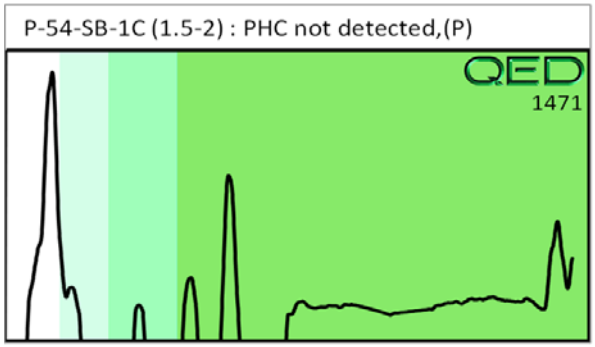
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

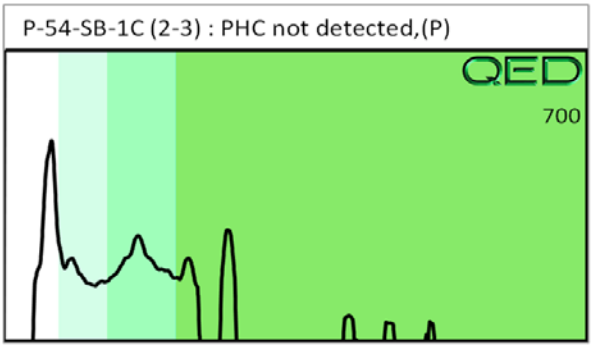
Fingerprints provide a tentative hydrocarbon identification. The abbreviations are:- FCM = Results calculated using Fundamental Calibration Mode : % = confidence for sample fingerprint match to library

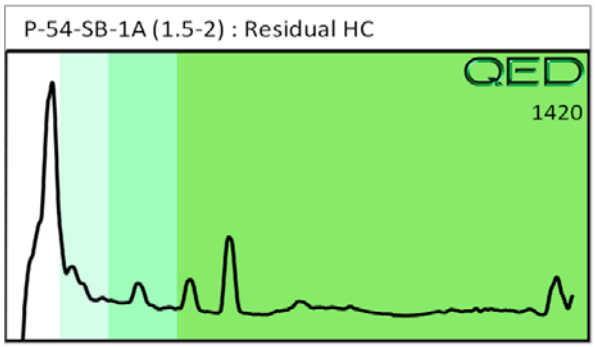
(SBS) or (LBS) = Site Specific or Library Background Subtraction applied to result : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate present

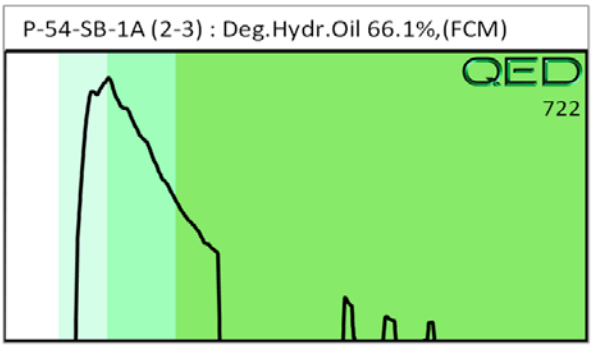

P-54-SB-1B (1.5-2) : ,(FCM),(OCR)
QED
700

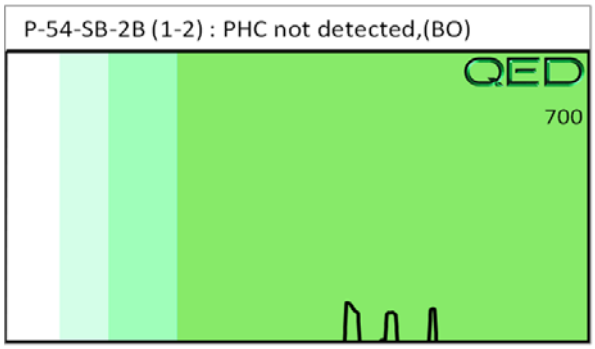

P-54-SB-1B (2.5-3) : Road Tar
QED
2122

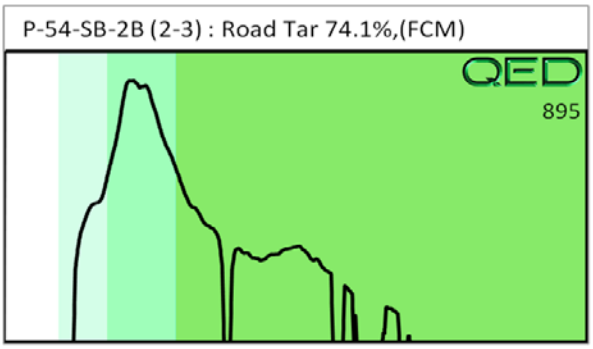

P-54-SB-1C (1.5-2) : PHC not detected,(P)
QED
1471

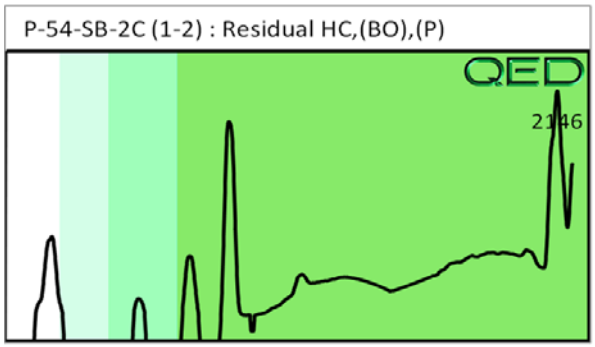

P-54-SB-1C (2-3) : PHC not detected,(P)
QED
700

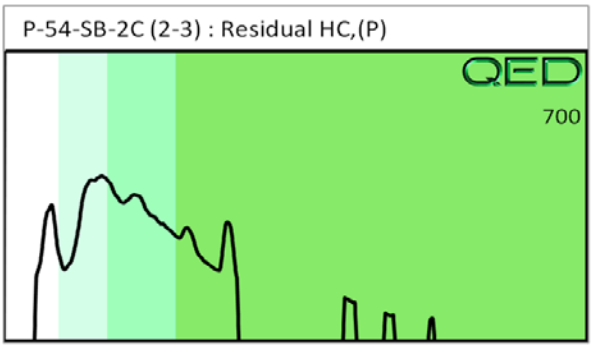

P-54-SB-1A (1.5-2) : Residual HC
QED
1420


P-54-SB-1A (2-3) : Deg.Hydr.Oil 66.1%,(FCM)
QED
722


P-54-SB-2B (1-2) : PHC not detected,(BO)
QED
700


P-54-SB-2B (2-3) : Road Tar 74.1%,(FCM)
QED
895


P-54-SB-2C (1-2) : Residual HC,(BO),(P)
QED
2146


P-54-SB-2C (2-3) : Residual HC,(P)
QED
700

QED REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS AQROS

Hydrocarbon Analysis Results

Client: NCDOT
Address: Parcel 54

Samples taken Tuesday, June 5, 2018
Samples extracted Tuesday, June 5, 2018
Samples analysed Tuesday, June 5, 2018

Contact: Craig Haden

Operator Thomas Fisher

Project: R-5020B Whiteville

F03640

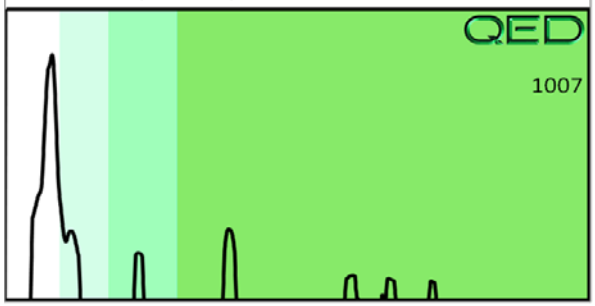
Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	Ratios			HC Fingerprint Match
										% light	% mid	% heavy	
s	P-54-SB-2 (14.5-15)	27.1	<0.68	<0.68	<0.68	<0.68	<0.14	<0.22	<0.027	0	0	0	PHC not detected
s	P-54-SB-3 (1-2)	26.3	<0.66	<0.66	4.1	4.1	2	<0.21	<0.026	0	82.6	17.4	Road Tar 93.1%,(FCM)
s	P-54-SB-3 (4-5)	26.5	<0.66	<0.66	<0.66	<0.66	<0.13	<0.21	<0.027	0	0	0	PHC not detected,(P)
s	P-54-SB-4 (1-2)	64.6	<1.6	<1.6	<1.6	<1.6	<0.32	<0.52	<0.065	0	0	0	,(FCM)
s	P-54-SB-4 (4-5)	64.6	<1.6	<1.6	<1.6	<1.6	<0.32	<0.52	<0.065	0	0	0	,(FCM)
s	P-54-SB-5 (1-2)	29.2	<0.73	<0.73	1.5	1.5	1.5	<0.23	<0.029	0	60	40	V.Deg.PHC 74.2%,(FCM),(BO)
s	P-54-SB-5 (4-5)	26.5	<0.66	<0.66	<0.66	<0.66	<0.13	<0.21	<0.027	0	0	0	PHC not detected,(P)

Initial Calibrator QC check OK Final FCM QC Check OK 95.2 %

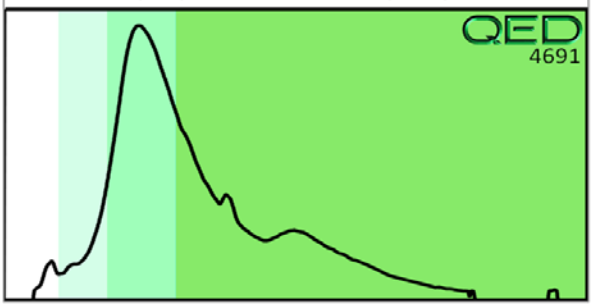
Results generated by a QED HC-1 analyser. Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values are not corrected for moisture or stone content

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

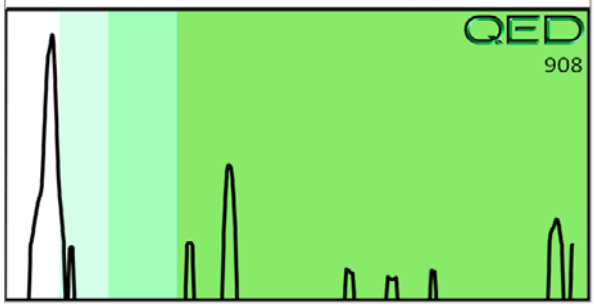
P-54-SB-2 (14.5-15) : PHC not detected



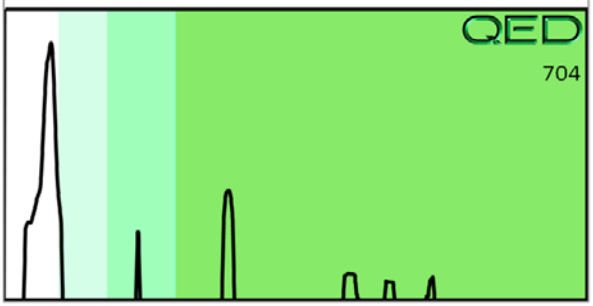
P-54-SB-3 (1-2) : Road Tar 93.1%,(FCM)



P-54-SB-3 (4-5) : PHC not detected,(P)

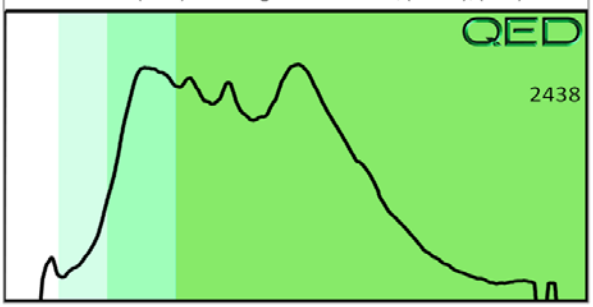


P-54-SB-4 (1-2) : ,(FCM)

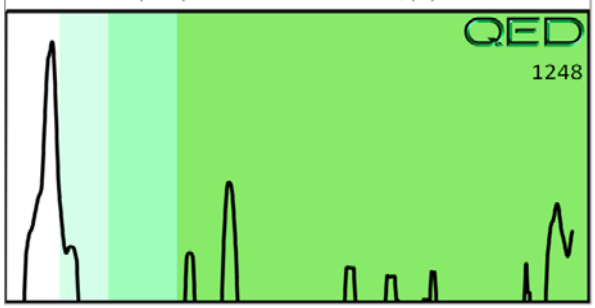


P-54-SB-4 (4-5) : ,(FCM)

P-54-SB-5 (1-2) : V.Deg.PHC 74.2%,(FCM),(BO)



P-54-SB-5 (4-5) : PHC not detected,(P)



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

June 21, 2018

Katie Lippard
APEX
136 Fairview Rd
Mooresville, NC 28117

RE: Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Dear Katie Lippard:
Enclosed are the analytical results for sample(s) received by the laboratory on June 08, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Trey Carter
trey.carter@pacelabs.com
(704)875-9092
Project Manager

Enclosures

cc: Tim Besier, Apex Companies
Chemical Testing Engineer, Materials and Tests Unit
Troy Holzschuh, Apex

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

CERTIFICATIONS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
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
Virginia/VELAP Certification #: 460221

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

SAMPLE SUMMARY

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92387844001	**P-6-SB-3**	Water	06/07/18 12:30	06/08/18 15:18
92387844002	**P-2-SB-4**	Water	06/07/18 16:15	06/08/18 15:18
92387844003	**P-54-SB-2**	Water	06/07/18 17:45	06/08/18 15:18

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

SAMPLE ANALYTE COUNT

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92387844001	**P-6-SB-3**	MADEP EPH	SEM	7	PASI-C
		MADEP VPH	CL	5	PASI-C
		EPA 8270	PKS	74	PASI-C
		EPA 8260	CAH	68	PASI-C
92387844002	**P-2-SB-4**	MADEP EPH	SEM	7	PASI-C
		MADEP VPH	CL	5	PASI-C
		EPA 8270	PKS	74	PASI-C
		EPA 8260	CAH	68	PASI-C
92387844003	**P-54-SB-2**	MADEP EPH	SEM	7	PASI-C
		MADEP VPH	CL	5	PASI-C
		EPA 8270	PKS	74	PASI-C
		EPA 8260	CAH	68	PASI-C

