

December 21, 2016

Mr. Terry Fox, L.G.
North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Preliminary Site Assessment**
Golden of Raeford, LLC Property (Parcel #204)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina
State Project: U-4405
WBS Element 39049.1.1
SIES Project No. 2016.0054.NDOT

Dear Mr. Fox:

Solutions-IES, Inc., (SIES) has completed the Preliminary Site Assessment conducted at the above-referenced property. The work was performed in accordance with the Technical and Cost proposal dated September 26, 2016, and the North Carolina Department of Transportation's (NCDOT's) Notice to Proceed dated September 26, 2016. Activities associated with the assessment consisted of conducting a geophysical investigation, collecting soil samples for analysis, and reviewing applicable North Carolina Department of Environmental Quality (NCDEQ) records. The purpose of this report is to document the field activities, present the laboratory analyses, and provide recommendations regarding the property.

Location and Description

The Golden of Raeford, LLC Property (Parcel #204) is located at 4537 Raeford Road in Fayetteville, Cumberland County, North Carolina. The property is situated on the south side of Raeford Road in the southwest quadrant of the intersection of Raeford Road and Scotland Drive (**Figure 1**). The property consists of an active gas station and convenience store (Raeford Road Sunoco) in the northern part of the property and a used tire retail and installation business (Raeford Road Service Center) on the southern part of the property. Based on a review of on-line UST registry information, three gasoline underground storage tanks (USTs) were installed on the property in 1985.

An asphalt parking area surrounds the building and extends almost to the property boundaries. An attached canopy is located at the front of the gas station building and includes two dispensers on each side of the canopy. A concrete pad covering the existing USTs is located east of the building/canopy (noted as U/G Tank on **Figure 2**). The proposed easement was not marked at the site as of the date of the field work, but NCDOT plan sheets show the proposed easement as potentially impacting the canopy.

The NCDOT requested a Preliminary Site Assessment for the right-of-way and proposed easement because of the presence of the gas station. The scope of work as defined in the Request for Technical and Cost Proposal was to evaluate the site with respect to the presence of known and unknown USTs and assess where contamination exists on the right-of-way/proposed easement. An estimate of the quantity of impacted soil was to be provided, if impacted soils were encountered.

SIES reviewed the on-line NCDEQ Incident Management database and Incident Number 9788 (Jim's Texaco) was assigned to the site. A further review of files regarding the incident from the NCDEQ Fayetteville Regional Office indicated that S&ME, Inc. (S&ME)¹ conducted a soil and groundwater investigation on an adjacent property as part of a real estate transaction. The investigation included soil and groundwater sampling on the Golden of Raeford (the former Jim's Texaco) property. One soil sample contained a detectable diesel fuel concentration, but below the applicable action level. A groundwater sample from an existing on-site well contained several compounds above the 2005 groundwater quality standards. Excerpts of this and other reports are provided in **Appendix A**.

In a report dated March 2006, Advantage Environmental Consultants, LLC², collected three groundwater samples and four soil samples from the Golden of Raeford property and measured for free product in the three existing monitoring wells (reportedly installed in 1992, but no documentation of the work was in the NCDEQ files). According to the conclusions of the report, "liquid phase hydrocarbon (LPH) was found to exist in 2 of the 3 existing monitoring wells at thicknesses of approximately 1.5 inches and 13 inches. The results of the soil and groundwater sampling indicated environmental impact throughout the majority of the site."

On April 24, 2006, Raeford Road Holdings purchased the site. Because the previous owner had ignored Notices of Violation for the contamination at the site, the NCDEQ issued a Notice of Regulatory Requirements (NORR) to the new owner requiring a Limited Site Assessment (LSA)³. As part of the LSA, three additional monitoring wells were installed at the site. The LSA reported that free product was detected at thicknesses of 1.67 and 2.14 feet in two of the site monitoring wells. Individual petroleum compounds were detected in the remaining groundwater samples, some of which were present at concentrations above the Gross Contaminant Levels (GCLs). Based on the presence of free product and exceedance of the GCLs, the site was assigned an intermediate risk classification.

¹ S&ME, Inc., Limited Soil and Groundwater Sampling Services, Proposed Wal-Mart SuperCenter Property, November 22, 2005.

² Advantage Environmental Consultants, LLC, Phase II Environmental Site Assessment, Vacant Raeford Road Sunoco Station, 4537 Raeford Road, March 6, 2006.

³ Advantage Environmental Consultants, LLC, Phase II Limited Site Assessment Prepared in Response to a Leaking Underground Storage Tank Located at Raeford Road Sunoco (Formerly Jim's Texaco), 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina, June 4, 2008.

To remediate the free product, aggressive fluid vapor recovery (AFVR) events were conducted in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013⁴, with limited success.

On March 27, 2013, the NCDEQ issued a NORR to the site owner to complete a Comprehensive Site Assessment (CSA). Ten soil borings were advanced in the area of the USTs and dispensers as part of the CSA. The analytical results indicated that “detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. Five additional groundwater monitoring wells were installed for the CSA, making a total of 10 shallow monitoring wells and 1 deep monitoring well. The CSA findings indicated that five of the ten wells contained free product and the remaining five wells contained petroleum constituents at concentrations above the 15A NCAC 2L groundwater quality standards. One well contained benzene at a concentration well above the GCL. Groundwater was encountered at depths of approximately 20 to 22 feet below the top of casing.

After reviewing the CSA, the NCDEQ issued a NORR for the responsible party to prepare a Corrective Action Plan (CAP)⁵. The CAP recommended continued AFVR events until such time the free product was eliminated. After free product removal, the CAP recommended reassessing the site to evaluate monitored natural attenuation. No additional documentation was in the files to indicate that corrective action has been implemented. As a convenience to the reader, relevant excerpts from the file documents are presented in **Attachment A** and the file reports (without lab data reports) are added to the end of this report.

SIES also examined the UST registration database to obtain UST ownership information. According to the database, the USTs on the property are operated under Facility Number 00-0-0000025474. The active USTs include three 10,000-gallon gasoline USTs. The owner and operator of the tanks are listed as follows:

Owner
Golden of Raeford LLC
383 Thorncliff Drive
Raeford, NC 28376

Operator
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, NC 28304

Geophysical Survey

Prior to SIES’ mobilization to the site, Pyramid Environmental & Engineering of Greensboro, NC (Pyramid) conducted a geophysical survey to determine if the known USTs were in the right-of-

⁵ Advantage Environmental Consultants, LLC, Corrective Action Plan, Raeford Road Sunoco, 4537 Raeford Road, Fayetteville, North Carolina, June 1, 2015.

way/proposed easement and if additional USTs were present in that area. The geophysical survey consisted of an electromagnetic (EM) survey using a Geonics EM61 time-domain electromagnetic induction meter to locate buried metallic objects, and ground penetrating radar (GPR) using a Geophysical Survey Systems Inc. Utility Scan DF with a dual frequency 300/800 MHz antenna. The instruments were used specifically to locate USTs.

A survey grid was laid out along the right-of-way/proposed easement with the X-axis oriented approximately parallel to Raeford Road and the Y-axis oriented approximately perpendicular to Raeford Road. The grid was positioned to cover the entire right-of-way/proposed easement, as shown on **Figure 2** of the geophysical survey report in **Attachment B**.

The survey lines were spaced five feet apart and EM data were collected continuously along each survey line with a data logger. After collection, the data were reviewed in the field with graphical computer software. Following the EM survey, a GPR survey was conducted to further evaluate any significant metallic anomalies.

Access was available to all areas of the right-of-way/proposed easement. Most of the anomalies detected with the EM survey that were attributed to visual cultural features at the ground surface. THE GPR survey verified concrete reinforcement and found no additional structures. Collectively, the geophysical data did not show evidence of metallic USTs within the right-of-way/proposed easement. Pyramid's detailed report of findings and interpretations is presented in **Attachment B**.

Site Assessment Activities

On October 26, 2016, SIES mobilized to the site to conduct a Geoprobe® direct-push investigation to evaluate subsurface soil conditions on the property. As directed by the NCDOT, the Geoprobe® borings were terminated at 10 feet below ground surface (ft bgs) unless the location was in the vicinity of a known or suspected UST, which resulted in a boring terminated at 12 ft bgs. Five direct-push borings (204-SB-1 through 204-SB-5) were advanced throughout the right-of-way/proposed easement (**Figure 2**). The soil boring logs are included as **Attachment C**. Borings 204-SB-1 and 204-SB-3 were located to evaluate the subsurface conditions near proposed drop inlets. Borings 204-SB-2 and 204-SB-4 were placed to assess the eastern dispenser island and the existing UST area. Boring 204-SB-5 was located to evaluate the subsurface at the western dispenser island (see photos in **Attachment D**).

Continuous sampling using a Geoprobe® resulted in generally good recovery of soil samples from the direct-push borings. Soil samples were collected and contained in four-foot long acetate sleeves inside the direct-push Macro-Core® sampler. Each of the sleeves was divided into two-foot long sections for soil

sample screening. Soil from each two-foot interval was placed in a resealable plastic bag and the bag was set aside for volatilization of organic compounds from the soil to the bag headspace. A photoionization detector (PID) probe was inserted into the bag and the reading was recorded.

If the PID concentrations in a boring were consistently low, one sample from the bottom interval was selected for analysis. If the PID concentrations were elevated, samples at the elevated and bottom intervals were selected for analyses. The PID results are summarized in **Table 1**.

The selected soil samples were submitted to an on-site mobile laboratory for analysis of total petroleum hydrocarbons (TPH) diesel range organics (DRO) and gasoline range organics (GRO using ultraviolet fluorescence (UVF) methodology. Each boring was backfilled with bentonite and drill cuttings to the surface after completion.

The lithology encountered by the direct-push samples was generally consistent throughout the site. The ground surface was covered with about 0.5 feet of asphalt or topsoil. Below this surface cover to a depth of about six to eleven feet was a tan fine-grained sand or clayey sand. Underlying the sand was a light brown silty clay. No groundwater or bedrock was noted in any of the borings.

According to the 1985 Geologic Map of North Carolina, the site is within of Coastal Plain Physiographic Province in North Carolina near the contact between the Cretaceous Black Creek and Middendorf Formations. The strata of the Black Creek Formation consist of gray to black clay, thin lenses of fine-grained sand and thick lenses of cross-bedded sand. The lithology may also include glauconite and fossils. In comparison, the Middendorf Formation consists of sand, sandstone, and mudstone that are laterally discontinuous. The soils observed at the site are consistent with the Middendorf Formation as the parent material.

Analytical Results

The laboratory data are summarized in **Table 1** and the complete report is presented in **Attachment E**. Seven soil samples were submitted for analysis (multiple samples were collected from borings 204-SB-2 and 204-SB-5). one sample contained detectable GRO compounds and six contained detectable DRO compounds. Soil sample 204-SB-3-8-10 contained 0.26 milligrams per kilogram (mg/kg) GRO. DRO concentrations in the 5 soil borings ranged from 0.16 to 17.1 mg/kg. The action levels are 50 mg/kg for GRO and 100 mg/kg for DRO⁶. None of the soil samples analyzed for this site contained DRO or GRO concentrations above their respective action levels.

⁶ NCDEQ, *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons (TPH)*, July 26, 2016.

Conclusions and Recommendations

A Preliminary Site Assessment was conducted to evaluate the Golden of Raeford, LLC Property (Parcel #204) located at 4537 Raeford Road in Fayetteville, Cumberland County, North Carolina. Documents within the NCDEQ UST Section files indicate that a release occurred at the site resulting in soil and groundwater contamination and free product. One soil sample collected as part of a CSA contained GRO above the action level. Groundwater samples from site monitoring wells indicated several petroleum compounds present at concentrations above the North Carolina groundwater quality standards.

A geophysical survey conducted at the site indicated no metallic USTs within the right-of-way/proposed easement. Five soil borings were advanced to evaluate the subsurface soil conditions along the right-of-way/proposed easement. None of the analyzed soil samples detected GRO or DRO concentrations above their respective action levels.

Free product and associated soil contamination have been detected throughout the eastern half of the site, including the right-of-way/proposed easement. Borings 204-SB-2, 204-SB-3, and 204-SB-4 were drilled in this location; however, soil sample UVF analysis detected neither GRO nor DRO above the applicable action levels. However, it is possible that some soil contamination exists in the smear zone above the water table (~20 to 22 feet below top of casing) in this location.

The UVF analytical results (**Table 1**) of the soil samples collected on October 25, 2016 indicate that none of the soil samples contained DRO or GRO concentrations above the action level. Therefore, no estimate of the volume of soil requiring possible remediation was made.


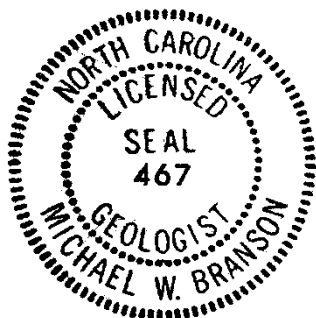
SIES appreciates the opportunity to work with the NCDOT on this project. Because compounds were detected above the method detection limit in the soil samples, SIES recommends that a copy of this report be submitted to the Division of Waste Management, UST Section, in the Fayetteville Regional Office. If you have any questions, please contact us at (919) 873-1060.

Sincerely,



Michael W. Branson, P.G.
Project Manager

Attachments



John Palmer, P.G.
Senior Hydrogeologist

TABLE 1
SOIL FIELD SCREENING AND ANALYTICAL RESULTS
GOLDEN OF RAEFORD LLC PROPERTY (PARCEL #204)
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA
STATE PROJECT: U-4405
WBS ELEMENT 39049.1.1
SIES PROJECT NO. 2016.0054.NDOT