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

SUMMARY OF DETECTION

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92387844001	**P-6-SB-3**					
EPA 8270	Phenol	6.8J	ug/L	10.0	06/15/18 12:30	
EPA 8260	Acetone	21.8J	ug/L	25.0	06/15/18 02:22	
EPA 8260	Ethylbenzene	0.46J	ug/L	1.0	06/15/18 02:22	
EPA 8260	Naphthalene	0.42J	ug/L	1.0	06/15/18 02:22	
EPA 8260	Toluene	2.5	ug/L	1.0	06/15/18 02:22	
EPA 8260	1,2,4-Trimethylbenzene	0.82J	ug/L	1.0	06/15/18 02:22	
92387844002	**P-2-SB-4**					
MADEP EPH	Aliphatic (C09-C18)	63100000	ug/L	1000000	06/21/18 11:40	N2
MADEP EPH	Aromatic (C11-C22)	2940000	ug/L	20000	06/21/18 07:19	N2
MADEP VPH	Aliphatic (C05-C08)	37600	ug/L	6250	06/11/18 21:07	N2
MADEP VPH	Aliphatic (C09-C12)	62800	ug/L	6250	06/11/18 21:07	N2
MADEP VPH	Aromatic (C09-C10)	22200	ug/L	6250	06/11/18 21:07	N2
EPA 8270	1-Methylnaphthalene	120	ug/L	10.0	06/15/18 13:02	
EPA 8270	2-Methylnaphthalene	276	ug/L	50.0	06/15/18 14:11	
EPA 8270	Naphthalene	671	ug/L	50.0	06/15/18 14:11	
EPA 8260	Benzene	2510	ug/L	100	06/15/18 15:33	
EPA 8260	2-Butanone (MEK)	829	ug/L	500	06/15/18 15:33	
EPA 8260	Chloroethane	111	ug/L	100	06/15/18 15:33	
EPA 8260	Ethylbenzene	5400	ug/L	100	06/15/18 15:33	
EPA 8260	Isopropylbenzene (Cumene)	686	ug/L	100	06/15/18 15:33	
EPA 8260	4-Methyl-2-pentanone (MIBK)	97.4J	ug/L	500	06/15/18 15:33	
EPA 8260	Naphthalene	2320	ug/L	100	06/15/18 15:33	
EPA 8260	n-Propylbenzene	1870	ug/L	100	06/15/18 15:33	
EPA 8260	Toluene	13500	ug/L	100	06/15/18 15:33	
EPA 8260	1,2,4-Trimethylbenzene	12800	ug/L	100	06/15/18 15:33	
EPA 8260	1,3,5-Trimethylbenzene	4230	ug/L	100	06/15/18 15:33	
EPA 8260	Xylene (Total)	31600	ug/L	100	06/15/18 15:33	
92387844003	**P-54-SB-2**					
MADEP EPH	Aromatic (C11-C22)	361	ug/L	100	06/20/18 18:29	N2
MADEP VPH	Aliphatic (C05-C08)	1500	ug/L	250	06/11/18 18:45	N2
MADEP VPH	Aliphatic (C09-C12)	6830	ug/L	250	06/11/18 18:45	N2
MADEP VPH	Aromatic (C09-C10)	2290	ug/L	250	06/11/18 18:45	N2
EPA 8270	2,4-Dimethylphenol	7.4J	ug/L	8.3	06/15/18 13:34	
EPA 8270	1-Methylnaphthalene	11.5	ug/L	8.3	06/15/18 13:34	
EPA 8270	2-Methylnaphthalene	21.9	ug/L	8.3	06/15/18 13:34	
EPA 8270	Naphthalene	76.4	ug/L	8.3	06/15/18 13:34	
EPA 8260	Benzene	1.7J	ug/L	4.0	06/18/18 19:15	
EPA 8260	n-Butylbenzene	23.0	ug/L	4.0	06/18/18 19:15	
EPA 8260	sec-Butylbenzene	9.5	ug/L	4.0	06/18/18 19:15	
EPA 8260	Ethylbenzene	303	ug/L	4.0	06/18/18 19:15	
EPA 8260	Isopropylbenzene (Cumene)	30.1	ug/L	4.0	06/18/18 19:15	
EPA 8260	Methyl-tert-butyl ether	5.7	ug/L	4.0	06/18/18 19:15	
EPA 8260	Naphthalene	113	ug/L	4.0	06/18/18 19:15	
EPA 8260	n-Propylbenzene	95.9	ug/L	4.0	06/18/18 19:15	
EPA 8260	Toluene	122	ug/L	4.0	06/18/18 19:15	
EPA 8260	1,2,4-Trimethylbenzene	511	ug/L	4.0	06/18/18 19:15	

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SUMMARY OF DETECTION

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92387844003	**P-54-SB-2**					
EPA 8260	1,3,5-Trimethylbenzene	161	ug/L	4.0	06/18/18 19:15	
EPA 8260	Xylene (Total)	1460	ug/L	4.0	06/18/18 19:15	

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-6-SB-3 **Lab ID: 92387844001** Collected: 06/07/18 12:30 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
MADEP EPH NC Water	Analytical Method: MADEP EPH Preparation Method: MADEP EPH								
Aliphatic (C09-C18)	ND	ug/L	114	114	1	06/18/18 20:54	06/19/18 15:09		N2
Aliphatic (C19-C36)	ND	ug/L	114	114	1	06/18/18 20:54	06/19/18 15:09		N2
Aromatic (C11-C22)	ND	ug/L	114	114	1	06/18/18 20:54	06/19/18 15:09		N2
Surrogates									
Nonatriacontane (S)	91	%	40-140		1	06/18/18 20:54	06/19/18 15:09	7194-86-7	
o-Terphenyl (S)	77	%	40-140		1	06/18/18 20:54	06/19/18 15:09	84-15-1	
2-Fluorobiphenyl (S)	91	%	40-140		1	06/18/18 20:54	06/19/18 15:09	321-60-8	
2-Bromonaphthalene (S)	98	%	40-140		1	06/18/18 20:54	06/19/18 15:09	580-13-2	
VPH NC Water	Analytical Method: MADEP VPH								
Aliphatic (C05-C08)	ND	ug/L	50.0	50.0	1		06/11/18 16:21		N2
Aliphatic (C09-C12)	ND	ug/L	50.0	50.0	1		06/11/18 16:21		N2
Aromatic (C09-C10)	ND	ug/L	50.0	50.0	1		06/11/18 16:21		N2
Surrogates									
4-Bromofluorobenzene (FID) (S)	88	%	70-130		1		06/11/18 16:21	460-00-4	
4-Bromofluorobenzene (PID) (S)	86	%	70-130		1		06/11/18 16:21	460-00-4	
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Acenaphthene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 12:30	83-32-9	
Acenaphthylene	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 12:30	208-96-8	
Aniline	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 12:30	62-53-3	L2
Anthracene	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 12:30	120-12-7	
Benzo(a)anthracene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 12:30	56-55-3	
Benzo(a)pyrene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 12:30	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	10.0	1.5	1	06/14/18 20:46	06/15/18 12:30	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	10.0	1.8	1	06/14/18 20:46	06/15/18 12:30	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	10.0	1.8	1	06/14/18 20:46	06/15/18 12:30	207-08-9	
Benzoic Acid	ND	ug/L	50.0	17.3	1	06/14/18 20:46	06/15/18 12:30	65-85-0	
Benzyl alcohol	ND	ug/L	20.0	7.0	1	06/14/18 20:46	06/15/18 12:30	100-51-6	
4-Bromophenylphenyl ether	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 12:30	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 12:30	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	20.0	4.6	1	06/14/18 20:46	06/15/18 12:30	59-50-7	
4-Chloroaniline	ND	ug/L	20.0	6.8	1	06/14/18 20:46	06/15/18 12:30	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 12:30	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 12:30	111-44-4	
2-Chloronaphthalene	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 12:30	91-58-7	
2-Chlorophenol	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 12:30	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 12:30	7005-72-3	
Chrysene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 12:30	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	10.0	1.9	1	06/14/18 20:46	06/15/18 12:30	53-70-3	
Dibenzofuran	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 12:30	132-64-9	
1,2-Dichlorobenzene	ND	ug/L	10.0	3.2	1	06/14/18 20:46	06/15/18 12:30	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	3.2	1	06/14/18 20:46	06/15/18 12:30	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 12:30	106-46-7	B
3,3'-Dichlorobenzidine	ND	ug/L	20.0	2.8	1	06/14/18 20:46	06/15/18 12:30	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 12:30	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-6-SB-3 **Lab ID: 92387844001** Collected: 06/07/18 12:30 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Diethylphthalate	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 12:30	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.0	1.9	1	06/14/18 20:46	06/15/18 12:30	105-67-9	
Dimethylphthalate	ND	ug/L	10.0	2.3	1	06/14/18 20:46	06/15/18 12:30	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 12:30	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	20.0	4.4	1	06/14/18 20:46	06/15/18 12:30	534-52-1	
2,4-Dinitrophenol	ND	ug/L	50.0	10.1	1	06/14/18 20:46	06/15/18 12:30	51-28-5	
2,4-Dinitrotoluene	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 12:30	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 12:30	606-20-2	
Di-n-octylphthalate	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 12:30	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	6.0	1.4	1	06/14/18 20:46	06/15/18 12:30	117-81-7	
Fluoranthene	ND	ug/L	10.0	1.7	1	06/14/18 20:46	06/15/18 12:30	206-44-0	
Fluorene	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 12:30	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 12:30	87-68-3	
Hexachlorobenzene	ND	ug/L	10.0	2.5	1	06/14/18 20:46	06/15/18 12:30	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 12:30	77-47-4	
Hexachloroethane	ND	ug/L	10.0	4.0	1	06/14/18 20:46	06/15/18 12:30	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.0	1.7	1	06/14/18 20:46	06/15/18 12:30	193-39-5	
Isophorone	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 12:30	78-59-1	
1-Methylnaphthalene	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 12:30	90-12-0	
2-Methylnaphthalene	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 12:30	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.0	3.6	1	06/14/18 20:46	06/15/18 12:30	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 12:30	15831-10-4	
Naphthalene	ND	ug/L	10.0	3.2	1	06/14/18 20:46	06/15/18 12:30	91-20-3	
2-Nitroaniline	ND	ug/L	50.0	5.5	1	06/14/18 20:46	06/15/18 12:30	88-74-4	
3-Nitroaniline	ND	ug/L	50.0	5.0	1	06/14/18 20:46	06/15/18 12:30	99-09-2	
4-Nitroaniline	ND	ug/L	20.0	3.6	1	06/14/18 20:46	06/15/18 12:30	100-01-6	
Nitrobenzene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 12:30	98-95-3	
2-Nitrophenol	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 12:30	88-75-5	
4-Nitrophenol	ND	ug/L	50.0	7.8	1	06/14/18 20:46	06/15/18 12:30	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 12:30	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 12:30	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 12:30	86-30-6	
2,2'-Oxybis(1-chloropropane)	ND	ug/L	10.0	2.5	1	06/14/18 20:46	06/15/18 12:30	108-60-1	
Pentachlorophenol	ND	ug/L	25.0	3.1	1	06/14/18 20:46	06/15/18 12:30	87-86-5	
Phenanthrene	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 12:30	85-01-8	
Phenol	**6.8J**	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 12:30	108-95-2	
Pyrene	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 12:30	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 12:30	120-82-1	
2,4,5-Trichlorophenol	ND	ug/L	10.0	2.3	1	06/14/18 20:46	06/15/18 12:30	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 12:30	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	78	%	40-121		1	06/14/18 20:46	06/15/18 12:30	4165-60-0	
2-Fluorobiphenyl (S)	82	%	45-139		1	06/14/18 20:46	06/15/18 12:30	321-60-8	
Terphenyl-d14 (S)	55	%	48-146		1	06/14/18 20:46	06/15/18 12:30	1718-51-0	
Phenol-d6 (S)	51	%	18-105		1	06/14/18 20:46	06/15/18 12:30	13127-88-3	
2-Fluorophenol (S)	49	%	13-118		1	06/14/18 20:46	06/15/18 12:30	367-12-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-6-SB-3 **Lab ID: 92387844001** Collected: 06/07/18 12:30 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Surrogates									
2,4,6-Tribromophenol (S)	79	%	31-170		1	06/14/18 20:46	06/15/18 12:30	118-79-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	**21.8J**	ug/L	25.0	10.0	1		06/15/18 02:22	67-64-1	
Benzene	ND	ug/L	1.0	0.25	1		06/15/18 02:22	71-43-2	
Bromobenzene	ND	ug/L	1.0	0.30	1		06/15/18 02:22	108-86-1	
Bromochloromethane	ND	ug/L	1.0	0.17	1		06/15/18 02:22	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	0.18	1		06/15/18 02:22	75-27-4	
Bromoform	ND	ug/L	1.0	0.26	1		06/15/18 02:22	75-25-2	
Bromomethane	ND	ug/L	2.0	0.29	1		06/15/18 02:22	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	0.96	1		06/15/18 02:22	78-93-3	
n-Butylbenzene	ND	ug/L	1.0	0.41	1		06/15/18 02:22	104-51-8	
sec-Butylbenzene	ND	ug/L	1.0	0.38	1		06/15/18 02:22	135-98-8	
tert-Butylbenzene	ND	ug/L	1.0	0.40	1		06/15/18 02:22	98-06-6	L2
Carbon tetrachloride	ND	ug/L	1.0	0.25	1		06/15/18 02:22	56-23-5	
Chlorobenzene	ND	ug/L	1.0	0.23	1		06/15/18 02:22	108-90-7	
Chloroethane	ND	ug/L	1.0	0.54	1		06/15/18 02:22	75-00-3	
Chloroform	ND	ug/L	1.0	0.14	1		06/15/18 02:22	67-66-3	
Chloromethane	ND	ug/L	1.0	0.11	1		06/15/18 02:22	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	0.35	1		06/15/18 02:22	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	0.31	1		06/15/18 02:22	106-43-4	
Dibromochloromethane	ND	ug/L	1.0	0.21	1		06/15/18 02:22	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	0.27	1		06/15/18 02:22	106-93-4	
Dibromomethane	ND	ug/L	1.0	0.21	1		06/15/18 02:22	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	0.30	1		06/15/18 02:22	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	0.24	1		06/15/18 02:22	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	0.33	1		06/15/18 02:22	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	0.21	1		06/15/18 02:22	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	0.32	1		06/15/18 02:22	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	0.24	1		06/15/18 02:22	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	0.56	1		06/15/18 02:22	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	0.19	1		06/15/18 02:22	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	0.49	1		06/15/18 02:22	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	0.27	1		06/15/18 02:22	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	0.28	1		06/15/18 02:22	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	0.13	1		06/15/18 02:22	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	0.49	1		06/15/18 02:22	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	0.13	1		06/15/18 02:22	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	0.26	1		06/15/18 02:22	10061-02-6	
Diisopropyl ether	ND	ug/L	1.0	0.12	1		06/15/18 02:22	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	150	78.4	1		06/15/18 02:22	123-91-1	
Ethylbenzene	**0.46J**	ug/L	1.0	0.30	1		06/15/18 02:22	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	1.0	0.71	1		06/15/18 02:22	87-68-3	
2-Hexanone	ND	ug/L	5.0	0.46	1		06/15/18 02:22	591-78-6	
Isopropylbenzene (Cumene)	ND	ug/L	1.0	0.40	1		06/15/18 02:22	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-6-SB-3 **Lab ID: 92387844001** Collected: 06/07/18 12:30 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
p-Isopropyltoluene	ND	ug/L	1.0	0.31	1		06/15/18 02:22	99-87-6	
Methylene Chloride	ND	ug/L	2.0	0.97	1		06/15/18 02:22	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	0.33	1		06/15/18 02:22	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	1.0	0.21	1		06/15/18 02:22	1634-04-4	
Naphthalene	**0.42J**	ug/L	1.0	0.24	1		06/15/18 02:22	91-20-3	
n-Propylbenzene	ND	ug/L	1.0	0.42	1		06/15/18 02:22	103-65-1	
Styrene	ND	ug/L	1.0	0.26	1		06/15/18 02:22	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	0.33	1		06/15/18 02:22	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	0.40	1		06/15/18 02:22	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	0.46	1		06/15/18 02:22	127-18-4	
Toluene	**2.5**	ug/L	1.0	0.26	1		06/15/18 02:22	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	0.33	1		06/15/18 02:22	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	0.35	1		06/15/18 02:22	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	0.48	1		06/15/18 02:22	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	0.29	1		06/15/18 02:22	79-00-5	
Trichloroethene	ND	ug/L	1.0	0.47	1		06/15/18 02:22	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	0.20	1		06/15/18 02:22	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	0.41	1		06/15/18 02:22	96-18-4	
1,2,4-Trimethylbenzene	**0.82J**	ug/L	1.0	0.31	1		06/15/18 02:22	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/L	1.0	0.36	1		06/15/18 02:22	108-67-8	
Vinyl acetate	ND	ug/L	2.0	0.35	1		06/15/18 02:22	108-05-4	
Vinyl chloride	ND	ug/L	1.0	0.62	1		06/15/18 02:22	75-01-4	
Xylene (Total)	ND	ug/L	1.0	1.0	1		06/15/18 02:22	1330-20-7	
Surrogates									
4-Bromofluorobenzene (S)	99	%	70-130		1		06/15/18 02:22	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	70-130		1		06/15/18 02:22	17060-07-0	
Toluene-d8 (S)	103	%	70-130		1		06/15/18 02:22	2037-26-5	