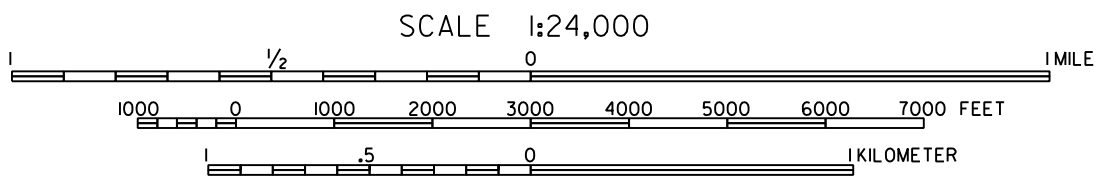
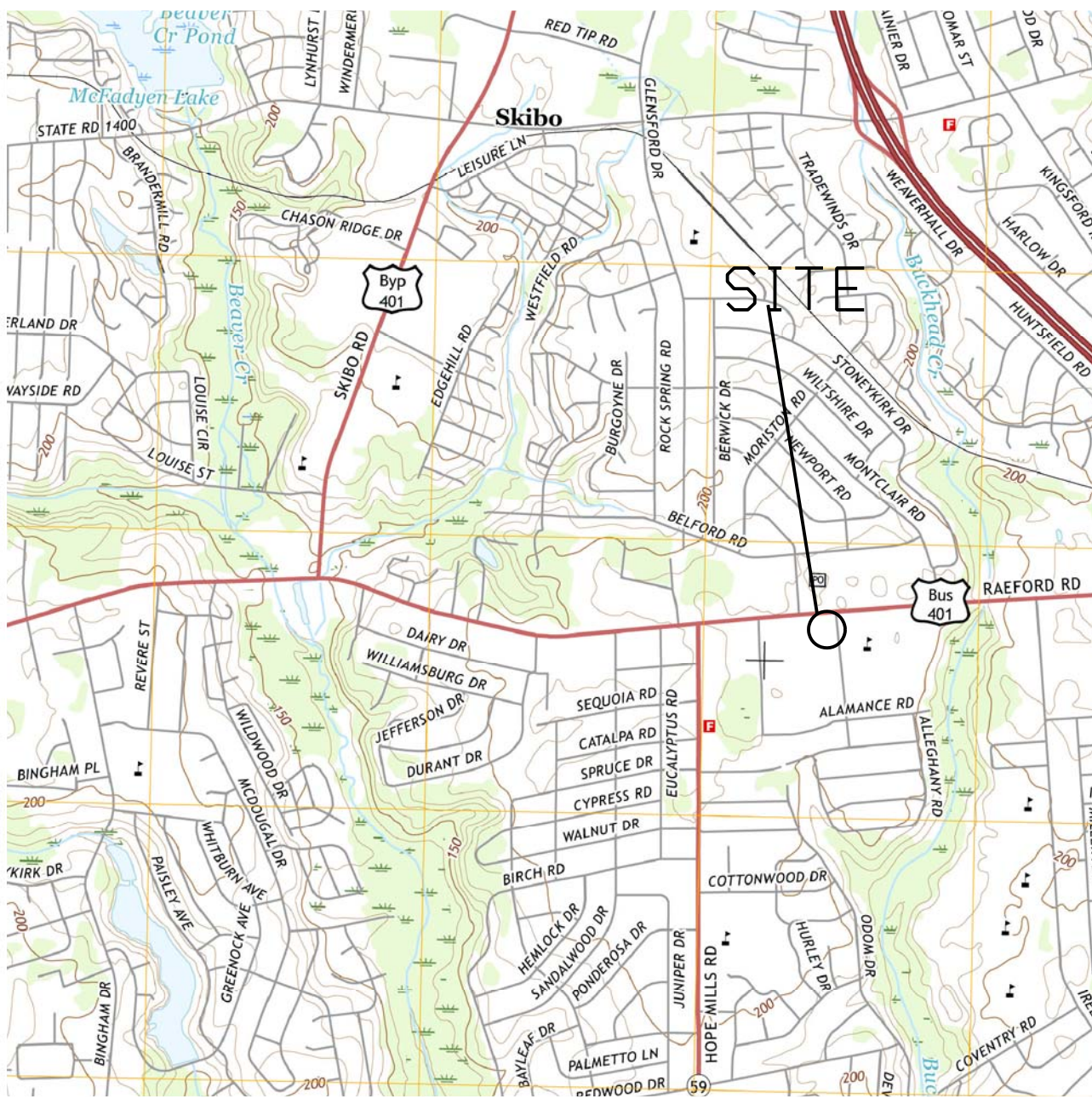
SAMPLE ID	DEPTH (ft)	PID READING (ppm)	SAMPLE ID	ANALYTICAL RESULTS (mg/kg)	
				UVF GRO	UVF DRO
		Action Level (mg/kg)		50	100
204-SB-1	0 - 2	0.0			
	2 - 4	0.0			
	4 - 6	0.0			
	6 - 8	0.0			
	8 - 10	18.6	204-SB-1-8-10	<0.58	2.4
204-SB-2	0 - 2	56.9			
	2 - 4	92.3			
	4 - 6	90.4	204-SB-2-4-6	<0.63	17.1
	6 - 8	57.3			
	8 - 10	80.1			
204-SB-3	10 - 12	8.5	204-SB-2-10-12	<0.56	1.0
	0 - 2	0.0			
	2 - 4	0.1			
	4 - 6	0.0			
	6 - 8	0.1			
204-SB-4	8 - 10	0.1	204-SB-3-8-10	0.26	0.16
	0 - 2	0.0			
	2 - 4	0.0			
	4 - 6	0.0			
	6 - 8	0.1			
204-SB-5	8 - 10	0.2			
	10 - 12	0.0	204-SB-4-10-12	<0.62	16.1
	0 - 2	53.9			
	2 - 4	28.1			
	4 - 6	71.6	204-SB-5-4-6	<0.63	<0.63
204-SB-5	6 - 8	36.1			
	8 - 10	17.6	204-SB-5-8-10	<0.58	6.0

- 1) ft - feet
- 2) ppm - parts per million.
- 3) PID - photoionization ionization detector
- 4) mg/kg - milligrams per kilogram.
- 5) UVF DRO - Diesel range organics by UVF.
- 6) UVF GRO - Gasoline range organics by UVF.
- 7) Action level based upon NCDEQ memo *Guidelines for North Carolina Action Limits for Total Petroleum Hydrocarbons* - July 29, 2016.
- 8) Soil samples were collected on October 26, 2016.
- 9) **Bold** values are above the detection level.

FIGURES



PROJECT NUMBER 2016-0054.NDOT
 CHECKED BY JEP
 PROJECT MANAGER MWB
 DATE NOVEMBER 2016
 FILE FAYETTEVILLE PSAS



SOURCE: U.S. GEOLOGICAL SURVEY 7.5 MIN QUADRANGLE: FAYETTEVILLE, NC (2016)

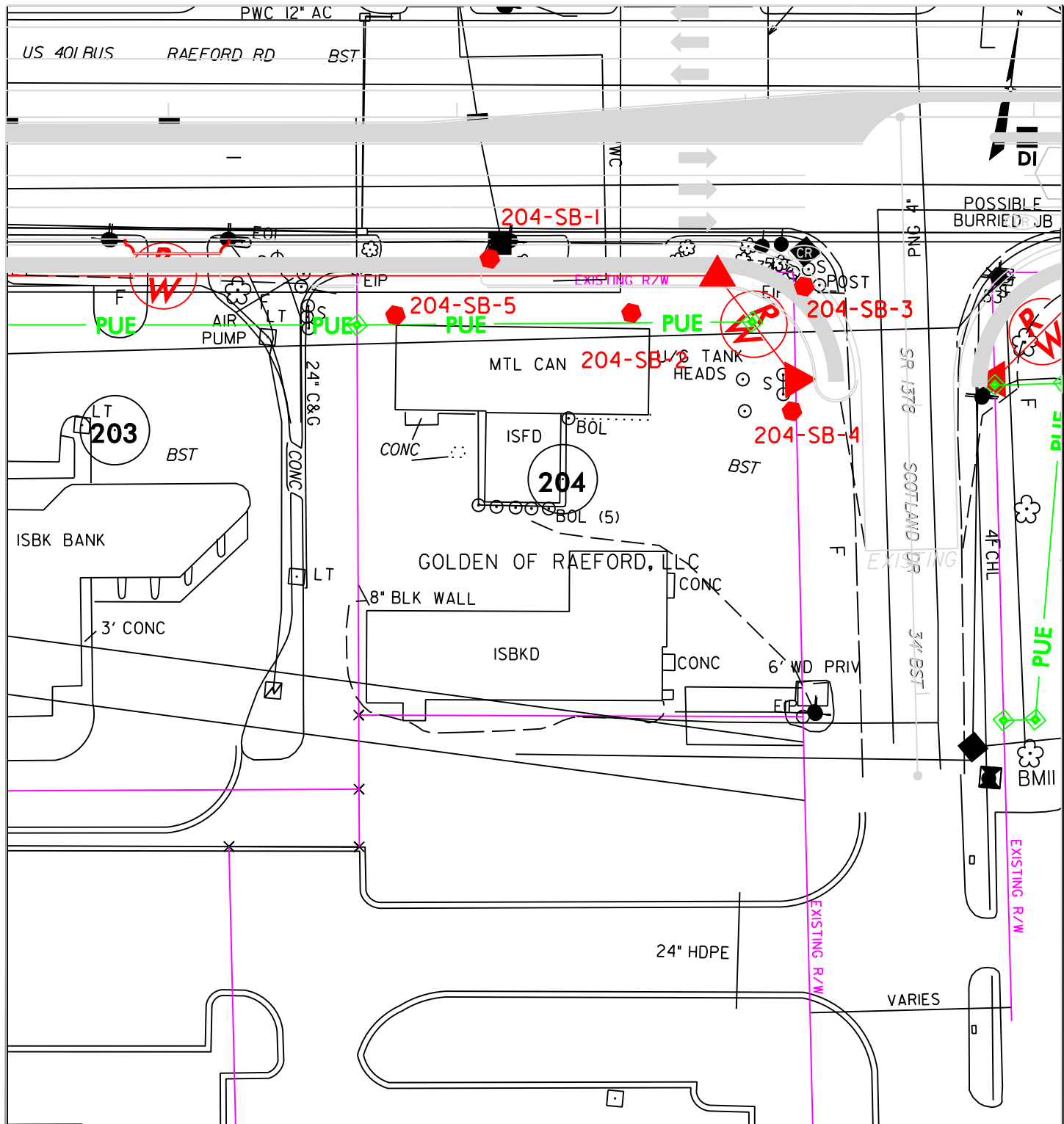


1101 NOWELL ROAD
 RALEIGH, NORTH CAROLINA 27607
 TEL: (919) 873-1060 FAX: (919) 873-1074

VICINITY MAP
 GOLDEN OF RAEFORD, LLC PROPERTY (PARCEL #204)
 FAYETTEVILLE, CUMBERLAND COUNTY NORTH CAROLINA

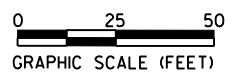
FIGURE
 1

PROJECT NUMBER 2016.0054.ND07
 MWB
 DRAFTER
 JEP
 CHECKED BY MWB
 PROJECT MANAGER MWB
 DATE NOVEMBER 2016
 FAYETTEVILLE PSAS
 FILE



LEGEND

204-SB-1
 ● SOIL SAMPLE LOCATION AND IDENTIFICATION



Solutions-IES
 Industrial & Environmental Services
 1101 NOWELL ROAD
 RALEIGH, NORTH CAROLINA 27607
 TEL: (919) 873-1060 FAX: (919) 873-1074

SITE MAP
 GOLDEN OF RAEFORD LLC PROPERTY (PARCEL #204)
 FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA

FIGURE
 2

ATTACHMENT A



November 22, 2005

Kimley-Horn and Associates, Inc.
4651 Charlotte Park Drive, Suite 300
Charlotte, North Carolina 28217

ATTENTION: Mr. Eric Riedinger

Reference: **LIMITED SOIL AND GROUNDWATER SAMPLING SERVICES**
Proposed Wal-Mart SuperCenter Property
Raeford Road
Fayetteville, North Carolina
Job No. 1051-05-508B

Dear Mr. Riedinger:

S&ME, Inc. (S&ME) is pleased to present the findings of our limited soil and groundwater sampling services conducted on the above referenced property in accordance with our Proposal No EPRO-05-10-06 (revised) dated November 4, 2005.

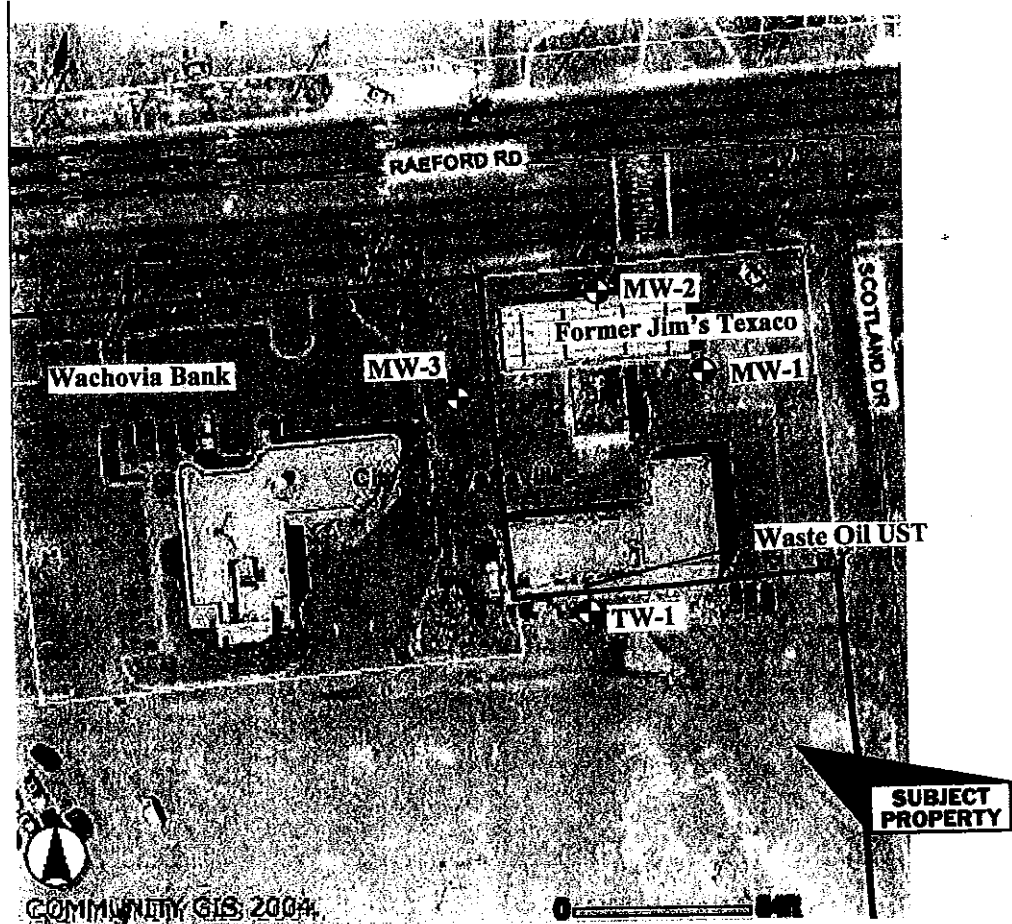
PROJECT INFORMATION


S&ME is currently performing a Phase I Environmental Site Assessment and a Geotechnical Subsurface Exploration, which were authorized by you for the above referenced property (Figure 1). An existing gasoline/convenience store with an automotive garage, which is identified as a Leaking Underground Storage Tank site (Jim's Texaco), adjoins the subject property to the northeast.

Based on our review of files maintained by the North Carolina Department of Environment and Natural Resources, three groundwater monitoring wells (MW-1 through MW-3) were installed to assess groundwater quality at the Jim's Texaco site in the early 1990s. Free product was measured in MW-1 and MW-2, which were installed on the gasoline station's property. High concentrations of petroleum constituents, which exceeded the North Carolina groundwater quality



Map shows the Northeast corner of the subject property



 Approximate Well Location

Scale: As Shown

Job No : 1051-05-508B

Date: 11/21/2005

Ref: 2001 Cumberland Co.
Aerial Tax Map



SAMPLE LOCATION MAP
Sampling Services
Proposed Wal-Mart SuperCenter
Raeford Road
Fayetteville, North Carolina

Figure No:

2

Table 2

Summary of Soil Quality Data
Limited Soil and Groundwater Sampling Services

Proposed Wal-Mart SuperCenter Property
Raeford Road
Fayetteville, North Carolina
Job No. 1051-05-508B

Analysis Compound	TW-1	Reportable Concentration
	13.5' - 15'	
<u>EPA Method 5030</u> Gasoline Range Organics	BDL	10
<u>EPA Method 3550</u> Diesel Range Organics	4	10
<u>EPA Method 9071</u> Oil and Grease	BDL	NA

All quantities expressed in mg/Kg milligrams per kilograms (parts per million)

BDL: below method detection limits

NA: Not applicable

Constituents not listed were below the detection limit of the analytical method.

Regulatory standards as set forth in "Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section"

Analytical results greater than applicable standards are given in bold print.

Table 3

Summary of Groundwater Quality Data
 Limited Soil and Groundwater Sampling Services

Proposed Wal-Mart SuperCenter Property
 Raeford Road
 Fayetteville, North Carolina
 Job No. 1051-05-508B

Compound	TW-1	MW-3	MW-3	2L Regulatory Standards
	11-8-05	11-8-05	9-28-92	
MTBE	6,500	BDL	1,382	200
Benzene	14,000	160	2,756	1
Toluene	47,000	BDL	10,348	1,000
Ethyl benzene	3,700	82	BDL	550
M,P,O-Xylenes	36,000	2,090	1,557	530
Naphthalene	BDL	BDL	58	21
1,4-Dichlorobenzene	BDL	BDL	423	75
1,2-Dichlorobenzene	BDL	BDL	424	620

All quantities expressed in µg/L micrograms per liter (parts per billion)

Analytical results of groundwater samples collected at MW-3 collected in 1992 were obtained from the Preliminary Assessment Report dated October 15, 1992 completed by TTS/Environmental.

BDL: below method detection limits

Regulatory standards as set forth in 15A NCAC 2L, "Classifications and Standards Applicable to the Groundwaters of North Carolina" or in guidance documents issued by the NCDENR.

Analytical results greater than applicable standards are given in bold print.

***A*dvantage *E*nvironmental
Consultants, LLC**

PHASE II ENVIRONMENTAL SITE ASSESSMENT

**Vacant Raeford Road Sunoco Station
4537 Raeford Road
Fayetteville, North Carolina**

**AEC Project No. 06-017
March 6, 2006**

Prepared for:

**Mr. Mervis Samuels
BB&T
9658 Baltimore Avenue, Suite 207
College Park, Maryland 20740**

On behalf of:

**Empire Petroleum Marketing LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855**

Prepared by:

**Advantage Environmental Consultants, LLC
Jessup 8610 Washington Blvd, Suite 217
Jessup, Maryland 20794
Phone (301) 776-0500
(301) 776-0500 • FAX (301) 776-1123**

4.0 INVESTIGATION ACTIVITY RESULTS

4.1 Soil Sample Analytical Results

The soil analytical results revealed elevated levels of VPH. Specifically, VPH was found in samples SB1 @ 21' and SB4 @ 11'. Samples SB3 @ 16' and SB5 @ 20' were below detection limits (bdl) for VPH. It should be noted that the detection limit is defined as the minimum concentration of the compound that can be reliably quantified by the laboratory performing the analysis per the recognized method. In addition to the VPH exceedances, several VOCs were also detected. The most significant were Benzene, n-butylbenzene, and Naphthalene. Most of the VOC analytes listed below are common petroleum constituents. Soil analytical results are illustrated on Figure 3 in Appendix A.

**Table 1: Soil Sample Analytical Results
Vacant Raeford Road Sunoco Station
4537 Raeford Road, Fayetteville, NC
February 16, 2005**

Analyte	SB1 @ 21'	SB3 @ 16'	SB4 @ 11'	SB5 @ 20'	NC DENR Commercial Cleanup Levels
Benzene	1.37	0.021	28.9	0.005	200
sec-Butylbenzene	0.655	bdl	97.1	bdl	4,088
n-Butylbenzene	3.00	bdl	364	bdl	4,088
Ethylbenzene	9.48	0.012	206	0.002	40,000
Isopropylbenzene	1.61	bdl	293	bdl	40,880
p-Isopropyltoluene	0.331	bdl	40	bdl	not listed
Methyl tert-Butyl Ether (MTBE)	0.234	0.110	bdl	0.086	4,088
Naphthalene	5.23	0.016	505	0.008	1,635
n-Propylbenzene	5.24	0.002	93.6	0.001	4,088
Toluene	26.9	0.036	351	0.013	82,000
1,3,5-Trimethylbenzene	9.70	0.009	189	0.003	20,440
1,2,4-Trimethylbenzene	31.0	0.030	585	0.012	20,440
Xylenes, Total	52.6	0.066	1,080	0.015	200,000
C5 - C8 Aliphatic Hydrocarbons, Unadjusted	134	bdl	4,160	bdl	not listed
C9 - C10 Aromatic Hydrocarbons	136	bdl	1,850	bdl	not listed
C9 - C12 Aliphatic Hydrocarbons, Unadjusted	392	bdl	4,470	bdl	not listed
C9 - C12 Aliphatic Hydrocarbons	256	bdl	2,260	bdl	not listed

All analytes reported in mg/kg

bdl = denotes results below analytical detection level

All analyte levels are compared to the North Carolina Department of Environment and Natural Resource (NC DENR) "Guidelines for Assessment and Corrective Action", Dated July 1, 2001

Copies of the completed laboratory analytical reports and chain-of-custody forms are provided in Appendix C.

4.2 Groundwater Sample Analytical Results

The groundwater analytical results revealed elevated levels of VPH. Specifically, VPH was found in samples SB1 W, SB3 W, and SB4 W. In addition to the VPH exceedances, several VOCs were also detected. The most significant were Benzene, Toluene, and Xylenes. Most of the VOC analytes listed below are common petroleum constituents. Copies of the completed laboratory analytical reports and chain-of-custody forms are provided in Appendix C.

**Table 2: Soil Sample Analytical Results
Vacant Raeford Road Sunoco Station
4537 Raeford Road, Fayetteville, NC
February 16, 2005**

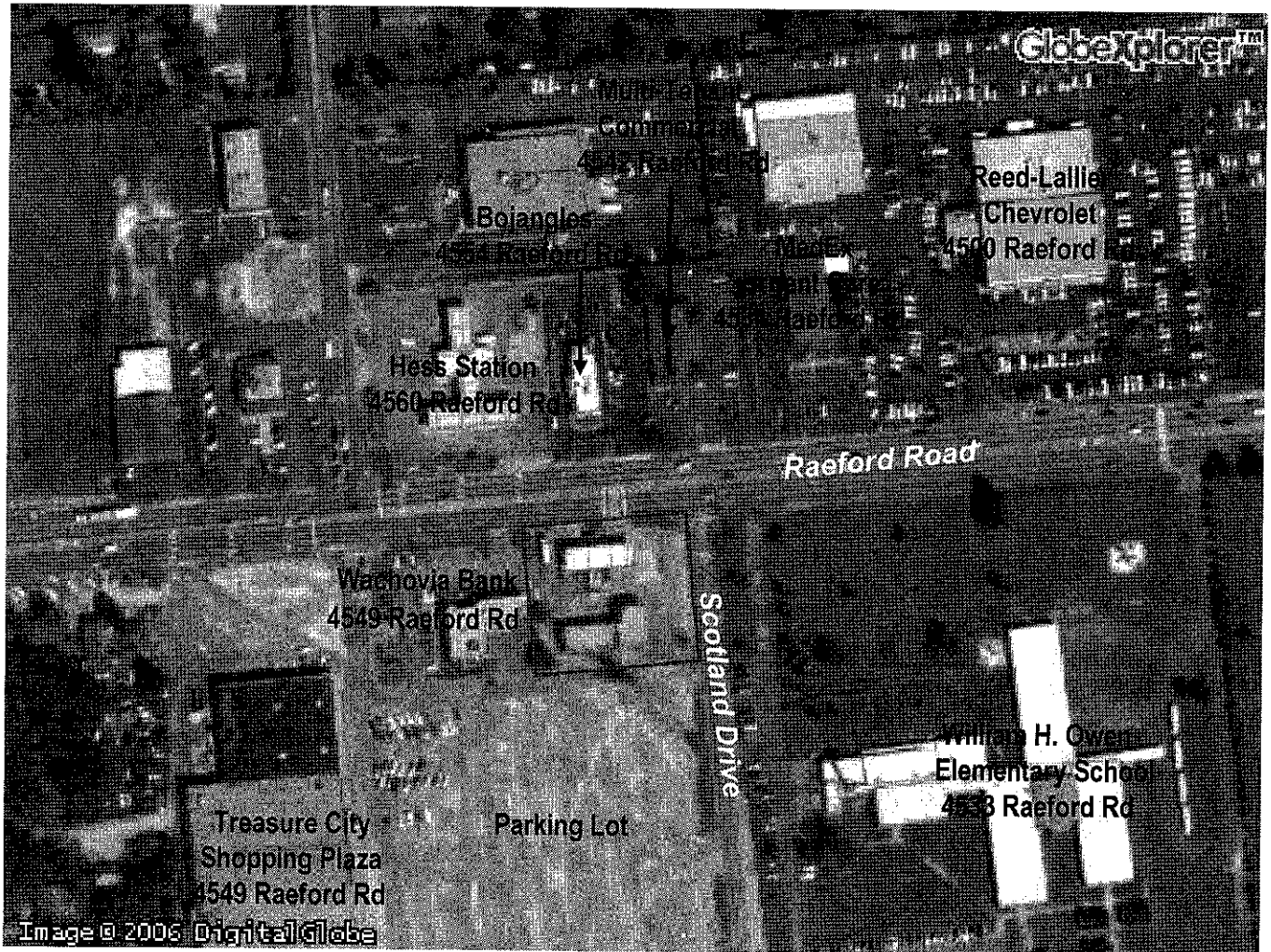
Analyte	SB1 W	SB3 W	SB4 W	NC DENR Groundwater Quality Standards
Benzene	14,500	9,050	1,120	1
sec-Butylbenzene	24	bdl	bdl	70
Chloroform	7.09	1.16	bdl	0.00019
1,2-Dibromoethane	15.5	bdl	bdl	0.0004
Ethylbenzene	2,250	2,970	1,470	29
2-Hexanone	61	bdl	bdl	280
Isopropylbenzene	194	91.3	168	70
p-Isopropyltoluene	11.3	11.0	8.55	not listed
Methyl tert-Butyl Ether (MTBE)	737	286	3.86	200
Methylene Chloride	bdl	bdl	10.2	5
Naphthalene	270	191	213	21
n-Propylbenzene	413	146	189	70
Toluene	25,700	27,900	15,500	1,000
1,1,2-Trichloroethane	bdl	bdl	8.30	not listed
1,3,5-Trimethylbenzene	794	580	349	350
1,2,4-Trimethylbenzene	2,490	2,190	1,300	350
Xylenes, Total	11,500	15,600	7,820	530
C5 - C8 Aliphatic Hydrocarbons, Unadjusted	117,000	47,000	45,700	not listed
C9 - C10 Aromatic Hydrocarbons	12,700	4,070	5,170	not listed
C9 - C12 Aliphatic Hydrocarbons, Unadjusted	42,600	20,200	21,300	not listed
C9 - C12 Aliphatic Hydrocarbons	29,900	16,100	16,100	not listed

All analytes in µg/L

bdl = denotes results below analytical detection level

bold denoted exceeding NC DENR Groundwater Quality Standards

All analyte levels are compared to the North Carolina Department of Environment and Natural Resource (NC DENR) "Guidelines for Assessment and Corrective Action", Dated July 1, 2001



**ADVANTAGE
ENVIRONMENTAL
CONSULTANTS, LLC**

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

**Figure 1 - Site Plan
 Vacant Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina**

AEC Project No.:
06-017

Report Date:
3/6/06

Drawn By:
LAK

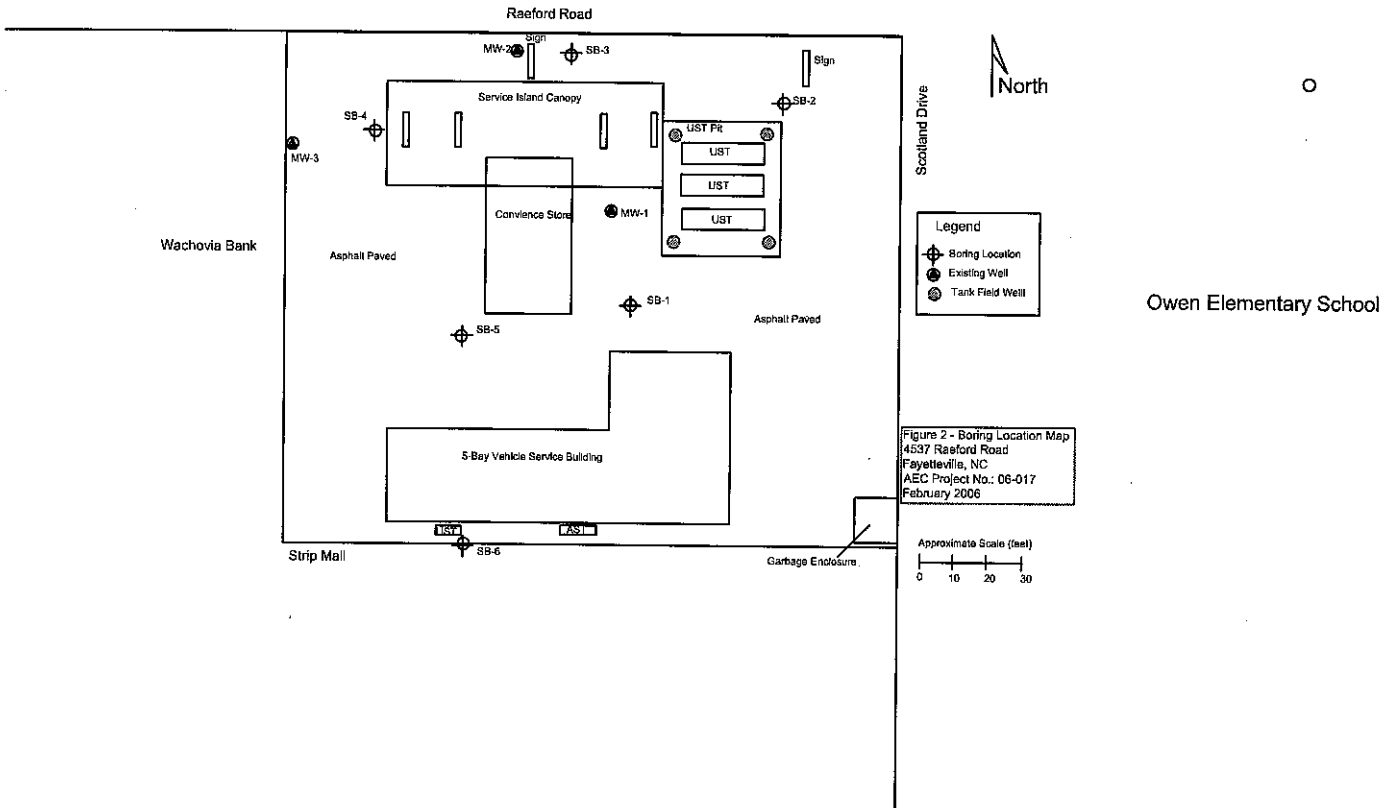
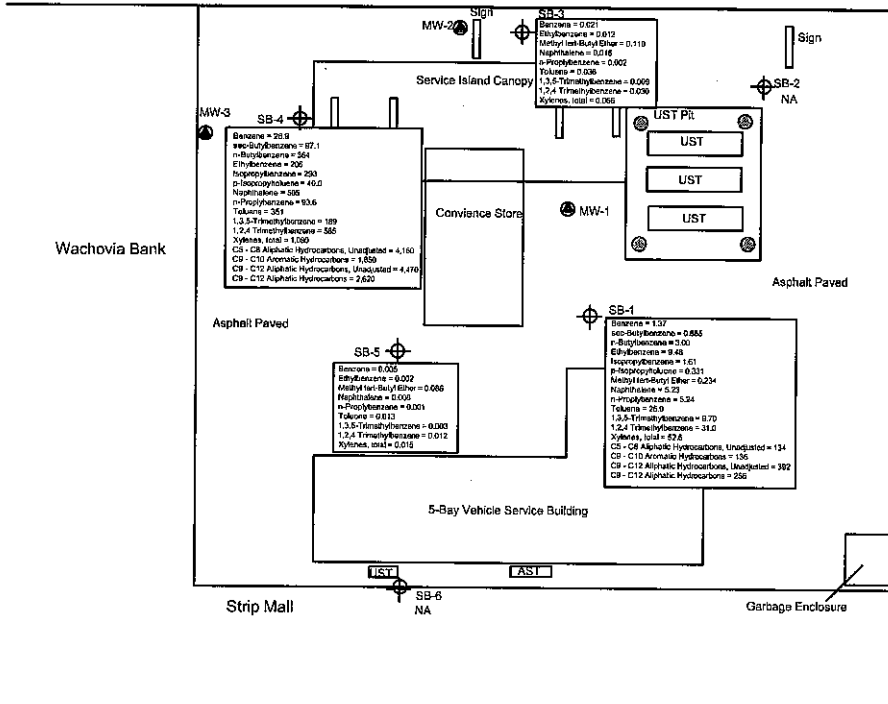