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-2-SB-4 **Lab ID: 92387844002** Collected: 06/07/18 16:15 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
MADEP EPH NC Water	Analytical Method: MADEP EPH Preparation Method: MADEP EPH								
Aliphatic (C09-C18)	**63100000**	ug/L	1000000	1000000	1000	06/18/18 20:54	06/21/18 11:40		N2
Aliphatic (C19-C36)	ND	ug/L	1000000	1000000	1000	06/18/18 20:54	06/21/18 11:40		N2
Aromatic (C11-C22)	**2940000**	ug/L	20000	20000	20	06/18/18 20:54	06/21/18 07:19		N2
Surrogates									
Nonatriacontane (S)	67900	%	40-140		1000	06/18/18 20:54	06/21/18 11:40	7194-86-7	S4
o-Terphenyl (S)	406	%	40-140		20	06/18/18 20:54	06/21/18 07:19	84-15-1	S4
2-Fluorobiphenyl (S)	952	%	40-140		20	06/18/18 20:54	06/21/18 07:19	321-60-8	S4
2-Bromonaphthalene (S)	2670	%	40-140		20	06/18/18 20:54	06/21/18 07:19	580-13-2	S4
VPH NC Water	Analytical Method: MADEP VPH								
Aliphatic (C05-C08)	**37600**	ug/L	6250	6250	125		06/11/18 21:07		N2
Aliphatic (C09-C12)	**62800**	ug/L	6250	6250	125		06/11/18 21:07		N2
Aromatic (C09-C10)	**22200**	ug/L	6250	6250	125		06/11/18 21:07		N2
Surrogates									
4-Bromofluorobenzene (FID) (S)	89	%	70-130		125		06/11/18 21:07	460-00-4	
4-Bromofluorobenzene (PID) (S)	89	%	70-130		125		06/11/18 21:07	460-00-4	
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Acenaphthene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 13:02	83-32-9	
Acenaphthylene	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 13:02	208-96-8	
Aniline	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 13:02	62-53-3	L2
Anthracene	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 13:02	120-12-7	
Benzo(a)anthracene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 13:02	56-55-3	
Benzo(a)pyrene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 13:02	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	10.0	1.5	1	06/14/18 20:46	06/15/18 13:02	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	10.0	1.8	1	06/14/18 20:46	06/15/18 13:02	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	10.0	1.8	1	06/14/18 20:46	06/15/18 13:02	207-08-9	
Benzoic Acid	ND	ug/L	50.0	17.3	1	06/14/18 20:46	06/15/18 13:02	65-85-0	
Benzyl alcohol	ND	ug/L	20.0	7.0	1	06/14/18 20:46	06/15/18 13:02	100-51-6	
4-Bromophenylphenyl ether	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 13:02	101-55-3	
Butylbenzylphthalate	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 13:02	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	20.0	4.6	1	06/14/18 20:46	06/15/18 13:02	59-50-7	
4-Chloroaniline	ND	ug/L	20.0	6.8	1	06/14/18 20:46	06/15/18 13:02	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 13:02	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 13:02	111-44-4	
2-Chloronaphthalene	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 13:02	91-58-7	
2-Chlorophenol	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 13:02	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 13:02	7005-72-3	
Chrysene	ND	ug/L	10.0	1.3	1	06/14/18 20:46	06/15/18 13:02	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	10.0	1.9	1	06/14/18 20:46	06/15/18 13:02	53-70-3	
Dibenzofuran	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 13:02	132-64-9	
1,2-Dichlorobenzene	ND	ug/L	10.0	3.2	1	06/14/18 20:46	06/15/18 13:02	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	10.0	3.2	1	06/14/18 20:46	06/15/18 13:02	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 13:02	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/L	20.0	2.8	1	06/14/18 20:46	06/15/18 13:02	91-94-1	
2,4-Dichlorophenol	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 13:02	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-2-SB-4 **Lab ID: 92387844002** Collected: 06/07/18 16:15 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Diethylphthalate	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 13:02	84-66-2	
2,4-Dimethylphenol	ND	ug/L	10.0	1.9	1	06/14/18 20:46	06/15/18 13:02	105-67-9	
Dimethylphthalate	ND	ug/L	10.0	2.3	1	06/14/18 20:46	06/15/18 13:02	131-11-3	
Di-n-butylphthalate	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 13:02	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	20.0	4.4	1	06/14/18 20:46	06/15/18 13:02	534-52-1	
2,4-Dinitrophenol	ND	ug/L	50.0	10.1	1	06/14/18 20:46	06/15/18 13:02	51-28-5	
2,4-Dinitrotoluene	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 13:02	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	10.0	2.9	1	06/14/18 20:46	06/15/18 13:02	606-20-2	
Di-n-octylphthalate	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 13:02	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	6.0	1.4	1	06/14/18 20:46	06/15/18 13:02	117-81-7	
Fluoranthene	ND	ug/L	10.0	1.7	1	06/14/18 20:46	06/15/18 13:02	206-44-0	
Fluorene	ND	ug/L	10.0	3.0	1	06/14/18 20:46	06/15/18 13:02	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	3.1	1	06/14/18 20:46	06/15/18 13:02	87-68-3	
Hexachlorobenzene	ND	ug/L	10.0	2.5	1	06/14/18 20:46	06/15/18 13:02	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 13:02	77-47-4	
Hexachloroethane	ND	ug/L	10.0	4.0	1	06/14/18 20:46	06/15/18 13:02	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.0	1.7	1	06/14/18 20:46	06/15/18 13:02	193-39-5	
Isophorone	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 13:02	78-59-1	
1-Methylnaphthalene	**120**	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 13:02	90-12-0	
2-Methylnaphthalene	**276**	ug/L	50.0	14.2	5	06/14/18 20:46	06/15/18 14:11	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	10.0	3.6	1	06/14/18 20:46	06/15/18 13:02	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 13:02	15831-10-4	
Naphthalene	**671**	ug/L	50.0	16.2	5	06/14/18 20:46	06/15/18 14:11	91-20-3	
2-Nitroaniline	ND	ug/L	50.0	5.5	1	06/14/18 20:46	06/15/18 13:02	88-74-4	
3-Nitroaniline	ND	ug/L	50.0	5.0	1	06/14/18 20:46	06/15/18 13:02	99-09-2	
4-Nitroaniline	ND	ug/L	20.0	3.6	1	06/14/18 20:46	06/15/18 13:02	100-01-6	
Nitrobenzene	ND	ug/L	10.0	3.4	1	06/14/18 20:46	06/15/18 13:02	98-95-3	
2-Nitrophenol	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 13:02	88-75-5	
4-Nitrophenol	ND	ug/L	50.0	7.8	1	06/14/18 20:46	06/15/18 13:02	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 13:02	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 13:02	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	10.0	2.0	1	06/14/18 20:46	06/15/18 13:02	86-30-6	
2,2'-Oxybis(1-chloropropane)	ND	ug/L	10.0	2.5	1	06/14/18 20:46	06/15/18 13:02	108-60-1	
Pentachlorophenol	ND	ug/L	25.0	3.1	1	06/14/18 20:46	06/15/18 13:02	87-86-5	
Phenanthrene	ND	ug/L	10.0	2.4	1	06/14/18 20:46	06/15/18 13:02	85-01-8	
Phenol	ND	ug/L	10.0	2.7	1	06/14/18 20:46	06/15/18 13:02	108-95-2	
Pyrene	ND	ug/L	10.0	1.2	1	06/14/18 20:46	06/15/18 13:02	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	10.0	2.6	1	06/14/18 20:46	06/15/18 13:02	120-82-1	
2,4,5-Trichlorophenol	ND	ug/L	10.0	2.3	1	06/14/18 20:46	06/15/18 13:02	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	10.0	2.8	1	06/14/18 20:46	06/15/18 13:02	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	72	%	40-121		1	06/14/18 20:46	06/15/18 13:02	4165-60-0	
2-Fluorobiphenyl (S)	79	%	45-139		1	06/14/18 20:46	06/15/18 13:02	321-60-8	
Terphenyl-d14 (S)	55	%	48-146		1	06/14/18 20:46	06/15/18 13:02	1718-51-0	
Phenol-d6 (S)	61	%	18-105		1	06/14/18 20:46	06/15/18 13:02	13127-88-3	
2-Fluorophenol (S)	66	%	13-118		1	06/14/18 20:46	06/15/18 13:02	367-12-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-2-SB-4 **Lab ID: 92387844002** Collected: 06/07/18 16:15 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Surrogates									
2,4,6-Tribromophenol (S)	99	%	31-170		1	06/14/18 20:46	06/15/18 13:02	118-79-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	2500	1000	100		06/15/18 15:33	67-64-1	
Benzene	**2510**	ug/L	100	25.0	100		06/15/18 15:33	71-43-2	
Bromobenzene	ND	ug/L	100	30.0	100		06/15/18 15:33	108-86-1	
Bromochloromethane	ND	ug/L	100	17.0	100		06/15/18 15:33	74-97-5	
Bromodichloromethane	ND	ug/L	100	18.0	100		06/15/18 15:33	75-27-4	
Bromoform	ND	ug/L	100	26.0	100		06/15/18 15:33	75-25-2	
Bromomethane	ND	ug/L	200	29.0	100		06/15/18 15:33	74-83-9	
2-Butanone (MEK)	**829**	ug/L	500	96.0	100		06/15/18 15:33	78-93-3	
n-Butylbenzene	ND	ug/L	100	41.0	100		06/15/18 15:33	104-51-8	
sec-Butylbenzene	ND	ug/L	100	38.0	100		06/15/18 15:33	135-98-8	
tert-Butylbenzene	ND	ug/L	100	40.0	100		06/15/18 15:33	98-06-6	
Carbon tetrachloride	ND	ug/L	100	25.0	100		06/15/18 15:33	56-23-5	
Chlorobenzene	ND	ug/L	100	23.0	100		06/15/18 15:33	108-90-7	
Chloroethane	**111**	ug/L	100	54.0	100		06/15/18 15:33	75-00-3	
Chloroform	ND	ug/L	100	14.0	100		06/15/18 15:33	67-66-3	
Chloromethane	ND	ug/L	100	11.0	100		06/15/18 15:33	74-87-3	
2-Chlorotoluene	ND	ug/L	100	35.0	100		06/15/18 15:33	95-49-8	
4-Chlorotoluene	ND	ug/L	100	31.0	100		06/15/18 15:33	106-43-4	
Dibromochloromethane	ND	ug/L	100	21.0	100		06/15/18 15:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	100	27.0	100		06/15/18 15:33	106-93-4	
Dibromomethane	ND	ug/L	100	21.0	100		06/15/18 15:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	100	30.0	100		06/15/18 15:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	100	24.0	100		06/15/18 15:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	100	33.0	100		06/15/18 15:33	106-46-7	
Dichlorodifluoromethane	ND	ug/L	100	21.0	100		06/15/18 15:33	75-71-8	
1,1-Dichloroethane	ND	ug/L	100	32.0	100		06/15/18 15:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	100	24.0	100		06/15/18 15:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	100	56.0	100		06/15/18 15:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	100	19.0	100		06/15/18 15:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	100	49.0	100		06/15/18 15:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	100	27.0	100		06/15/18 15:33	78-87-5	
1,3-Dichloropropane	ND	ug/L	100	28.0	100		06/15/18 15:33	142-28-9	
2,2-Dichloropropane	ND	ug/L	100	13.0	100		06/15/18 15:33	594-20-7	
1,1-Dichloropropene	ND	ug/L	100	49.0	100		06/15/18 15:33	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	100	13.0	100		06/15/18 15:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	100	26.0	100		06/15/18 15:33	10061-02-6	
Diisopropyl ether	ND	ug/L	100	12.0	100		06/15/18 15:33	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	15000	7840	100		06/15/18 15:33	123-91-1	
Ethylbenzene	**5400**	ug/L	100	30.0	100		06/15/18 15:33	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	100	71.0	100		06/15/18 15:33	87-68-3	
2-Hexanone	ND	ug/L	500	46.0	100		06/15/18 15:33	591-78-6	
Isopropylbenzene (Cumene)	**686**	ug/L	100	40.0	100		06/15/18 15:33	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-2-SB-4 **Lab ID: 92387844002** Collected: 06/07/18 16:15 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
p-Isopropyltoluene	ND	ug/L	100	31.0	100		06/15/18 15:33	99-87-6	
Methylene Chloride	ND	ug/L	200	97.0	100		06/15/18 15:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	**97.4J**	ug/L	500	33.0	100		06/15/18 15:33	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	100	21.0	100		06/15/18 15:33	1634-04-4	
Naphthalene	**2320**	ug/L	100	24.0	100		06/15/18 15:33	91-20-3	
n-Propylbenzene	**1870**	ug/L	100	42.0	100		06/15/18 15:33	103-65-1	
Styrene	ND	ug/L	100	26.0	100		06/15/18 15:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	100	33.0	100		06/15/18 15:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	100	40.0	100		06/15/18 15:33	79-34-5	
Tetrachloroethene	ND	ug/L	100	46.0	100		06/15/18 15:33	127-18-4	
Toluene	**13500**	ug/L	100	26.0	100		06/15/18 15:33	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	100	33.0	100		06/15/18 15:33	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	100	35.0	100		06/15/18 15:33	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	100	48.0	100		06/15/18 15:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	100	29.0	100		06/15/18 15:33	79-00-5	
Trichloroethene	ND	ug/L	100	47.0	100		06/15/18 15:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	100	20.0	100		06/15/18 15:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	100	41.0	100		06/15/18 15:33	96-18-4	
1,2,4-Trimethylbenzene	**12800**	ug/L	100	31.0	100		06/15/18 15:33	95-63-6	
1,3,5-Trimethylbenzene	**4230**	ug/L	100	36.0	100		06/15/18 15:33	108-67-8	
Vinyl acetate	ND	ug/L	200	35.0	100		06/15/18 15:33	108-05-4	
Vinyl chloride	ND	ug/L	100	62.0	100		06/15/18 15:33	75-01-4	
Xylene (Total)	**31600**	ug/L	100	100	100		06/15/18 15:33	1330-20-7	
Surrogates									
4-Bromofluorobenzene (S)	101	%	70-130		100		06/15/18 15:33	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	70-130		100		06/15/18 15:33	17060-07-0	
Toluene-d8 (S)	100	%	70-130		100		06/15/18 15:33	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-54-SB-2 **Lab ID: 92387844003** Collected: 06/07/18 17:45 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
MADEP EPH NC Water	Analytical Method: MADEP EPH Preparation Method: MADEP EPH								
Aliphatic (C09-C18)	ND	ug/L	100	100	1	06/18/18 20:54	06/20/18 18:29		N2
Aliphatic (C19-C36)	ND	ug/L	100	100	1	06/18/18 20:54	06/20/18 18:29		N2
Aromatic (C11-C22)	**361**	ug/L	100	100	1	06/18/18 20:54	06/20/18 18:29		N2
Surrogates									
Nonatriacontane (S)	58	%	40-140		1	06/18/18 20:54	06/20/18 18:29	7194-86-7	
o-Terphenyl (S)	44	%	40-140		1	06/18/18 20:54	06/20/18 18:29	84-15-1	
2-Fluorobiphenyl (S)	62	%	40-140		1	06/18/18 20:54	06/20/18 18:29	321-60-8	
2-Bromonaphthalene (S)	66	%	40-140		1	06/18/18 20:54	06/20/18 18:29	580-13-2	
VPH NC Water	Analytical Method: MADEP VPH								
Aliphatic (C05-C08)	**1500**	ug/L	250	250	5		06/11/18 18:45		N2
Aliphatic (C09-C12)	**6830**	ug/L	250	250	5		06/11/18 18:45		N2
Aromatic (C09-C10)	**2290**	ug/L	250	250	5		06/11/18 18:45		N2
Surrogates									
4-Bromofluorobenzene (FID) (S)	93	%	70-130		5		06/11/18 18:45	460-00-4	
4-Bromofluorobenzene (PID) (S)	92	%	70-130		5		06/11/18 18:45	460-00-4	
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Acenaphthene	ND	ug/L	8.3	2.8	1	06/14/18 20:46	06/15/18 13:34	83-32-9	
Acenaphthylene	ND	ug/L	8.3	2.5	1	06/14/18 20:46	06/15/18 13:34	208-96-8	
Aniline	ND	ug/L	8.3	2.6	1	06/14/18 20:46	06/15/18 13:34	62-53-3	L2
Anthracene	ND	ug/L	8.3	1.7	1	06/14/18 20:46	06/15/18 13:34	120-12-7	
Benzo(a)anthracene	ND	ug/L	8.3	1.1	1	06/14/18 20:46	06/15/18 13:34	56-55-3	
Benzo(a)pyrene	ND	ug/L	8.3	1.1	1	06/14/18 20:46	06/15/18 13:34	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	8.3	1.2	1	06/14/18 20:46	06/15/18 13:34	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	8.3	1.5	1	06/14/18 20:46	06/15/18 13:34	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	8.3	1.5	1	06/14/18 20:46	06/15/18 13:34	207-08-9	
Benzoic Acid	ND	ug/L	41.7	14.4	1	06/14/18 20:46	06/15/18 13:34	65-85-0	
Benzyl alcohol	ND	ug/L	16.7	5.8	1	06/14/18 20:46	06/15/18 13:34	100-51-6	
4-Bromophenylphenyl ether	ND	ug/L	8.3	2.2	1	06/14/18 20:46	06/15/18 13:34	101-55-3	
Butylbenzylphthalate	ND	ug/L	8.3	1.1	1	06/14/18 20:46	06/15/18 13:34	85-68-7	
4-Chloro-3-methylphenol	ND	ug/L	16.7	3.8	1	06/14/18 20:46	06/15/18 13:34	59-50-7	
4-Chloroaniline	ND	ug/L	16.7	5.6	1	06/14/18 20:46	06/15/18 13:34	106-47-8	
bis(2-Chloroethoxy)methane	ND	ug/L	8.3	2.5	1	06/14/18 20:46	06/15/18 13:34	111-91-1	
bis(2-Chloroethyl) ether	ND	ug/L	8.3	2.6	1	06/14/18 20:46	06/15/18 13:34	111-44-4	
2-Chloronaphthalene	ND	ug/L	8.3	2.5	1	06/14/18 20:46	06/15/18 13:34	91-58-7	
2-Chlorophenol	ND	ug/L	8.3	2.4	1	06/14/18 20:46	06/15/18 13:34	95-57-8	
4-Chlorophenylphenyl ether	ND	ug/L	8.3	2.4	1	06/14/18 20:46	06/15/18 13:34	7005-72-3	
Chrysene	ND	ug/L	8.3	1.1	1	06/14/18 20:46	06/15/18 13:34	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	8.3	1.6	1	06/14/18 20:46	06/15/18 13:34	53-70-3	
Dibenzofuran	ND	ug/L	8.3	2.8	1	06/14/18 20:46	06/15/18 13:34	132-64-9	
1,2-Dichlorobenzene	ND	ug/L	8.3	2.7	1	06/14/18 20:46	06/15/18 13:34	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	8.3	2.7	1	06/14/18 20:46	06/15/18 13:34	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	8.3	2.1	1	06/14/18 20:46	06/15/18 13:34	106-46-7	
3,3'-Dichlorobenzidine	ND	ug/L	16.7	2.3	1	06/14/18 20:46	06/15/18 13:34	91-94-1	
2,4-Dichlorophenol	ND	ug/L	8.3	2.3	1	06/14/18 20:46	06/15/18 13:34	120-83-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-54-SB-2 **Lab ID: 92387844003** Collected: 06/07/18 17:45 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Diethylphthalate	ND	ug/L	8.3	1.7	1	06/14/18 20:46	06/15/18 13:34	84-66-2	
2,4-Dimethylphenol	**7.4J**	ug/L	8.3	1.6	1	06/14/18 20:46	06/15/18 13:34	105-67-9	
Dimethylphthalate	ND	ug/L	8.3	1.9	1	06/14/18 20:46	06/15/18 13:34	131-11-3	
Di-n-butylphthalate	ND	ug/L	8.3	1.0	1	06/14/18 20:46	06/15/18 13:34	84-74-2	
4,6-Dinitro-2-methylphenol	ND	ug/L	16.7	3.6	1	06/14/18 20:46	06/15/18 13:34	534-52-1	
2,4-Dinitrophenol	ND	ug/L	41.7	8.4	1	06/14/18 20:46	06/15/18 13:34	51-28-5	
2,4-Dinitrotoluene	ND	ug/L	8.3	2.0	1	06/14/18 20:46	06/15/18 13:34	121-14-2	
2,6-Dinitrotoluene	ND	ug/L	8.3	2.4	1	06/14/18 20:46	06/15/18 13:34	606-20-2	
Di-n-octylphthalate	ND	ug/L	8.3	1.0	1	06/14/18 20:46	06/15/18 13:34	117-84-0	
bis(2-Ethylhexyl)phthalate	ND	ug/L	5.0	1.2	1	06/14/18 20:46	06/15/18 13:34	117-81-7	
Fluoranthene	ND	ug/L	8.3	1.4	1	06/14/18 20:46	06/15/18 13:34	206-44-0	
Fluorene	ND	ug/L	8.3	2.5	1	06/14/18 20:46	06/15/18 13:34	86-73-7	
Hexachloro-1,3-butadiene	ND	ug/L	8.3	2.6	1	06/14/18 20:46	06/15/18 13:34	87-68-3	
Hexachlorobenzene	ND	ug/L	8.3	2.0	1	06/14/18 20:46	06/15/18 13:34	118-74-1	
Hexachlorocyclopentadiene	ND	ug/L	8.3	2.8	1	06/14/18 20:46	06/15/18 13:34	77-47-4	
Hexachloroethane	ND	ug/L	8.3	3.3	1	06/14/18 20:46	06/15/18 13:34	67-72-1	
Indeno(1,2,3-cd)pyrene	ND	ug/L	8.3	1.4	1	06/14/18 20:46	06/15/18 13:34	193-39-5	
Isophorone	ND	ug/L	8.3	2.3	1	06/14/18 20:46	06/15/18 13:34	78-59-1	
1-Methylnaphthalene	**11.5**	ug/L	8.3	2.3	1	06/14/18 20:46	06/15/18 13:34	90-12-0	
2-Methylnaphthalene	**21.9**	ug/L	8.3	2.4	1	06/14/18 20:46	06/15/18 13:34	91-57-6	
2-Methylphenol(o-Cresol)	ND	ug/L	8.3	3.0	1	06/14/18 20:46	06/15/18 13:34	95-48-7	
3&4-Methylphenol(m&p Cresol)	ND	ug/L	8.3	2.0	1	06/14/18 20:46	06/15/18 13:34	15831-10-4	
Naphthalene	**76.4**	ug/L	8.3	2.7	1	06/14/18 20:46	06/15/18 13:34	91-20-3	
2-Nitroaniline	ND	ug/L	41.7	4.6	1	06/14/18 20:46	06/15/18 13:34	88-74-4	
3-Nitroaniline	ND	ug/L	41.7	4.2	1	06/14/18 20:46	06/15/18 13:34	99-09-2	
4-Nitroaniline	ND	ug/L	16.7	3.0	1	06/14/18 20:46	06/15/18 13:34	100-01-6	
Nitrobenzene	ND	ug/L	8.3	2.8	1	06/14/18 20:46	06/15/18 13:34	98-95-3	
2-Nitrophenol	ND	ug/L	8.3	2.2	1	06/14/18 20:46	06/15/18 13:34	88-75-5	
4-Nitrophenol	ND	ug/L	41.7	6.5	1	06/14/18 20:46	06/15/18 13:34	100-02-7	
N-Nitrosodimethylamine	ND	ug/L	8.3	2.3	1	06/14/18 20:46	06/15/18 13:34	62-75-9	
N-Nitroso-di-n-propylamine	ND	ug/L	8.3	2.2	1	06/14/18 20:46	06/15/18 13:34	621-64-7	
N-Nitrosodiphenylamine	ND	ug/L	8.3	1.7	1	06/14/18 20:46	06/15/18 13:34	86-30-6	
2,2'-Oxybis(1-chloropropane)	ND	ug/L	8.3	2.1	1	06/14/18 20:46	06/15/18 13:34	108-60-1	
Pentachlorophenol	ND	ug/L	20.8	2.6	1	06/14/18 20:46	06/15/18 13:34	87-86-5	
Phenanthrene	ND	ug/L	8.3	2.0	1	06/14/18 20:46	06/15/18 13:34	85-01-8	
Phenol	ND	ug/L	8.3	2.3	1	06/14/18 20:46	06/15/18 13:34	108-95-2	
Pyrene	ND	ug/L	8.3	1.0	1	06/14/18 20:46	06/15/18 13:34	129-00-0	
1,2,4-Trichlorobenzene	ND	ug/L	8.3	2.1	1	06/14/18 20:46	06/15/18 13:34	120-82-1	
2,4,5-Trichlorophenol	ND	ug/L	8.3	1.9	1	06/14/18 20:46	06/15/18 13:34	95-95-4	
2,4,6-Trichlorophenol	ND	ug/L	8.3	2.4	1	06/14/18 20:46	06/15/18 13:34	88-06-2	
Surrogates									
Nitrobenzene-d5 (S)	79	%	40-121		1	06/14/18 20:46	06/15/18 13:34	4165-60-0	
2-Fluorobiphenyl (S)	80	%	45-139		1	06/14/18 20:46	06/15/18 13:34	321-60-8	
Terphenyl-d14 (S)	59	%	48-146		1	06/14/18 20:46	06/15/18 13:34	1718-51-0	
Phenol-d6 (S)	59	%	18-105		1	06/14/18 20:46	06/15/18 13:34	13127-88-3	
2-Fluorophenol (S)	63	%	13-118		1	06/14/18 20:46	06/15/18 13:34	367-12-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-54-SB-2 **Lab ID: 92387844003** Collected: 06/07/18 17:45 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV RVE Semivol Organic	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Surrogates									
2,4,6-Tribromophenol (S)	98	%	31-170		1	06/14/18 20:46	06/15/18 13:34	118-79-6	
8260 MSV Low Level	Analytical Method: EPA 8260								
Acetone	ND	ug/L	100	40.0	4		06/18/18 19:15	67-64-1	
Benzene	**1.7J**	ug/L	4.0	1.0	4		06/18/18 19:15	71-43-2	
Bromobenzene	ND	ug/L	4.0	1.2	4		06/18/18 19:15	108-86-1	
Bromochloromethane	ND	ug/L	4.0	0.68	4		06/18/18 19:15	74-97-5	
Bromodichloromethane	ND	ug/L	4.0	0.72	4		06/18/18 19:15	75-27-4	
Bromoform	ND	ug/L	4.0	1.0	4		06/18/18 19:15	75-25-2	
Bromomethane	ND	ug/L	8.0	1.2	4		06/18/18 19:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	20.0	3.8	4		06/18/18 19:15	78-93-3	
n-Butylbenzene	**23.0**	ug/L	4.0	1.6	4		06/18/18 19:15	104-51-8	
sec-Butylbenzene	**9.5**	ug/L	4.0	1.5	4		06/18/18 19:15	135-98-8	
tert-Butylbenzene	ND	ug/L	4.0	1.6	4		06/18/18 19:15	98-06-6	
Carbon tetrachloride	ND	ug/L	4.0	1.0	4		06/18/18 19:15	56-23-5	
Chlorobenzene	ND	ug/L	4.0	0.92	4		06/18/18 19:15	108-90-7	
Chloroethane	ND	ug/L	4.0	2.2	4		06/18/18 19:15	75-00-3	
Chloroform	ND	ug/L	4.0	0.56	4		06/18/18 19:15	67-66-3	
Chloromethane	ND	ug/L	4.0	0.44	4		06/18/18 19:15	74-87-3	
2-Chlorotoluene	ND	ug/L	4.0	1.4	4		06/18/18 19:15	95-49-8	
4-Chlorotoluene	ND	ug/L	4.0	1.2	4		06/18/18 19:15	106-43-4	
Dibromochloromethane	ND	ug/L	4.0	0.84	4		06/18/18 19:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	4.0	1.1	4		06/18/18 19:15	106-93-4	
Dibromomethane	ND	ug/L	4.0	0.84	4		06/18/18 19:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	4.0	1.2	4		06/18/18 19:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	4.0	0.96	4		06/18/18 19:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	4.0	1.3	4		06/18/18 19:15	106-46-7	
Dichlorodifluoromethane	ND	ug/L	4.0	0.84	4		06/18/18 19:15	75-71-8	
1,1-Dichloroethane	ND	ug/L	4.0	1.3	4		06/18/18 19:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	4.0	0.96	4		06/18/18 19:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	4.0	2.2	4		06/18/18 19:15	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	4.0	0.76	4		06/18/18 19:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	4.0	2.0	4		06/18/18 19:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	4.0	1.1	4		06/18/18 19:15	78-87-5	
1,3-Dichloropropane	ND	ug/L	4.0	1.1	4		06/18/18 19:15	142-28-9	
2,2-Dichloropropane	ND	ug/L	4.0	0.52	4		06/18/18 19:15	594-20-7	
1,1-Dichloropropene	ND	ug/L	4.0	2.0	4		06/18/18 19:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	4.0	0.52	4		06/18/18 19:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	4.0	1.0	4		06/18/18 19:15	10061-02-6	
Diisopropyl ether	ND	ug/L	4.0	0.48	4		06/18/18 19:15	108-20-3	
1,4-Dioxane (p-Dioxane)	ND	ug/L	600	313	4		06/18/18 19:15	123-91-1	
Ethylbenzene	**303**	ug/L	4.0	1.2	4		06/18/18 19:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	4.0	2.8	4		06/18/18 19:15	87-68-3	
2-Hexanone	ND	ug/L	20.0	1.8	4		06/18/18 19:15	591-78-6	
Isopropylbenzene (Cumene)	**30.1**	ug/L	4.0	1.6	4		06/18/18 19:15	98-82-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Sample: P-54-SB-2 **Lab ID: 92387844003** Collected: 06/07/18 17:45 Received: 06/08/18 15:18 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV Low Level	Analytical Method: EPA 8260								
p-Isopropyltoluene	ND	ug/L	4.0	1.2	4		06/18/18 19:15	99-87-6	
Methylene Chloride	ND	ug/L	8.0	3.9	4		06/18/18 19:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20.0	1.3	4		06/18/18 19:15	108-10-1	
Methyl-tert-butyl ether	**5.7**	ug/L	4.0	0.84	4		06/18/18 19:15	1634-04-4	
Naphthalene	**113**	ug/L	4.0	0.96	4		06/18/18 19:15	91-20-3	
n-Propylbenzene	**95.9**	ug/L	4.0	1.7	4		06/18/18 19:15	103-65-1	
Styrene	ND	ug/L	4.0	1.0	4		06/18/18 19:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	4.0	1.3	4		06/18/18 19:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	4.0	1.6	4		06/18/18 19:15	79-34-5	
Tetrachloroethene	ND	ug/L	4.0	1.8	4		06/18/18 19:15	127-18-4	
Toluene	**122**	ug/L	4.0	1.0	4		06/18/18 19:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	4.0	1.3	4		06/18/18 19:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	4.0	1.4	4		06/18/18 19:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	4.0	1.9	4		06/18/18 19:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	4.0	1.2	4		06/18/18 19:15	79-00-5	
Trichloroethene	ND	ug/L	4.0	1.9	4		06/18/18 19:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	4.0	0.80	4		06/18/18 19:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	4.0	1.6	4		06/18/18 19:15	96-18-4	
1,2,4-Trimethylbenzene	**511**	ug/L	4.0	1.2	4		06/18/18 19:15	95-63-6	
1,3,5-Trimethylbenzene	**161**	ug/L	4.0	1.4	4		06/18/18 19:15	108-67-8	
Vinyl acetate	ND	ug/L	8.0	1.4	4		06/18/18 19:15	108-05-4	
Vinyl chloride	ND	ug/L	4.0	2.5	4		06/18/18 19:15	75-01-4	
Xylene (Total)	**1460**	ug/L	4.0	4.0	4		06/18/18 19:15	1330-20-7	
Surrogates									
4-Bromofluorobenzene (S)	96	%	70-130		4		06/18/18 19:15	460-00-4	
1,2-Dichloroethane-d4 (S)	105	%	70-130		4		06/18/18 19:15	17060-07-0	
Toluene-d8 (S)	104	%	70-130		4		06/18/18 19:15	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 414279 Analysis Method: MADEP VPH
QC Batch Method: MADEP VPH Analysis Description: VPH NC Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