Figure 2 - Boring Location Map
 4537 Raeford Road
 Fayetteville, NC
 AEC Project No.: 06-017
 February 2006

Raeferd Road

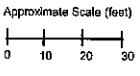


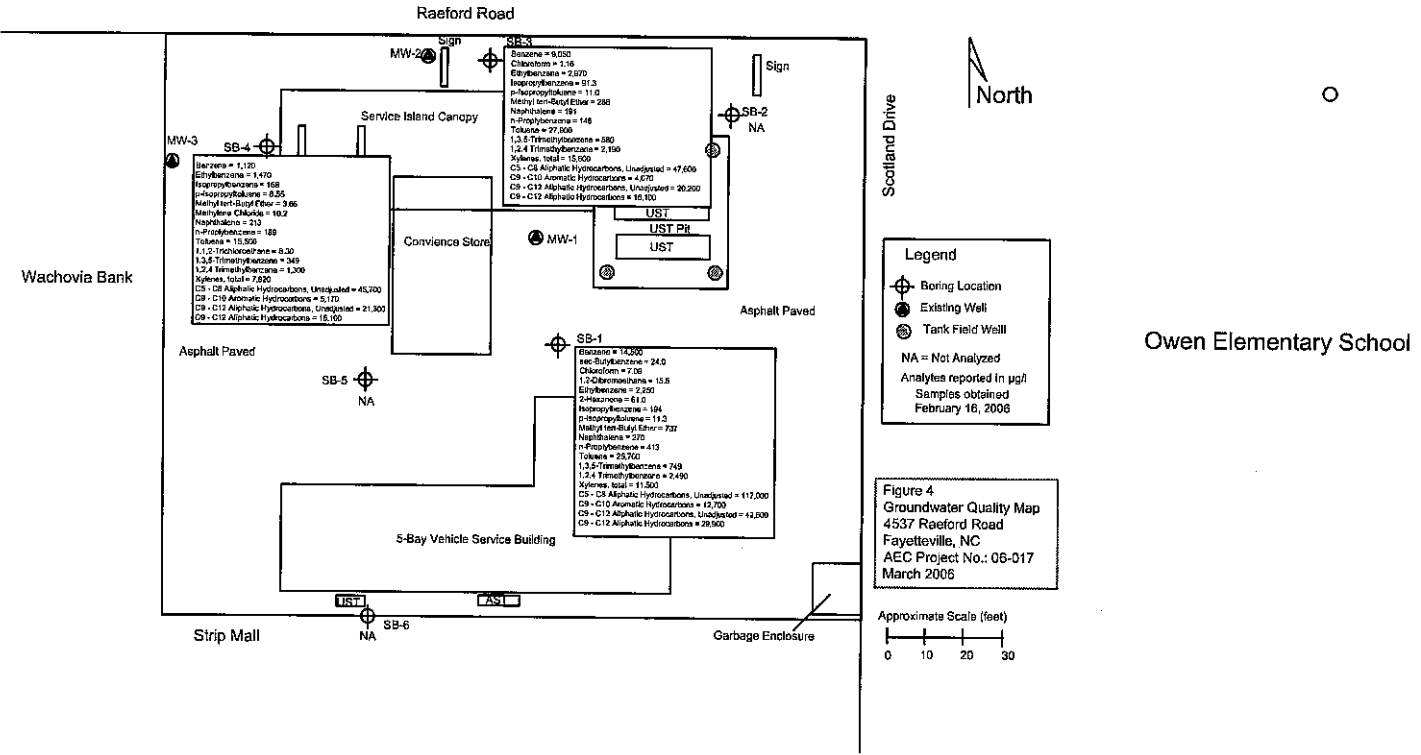
Legend

- Boring Location
- Existing Well
- Tank Field Well
- NA = Not Analyzed

Analytes reported in mg/kg
Samples obtained February 16, 2005

Figure 3 - Soil Quality Map
4537 Raeferd Road
Fayetteville, NC
AEC Project No.: 06-017
March 2005





REC-11
JUN 10 2008

DENR - FAYETTEVILLE REGIONAL OFFICE

**PHASE II LIMITED SITE ASSESSMENT
PREPARED IN RESPONSE TO A LEAKING UNDERGROUND STORAGE
TANK LOCATED AT:
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
4537 RAEFORD ROAD
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA**

**GROUNDWATER INCIDENT NUMBER: 9788
NCDENR-UST SECTION FACILITY ID # 0-025474**

June 4, 2008

Responsible Party:

Raeform Road Holdings, LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855
(301) 921-9200

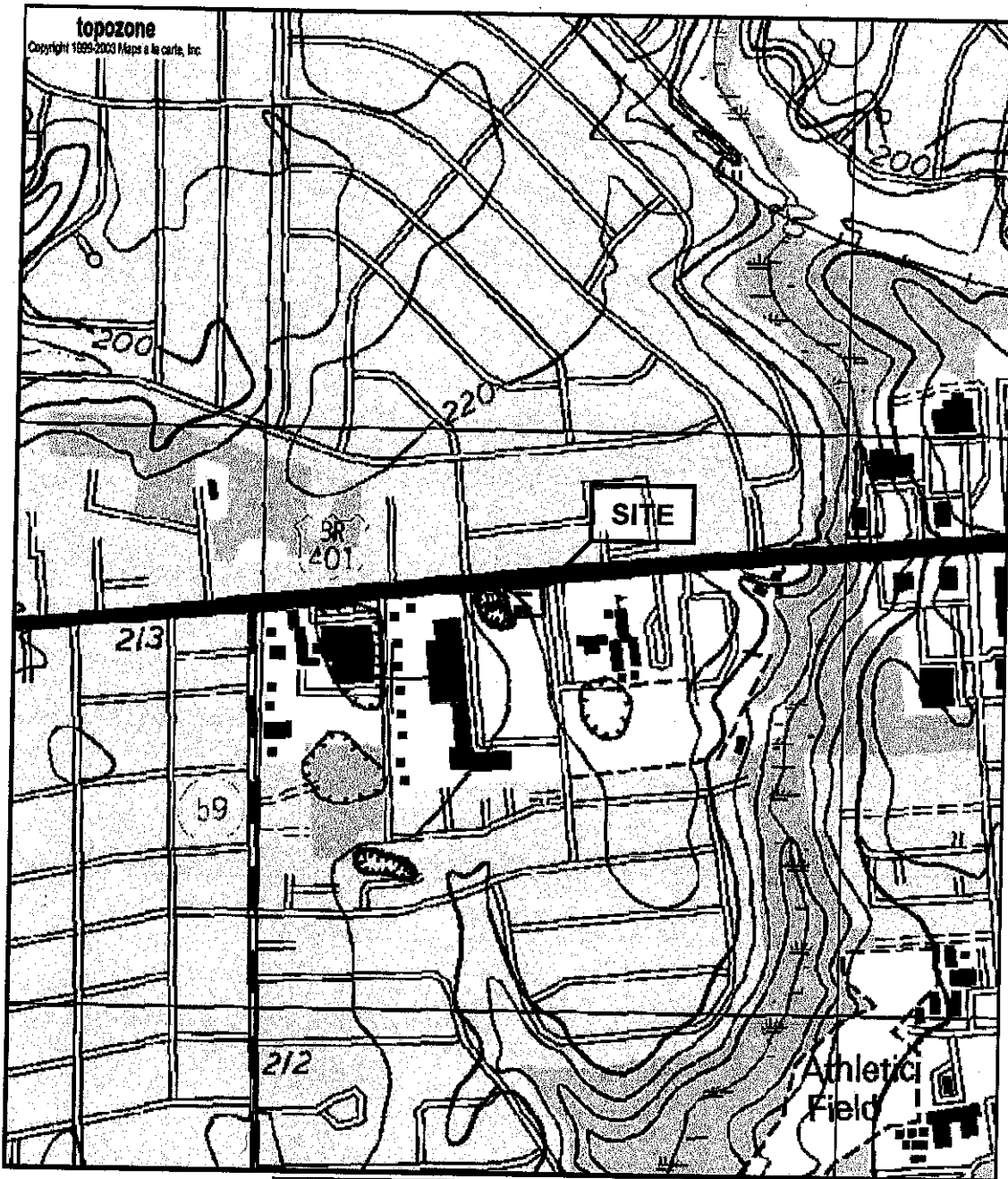
Current Property Owner:

Raeform Road Holdings, LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855
(301) 921-9200

Consultant:

Advantage Environmental Consultants, LLC
277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
(615) 376-3022

Release Discovery Date: April 27, 1992
Cause of Release: Underground Storage Tanks
UST Sizes and Contents: (3) 10,000-gallon gasoline, (1) 150-gallon waste oil
Latitude: 35° 02' 35"N, Longitude: 78° 57' 22"W



0 0.1 0.2 0.3 0.4 0.5 km
 0 0.09 0.18 0.27 0.36 0.45 mi
 Map center is 35° 02' 35"N, 78° 57' 22"W (WGS84/NAD83)
Fayetteville quadrangle
 Projection is UTM Zone 17 NAD83 Datum

M*
 G
 M=-8.449
 G=1.174

ADVANTAGE
 ENVIRONMENTAL
CONSULTANTS, LLC

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

Figure 1 – Topographic Map
 Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina

AEC Project No.:
08-030N

Report Date:
5/29/08

Drawn By:
WML



Figure 2 – Adjacent Properties
 Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina

ADVANTAGE
 ENVIRONMENTAL
 CONSULTANTS, LLC

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

AEC Project No.:
 08-030N

Report Date:
 5/29/08

Drawn By:
 WML

Raeferd Road

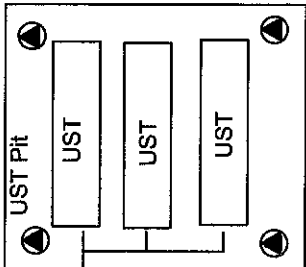
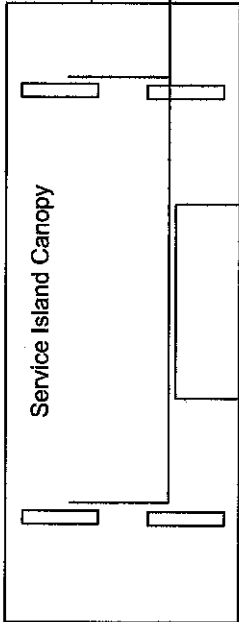
MW-2



Sign

Sign

Service Island Canopy



Convenience Store

MW-1



Asphalt Paved

MW-4

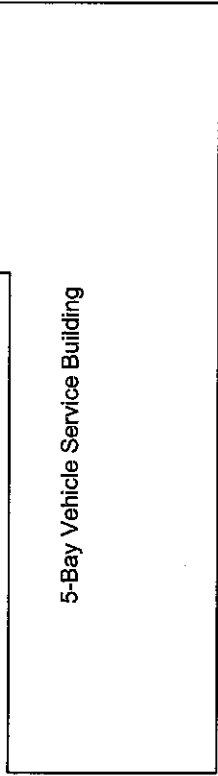


Asphalt Paved

MW-5



5-Bay Vehicle Service Building

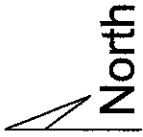


UST

AST

Garbage Enclosure

MW-6



Scotland Drive

Legend

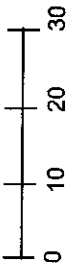
- New Well
- Existing Well
- Tank Field Well

Utilities

- Electric
- Water
- Gas
- Petroleum

Figure 3 - Site Map
 4537 Raeferd Road
 Fayetteville, NC
 AEC Project No.: 08-030N
 May 2008

Approximate Scale (feet)



Raeferd Road

Sign

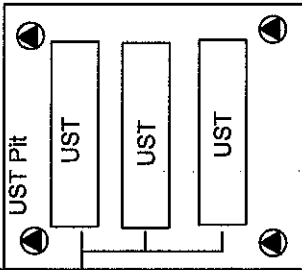
MW-2

1.67' Free Product

B - 68
 E - 23
 T - 86
 X - 250
 M - 12
 TPH - 3810

MW-3

Service Island Canopy



Convenience Store

MW-1

2.14' Free Product

Asphalt Paved

B - 8300
 E - 2000
 T - 22000
 X - 11000
 M - 2000
 TPH - 710

MW-4

Asphalt Paved

B - 2000
 E - 670
 T - 2100
 X - 3200
 M - 1400
 TPH - 5230

MW-5

B - 5300
 E - 1300
 T - 14000
 X - 6000
 M - 1200
 TPH - 330

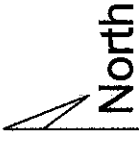
MW-6

5-Bay Vehicle Service Building

UST

UST

Garbage Enclosure



Legend

- New Well
- Existing Well
- Tank Field Well

Utilities

- Electric
- Water
- Gas
- Petroleum

Concentrations in ug/L

- B - Benzene
- E - Ethylbenzene
- T - Toluene
- X - Xylene
- M - MTBE
- TPH - VPH + EPH

Scotland Drive

Figure 4 - Groundwater

Contaminant Map

May 1, 2008

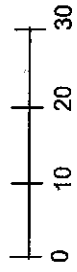
4537 Raeferd Road

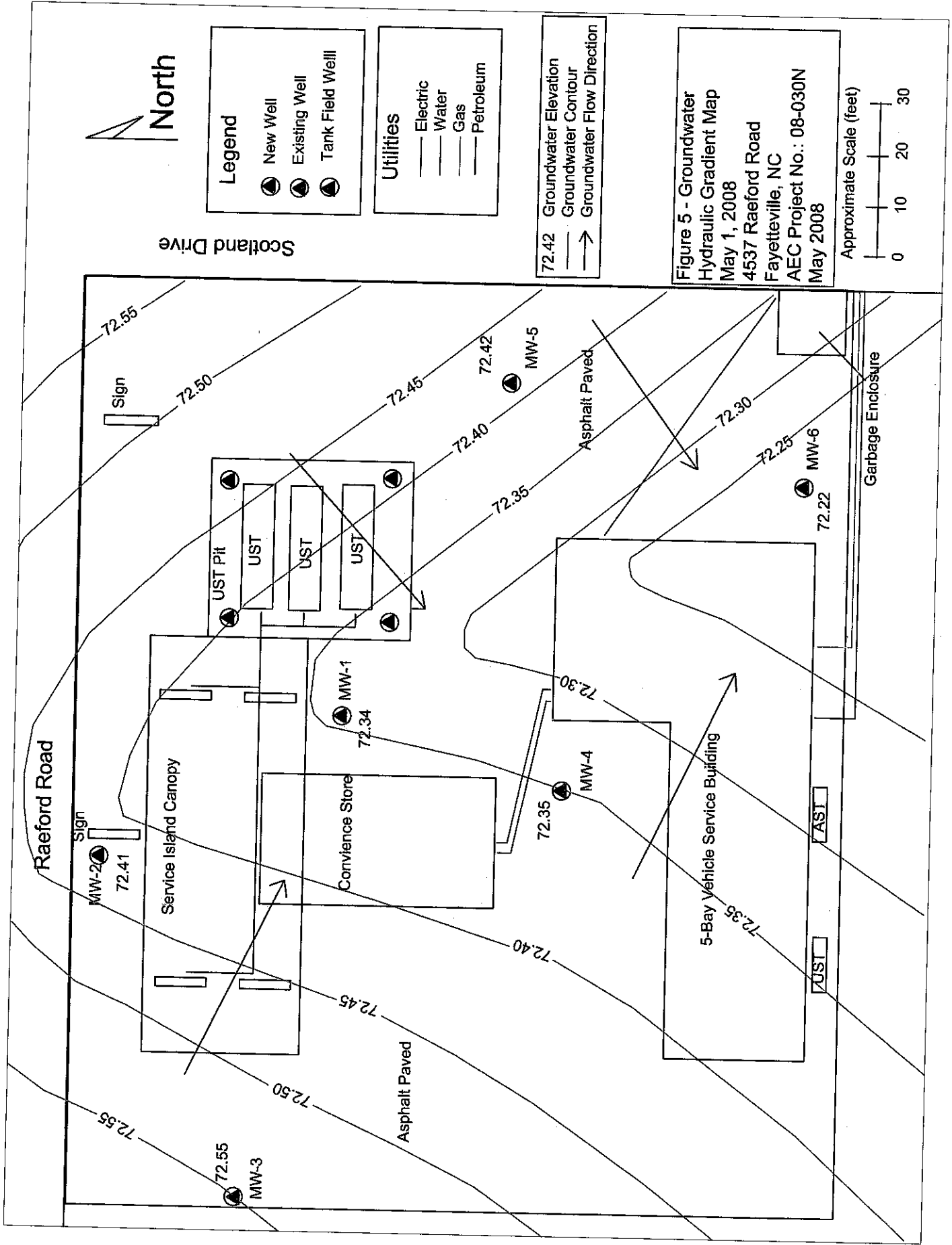
Fayetteville, NC

AEC Project No.: 08-030N

May 2008

Approximate Scale (feet)





North

Legend

- New Well
- Existing Well
- Tank Field Well

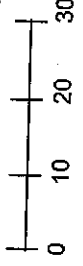
Utilities

- Electric
- Water
- Gas
- Petroleum

- 72.42 Groundwater Elevation
- Groundwater Contour
- Groundwater Flow Direction

Figure 5 - Groundwater Hydraulic Gradient Map
 May 1, 2008
 4537 Raeford Road
 Fayetteville, NC
 AEC Project No.: 08-030N
 May 2008

Approximate Scale (feet)



Raeford Road

Scotland Drive

Sign

MW-2
72.41

Service Island Canopy

MW-1
72.34

Convenience Store

MW-4
72.35

5-Bay Vehicle Service Building

UST

UST

Garbage Enclosure

Asphalt Paved

Asphalt Paved

72.55

72.50

72.50

72.55

MW-3

72.45

72.45

72.40

72.42

MW-5

72.35

72.30

72.30

72.25

MW-6

72.22

SECTION B
TABLES/WELL CONSTRUCTION LOGS

Table 1

UST Information
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina 28304

UST ID #	Last Contents	Previous Contents	Capacity (gallons)	Construction Details	Descriptions of Associated Piping	Date Tank Installed	Status of UST	Was release associated with UST
T-1	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-2	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-3	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-4	Waste Oil	Waste Oil	150	Steel	Steel	unknown	Not in Use	No
Removed Tank 1	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 2	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 3	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown

Table 3

Summary of Analytical Data – Groundwater
 EPA Method MADEP-EPH and MADEP-VPH
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina 28304

Analytical Method >		MADEP-VPH	MADEP-EPH MADEP-VPH	MADEP-EPH	MADEP-EPH MADEP-VPH
Well ID	Contaminant of Concern >	C5-C8 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics
	Date Collected m/dd/yy				
MW-1	5/01/08	FP	FP	FP	FP
MW-2	5/01/08	FP	FP	FP	FP
MW-3	5/01/08	380	1690	350	1390
MW-4	5/01/08	ND	350	ND	360
MW-5	5/01/08	ND	5,000	ND	230
MW-6	5/01/08	ND	ND	ND	330
2L Standard (ug/l)		420	4,200	42,000	210
GCL (ug/l)		NA	NA	NA	NA

FP – Free Product

Results are in ug/l

ND – None Detected

NA – None Available

Bold results indicate exceedence of 2L Standards

10/20/13
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
FAYETTEVILLE REGIONAL OFFICE

**COMPREHENSIVE SITE ASSESSMENT
PREPARED IN RESPONSE TO A LEAKING UNDERGROUND
STORAGE TANK(S) AT:
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA**

**NCDENR-UST SECTION INCIDENT NUMBER: 9788
NCDENR-UST SECTION FACILITY ID# 0-025474**

July 19, 2013

Responsible Party:

Raeford Road Holdings, LLC
9055 Comprint Court, Suite 200
Gaithersburg, Maryland 20877
(301) 921-9200

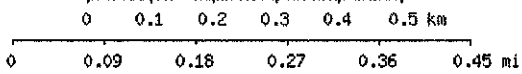
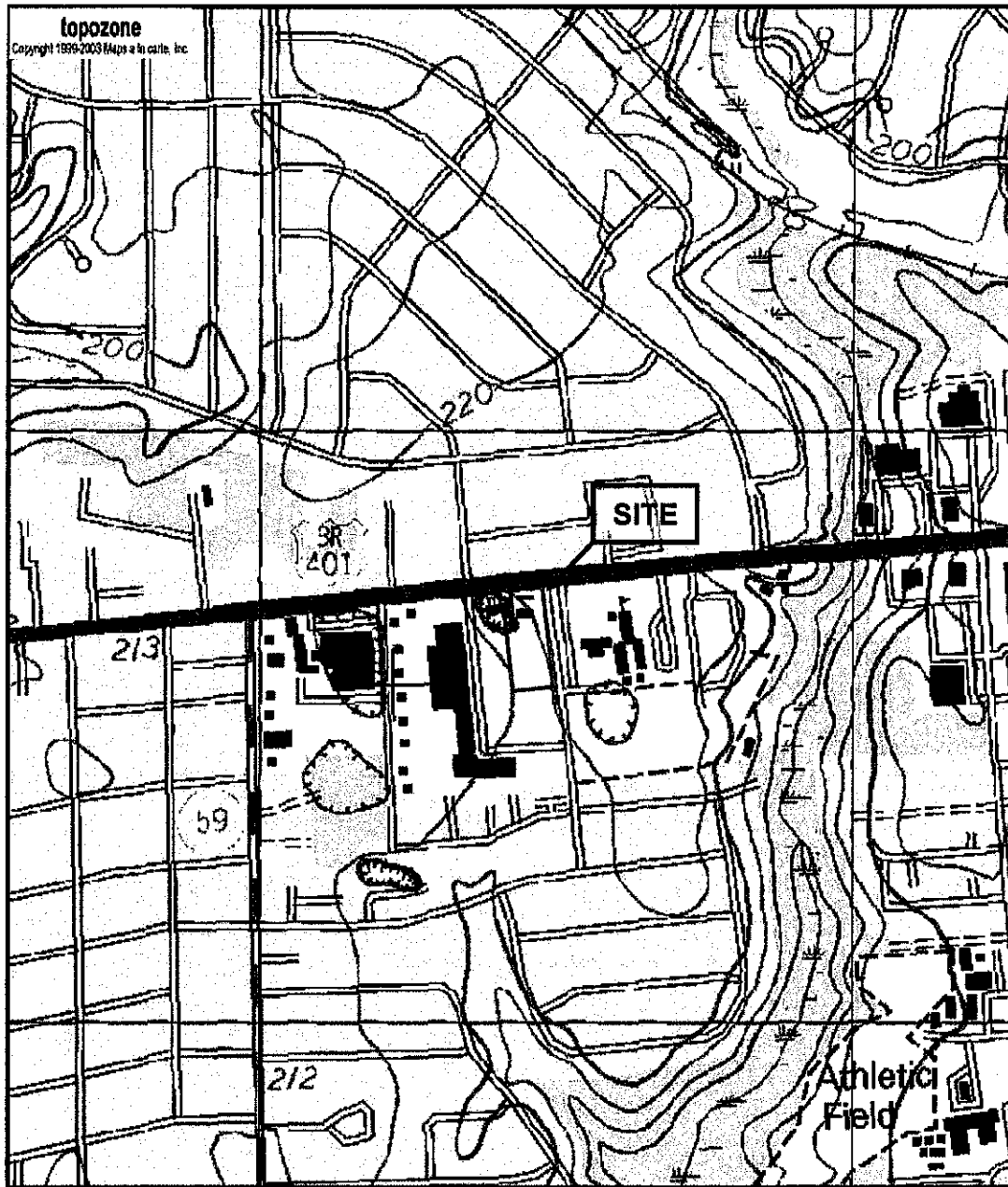
Current Property Owner:

Raeford Road Holdings, LLC
9055 Comprint Court, Suite 200
Gaithersburg, Maryland 20877
(301) 921-9200

Consultant:

Advantage Environmental Consultants, LLC
277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
(615) 376-3022

Release Discovery Date: April 27, 1992
Cause of Release: Underground Storage Tanks
UST Size and Contents: (3) 10,000-gallon gasoline USTs, & (1) 150-gallon waste oil UST
Latitude: N 35° 02' 35", Longitude: W 78° 57' 22"



Map center is 35° 02' 35"N, 78° 57' 22"W (WGS84/NAD83)
Fayetteville quadrangle
 Projection is UTM Zone 17 NAD83 Datum

M=8.449
 G=1.174

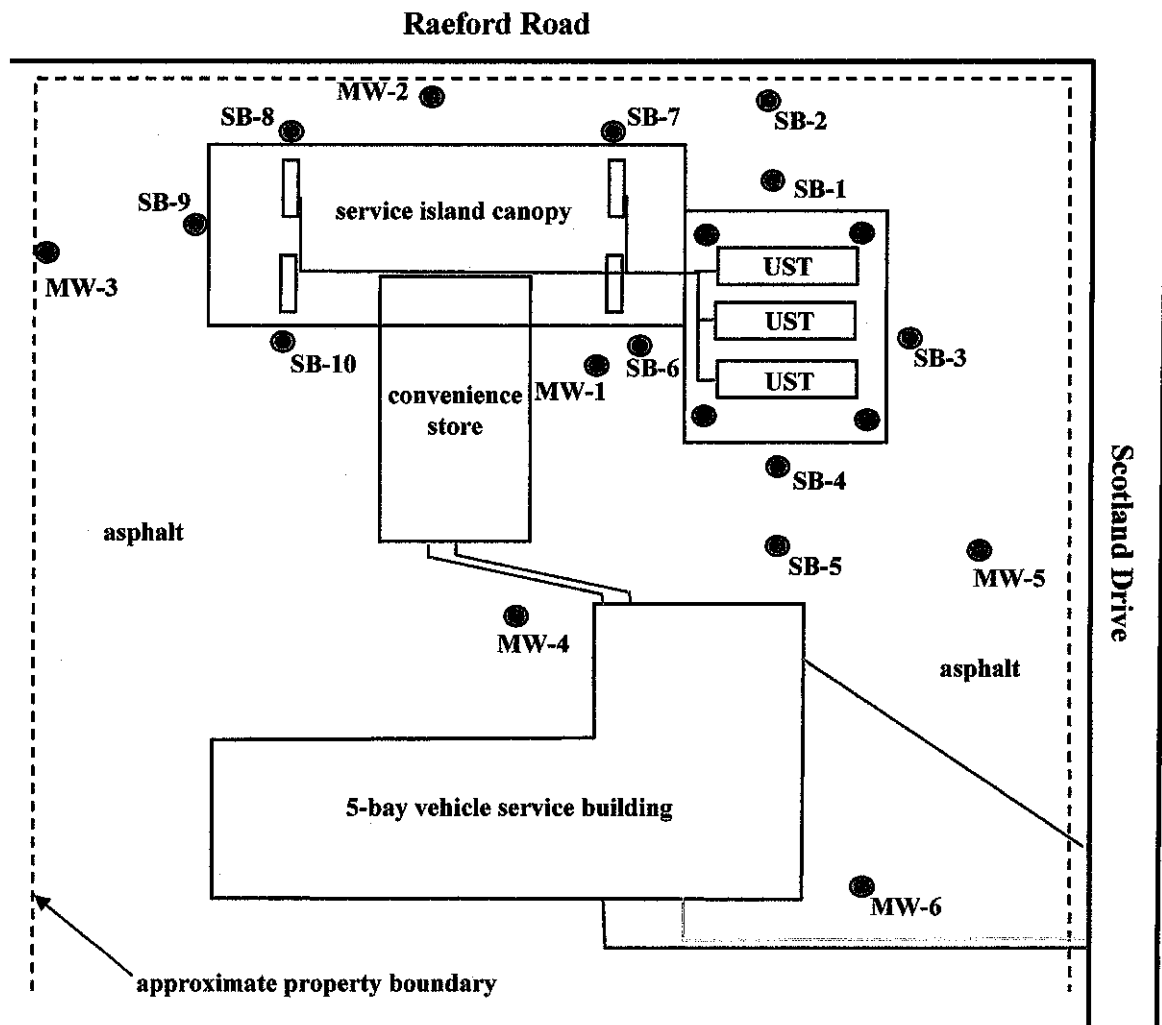


277 Wilson Pike Circle, Suite 201
 Brentwood, Tennessee 37027
 Phone: 615-376-3022 Fax: 615-376-3034

Figure 1 – Topographic Map
Raeform Road Sunoco
4537 Raeform Road
Fayetteville, North Carolina

AEC Project No.: 13-059N	Report Date: 7/13	Drawn By: WML
------------------------------------	-----------------------------	-------------------------

FIGURE 2 SOIL BORING AND UST SYSTEM LOCATIONS



↑ N

- - tank field well
- - monitoring well
- - soil boring location

Utilities

- electric
- water
- gas
- petroleum

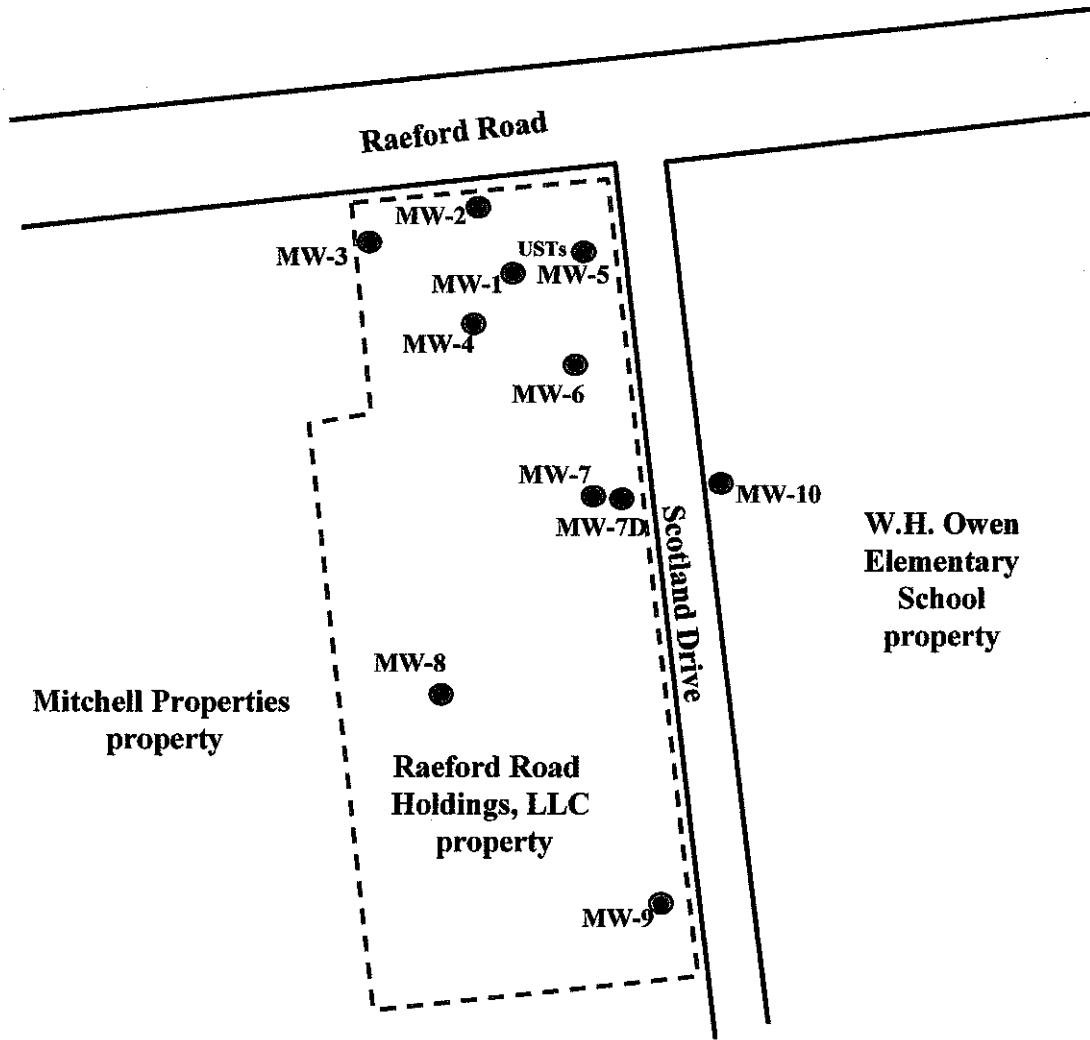


277 Wilson Pike Circle, Suite 201
 Brentwood, Tennessee 37027
 Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=30'	WML