METHOD BLANK: 2297276 Matrix: Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aliphatic (C05-C08)	ug/L	ND	50.0	50.0	06/11/18 15:24	N2
Aliphatic (C09-C12)	ug/L	ND	50.0	50.0	06/11/18 15:24	N2
Aromatic (C09-C10)	ug/L	ND	50.0	50.0	06/11/18 15:24	N2
4-Bromofluorobenzene (FID) (S)	%	90	70-130		06/11/18 15:24	
4-Bromofluorobenzene (PID) (S)	%	88	70-130		06/11/18 15:24	

LABORATORY CONTROL SAMPLE & LCSD: 2297277 2297278

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aliphatic (C05-C08)	ug/L	300	324	317	108	106	70-130	2	25	N2
Aliphatic (C09-C12)	ug/L	300	302	304	101	101	30-130	1	25	N2
Aromatic (C09-C10)	ug/L	100	104	102	104	102	70-130	2	25	N2
4-Bromofluorobenzene (FID) (S)	%				105	105	70-130			
4-Bromofluorobenzene (PID) (S)	%				104	104	70-130			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 415295 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92387844001

METHOD BLANK: 2303142 Matrix: Water
Associated Lab Samples: 92387844001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	0.33	06/14/18 23:23	
1,1,1-Trichloroethane	ug/L	ND	1.0	0.48	06/14/18 23:23	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	0.40	06/14/18 23:23	
1,1,2-Trichloroethane	ug/L	ND	1.0	0.29	06/14/18 23:23	
1,1-Dichloroethane	ug/L	ND	1.0	0.32	06/14/18 23:23	
1,1-Dichloroethene	ug/L	ND	1.0	0.56	06/14/18 23:23	
1,1-Dichloropropene	ug/L	ND	1.0	0.49	06/14/18 23:23	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	0.33	06/14/18 23:23	
1,2,3-Trichloropropane	ug/L	ND	1.0	0.41	06/14/18 23:23	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	0.35	06/14/18 23:23	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.31	06/14/18 23:23	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	0.27	06/14/18 23:23	
1,2-Dichlorobenzene	ug/L	ND	1.0	0.30	06/14/18 23:23	
1,2-Dichloroethane	ug/L	ND	1.0	0.24	06/14/18 23:23	
1,2-Dichloropropane	ug/L	ND	1.0	0.27	06/14/18 23:23	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.36	06/14/18 23:23	
1,3-Dichlorobenzene	ug/L	ND	1.0	0.24	06/14/18 23:23	
1,3-Dichloropropane	ug/L	ND	1.0	0.28	06/14/18 23:23	
1,4-Dichlorobenzene	ug/L	ND	1.0	0.33	06/14/18 23:23	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	78.4	06/14/18 23:23	
2,2-Dichloropropane	ug/L	ND	1.0	0.13	06/14/18 23:23	
2-Butanone (MEK)	ug/L	ND	5.0	0.96	06/14/18 23:23	
2-Chlorotoluene	ug/L	ND	1.0	0.35	06/14/18 23:23	
2-Hexanone	ug/L	ND	5.0	0.46	06/14/18 23:23	
4-Chlorotoluene	ug/L	ND	1.0	0.31	06/14/18 23:23	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	0.33	06/14/18 23:23	
Acetone	ug/L	ND	25.0	10.0	06/14/18 23:23	
Benzene	ug/L	ND	1.0	0.25	06/14/18 23:23	
Bromobenzene	ug/L	ND	1.0	0.30	06/14/18 23:23	
Bromochloromethane	ug/L	ND	1.0	0.17	06/14/18 23:23	
Bromodichloromethane	ug/L	ND	1.0	0.18	06/14/18 23:23	
Bromoform	ug/L	ND	1.0	0.26	06/14/18 23:23	
Bromomethane	ug/L	ND	2.0	0.29	06/14/18 23:23	
Carbon tetrachloride	ug/L	ND	1.0	0.25	06/14/18 23:23	
Chlorobenzene	ug/L	ND	1.0	0.23	06/14/18 23:23	
Chloroethane	ug/L	ND	1.0	0.54	06/14/18 23:23	
Chloroform	ug/L	ND	1.0	0.14	06/14/18 23:23	
Chloromethane	ug/L	0.14J	1.0	0.11	06/14/18 23:23	
cis-1,2-Dichloroethene	ug/L	ND	1.0	0.19	06/14/18 23:23	
cis-1,3-Dichloropropene	ug/L	ND	1.0	0.13	06/14/18 23:23	
Dibromochloromethane	ug/L	ND	1.0	0.21	06/14/18 23:23	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(704)875-9092

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

METHOD BLANK: 2303142 Matrix: Water
Associated Lab Samples: 92387844001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromomethane	ug/L	ND	1.0	0.21	06/14/18 23:23	
Dichlorodifluoromethane	ug/L	ND	1.0	0.21	06/14/18 23:23	
Diisopropyl ether	ug/L	ND	1.0	0.12	06/14/18 23:23	
Ethylbenzene	ug/L	ND	1.0	0.30	06/14/18 23:23	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	0.71	06/14/18 23:23	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.40	06/14/18 23:23	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.21	06/14/18 23:23	
Methylene Chloride	ug/L	ND	2.0	0.97	06/14/18 23:23	
n-Butylbenzene	ug/L	ND	1.0	0.41	06/14/18 23:23	
n-Propylbenzene	ug/L	ND	1.0	0.42	06/14/18 23:23	
Naphthalene	ug/L	ND	1.0	0.24	06/14/18 23:23	
p-Isopropyltoluene	ug/L	ND	1.0	0.31	06/14/18 23:23	
sec-Butylbenzene	ug/L	ND	1.0	0.38	06/14/18 23:23	
Styrene	ug/L	ND	1.0	0.26	06/14/18 23:23	
tert-Butylbenzene	ug/L	ND	1.0	0.40	06/14/18 23:23	
Tetrachloroethene	ug/L	ND	1.0	0.46	06/14/18 23:23	
Toluene	ug/L	ND	1.0	0.26	06/14/18 23:23	
trans-1,2-Dichloroethene	ug/L	ND	1.0	0.49	06/14/18 23:23	
trans-1,3-Dichloropropene	ug/L	ND	1.0	0.26	06/14/18 23:23	
Trichloroethene	ug/L	ND	1.0	0.47	06/14/18 23:23	
Trichlorofluoromethane	ug/L	ND	1.0	0.20	06/14/18 23:23	
Vinyl acetate	ug/L	ND	2.0	0.35	06/14/18 23:23	
Vinyl chloride	ug/L	ND	1.0	0.62	06/14/18 23:23	
Xylene (Total)	ug/L	ND	1.0	1.0	06/14/18 23:23	
1,2-Dichloroethane-d4 (S)	%	102	70-130		06/14/18 23:23	
4-Bromofluorobenzene (S)	%	102	70-130		06/14/18 23:23	
Toluene-d8 (S)	%	103	70-130		06/14/18 23:23	

LABORATORY CONTROL SAMPLE: 2303143

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	44.5	89	80-125	
1,1,1-Trichloroethane	ug/L	50	45.0	90	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	44.4	89	79-124	
1,1,2-Trichloroethane	ug/L	50	43.2	86	85-125	
1,1-Dichloroethane	ug/L	50	43.5	87	73-126	
1,1-Dichloroethene	ug/L	50	45.2	90	66-135	
1,1-Dichloropropene	ug/L	50	45.0	90	74-135	
1,2,3-Trichlorobenzene	ug/L	50	44.3	89	73-135	
1,2,3-Trichloropropane	ug/L	50	45.1	90	75-130	
1,2,4-Trichlorobenzene	ug/L	50	45.8	92	75-134	
1,2,4-Trimethylbenzene	ug/L	50	42.3	85	79-125	
1,2-Dibromoethane (EDB)	ug/L	50	45.4	91	83-124	
1,2-Dichlorobenzene	ug/L	50	43.3	87	80-133	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE: 2303143

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane	ug/L	50	42.5	85	67-128	
1,2-Dichloropropane	ug/L	50	42.0	84	75-132	
1,3,5-Trimethylbenzene	ug/L	50	43.7	87	79-123	
1,3-Dichlorobenzene	ug/L	50	42.6	85	77-130	
1,3-Dichloropropane	ug/L	50	44.6	89	76-131	
1,4-Dichlorobenzene	ug/L	50	43.0	86	78-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1020	102	71-125	
2,2-Dichloropropane	ug/L	50	50.2	100	40-160	
2-Butanone (MEK)	ug/L	100	91.8	92	61-144	
2-Chlorotoluene	ug/L	50	42.5	85	74-132	
2-Hexanone	ug/L	100	95.1	95	68-143	
4-Chlorotoluene	ug/L	50	43.1	86	76-133	
4-Methyl-2-pentanone (MIBK)	ug/L	100	91.9	92	72-135	
Acetone	ug/L	100	88.1	88	48-146	
Benzene	ug/L	50	42.5	85	80-125	
Bromobenzene	ug/L	50	43.6	87	75-125	
Bromochloromethane	ug/L	50	44.9	90	71-125	
Bromodichloromethane	ug/L	50	44.9	90	78-124	
Bromoform	ug/L	50	49.0	98	71-128	
Bromomethane	ug/L	50	41.6	83	40-160	
Carbon tetrachloride	ug/L	50	45.0	90	69-131	
Chlorobenzene	ug/L	50	42.9	86	81-122	
Chloroethane	ug/L	50	37.2	74	39-148	
Chloroform	ug/L	50	45.8	92	73-127	
Chloromethane	ug/L	50	38.9	78	44-146	
cis-1,2-Dichloroethene	ug/L	50	44.0	88	74-124	
cis-1,3-Dichloropropene	ug/L	50	45.3	91	72-132	
Dibromochloromethane	ug/L	50	46.9	94	78-125	
Dibromomethane	ug/L	50	43.1	86	82-120	
Dichlorodifluoromethane	ug/L	50	35.8	72	34-157	
Diisopropyl ether	ug/L	50	44.5	89	69-135	
Ethylbenzene	ug/L	50	42.8	86	79-121	
Hexachloro-1,3-butadiene	ug/L	50	46.7	93	72-131	
Isopropylbenzene (Cumene)	ug/L	50	44.8	90	81-132	
Methyl-tert-butyl ether	ug/L	50	44.2	88	74-131	
Methylene Chloride	ug/L	50	39.7	79	64-133	
n-Butylbenzene	ug/L	50	45.9	92	78-127	
n-Propylbenzene	ug/L	50	44.4	89	78-130	
Naphthalene	ug/L	50	45.4	91	73-133	
p-Isopropyltoluene	ug/L	50	44.5	89	80-131	
sec-Butylbenzene	ug/L	50	44.4	89	80-133	
Styrene	ug/L	50	44.3	89	84-126	
tert-Butylbenzene	ug/L	50	38.0	76	77-133	L2
Tetrachloroethene	ug/L	50	44.2	88	78-122	
Toluene	ug/L	50	42.3	85	80-121	
trans-1,2-Dichloroethene	ug/L	50	44.3	89	71-127	
trans-1,3-Dichloropropene	ug/L	50	46.0	92	69-141	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical®
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(704)875-9092

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE: 2303143

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Trichloroethene	ug/L	50	43.5	87	78-122	
Trichlorofluoromethane	ug/L	50	43.2	86	53-137	
Vinyl acetate	ug/L	100	101	101	40-160	
Vinyl chloride	ug/L	50	42.1	84	50-150	
Xylene (Total)	ug/L	150	133	89	81-126	
1,2-Dichloroethane-d4 (S)	%			102	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2303482 2303483