FIGURE 3 MONITORING WELL LOCATION MAP



- - shallow monitoring wells
- - deep well

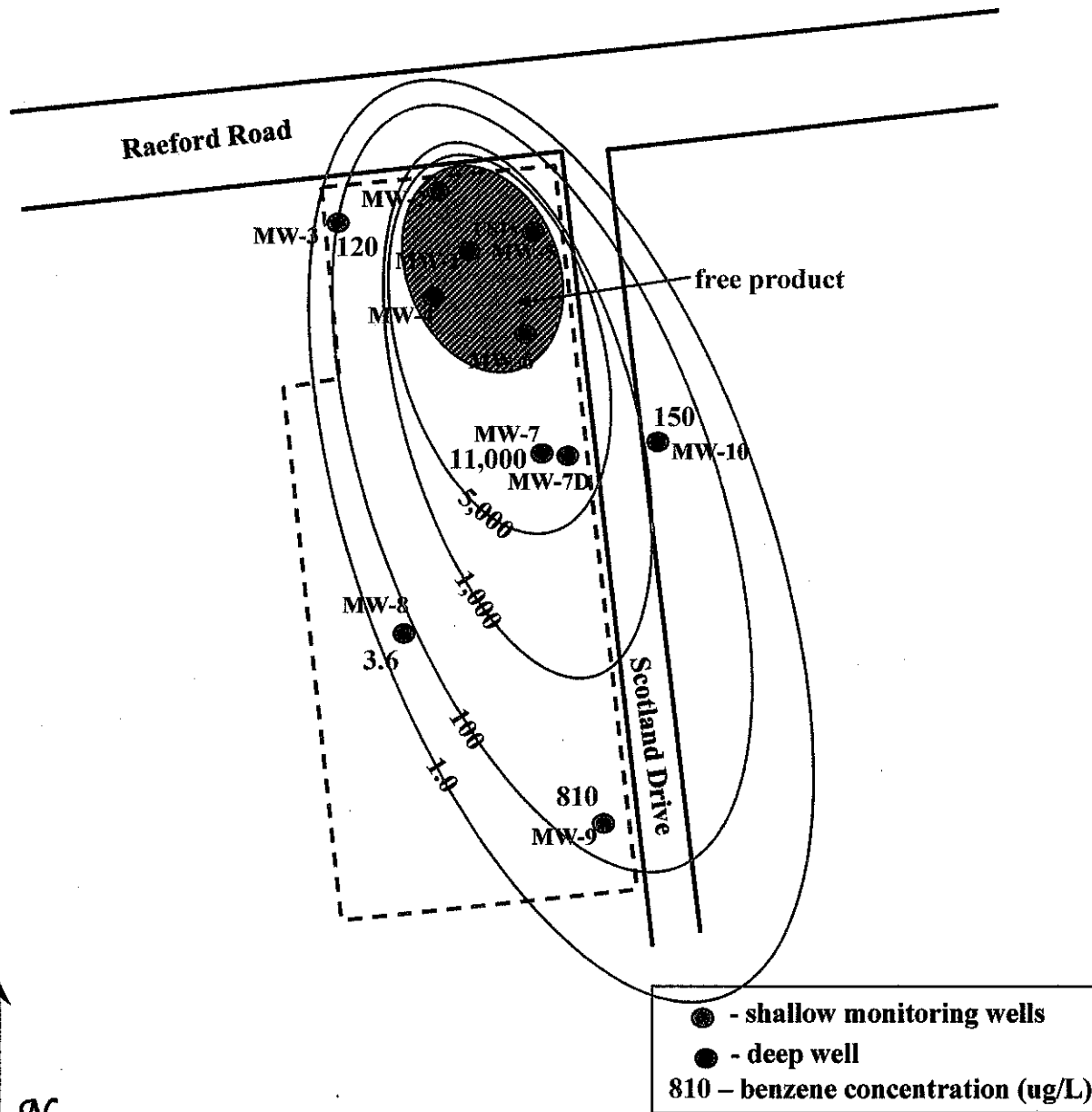


277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=150'	WML

FIGURE 4 BENZENE GROUNDWATER ISOCONCENTRATION MAP



277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:
13-059N

Scale:
1"=150'

Drawn By:
WML

Table 3
 Summary of Analytical Data – Soil
 EPA Method 8260
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260
Sample ID	Contaminant of Concern >		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene	MTBE	Total Xylenes
	Date Collected m/dd/yy	Sample Depth (ft)															
SB-1	6/04/13	8-10'	7.3	2.2	5.7	ND	ND	ND	ND	1.6	0.51	0.52	ND	ND	ND	ND	2.6
SB-1	6/04/13	18-20'	0.053	0.014	0.015	ND	ND	0.047	0.002	0.020	0.0026	0.0074	0.08	ND	0.26	0.068	0.27
SB-2	6/04/13	8-10'	0.014	0.0037	0.028	ND	ND	0.0068	ND	0.0056	0.00072	0.001	0.0092	ND	0.030	0.061	0.037
SB-2	6/04/13	18-20'	0.0081	ND	0.035	0.0085	ND	0.00057	ND	0.0014	ND	ND	0.001	ND	0.0024	0.014	0.0019
SB-3	6/04/13	8-10'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00038	ND	ND	0.004	ND
SB-3	6/04/13	18-20'	ND	ND	0.020	ND	ND	0.00044	ND	ND	ND	ND	0.00087	ND	0.0014	0.004	0.00081
SB-4	6/04/13	8-10'	ND	ND	0.014	ND	ND	ND	ND	ND	ND	ND	0.00044	ND	ND	ND	ND
SB-4	6/04/13	18-20'	0.140	0.040	ND	ND	ND	0.170	ND	ND	ND	ND	0.650	ND	1.7	0.150	0.96
SB-5	6/04/13	8-10'	0.0031	0.001	ND	ND	ND	0.005	ND	ND	ND	0.00064	0.036	ND	0.021	0.0098	0.025
SB-5	6/04/13	18-20'	0.00052	ND	0.016	0.0047	ND	0.00059	ND	ND	ND	ND	0.0033	ND	0.0048	0.013	0.0016
Soil to Groundwater MSCC			8.5	8.3	24	16	0.12	4.9	1.7	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6
Residential MSCC			782	782	14000	9385	100	1560	1564	313	626	626	18	626	1200	350	3129
Industrial/Commercial MSCC			20440	20440	360000	245280	4000	40000	40880	8176	16350	16350	164	16350	32000	3100	81760

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3 (continued)
 Summary of Analytical Data – Soil
 MADEP Methods VPH
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			MADEP VPH	MADEP VPH	MADEP VPH					
Sample ID	Contaminant of Concern >		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics					
	Date Collected m/dd/yy	Sample Depth (ft)								
SB-1	6/04/13	8-10'	50	404	299					
SB-1	6/04/13	18-20'	0.66	ND	0.483					
SB-2	6/04/13	8-10'	ND	ND	0.274					
SB-2	6/04/13	18-20'	ND	ND	ND					
SB-3	6/04/13	8-10'	ND	ND	ND					
SB-3	6/04/13	18-20'	ND	ND	ND					
SB-4	6/04/13	8-10'	ND	1.47	0.710					
SB-4	6/04/13	18-20'	6.81	2.49	1.12					
SB-5	6/04/13	8-10'	ND	ND	ND					
SB-5	6/04/13	18-20'	ND	ND	ND					
Soil to Groundwater MSCC			68	540	31					
Residential MSCC			939	1500	469					
Industrial/Commercial MSCC			24258	40000	12264					

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3
Summary of Analytical Data – Soil
 EPA Method 8260
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			8260	8260	8270	8270	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	
Sample ID	Contaminant of Concern >		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene	MTBE	Total Xylenes
	Date Collected m/dd/yy	Sample Depth (ft)															
SB-6	6/04/13	8-10'	0.0049	0.0021	0.019	ND	ND	0.0049	ND	0.0011	ND	0.0005	0.035	ND	0.014	0.049	0.015
SB-6	6/04/13	18-20'	0.016	0.0073	0.087	0.040	ND	0.0071	0.00047	0.028	0.0013	0.0015	0.019	ND	0.059	0.026	0.053
SB-7	6/04/13	8-10'	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	0.0083	ND	0.0027	0.0071	0.0029
SB-7	6/04/13	18-20'	0.0016	0.00049	0.040	ND	ND	0.0014	ND	0.0025	ND	ND	0.0025	ND	0.0058	0.020	0.0069
SB-8	6/04/13	8-10'	0.0072	0.0031	0.018	ND	ND	0.0062	0.00092	ND	ND	0.00076	0.011	ND	0.0077	0.022	0.035
SB-8	6/04/13	18-20'	0.0091	0.0025	0.023	ND	ND	0.0044	0.00052	0.0014	ND	0.0015	0.0021	ND	0.022	0.0069	0.028
SB-9	6/04/13	8-10'	5.1	2.5	0.890	ND	0.220	0.570	0.450	0.350	0.980	1.7	ND	0.410	ND	ND	0.720
SB-9	6/04/13	18-20'	0.0014	0.00048	0.058	ND	ND	ND	ND	0.0018	ND	ND	ND	ND	ND	0.0028	0.0008
SB-10	6/04/13	8-10'	.00095	0.00036	0.033	0.0052	ND	ND	ND	ND	ND	ND	ND	ND	.00045	ND	0.002
SB-10	6/04/13	18-20'	0.850	0.250	0.760	ND	ND	0.100	ND	0.720	0.088	0.120	ND	ND	0.230	ND	0.660
Soil to Groundwater MSCC			8.5	8.3	24	16	0.12	4.9	1.7	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6
Residential MSCC			782	782	14000	9385	100	1560	1564	313	626	626	18	626	1200	350	3129
Industrial/Commercial MSCC			20440	20440	360000	245280	4000	40000	40880	8176	16350	16350	164	16350	32000	3100	81760

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3 (continued)
 Summary of Analytical Data – Soil
 MADEP Methods VPH
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Analytical Method >			MADEP VPH	MADEP VPH	MADEP VPH					
Sample ID	Contaminant of Concern >		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics					
	Date Collected m/dd/yy	Sample Depth (ft)								
SB-6	6/04/13	8-10'	ND	ND	ND					
SB-6	6/04/13	18-20'	ND	ND	0.312					
SB-7	6/04/13	8-10'	ND	ND	ND					
SB-7	6/04/13	18-20'	1.85	1.65	1.07					
SB-8	6/04/13	8-10'	ND	ND	ND					
SB-8	6/04/13	18-20'	ND	ND	ND					
SB-9	6/04/13	8-10'	0.912	ND	0.933					
SB-9	6/04/13	18-20'	ND	ND	ND					
SB-10	6/04/13	8-10'	ND	ND	ND					
SB-10	6/04/13	18-20'	4.51	60	35.5					
Soil to Groundwater MSCC			68	540	31					
Residential MSCC			939	1500	469					
Industrial/Commercial MSCC			24258	40000	12264					

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 4
Summary of Analytical Data – Groundwater
EPA Method 504.1/6200b
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina

Analytical Method >			504.1	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b
Well ID	Contaminant of Concern >		1,2-Dibromoethane	Benzene	Chloroform	Ethylbenzene	Isopropyl Benzene	MTBE	n-Butyl Benzene	n-Propyl Benzene	Naphthalene	Toluene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	Total Xylenes
	Date Collected m/dd/yy	Sample ID													
MW-3	6/07/13	MW-3	ND	120	ND	46	5.8	13	4.0	16	13	280	58	150	400
MW-7	6/07/13	MW-7	1.2	11,000	ND	2,400	140	2,600	120	270	460	32,000	510	2,000	14,000
MW-7D	6/07/13	MW-7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8	6/07/13	MW-8	ND	3.6	3.6	ND	ND	2.6	ND	ND	ND	ND	ND	ND	ND
MW-9	6/07/13	MW-9	ND	810	ND	61	9.1	200	6.9	8.2	39	290	27	89	510
MW-10	6/07/13	MW-10	ND	150	ND	16	2.0	110	1.4	3.3	9.6	2.2	ND	3.6	15
2L Standard (ug/l)			0.02	1	70	600	70	20	70	70	6	600	400	400	500
GCL (ug/l)			50	5,000	70,000	84,500	25,000	20,000	6,900	30,000	6,000	260,000	25,000	28,500	85,500

Results are in ug/l
 Bold results indicate exceedence of 2L Standards
 Bold and shaded results indicate exceedence of GCL

Table 4 (continued)
Summary of Analytical Data – Groundwater
EPA Methods 6010c/MADEP-VPH
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina

Analytical Method >						6010c		MADEP VPH	MADEP VPH	MADEP VPH
Well ID	Contaminant of Concern >					Total Lead		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 aromatics
	Date Collected m/dd/yy	Sample ID								
6/07/13	6/07/13	6/07/13				ND		865	628	940
6/07/13	6/07/13	6/07/13				3.79		57,400	16,700	5,800
6/07/13	6/07/13	6/07/13				ND		ND	ND	2.8
6/07/13	6/07/13	6/07/13				ND		6.4	ND	ND
6/07/13	6/07/13	6/07/13				ND		1,590	572	330
6/07/13	6/07/13	6/07/13				ND		246	33.1	43
2L Standard (ug/l)						15		400	700	200
GCL (ug/l)						15,000		NRS	NRS	NRS

Results are in ug/l
Bold results indicate exceedence of 2L Standards
Bold and shaded results indicate exceedence of GCL



June 1, 2015

Mr. James W. Brown
North Carolina Department of Environment and Natural Resources
Fayetteville Regional Office
225 Green Street, Suite 714
Systel Building
Fayetteville, North Carolina 23801

**Subject: Corrective Action Plan
Raeford Road Sunoco
4735 Raeford Road
Fayetteville, North Carolina 28304
Case #9788
AEC Project No. 15-020R**

Dear Mr. Brown:

Advantage Environmental Consultants, LLC (AEC) has prepared a Corrective Action Plan (CAP) for the above-referenced property. This CAP includes Site observations, investigation information, soil and groundwater testing information, and report preparation. This report includes AEC's findings, conclusions, recommendations, and supporting documentation.