Parameter	Units	92387799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	20	20	19.0	19.3	95	96	70-130	2	30	
1,1,1-Trichloroethane	ug/L	ND	20	20	19.6	19.7	98	99	70-130	0	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	20	20	18.5	18.7	93	94	70-130	1	30	
1,1,2-Trichloroethane	ug/L	ND	20	20	18.5	19.4	93	97	70-130	4	30	
1,1-Dichloroethane	ug/L	ND	20	20	19.1	19.3	95	97	70-130	1	30	
1,1-Dichloroethene	ug/L	ND	20	20	21.0	21.5	105	108	70-166	3	30	
1,1-Dichloropropene	ug/L	ND	20	20	20.0	20.3	100	101	70-130	2	30	
1,2,3-Trichlorobenzene	ug/L	ND	20	20	18.5	18.7	92	94	70-130	1	30	
1,2,3-Trichloropropane	ug/L	ND	20	20	18.6	19.1	93	95	70-130	3	30	
1,2,4-Trichlorobenzene	ug/L	ND	20	20	19.1	19.4	95	97	70-130	2	30	
1,2,4-Trimethylbenzene	ug/L	ND	20	20	19.0	19.2	95	96	70-130	1	30	
1,2-Dibromoethane (EDB)	ug/L	ND	20	20	19.3	19.4	96	97	70-130	1	30	
1,2-Dichlorobenzene	ug/L	ND	20	20	18.8	19.0	94	95	70-130	1	30	
1,2-Dichloroethane	ug/L	ND	20	20	17.9	18.4	90	92	70-130	3	30	
1,2-Dichloropropane	ug/L	ND	20	20	19.2	18.9	96	94	70-130	2	30	
1,3,5-Trimethylbenzene	ug/L	ND	20	20	19.6	19.8	98	99	70-130	1	30	
1,3-Dichlorobenzene	ug/L	ND	20	20	18.7	18.8	93	94	70-130	1	30	
1,3-Dichloropropane	ug/L	ND	20	20	19.3	19.6	96	98	70-130	2	30	
1,4-Dichlorobenzene	ug/L	ND	20	20	19.0	19.0	95	95	70-130	0	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	400	400	398	413	100	103	70-130	4	30	
2,2-Dichloropropane	ug/L	ND	20	20	22.6	22.7	113	113	70-130	0	30	
2-Butanone (MEK)	ug/L	ND	40	40	40.0	43.0	100	107	70-130	7	30	
2-Chlorotoluene	ug/L	ND	20	20	19.2	19.1	96	95	70-130	1	30	
2-Hexanone	ug/L	ND	40	40	39.0	40.3	98	101	70-130	3	30	
4-Chlorotoluene	ug/L	ND	20	20	19.3	19.5	96	97	70-130	1	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	40	40	38.6	39.9	96	100	70-130	3	30	
Acetone	ug/L	ND	40	40	41.1	47.1	56	72	70-130	14	30	M1
Benzene	ug/L	ND	20	20	19.6	20.0	98	100	70-148	2	30	
Bromobenzene	ug/L	ND	20	20	19.3	19.2	97	96	70-130	1	30	
Bromochloromethane	ug/L	ND	20	20	19.5	19.2	98	96	70-130	1	30	
Bromodichloromethane	ug/L	ND	20	20	19.3	19.8	96	99	70-130	3	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2303482 2303483

Parameter	Units	92387799001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromoform	ug/L	ND	20	20	19.2	19.5	96	97	70-130	1	30	
Bromomethane	ug/L	ND	20	20	18.6	19.1	93	96	70-130	3	30	
Carbon tetrachloride	ug/L	ND	20	20	20.8	21.3	104	107	70-130	2	30	
Chlorobenzene	ug/L	ND	20	20	19.0	19.2	95	96	70-146	1	30	
Chloroethane	ug/L	ND	20	20	18.7	18.8	93	94	70-130	1	30	
Chloroform	ug/L	ND	20	20	18.7	19.0	94	95	70-130	1	30	
Chloromethane	ug/L	ND	20	20	18.4	19.4	92	97	70-130	5	30	
cis-1,2-Dichloroethene	ug/L	ND	20	20	19.8	20.2	99	101	70-130	2	30	
cis-1,3-Dichloropropene	ug/L	ND	20	20	19.9	20.1	99	101	70-130	1	30	
Dibromochloromethane	ug/L	ND	20	20	19.0	19.4	95	97	70-130	2	30	
Dibromomethane	ug/L	ND	20	20	19.0	19.8	95	99	70-130	4	30	
Dichlorodifluoromethane	ug/L	ND	20	20	22.3	22.8	112	114	70-130	2	30	
Diisopropyl ether	ug/L	ND	20	20	19.1	19.2	95	96	70-130	1	30	
Ethylbenzene	ug/L	ND	20	20	19.3	19.5	96	98	70-130	1	30	
Hexachloro-1,3-butadiene	ug/L	ND	20	20	20.0	19.8	100	99	70-130	1	30	
Isopropylbenzene (Cumene)	ug/L	ND	20	20	19.9	20.0	100	100	70-130	0	30	
Methyl-tert-butyl ether	ug/L	ND	20	20	18.3	18.9	92	95	70-130	3	30	
Methylene Chloride	ug/L	ND	20	20	11.2	11.2	56	56	70-130	0	30	M1
n-Butylbenzene	ug/L	ND	20	20	20.0	20.0	100	100	70-130	0	30	
n-Propylbenzene	ug/L	ND	20	20	20.2	20.0	101	100	70-130	1	30	
Naphthalene	ug/L	ND	20	20	18.8	19.0	94	95	70-130	1	30	
p-Isopropyltoluene	ug/L	ND	20	20	19.7	19.6	98	98	70-130	0	30	
sec-Butylbenzene	ug/L	ND	20	20	20.0	19.9	100	100	70-130	1	30	
Styrene	ug/L	ND	20	20	19.3	19.4	96	97	70-130	1	30	
tert-Butylbenzene	ug/L	ND	20	20	17.1	16.7	85	84	70-130	2	30	
Tetrachloroethene	ug/L	ND	20	20	20.5	20.2	102	101	70-130	1	30	
Toluene	ug/L	ND	20	20	19.3	19.6	96	98	70-155	1	30	
trans-1,2-Dichloroethene	ug/L	ND	20	20	20.2	20.0	101	100	70-130	1	30	
trans-1,3-Dichloropropene	ug/L	ND	20	20	19.5	20.1	97	100	70-130	3	30	
Trichloroethene	ug/L	ND	20	20	19.5	19.6	97	98	69-151	1	30	
Trichlorofluoromethane	ug/L	ND	20	20	21.4	21.1	107	106	70-130	1	30	
Vinyl acetate	ug/L	ND	40	40	42.1	42.5	105	106	70-130	1	30	
Vinyl chloride	ug/L	ND	20	20	20.8	20.6	104	103	70-130	1	30	
Xylene (Total)	ug/L	ND	60	60	59.0	59.2	98	99	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						96	99	70-130			
4-Bromofluorobenzene (S)	%						99	101	70-130			
Toluene-d8 (S)	%						99	101	70-130			

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 415385 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92387844002

METHOD BLANK: 2303519 Matrix: Water
Associated Lab Samples: 92387844002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	0.33	06/15/18 12:01	
1,1,1-Trichloroethane	ug/L	ND	1.0	0.48	06/15/18 12:01	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	0.40	06/15/18 12:01	
1,1,2-Trichloroethane	ug/L	ND	1.0	0.29	06/15/18 12:01	
1,1-Dichloroethane	ug/L	ND	1.0	0.32	06/15/18 12:01	
1,1-Dichloroethene	ug/L	ND	1.0	0.56	06/15/18 12:01	
1,1-Dichloropropene	ug/L	ND	1.0	0.49	06/15/18 12:01	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	0.33	06/15/18 12:01	
1,2,3-Trichloropropane	ug/L	ND	1.0	0.41	06/15/18 12:01	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	0.35	06/15/18 12:01	
1,2,4-Trimethylbenzene	ug/L	ND	1.0	0.31	06/15/18 12:01	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	0.27	06/15/18 12:01	
1,2-Dichlorobenzene	ug/L	ND	1.0	0.30	06/15/18 12:01	
1,2-Dichloroethane	ug/L	ND	1.0	0.24	06/15/18 12:01	
1,2-Dichloropropane	ug/L	ND	1.0	0.27	06/15/18 12:01	
1,3,5-Trimethylbenzene	ug/L	ND	1.0	0.36	06/15/18 12:01	
1,3-Dichlorobenzene	ug/L	ND	1.0	0.24	06/15/18 12:01	
1,3-Dichloropropane	ug/L	ND	1.0	0.28	06/15/18 12:01	
1,4-Dichlorobenzene	ug/L	ND	1.0	0.33	06/15/18 12:01	
1,4-Dioxane (p-Dioxane)	ug/L	ND	150	78.4	06/15/18 12:01	
2,2-Dichloropropane	ug/L	ND	1.0	0.13	06/15/18 12:01	
2-Butanone (MEK)	ug/L	ND	5.0	0.96	06/15/18 12:01	
2-Chlorotoluene	ug/L	ND	1.0	0.35	06/15/18 12:01	
2-Hexanone	ug/L	ND	5.0	0.46	06/15/18 12:01	
4-Chlorotoluene	ug/L	ND	1.0	0.31	06/15/18 12:01	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	0.33	06/15/18 12:01	
Acetone	ug/L	ND	25.0	10.0	06/15/18 12:01	
Benzene	ug/L	ND	1.0	0.25	06/15/18 12:01	
Bromobenzene	ug/L	ND	1.0	0.30	06/15/18 12:01	
Bromochloromethane	ug/L	ND	1.0	0.17	06/15/18 12:01	
Bromodichloromethane	ug/L	ND	1.0	0.18	06/15/18 12:01	
Bromoform	ug/L	ND	1.0	0.26	06/15/18 12:01	
Bromomethane	ug/L	ND	2.0	0.29	06/15/18 12:01	
Carbon tetrachloride	ug/L	ND	1.0	0.25	06/15/18 12:01	
Chlorobenzene	ug/L	ND	1.0	0.23	06/15/18 12:01	
Chloroethane	ug/L	ND	1.0	0.54	06/15/18 12:01	
Chloroform	ug/L	ND	1.0	0.14	06/15/18 12:01	
Chloromethane	ug/L	ND	1.0	0.11	06/15/18 12:01	
cis-1,2-Dichloroethene	ug/L	ND	1.0	0.19	06/15/18 12:01	
cis-1,3-Dichloropropene	ug/L	ND	1.0	0.13	06/15/18 12:01	
Dibromochloromethane	ug/L	ND	1.0	0.21	06/15/18 12:01	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

METHOD BLANK: 2303519 Matrix: Water
Associated Lab Samples: 92387844002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromomethane	ug/L	ND	1.0	0.21	06/15/18 12:01	
Dichlorodifluoromethane	ug/L	ND	1.0	0.21	06/15/18 12:01	
Diisopropyl ether	ug/L	ND	1.0	0.12	06/15/18 12:01	
Ethylbenzene	ug/L	ND	1.0	0.30	06/15/18 12:01	
Hexachloro-1,3-butadiene	ug/L	ND	1.0	0.71	06/15/18 12:01	
Isopropylbenzene (Cumene)	ug/L	ND	1.0	0.40	06/15/18 12:01	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.21	06/15/18 12:01	
Methylene Chloride	ug/L	ND	2.0	0.97	06/15/18 12:01	
n-Butylbenzene	ug/L	ND	1.0	0.41	06/15/18 12:01	
n-Propylbenzene	ug/L	ND	1.0	0.42	06/15/18 12:01	
Naphthalene	ug/L	ND	1.0	0.24	06/15/18 12:01	
p-Isopropyltoluene	ug/L	ND	1.0	0.31	06/15/18 12:01	
sec-Butylbenzene	ug/L	ND	1.0	0.38	06/15/18 12:01	
Styrene	ug/L	ND	1.0	0.26	06/15/18 12:01	
tert-Butylbenzene	ug/L	ND	1.0	0.40	06/15/18 12:01	
Tetrachloroethene	ug/L	ND	1.0	0.46	06/15/18 12:01	
Toluene	ug/L	ND	1.0	0.26	06/15/18 12:01	
trans-1,2-Dichloroethene	ug/L	ND	1.0	0.49	06/15/18 12:01	
trans-1,3-Dichloropropene	ug/L	ND	1.0	0.26	06/15/18 12:01	
Trichloroethene	ug/L	ND	1.0	0.47	06/15/18 12:01	
Trichlorofluoromethane	ug/L	ND	1.0	0.20	06/15/18 12:01	
Vinyl acetate	ug/L	ND	2.0	0.35	06/15/18 12:01	
Vinyl chloride	ug/L	ND	1.0	0.62	06/15/18 12:01	
Xylene (Total)	ug/L	ND	1.0	1.0	06/15/18 12:01	
1,2-Dichloroethane-d4 (S)	%	103	70-130		06/15/18 12:01	
4-Bromofluorobenzene (S)	%	98	70-130		06/15/18 12:01	
Toluene-d8 (S)	%	100	70-130		06/15/18 12:01	

LABORATORY CONTROL SAMPLE: 2303520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	47.4	95	80-125	
1,1,1-Trichloroethane	ug/L	50	47.7	95	71-129	
1,1,2,2-Tetrachloroethane	ug/L	50	46.2	92	79-124	
1,1,2-Trichloroethane	ug/L	50	44.9	90	85-125	
1,1-Dichloroethane	ug/L	50	47.9	96	73-126	
1,1-Dichloroethene	ug/L	50	48.4	97	66-135	
1,1-Dichloropropene	ug/L	50	46.8	94	74-135	
1,2,3-Trichlorobenzene	ug/L	50	47.9	96	73-135	
1,2,3-Trichloropropane	ug/L	50	45.0	90	75-130	
1,2,4-Trichlorobenzene	ug/L	50	48.6	97	75-134	
1,2,4-Trimethylbenzene	ug/L	50	44.5	89	79-125	
1,2-Dibromoethane (EDB)	ug/L	50	47.8	96	83-124	
1,2-Dichlorobenzene	ug/L	50	46.0	92	80-133	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE: 2303520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane	ug/L	50	44.9	90	67-128	
1,2-Dichloropropane	ug/L	50	44.7	89	75-132	
1,3,5-Trimethylbenzene	ug/L	50	46.4	93	79-123	
1,3-Dichlorobenzene	ug/L	50	45.0	90	77-130	
1,3-Dichloropropane	ug/L	50	46.9	94	76-131	
1,4-Dichlorobenzene	ug/L	50	45.6	91	78-130	
1,4-Dioxane (p-Dioxane)	ug/L	1000	1020	102	71-125	
2,2-Dichloropropane	ug/L	50	55.2	110	40-160	
2-Butanone (MEK)	ug/L	100	95.3	95	61-144	
2-Chlorotoluene	ug/L	50	43.9	88	74-132	
2-Hexanone	ug/L	100	98.7	99	68-143	
4-Chlorotoluene	ug/L	50	45.3	91	76-133	
4-Methyl-2-pentanone (MIBK)	ug/L	100	93.8	94	72-135	
Acetone	ug/L	100	94.4	94	48-146	
Benzene	ug/L	50	44.9	90	80-125	
Bromobenzene	ug/L	50	46.0	92	75-125	
Bromochloromethane	ug/L	50	48.8	98	71-125	
Bromodichloromethane	ug/L	50	47.9	96	78-124	
Bromoform	ug/L	50	51.2	102	71-128	
Bromomethane	ug/L	50	39.1	78	40-160	
Carbon tetrachloride	ug/L	50	47.9	96	69-131	
Chlorobenzene	ug/L	50	45.2	90	81-122	
Chloroethane	ug/L	50	41.9	84	39-148	
Chloroform	ug/L	50	48.2	96	73-127	
Chloromethane	ug/L	50	44.9	90	44-146	
cis-1,2-Dichloroethene	ug/L	50	49.2	98	74-124	
cis-1,3-Dichloropropene	ug/L	50	48.6	97	72-132	
Dibromochloromethane	ug/L	50	49.4	99	78-125	
Dibromomethane	ug/L	50	46.0	92	82-120	
Dichlorodifluoromethane	ug/L	50	51.4	103	34-157	
Diisopropyl ether	ug/L	50	50.3	101	69-135	
Ethylbenzene	ug/L	50	45.4	91	79-121	
Hexachloro-1,3-butadiene	ug/L	50	49.6	99	72-131	
Isopropylbenzene (Cumene)	ug/L	50	47.3	95	81-132	
Methyl-tert-butyl ether	ug/L	50	47.3	95	74-131	
Methylene Chloride	ug/L	50	42.6	85	64-133	
n-Butylbenzene	ug/L	50	48.7	97	78-127	
n-Propylbenzene	ug/L	50	46.7	93	78-130	
Naphthalene	ug/L	50	48.0	96	73-133	
p-Isopropyltoluene	ug/L	50	46.6	93	80-131	
sec-Butylbenzene	ug/L	50	46.9	94	80-133	
Styrene	ug/L	50	46.7	93	84-126	
tert-Butylbenzene	ug/L	50	39.8	80	77-133	
Tetrachloroethene	ug/L	50	46.9	94	78-122	
Toluene	ug/L	50	44.7	89	80-121	
trans-1,2-Dichloroethene	ug/L	50	48.2	96	71-127	
trans-1,3-Dichloropropene	ug/L	50	49.0	98	69-141	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical®
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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE: 2303520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Trichloroethene	ug/L	50	45.8	92	78-122	
Trichlorofluoromethane	ug/L	50	48.5	97	53-137	
Vinyl acetate	ug/L	100	113	113	40-160	
Vinyl chloride	ug/L	50	49.4	99	50-150	
Xylene (Total)	ug/L	150	139	93	81-126	
1,2-Dichloroethane-d4 (S)	%			99	70-130	
4-Bromofluorobenzene (S)	%			102	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2303521 2303522

Parameter	Units	92387546049 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	500	500	480	498	96	100	70-130	4	30	
1,1,1-Trichloroethane	ug/L	ND	500	500	524	524	105	105	70-130	0	30	
1,1,2,2-Tetrachloroethane	ug/L	ND	500	500	470	461	94	92	70-130	2	30	
1,1,2-Trichloroethane	ug/L	ND	500	500	472	478	94	96	70-130	1	30	
1,1-Dichloroethane	ug/L	ND	500	500	519	532	104	106	70-130	2	30	
1,1-Dichloroethene	ug/L	ND	500	500	567	562	113	112	70-166	1	30	
1,1-Dichloropropene	ug/L	ND	500	500	535	537	107	107	70-130	0	30	
1,2,3-Trichlorobenzene	ug/L	ND	500	500	482	509	96	102	70-130	5	30	
1,2,3-Trichloropropane	ug/L	ND	500	500	467	442	93	88	70-130	5	30	
1,2,4-Trichlorobenzene	ug/L	ND	500	500	491	520	98	104	70-130	6	30	
1,2,4-Trimethylbenzene	ug/L	ND	500	500	491	506	98	101	70-130	3	30	
1,2-Dibromoethane (EDB)	ug/L	ND	500	500	497	484	99	97	70-130	3	30	
1,2-Dichlorobenzene	ug/L	ND	500	500	479	502	96	100	70-130	5	30	
1,2-Dichloroethane	ug/L	ND	500	500	487	494	95	97	70-130	1	30	
1,2-Dichloropropane	ug/L	ND	500	500	494	494	99	99	70-130	0	30	
1,3,5-Trimethylbenzene	ug/L	ND	500	500	505	534	101	107	70-130	6	30	
1,3-Dichlorobenzene	ug/L	ND	500	500	473	500	95	100	70-130	6	30	
1,3-Dichloropropane	ug/L	ND	500	500	496	490	99	98	70-130	1	30	
1,4-Dichlorobenzene	ug/L	ND	500	500	487	504	97	101	70-130	4	30	
1,4-Dioxane (p-Dioxane)	ug/L	ND	10000	10000	10400	10700	104	107	70-130	3	30	
2,2-Dichloropropane	ug/L	ND	500	500	588	572	118	114	70-130	3	30	
2-Butanone (MEK)	ug/L	ND	1000	1000	991	980	99	98	70-130	1	30	
2-Chlorotoluene	ug/L	ND	500	500	481	506	96	101	70-130	5	30	
2-Hexanone	ug/L	ND	1000	1000	998	1020	100	102	70-130	3	30	
4-Chlorotoluene	ug/L	ND	500	500	492	520	98	104	70-130	6	30	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	1000	1000	1060	966	106	97	70-130	9	30	
Acetone	ug/L	ND	1000	1000	873	846	87	85	70-130	3	30	
Benzene	ug/L	ND	500	500	524	526	100	101	70-148	0	30	
Bromobenzene	ug/L	ND	500	500	488	515	98	103	70-130	6	30	
Bromochloromethane	ug/L	ND	500	500	513	508	103	102	70-130	1	30	
Bromodichloromethane	ug/L	ND	500	500	488	507	98	101	70-130	4	30	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2303521 2303522

Parameter	Units	92387546049 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Bromoform	ug/L	ND	500	500	469	469	94	94	70-130	0	30	
Bromomethane	ug/L	ND	500	500	347	377	69	75	70-130	8	30	M1
Carbon tetrachloride	ug/L	ND	500	500	524	542	105	108	70-130	3	30	
Chlorobenzene	ug/L	ND	500	500	490	497	98	99	70-146	1	30	
Chloroethane	ug/L	ND	500	500	497	497	99	99	70-130	0	30	
Chloroform	ug/L	57.8	500	500	547	553	98	99	70-130	1	30	
Chloromethane	ug/L	ND	500	500	417	433	83	87	70-130	4	30	
cis-1,2-Dichloroethene	ug/L	ND	500	500	535	515	107	103	70-130	4	30	
cis-1,3-Dichloropropene	ug/L	ND	500	500	500	514	100	103	70-130	3	30	
Dibromochloromethane	ug/L	ND	500	500	483	469	97	94	70-130	3	30	
Dibromomethane	ug/L	ND	500	500	487	493	97	99	70-130	1	30	
Dichlorodifluoromethane	ug/L	ND	500	500	601	608	120	122	70-130	1	30	
Diisopropyl ether	ug/L	48.8	500	500	560	587	102	108	70-130	5	30	
Ethylbenzene	ug/L	ND	500	500	504	507	101	101	70-130	1	30	
Hexachloro-1,3-butadiene	ug/L	ND	500	500	521	540	104	108	70-130	3	30	
Isopropylbenzene (Cumene)	ug/L	ND	500	500	520	509	104	102	70-130	2	30	
Methyl-tert-butyl ether	ug/L	4040	500	500	4450	4490	83	90	70-130	1	30	
Methylene Chloride	ug/L	ND	500	500	359	370	72	74	70-130	3	30	
n-Butylbenzene	ug/L	ND	500	500	514	543	103	109	70-130	6	30	
n-Propylbenzene	ug/L	ND	500	500	513	537	103	107	70-130	5	30	
Naphthalene	ug/L	ND	500	500	477	501	95	100	70-130	5	30	
p-Isopropyltoluene	ug/L	ND	500	500	502	530	100	106	70-130	5	30	
sec-Butylbenzene	ug/L	ND	500	500	508	536	102	107	70-130	5	30	
Styrene	ug/L	ND	500	500	496	488	99	98	70-130	2	30	
tert-Butylbenzene	ug/L	ND	500	500	430	455	86	91	70-130	5	30	
Tetrachloroethene	ug/L	ND	500	500	527	507	105	101	70-130	4	30	
Toluene	ug/L	ND	500	500	506	506	101	101	70-155	0	30	
trans-1,2-Dichloroethene	ug/L	ND	500	500	536	545	107	109	70-130	2	30	
trans-1,3-Dichloropropene	ug/L	ND	500	500	500	498	100	100	70-130	1	30	
Trichloroethene	ug/L	ND	500	500	506	507	101	101	69-151	0	30	
Trichlorofluoromethane	ug/L	ND	500	500	572	582	114	116	70-130	2	30	
Vinyl acetate	ug/L	ND	1000	1000	1160	1160	116	116	70-130	0	30	
Vinyl chloride	ug/L	ND	500	500	548	555	110	111	70-130	1	30	
Xylene (Total)	ug/L	ND	1500	1500	1540	1540	102	103	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						100	97	70-130			
4-Bromofluorobenzene (S)	%						100	97	70-130			
Toluene-d8 (S)	%						100	100	70-130			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(704)875-9092

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 415620 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV Low Level
Associated Lab Samples: 92387844003

METHOD BLANK: 2304743 Matrix: Water
Associated Lab Samples: 92387844003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2-Dichloroethane	ug/L	ND	1.0	0.24	06/18/18 12:18	
Benzene	ug/L	ND	1.0	0.25	06/18/18 12:18	
Ethylbenzene	ug/L	ND	1.0	0.30	06/18/18 12:18	
Methyl-tert-butyl ether	ug/L	ND	1.0	0.21	06/18/18 12:18	
Naphthalene	ug/L	ND	1.0	0.24	06/18/18 12:18	
Toluene	ug/L	ND	1.0	0.26	06/18/18 12:18	
Xylene (Total)	ug/L	ND	1.0	1.0	06/18/18 12:18	
1,2-Dichloroethane-d4 (S)	%	104	70-130		06/18/18 12:18	
4-Bromofluorobenzene (S)	%	98	70-130		06/18/18 12:18	
Toluene-d8 (S)	%	98	70-130		06/18/18 12:18	

LABORATORY CONTROL SAMPLE: 2304744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichloroethane	ug/L	50	43.5	87	67-128	
Benzene	ug/L	50	44.8	90	80-125	
Ethylbenzene	ug/L	50	44.3	89	79-121	
Methyl-tert-butyl ether	ug/L	50	43.3	87	74-131	
Naphthalene	ug/L	50	46.6	93	73-133	
Toluene	ug/L	50	43.8	88	80-121	
Xylene (Total)	ug/L	150	136	91	81-126	
1,2-Dichloroethane-d4 (S)	%			101	70-130	
4-Bromofluorobenzene (S)	%			101	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2304745 2304746

Parameter	Units	92387695003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2-Dichloroethane	ug/L	ND	1000	1000	956	947	96	95	70-130	1	30	
Benzene	ug/L	337	1000	1000	1320	1310	98	97	70-148	1	30	
Ethylbenzene	ug/L	544	1000	1000	1530	1570	99	102	70-130	2	30	
Methyl-tert-butyl ether	ug/L	ND	1000	1000	989	995	99	100	70-130	1	30	
Naphthalene	ug/L	226	1000	1000	1260	1290	103	106	70-130	2	30	
Toluene	ug/L	6200	1000	1000	7460	7550	126	135	70-155	1	30	
Xylene (Total)	ug/L	3750	3000	3000	7050	7020	110	109	70-130	0	30	
1,2-Dichloroethane-d4 (S)	%						104	103	70-130			
4-Bromofluorobenzene (S)	%						103	99	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2304745 2304746

Parameter	Units	92387695003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Toluene-d8 (S)	%						101	99	70-130			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 415300 Analysis Method: EPA 8270
QC Batch Method: EPA 3510 Analysis Description: 8270 Water MSSV RVE
Associated Lab Samples: 92387844001, 92387844002, 92387844003

METHOD BLANK: 2303164 Matrix: Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,2,4-Trichlorobenzene	ug/L	ND	10.0	2.6	06/15/18 11:58	
1,2-Dichlorobenzene	ug/L	ND	10.0	3.2	06/15/18 11:58	
1,3-Dichlorobenzene	ug/L	ND	10.0	3.2	06/15/18 11:58	
1,4-Dichlorobenzene	ug/L	5.0J	10.0	2.6	06/15/18 11:58	
1-Methylnaphthalene	ug/L	ND	10.0	2.8	06/15/18 11:58	
2,2'-Oxybis(1-chloropropane)	ug/L	ND	10.0	2.5	06/15/18 11:58	
2,4,5-Trichlorophenol	ug/L	ND	10.0	2.3	06/15/18 11:58	
2,4,6-Trichlorophenol	ug/L	ND	10.0	2.8	06/15/18 11:58	
2,4-Dichlorophenol	ug/L	ND	10.0	2.7	06/15/18 11:58	
2,4-Dimethylphenol	ug/L	ND	10.0	1.9	06/15/18 11:58	
2,4-Dinitrophenol	ug/L	ND	50.0	10.1	06/15/18 11:58	
2,4-Dinitrotoluene	ug/L	ND	10.0	2.4	06/15/18 11:58	
2,6-Dinitrotoluene	ug/L	ND	10.0	2.9	06/15/18 11:58	
2-Chloronaphthalene	ug/L	ND	10.0	2.9	06/15/18 11:58	
2-Chlorophenol	ug/L	ND	10.0	2.9	06/15/18 11:58	
2-Methylnaphthalene	ug/L	ND	10.0	2.8	06/15/18 11:58	
2-Methylphenol(o-Cresol)	ug/L	ND	10.0	3.6	06/15/18 11:58	
2-Nitroaniline	ug/L	ND	50.0	5.5	06/15/18 11:58	
2-Nitrophenol	ug/L	ND	10.0	2.6	06/15/18 11:58	
3&4-Methylphenol(m&p Cresol)	ug/L	ND	10.0	2.4	06/15/18 11:58	
3,3'-Dichlorobenzidine	ug/L	ND	20.0	2.8	06/15/18 11:58	
3-Nitroaniline	ug/L	ND	50.0	5.0	06/15/18 11:58	
4,6-Dinitro-2-methylphenol	ug/L	ND	20.0	4.4	06/15/18 11:58	
4-Bromophenylphenyl ether	ug/L	ND	10.0	2.7	06/15/18 11:58	
4-Chloro-3-methylphenol	ug/L	ND	20.0	4.6	06/15/18 11:58	
4-Chloroaniline	ug/L	ND	20.0	6.8	06/15/18 11:58	
4-Chlorophenylphenyl ether	ug/L	ND	10.0	2.9	06/15/18 11:58	
4-Nitroaniline	ug/L	ND	20.0	3.6	06/15/18 11:58	
4-Nitrophenol	ug/L	ND	50.0	7.8	06/15/18 11:58	
Acenaphthene	ug/L	ND	10.0	3.4	06/15/18 11:58	
Acenaphthylene	ug/L	ND	10.0	3.0	06/15/18 11:58	
Aniline	ug/L	ND	10.0	3.1	06/15/18 11:58	
Anthracene	ug/L	ND	10.0	2.0	06/15/18 11:58	
Benzo(a)anthracene	ug/L	ND	10.0	1.3	06/15/18 11:58	
Benzo(a)pyrene	ug/L	ND	10.0	1.3	06/15/18 11:58	
Benzo(b)fluoranthene	ug/L	ND	10.0	1.5	06/15/18 11:58	
Benzo(g,h,i)perylene	ug/L	ND	10.0	1.8	06/15/18 11:58	
Benzo(k)fluoranthene	ug/L	ND	10.0	1.8	06/15/18 11:58	
Benzoic Acid	ug/L	ND	50.0	17.3	06/15/18 11:58	
Benzyl alcohol	ug/L	ND	20.0	7.0	06/15/18 11:58	
bis(2-Chloroethoxy)methane	ug/L	ND	10.0	3.0	06/15/18 11:58	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