We appreciate the opportunity to be of service to you. If you should have any questions regarding this report, please contact Mr. Andrew Owens at (804) 454-0072.

Sincerely,

ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

A handwritten signature in black ink, appearing to read 'Krista J. Tetrick', written over a horizontal line.

Krista J. Tetrick
Staff Scientist

A handwritten signature in black ink, appearing to read 'Andrew C. Owens', written over a horizontal line.

Andrew C. Owens, P.G.
Branch Manager

Attachments

CC: Mr. Jarrett Minkoff, Raeford Road Holdings, LLC

B. Executive Summary

The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Golden of Raeford, LLC and Anderson Raeford Corner, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline and Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. An out-of-use, 150-gallon waste oil UST is located immediately south of the Diamond Autosports building.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. An unknown quantity of gasoline was released from an unknown point in the UST system. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. These initial abatement measures were apparently not performed.

Phase II Environmental Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs and VPH) were detected in each of the four soil samples at concentrations below the applicable North Carolina Department of the Environment and Natural Resources (NCDENR) Industrial/Commercial Cleanup Levels.

AEC also collected three groundwater samples from temporary wells. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the Method for the Determination of volatile petroleum hydrocarbons (MADEP-VPH) test. Certain petroleum constituents (VOCs and VPH) were detected in each of the three groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards. The Phase II ESA, completed by AEC and dated March 6, 2006, was submitted to the NCDENR.

Phase II Limited Site Assessment

A Phase II Limited Site Assessment (LSA) was completed and submitted to the NCDENR on June 4, 2008. The LSA revealed the presence of approximately 2.14” and 1.67” of free phase petroleum product in the form of gasoline in monitoring well MW- 1 and MW-2, respectively on May 1, 2008. In response, Aggressive Fluid Vapor Recovery (AFVR) events were completed in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013.

Groundwater elevations across the Site and surrounding properties have varied between 20 to 23 feet beneath surface grade (bsg), dependent upon seasonal fluctuations. Hydraulic gradient through the area has been determined to flow generally to the southeast. See **Section A, Figure 2** for geologic cross section maps. Groundwater in the monitoring wells installed for completion of the Comprehensive Site Assessment (CSA) stabilized between 20.10 and 22.54 feet beneath surface grade.

Well Survey and Surface Water Body Investigation

AEC completed a walkthrough of all properties located within a 1,000-foot radius of the Site for the Phase II LSA completed on June 4, 2008. AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. The completed well survey did not identify the presence of water supply wells located within a 1,000-foot radius of the Site.

There are no surface water bodies located within 500 feet of the release area and the source area is not located within a wellhead protection area. The Site is located in the Coastal Plain Physiographic province. However, the Site and some surrounding properties within 1,500 feet obtain their potable water from the City of Fayetteville which obtains water from available surface water sources.

Comprehensive Site Assessment Soil Investigation

AEC mobilized to the Site on June 4, 2013 for the purpose of conducting field assessment activities necessary to complete assessment of petroleum contamination in the soils of the Site. In conducting this assessment, AEC advanced a series of ten soil borings, SB-1 through SB-10. Soils encountered while completing the soil borings consisted of dry to moist tan-orange-brown clayey to sandy silt to 20 feet below land surface (bls). The soil samples were collected for laboratory analysis at depths of 8 to 10 feet and 18 to 20 feet bls in each soil boring.

The borings were located in order to surround the suspected contaminant source area (UST and product dispenser locations). The exact locations of these ten soil borings are shown in **Section A, Figure 2**. These samples were submitted to Environmental Conservation Laboratories of Cary, NC (NCDENR-Division of Water Quality (DWQ) certification # 591) for laboratory analysis of VOCs by EPA Methods 8260 and VPH by MADEP-VPH.

The analytical results for EPA Method 8260 revealed the presence of numerous VOCs at detectable levels in each soil sample. Few VOCs in certain soil samples exceeded their Soil to Groundwater Maximum Soil Contaminant Concentrations (MSCCs) as set forth in *The Guidelines*. The constituents and samples exceeding their respective Soil to Groundwater MSCC include benzene in SB-1 at 18-20 feet, SB-2 at 8-10 feet, SB-2 at 18-20 feet, SB-4 at 18-20 feet, SB-5 at 8-10 feet, SB-6 at 8 to 10 feet, SB-6 at 18-20 feet, SB-7 at 8-10 feet, and SB-8 at 8-10 feet; naphthalene in SB-1 at 8-10 feet, SB-9 at 8-10 feet, and SB-10 at 18-20 feet; 4-isopropyltoluene in SB-9 at 8-10 feet; n-propylbenzene in SB-9 at 8-10 feet; and methyl tertiary-butyl ether (MTBE) in SB-4 at 18-20 feet. It should be noted that none of the detected VOCs exceeded the Residential or Industrial Commercial MSCCs.

The analytical results for the VPH analysis detected the presence of C5-C8 aliphatics, C9-C12 aliphatics or C9-C10 aromatics in samples SB-1 at 8-10 feet and SB-10 at 18-20 feet at concentrations in excess of their Soil to Groundwater MSCCs as set forth in *The Guidelines*. The detected VPH did not exceed the Residential or Industrial Commercial MSCCs. A summary of these soil analytical results is included in **Section B, Table 4**.

The detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. The elevated concentrations are largely related to the presence of free phase petroleum product on the groundwater beneath the Site, especially those samples collected at depth (18-20 feet). These soil analytical results do not define the lateral extent of soil contamination to the Soil to Groundwater MSCCs in the northern and southern directions. This is because the most recently obtained soil data shows that petroleum contaminated soils may underlie the North Carolina Department of Transportation (NCDOT) right of ways under the northern adjacent Raeford Road. Further, the areas to the south contain a large amount of buried utilities which will prohibit additional assessment activities in this direction. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs have been adequately defined. Further, the

remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

Comprehensive Site Assessment Groundwater Investigation

AEC mobilized to the Site on June 3-6, 2013 in order to install five additional permanent monitoring wells designated as MW-7, MW-7D, MW-8, MW-9, and MW-10. MW-10 is located on the eastern adjacent W.H. Owen Elementary School property. MW-7D is a deep Type III well. AEC returned to the Site on June 7, 2013 in order to sample the eleven monitoring wells (MW-1 through MW-10 and MW-7D) for completion of the Comprehensive Site Assessment (CSA) dated July 19, 2013. The groundwater samples collected from the monitoring wells were submitted for analysis by EPA Methods 8260, 504.1 1,2-Dibromoethane (EDB), 3030c (total lead), and the MADEP-VPH method. It is important to note that free phase petroleum product was observed in monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6. Therefore, these five wells were not sampled during the CSA.

Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-7, MW-8, MW-9, and MW-10; ethylbenzene in MW-7; isopropyl benzene in MW-7; n-butylbenzene in MW-7; n-propylbenzene in MW-7; MTBE in MW-7, MW-9, and MW-10; naphthalene in MW-7, MW-9, and MW-10; toluene in MW-7; 1,3,5 Trimethylbenzene in MW-7; 1,2,4 Trimethylbenzene in MW-7; and total xylenes in MW-7 and MW-9. Benzene was also found in the groundwater sample in MW-7 at a concentration exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Groundwater samples analyzed by MADEP-VPH revealed the presence of the targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: C5-C8 aliphatic hydrocarbons in MW-3, MW-7, and MW-9; C9-C12 aliphatic hydrocarbons in MW-7; and C9-C10 aromatic hydrocarbons in MW-3, MW-7, and MW-9. EDB was only detected in the sample from MW-7 at a concentration exceeding its maximum allowable concentration in groundwater. Lead was only detected in the sample from MW-7 at a concentration well below its maximum allowable concentration in groundwater.

In summary, data for the groundwater samples obtained from wells MW-3, MW-7, MW-8, MW-9, and MW-10 showed the presence of one or more targeted contaminants at levels above their maximum allowable concentrations in groundwater as defined by

15A NCAC 2L .0202. The results for this groundwater sampling event showed that the lateral extent of the groundwater contaminant plume was adequately defined in the horizontal direction to the Gross Contaminant Levels (GCLs) set forth in *The Guidelines*.

Isoconcentration maps for benzene, MTBE, and naphthalene have been prepared and can be found in **Section A, Figure 5**. **Section B, Table 4** is a summary of the combined analytical results for all of the sampling events.

Upon review of the data obtained by the CSA activities described above, it can be stated that while the horizontal extent of the groundwater contaminant plume has not been defined to the 15A NCAC 2L Standards it has successfully been defined to GCLs, which will be the target groundwater cleanup levels for this incident.

The vertical extent of groundwater contamination was addressed through installation of deep well MW-7D on June 5, 2013. MW-7D was installed immediately adjacent to MW-7 and it is screened from 60 to 70 feet below land surface. Analytical results for a groundwater sample collected from this well on June 7, 2013 indicated the presence of only C9-C10 aromatic hydrocarbons at a concentration of 2.8 ug/l which is well below the 15N NCAC 2L 0202 standard of 200 ug/l, respectively. It is possible that this contaminant was carried down from above. Based on these results, the vertical extent of groundwater contamination appears to be defined.

Contaminants related to the release are expected to continue to migrate with groundwater flow through the Site, to the southeast through the source area. The lateral migration of the plume is directly related to the groundwater flow through the area, the soil matrix through which migration will occur, and to the presence of structures in contact with the groundwater and/or product at the Site. No water supply wells are located within a 1,000-foot radius of the release area. Several contaminant plume maps for individual contaminants of concern are depicted in **Section A, Figures 5A, 5B, and 5C**. Due to the established direction of contaminated groundwater migration it is not likely that the release will impact the eastern adjacent school or any other environmentally sensitive receptors.

Currently the Site is classified as “intermediate risk” due to the presence of free phase petroleum product and at least one exceedence of the GCLs. While the removal of free phase petroleum product is required, the only way to lower the current risk classification from “intermediate” to “low” and close out the incident is to also eliminate all exceedences of GCLs in the groundwater.

The concentrations to which soil and groundwater must be remediated are outlined in Tables 4 and 5.

The removal of free product and GCL exceedences must be completed in order to eventually lower the classification to “low risk” which may result in the incident being closed out by the NCDENR. To accomplish this goal, AEC recommends quarterly AFVR events until groundwater sampling shows that free product has been removed to the maximum extent practical and groundwater sampling shows contaminant levels below the GCLs set forth in *The Guidelines*. Based on the low levels of petroleum contamination in Site soils, AEC believes the removal of free product will be sufficient to address soil impacts. Following free product removal, AEC believes that an evaluation of the processes of natural attenuation and biodegradation for addressing the residual groundwater contaminants may be considered. If it is determined that this is not a viable option then one or more active groundwater cleanup options, will need to be considered (eg In-Situ Chemical Oxidation (ISCO) or Air Sparging/Soil Vapor Extraction (AS/SVE)). The estimated cost per AFVR event is \$4,400.00.

AEC will review data collected during the AFVR events in order to evaluate the effectiveness of the selected remediation technology.

ATTACHMENT B

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION: PARCEL 204 – GOLDEN OF RAEFORD, LLC NCDOT PROJECT U-4405

4537 RAEFORD RD., FAYETTEVILLE, CUMBERLAND COUNTY, NC

NOVEMBER 4, 2016

Report prepared for: Mike Branson
Solutions, IES
1101 Nowell Road
Raleigh, North Carolina 27607

Prepared by: _____



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

Reviewed by: _____



Douglas A. Canavello, P.G.
NC License #1066

GEOPHYSICAL INVESTIGATION REPORT
Parcel 204 – 4537 Raeford Road
Fayetteville, Cumberland County, North Carolina

Table of Contents

Executive Summary	1
Introduction.....	2
Field Methodology.....	2
Discussion of Results.....	3
Summary and Conclusions	5
Limitations	5

Figures

- Figure 1 – Parcel 204 Geophysical Survey Boundaries and Site Photographs
- Figure 2 – Parcel 204 EM61 Results Contour Map
- Figure 3 – Parcel 204 GPR Transect Locations and Select Images

Appendices

- Appendix A – GPR Transect Images

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
SVE.....	Soil Vapor Extraction
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 204, located at 4537 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The majority of the EM anomalies were directly attributed to visible cultural features at the ground surface. EM interference was observed adjacent to the pump island from suspected metal reinforcement. This area was investigated by GPR. The GPR scans verified the presence of reinforcement in the concrete near the pump island, as well as a possible isolate conduit/pipe section. No additional structures were observed. Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 204.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Solutions, IES (Solutions) at Parcel 204, located at 4537 Raeford Road, Fayetteville, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project U-4405). Solutions directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted from October 12-17, 2016, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included an active service station with a pump island and canopy surrounded by asphalt and concrete parking space and grass medians. Aerial photographs showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. 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 11.0 software programs.

GPR data were acquired across select EM anomalies on October 17, 2016, 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 4 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	Telephone Pole	
2	Storm Drain	
3	Light Pole	
4	Telephone Pole and Sign	
5	Sign	
6	Pump Island and Reinforced Concrete	☑
7	Reinforced Concrete	☑
8	Suspected Metal Pipe and Reinforced Concrete	☑
9	Sign and Air Pump	

The majority of the EM anomalies recorded by the survey were directly attributed to visible cultural features such as utility poles, storm drains, signs, and an air pump. Suspected metal-reinforced concrete was present adjacent to the pump island area, resulting in EM interference. This area of reinforced concrete was investigated further by GPR.

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 5 GPR transects were performed at the site across the areas near the pump island suspected to contain reinforced concrete. The 5 transects all verified the presence of metal reinforcement in the concrete. Transect 5 also recorded an isolated hyperbolic reflector that suggested the possible presence of a conduit/pipe beneath the reinforcement at that location. No evidence of significant structures beneath the reinforcement such as USTs was observed.

Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 204.

SUMMARY & CONCLUSIONS

Pyramid’s evaluation of the EM61 and GPR data collected at Parcel 204 in Fayetteville, Cumberland County, 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. EM interference was observed adjacent to the pump island because of suspected metal reinforcement. This area was investigated by GPR.
- The GPR scans verified the presence of reinforcement in the concrete near the pump island, as well as a possible isolate conduit/pipe section. No additional structures were observed.
- Collectively, the geophysical data did not show any evidence of unknown metallic USTs at Parcel 204.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for Solutions, IES 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.