METHOD BLANK: 2303164 Matrix: Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
bis(2-Chloroethyl) ether	ug/L	ND	10.0	3.1	06/15/18 11:58	
bis(2-Ethylhexyl)phthalate	ug/L	ND	6.0	1.4	06/15/18 11:58	
Butylbenzylphthalate	ug/L	ND	10.0	1.3	06/15/18 11:58	
Chrysene	ug/L	ND	10.0	1.3	06/15/18 11:58	
Di-n-butylphthalate	ug/L	ND	10.0	1.2	06/15/18 11:58	
Di-n-octylphthalate	ug/L	ND	10.0	1.2	06/15/18 11:58	
Dibenz(a,h)anthracene	ug/L	ND	10.0	1.9	06/15/18 11:58	
Dibenzofuran	ug/L	ND	10.0	3.4	06/15/18 11:58	
Diethylphthalate	ug/L	ND	10.0	2.0	06/15/18 11:58	
Dimethylphthalate	ug/L	ND	10.0	2.3	06/15/18 11:58	
Fluoranthene	ug/L	ND	10.0	1.7	06/15/18 11:58	
Fluorene	ug/L	ND	10.0	3.0	06/15/18 11:58	
Hexachloro-1,3-butadiene	ug/L	3.5J	10.0	3.1	06/15/18 11:58	
Hexachlorobenzene	ug/L	ND	10.0	2.5	06/15/18 11:58	
Hexachlorocyclopentadiene	ug/L	ND	10.0	3.4	06/15/18 11:58	
Hexachloroethane	ug/L	ND	10.0	4.0	06/15/18 11:58	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	1.7	06/15/18 11:58	
Isophorone	ug/L	ND	10.0	2.7	06/15/18 11:58	
N-Nitroso-di-n-propylamine	ug/L	ND	10.0	2.6	06/15/18 11:58	
N-Nitrosodimethylamine	ug/L	ND	10.0	2.8	06/15/18 11:58	
N-Nitrosodiphenylamine	ug/L	ND	10.0	2.0	06/15/18 11:58	
Naphthalene	ug/L	ND	10.0	3.2	06/15/18 11:58	
Nitrobenzene	ug/L	ND	10.0	3.4	06/15/18 11:58	
Pentachlorophenol	ug/L	ND	25.0	3.1	06/15/18 11:58	
Phenanthrene	ug/L	ND	10.0	2.4	06/15/18 11:58	
Phenol	ug/L	ND	10.0	2.7	06/15/18 11:58	
Pyrene	ug/L	ND	10.0	1.2	06/15/18 11:58	
2,4,6-Tribromophenol (S)	%	34	31-170		06/15/18 11:58	
2-Fluorobiphenyl (S)	%	98	45-139		06/15/18 11:58	
2-Fluorophenol (S)	%	16	13-118		06/15/18 11:58	
Nitrobenzene-d5 (S)	%	87	40-121		06/15/18 11:58	
Phenol-d6 (S)	%	22	18-105		06/15/18 11:58	
Terphenyl-d14 (S)	%	74	48-146		06/15/18 11:58	

LABORATORY CONTROL SAMPLE & LCSD: 2303165 2303166

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trichlorobenzene	ug/L	50	29.3	31.8	59	64	31-120	8	30	
1,2-Dichlorobenzene	ug/L	50	28.7	31.6	57	63	38-120	10	30	
1,3-Dichlorobenzene	ug/L	50	27.9	30.0	56	60	30-122	7	30	
1,4-Dichlorobenzene	ug/L	50	30.5	33.4	61	67	37-120	9	30	
1-Methylnaphthalene	ug/L	50	34.2	37.3	68	75	34-113	9	30	
2,2'-Oxybis(1-chloropropane)	ug/L	50	21.4	23.2	43	46	18-120	8	30	
2,4,5-Trichlorophenol	ug/L	50	35.9	39.9	72	80	43-113	10	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE & LCSD: 2303165 2303166

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
2,4,6-Trichlorophenol	ug/L	50	34.9	38.4	70	77	42-120	9	30	
2,4-Dichlorophenol	ug/L	50	39.3	42.5	79	85	30-120	8	30	
2,4-Dimethylphenol	ug/L	50	34.8	37.8	70	76	29-111	8	30	
2,4-Dinitrophenol	ug/L	250	188	209	75	84	19-132	11	30	
2,4-Dinitrotoluene	ug/L	50	40.3	44.2	81	88	58-128	9	30	
2,6-Dinitrotoluene	ug/L	50	38.1	41.9	76	84	54-129	9	30	
2-Chloronaphthalene	ug/L	50	32.3	36.1	65	72	43-117	11	30	
2-Chlorophenol	ug/L	50	35.4	38.0	71	76	37-120	7	30	
2-Methylnaphthalene	ug/L	50	35.2	38.2	70	76	33-120	8	30	
2-Methylphenol(o-Cresol)	ug/L	50	36.4	40.4	73	81	31-120	10	30	
2-Nitroaniline	ug/L	100	62.4	70.4	62	70	48-121	12	30	
2-Nitrophenol	ug/L	50	34.5	38.3	69	77	25-116	10	30	
3&4-Methylphenol(m&p Cresol)	ug/L	50	35.7	39.2	71	78	23-120	9	30	
3,3'-Dichlorobenzidine	ug/L	100	61.6	53.5	62	54	10-154	14	30	
3-Nitroaniline	ug/L	100	74.5	81.2	75	81	43-115	9	30	
4,6-Dinitro-2-methylphenol	ug/L	100	88.3	101	88	101	44-124	14	30	
4-Bromophenylphenyl ether	ug/L	50	40.6	45.7	81	91	34-113	12	30	
4-Chloro-3-methylphenol	ug/L	100	76.3	82.4	76	82	31-110	8	30	
4-Chloroaniline	ug/L	100	69.9	65.1	70	65	20-120	7	30	
4-Chlorophenylphenyl ether	ug/L	50	38.4	42.3	77	85	34-116	10	30	
4-Nitroaniline	ug/L	100	77.3	84.1	77	84	46-128	8	30	
4-Nitrophenol	ug/L	250	152	162	61	65	11-120	7	30	
Acenaphthene	ug/L	50	37.1	41.9	74	84	48-114	12	30	
Acenaphthylene	ug/L	50	36.6	41.1	73	82	48-112	12	30	
Aniline	ug/L	50	12.6	8.7J	25	17	26-120		30	L2
Anthracene	ug/L	50	42.0	47.3	84	95	57-118	12	30	
Benzo(a)anthracene	ug/L	50	39.2	42.4	78	85	56-121	8	30	
Benzo(a)pyrene	ug/L	50	40.1	44.1	80	88	55-127	10	30	
Benzo(b)fluoranthene	ug/L	50	38.5	42.5	77	85	53-128	10	30	
Benzo(g,h,i)perylene	ug/L	50	40.1	46.1	80	92	54-125	14	30	
Benzo(k)fluoranthene	ug/L	50	44.0	48.0	88	96	51-123	9	30	
Benzoic Acid	ug/L	250	141	143	56	57	10-120	2	30	
Benzyl alcohol	ug/L	100	80.0	87.6	80	88	27-120	9	30	
bis(2-Chloroethoxy)methane	ug/L	50	38.4	41.4	77	83	32-120	8	30	
bis(2-Chloroethyl) ether	ug/L	50	35.1	37.3	70	75	33-111	6	30	
bis(2-Ethylhexyl)phthalate	ug/L	50	34.8	37.0	70	74	50-145	6	30	
Butylbenzylphthalate	ug/L	50	32.4	35.1	65	70	54-138	8	30	
Chrysene	ug/L	50	39.4	43.1	79	86	58-127	9	30	
Di-n-butylphthalate	ug/L	50	38.6	43.2	77	86	56-125	11	30	
Di-n-octylphthalate	ug/L	50	31.1	33.2	62	66	50-134	6	30	
Dibenz(a,h)anthracene	ug/L	50	41.3	47.4	83	95	53-129	14	30	
Dibenzofuran	ug/L	50	38.8	43.4	78	87	45-120	11	30	
Diethylphthalate	ug/L	50	37.2	40.3	74	81	53-120	8	30	
Dimethylphthalate	ug/L	50	37.9	41.2	76	82	55-116	8	30	
Fluoranthene	ug/L	50	43.0	48.2	86	96	57-125	12	30	
Fluorene	ug/L	50	39.8	43.5	80	87	53-118	9	30	
Hexachloro-1,3-butadiene	ug/L	50	28.4	29.6	57	59	23-120	4	30	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

LABORATORY CONTROL SAMPLE & LCSD: 2303165 2303166

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Hexachlorobenzene	ug/L	50	42.2	46.5	84	93	49-116	10	30	
Hexachlorocyclopentadiene	ug/L	50	25.1	27.3	50	55	26-158	8	30	
Hexachloroethane	ug/L	50	29.2	30.6	58	61	30-114	4	30	
Indeno(1,2,3-cd)pyrene	ug/L	50	40.6	46.3	81	93	55-128	13	30	
Isophorone	ug/L	50	33.9	35.7	68	71	31-118	5	30	
N-Nitroso-di-n-propylamine	ug/L	50	41.3	44.6	83	89	32-119	8	30	
N-Nitrosodimethylamine	ug/L	50	31.4	33.7	63	67	13-120	7	30	
N-Nitrosodiphenylamine	ug/L	50	40.5	45.1	81	90	43-120	11	30	
Naphthalene	ug/L	50	33.9	37.0	68	74	32-120	9	30	
Nitrobenzene	ug/L	50	38.5	41.3	77	83	33-110	7	30	
Pentachlorophenol	ug/L	100	75.7	85.4	76	85	10-137	12	30	
Phenanthrene	ug/L	50	41.7	46.9	83	94	57-117	12	30	
Phenol	ug/L	50	25.7	26.7	51	53	10-120	4	30	
Pyrene	ug/L	50	36.2	39.0	72	78	55-122	7	30	
2,4,6-Tribromophenol (S)	%				91	98	31-170			
2-Fluorobiphenyl (S)	%				82	88	45-139			
2-Fluorophenol (S)	%				60	63	13-118			
Nitrobenzene-d5 (S)	%				79	84	40-121			
Phenol-d6 (S)	%				53	55	18-105			
Terphenyl-d14 (S)	%				53	55	48-146			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

QC Batch: 415699 Analysis Method: MADEP EPH
QC Batch Method: MADEP EPH Analysis Description: MADEP EPH NC Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

METHOD BLANK: 2305074 Matrix: Water
Associated Lab Samples: 92387844001, 92387844002, 92387844003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aliphatic (C09-C18)	ug/L	ND	100	100	06/19/18 14:41	N2
Aliphatic (C19-C36)	ug/L	ND	100	100	06/19/18 14:41	N2
Aromatic (C11-C22)	ug/L	ND	100	100	06/19/18 14:41	N2
2-Bromonaphthalene (S)	%	96	40-140		06/19/18 14:41	
2-Fluorobiphenyl (S)	%	94	40-140		06/19/18 14:41	
Nonatriacontane (S)	%	97	40-140		06/19/18 14:41	
o-Terphenyl (S)	%	88	40-140		06/19/18 14:41	

LABORATORY CONTROL SAMPLE & LCSD: 2305075 2305076

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Aliphatic (C09-C18)	ug/L	300	130	125	43	42	40-140	4	50	N2
Aliphatic (C19-C36)	ug/L	400	271	223	68	56	40-140	19	50	N2
Aromatic (C11-C22)	ug/L	850	530	546	62	64	40-140	3	50	N2
2-Bromonaphthalene (S)	%				63	76	40-140			
2-Fluorobiphenyl (S)	%				63	62	40-140			
Nonatriacontane (S)	%				79	64	40-140			
o-Terphenyl (S)	%				70	82	40-140			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

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.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

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

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

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results for this analyte in associated samples may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NCDOT -001 WBS 41499.1.3
Pace Project No.: 92387844

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92387844001	**P-6-SB-3**	MADEP EPH	415699	MADEP EPH	415942
92387844002	**P-2-SB-4**	MADEP EPH	415699	MADEP EPH	415942
92387844003	**P-54-SB-2**	MADEP EPH	415699	MADEP EPH	415942
92387844001	**P-6-SB-3**	MADEP VPH	414279		
92387844002	**P-2-SB-4**	MADEP VPH	414279		
92387844003	**P-54-SB-2**	MADEP VPH	414279		
92387844001	**P-6-SB-3**	EPA 3510	415300	EPA 8270	415391
92387844002	**P-2-SB-4**	EPA 3510	415300	EPA 8270	415391
92387844003	**P-54-SB-2**	EPA 3510	415300	EPA 8270	415391
92387844001	**P-6-SB-3**	EPA 8260	415295		
92387844002	**P-2-SB-4**	EPA 8260	415385		
92387844003	**P-54-SB-2**	EPA 8260	415620		

Laboratory receiving samples: Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Apex Companies

Project

WO# : 92387844

92387844

Courier: ☐ Commercial ☑ Fed Ex ☐ UPS ☐ USPS ☐ Other: ☐ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: MD 6/8/18

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

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☑ IR Gun ID: 92T040 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 4.3 **Correction Factor: Add/Subtract (°C)** +0.4

Cooler Temp Corrected (°C): 4.7

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☑ No	☐ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

Field Data Required? ☐ Yes ☐ No

COMMENTS/SAMPLE DISCREPANCY

One 4oz HT for sample P-2-5B-4 D out of PH Range

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: TC Date: 6/12/18

Project Manager SRF Review: TC Date: 6/12/18

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

**Bottom half of box is to list number of bottle

Project **WO# : 92387844**

PM: RWC Due Date: 06/15/18

CLIENT: 92-APEX MOOR

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1											2					6											2		
2											2					6											2		
3											2					6											2		
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #
P-2-SB4	HCl	6	6.8.18	17:00	2ml	411787

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.

Pace Analytical

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

Section A — Required Client Information:

Company:	Apex Companies
Address:	10610 Metromont Pkwy
	Suite 206, Charlotte, NC 28269
Email:	tfisher@apexcos.com
Phone: 704-799-6390	Fax
Requested Due Date:	Std

Section B — Required Project Information:

Report To:	Tommy Fisher
Copy To:	
Purchase Order #:	WBS 46499.1.3
Project Name:	Groundwater samples - NCDOT
Project #:	NCDOT-001

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	trey.carter@pacelabs.com,
Pace Profile #:	1223-2

Regulatory Agency:

State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	8260 VOCs	8270 SVOC	VPH	EPH	Residual Chlorine (Y/N)	9238784
1	P-6-SB-3	WT	G			6/7/18	1230	17	10	X			X						X	X	X	X		001
2	P-2-SB-4	WT	G			6/7/18	1615	17	10	X			X						X	X	X	X		002
3	P-54-SB-2	WT	G			6/4/18	1745	17	10	X			X						X	X	X	X		003
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Thomas Fisher/Apex	6/8/18	1518		6/8/18	1518	1.7 / Y / N / Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Thomas Fisher

SIGNATURE of SAMPLER: Thomas Fisher

DATE Signed: 6/8/18

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
1.7	Y	N	Y