N ↑


APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA



View of Survey Area
(Facing Approximately East)

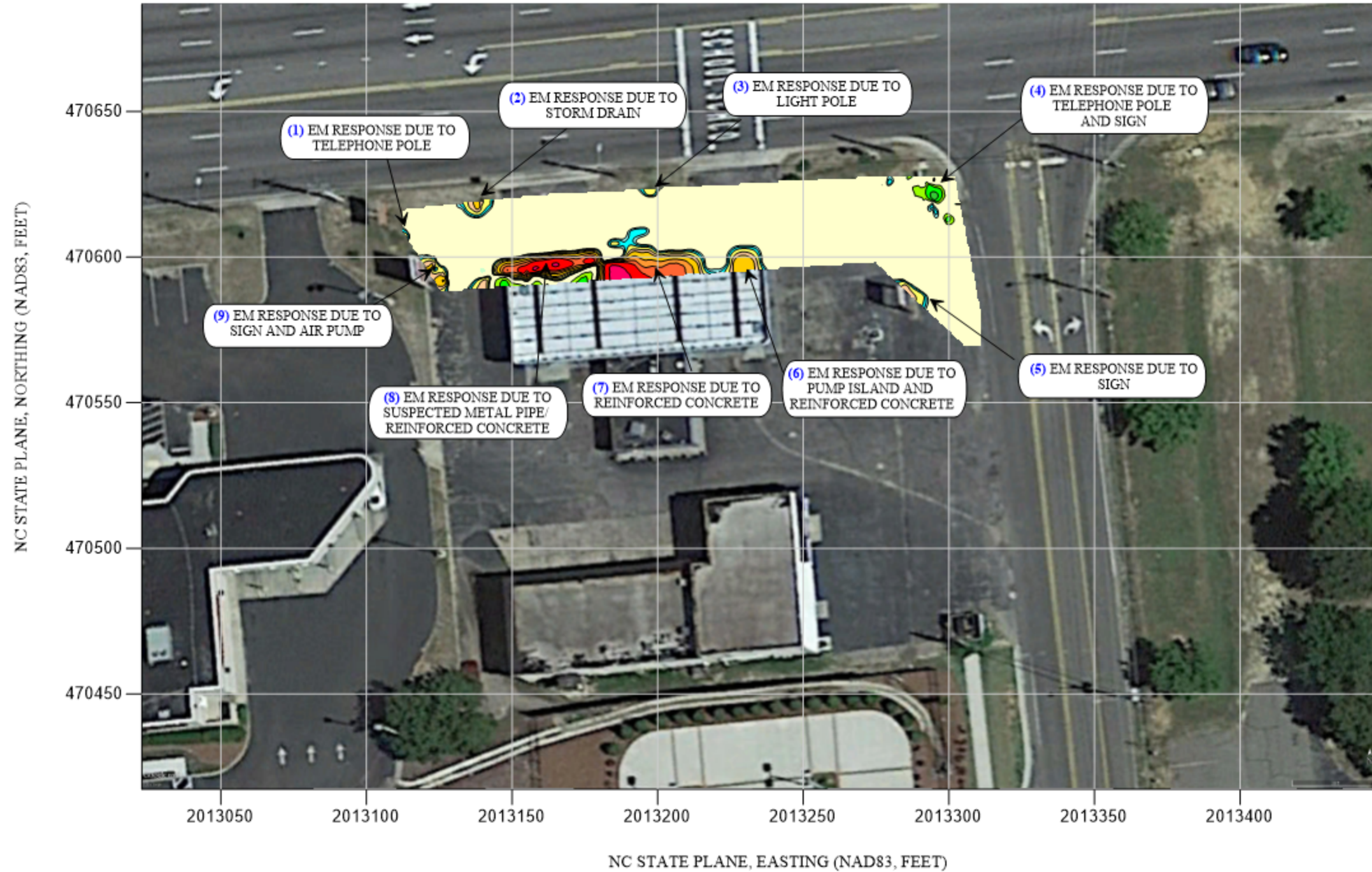


View of Northeast Survey Area
(Facing Approximately North)

TITLE		PARCEL 204 - GEOPHYSICAL SURVEY BOUNDARIES AND SITE PHOTOGRAPHS	
PROJECT		4537 RAEFORD ROAD FAYETTEVILLE, NORTH CAROLINA NCDOT PROJECT U-4405	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology	
DATE	10/19/16	CLIENT	SOLUTIONS, IES
PYRAMID PROJECT #:	2016-265	FIGURE 1	



EM61 METAL DETECTION RESULTS




NUMBERS IN BLUE (x) CORRESPOND TO ANOMALY TABLE INCLUDED IN THE REPORT

NO EVIDENCE OF UNKNOWN METALLIC USTs OBSERVED

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on October 12, 2016, using a Geonics EM61 instrument. Verification GPR data were collected using a GSSI UtilityScan DF unit with a dual frequency 300/800 MHz antenna on October 17, 2016.

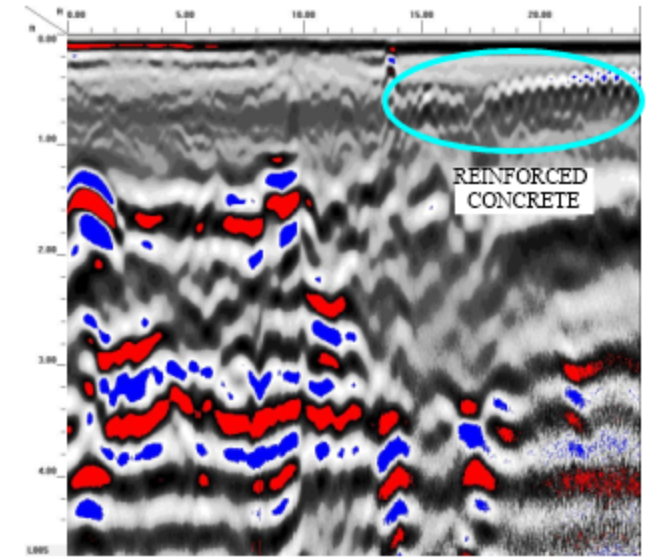
EM61 Metal Detection Response (millivolts)



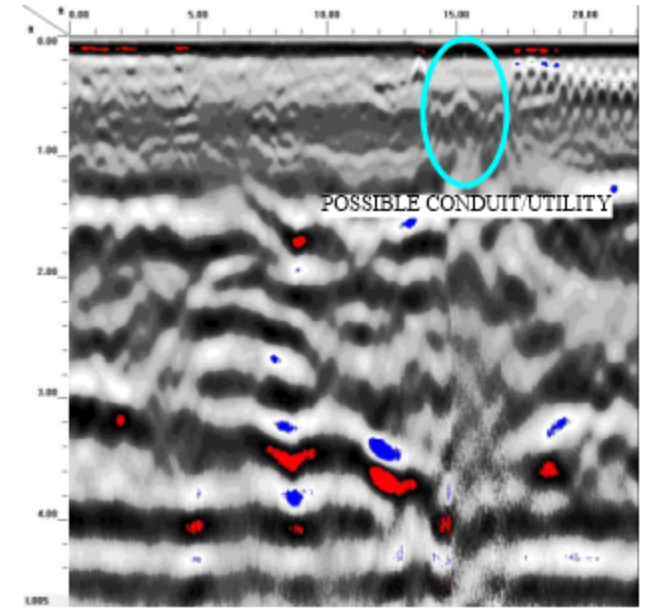
TITLE	PARCEL 204 - EM61 RESULTS CONTOUR MAP	
PROJECT	4537 RAEFORD ROAD FAYETTEVILLE, NORTH CAROLINA NCDOT PROJECT U-265	
		503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE	10/19/2016	CLIENT SOLUTIONS, IES
PYRAMID PROJECT #:	2016-265	FIGURE 2

N ↑

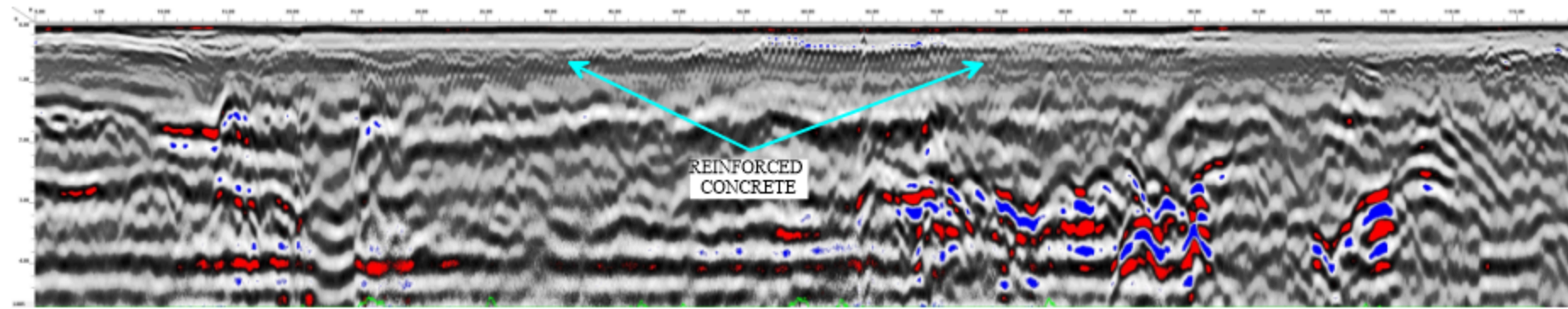
LOCATIONS OF GPR TRANSECTS




GPR TRANSECT 4 (T4)



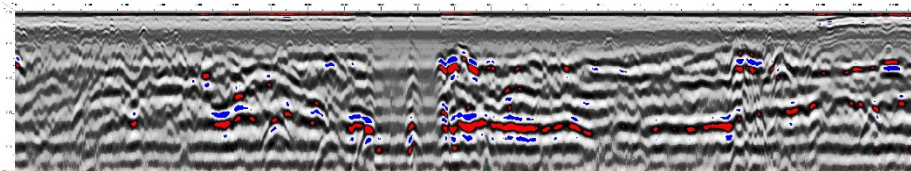
GPR TRANSECT 5 (T5)



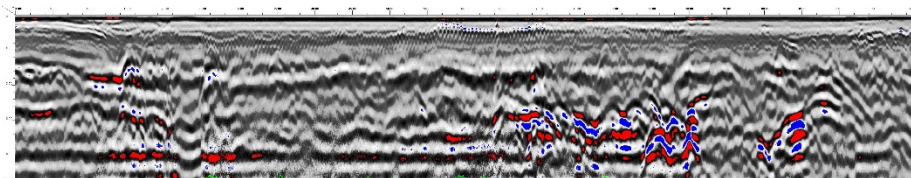
GPR TRANSECT 2 (T2)

TITLE	PARCEL 204 - GPR TRANSECT LOCATIONS AND SELECT IMAGES		
PROJECT	4537 RAEFORD ROAD FAYETTEVILLE, NORTH CAROLINA NCDOT PROJECT U-4405		
	 503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology		
DATE	10/19/2016	CLIENT	SOLUTIONS, IES
PYRAMID PROJECT #:	2016-265	FIGURE 3	

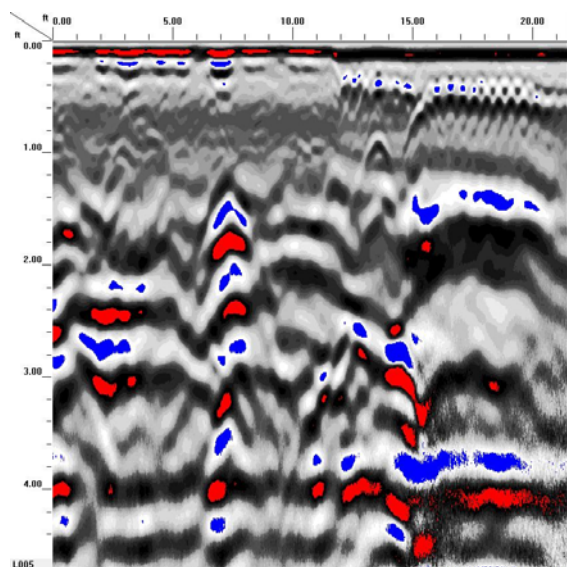
Appendix A – GPR Transect Images



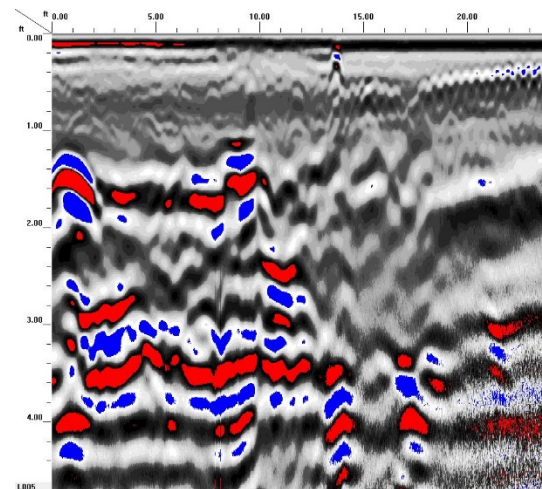
GPR TRANSECT 1



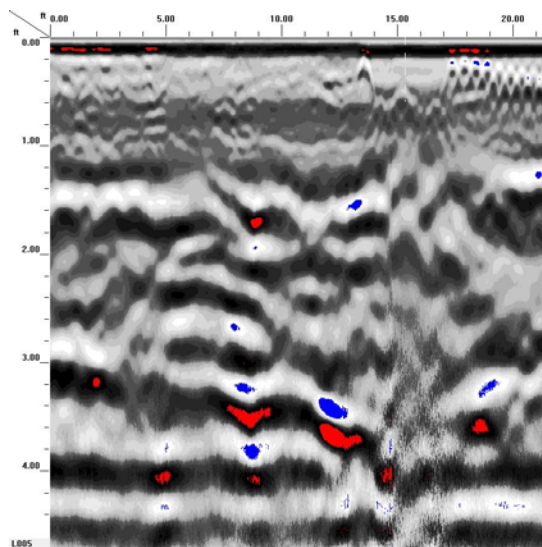
GPR TRANSECT 2



GPR TRANSECT 3



GPR TRANSECT 4



GPR TRANSECT 5

ATTACHMENT C

BORING LOCATION: Parcel #204, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 10 ft bgs SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA FINAL DTW: NA
LOGGED BY: Samuel McIntyre	CHECKED BY:

DEPTH (ft bgs)	SAMPLES			PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
	Sample ID and Interval	Recovery				
0						0
1				0.0	Tan clayey fine sand. Dry	1
2		80%				2
3				0.0		3
4						4
5				0.0	Light brown and red mottled silty clay. Dry	5
6		100%				6
7				0.0		7
8						8
9	204-SB-1-8-10	100%		18.6		9
10	End of Boring					10

BORING LOCATION: Parcel #204, Fayetteville, NC

PROJECT NUMBER:
2016.0054.NDOT

DRILLING CONTRACTOR: Regional Probing Services

DATE STARTED: 10/26/2016
DATE FINISHED: 10/26/2016

DRILLING METHOD: Direct Push BOREHOLE DIAMETER: 2.25"

TOTAL DEPTH (ft bgs): 12 ft bgs
SCREEN INTERVAL (ft bgs): NA

DRILLING EQUIPMENT: Geoprobe 5410

NORTHING: NA
EASTING: NA

SAMPLING METHOD: Macro Core

INITIAL DTW: NA
FINAL DTW: NA

LOGGED BY: Samuel McIntyre
CHECKED BY:

DEPTH (ft bgs)	SAMPLES			PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
	Sample ID and Interval	Recovery				
0					Asphalt.	0
1			56.9		Tan fine sand. Dry	1
2		80%				2
3			92.3			3
4	204-SB-2-4-6					4
5			90.4			5
6		100%				6
7			57.3			7
8	204-SB-2-8-10					8
9			80.1			9
10						10
11			8.5		Light brown silty clay. Dry.	11
12						12

End of Boring

BORING LOCATION: Parcel #204, Fayetteville, NC

PROJECT NUMBER:
2016.0054.NDOT

DRILLING CONTRACTOR: Regional Probing Services

DATE STARTED: 10/26/2016
DATE FINISHED: 10/26/2016

DRILLING METHOD: Direct Push BOREHOLE DIAMETER: 2.25"

TOTAL DEPTH (ft bgs): 10 ft bgs
SCREEN INTERVAL (ft bgs): NA

DRILLING EQUIPMENT: Geoprobe 5410

NORTHING: NA
EASTING: NA

SAMPLING METHOD: Macro Core

INITIAL DTW: NA
FINAL DTW: NA

LOGGED BY: Samuel McIntyre
CHECKED BY:

DEPTH (ft bgs)	SAMPLES			PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
	Sample ID and Interval	Recovery				
0						0
1				0.0	Tan clayey fine sand. Dry	1
2		100%				2
3				0.1		3
4						4
5				0.0	Light brown and red mottled silty clay. Dry	5
6		100%				6
7				0.1		7
8						8
9	204-SB-3-8-10	100%		0.1		9
10						10

End of Boring

BORING LOCATION: Parcel #204, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 12 ft bgs SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA FINAL DTW: NA
LOGGED BY: Samuel McIntyre	CHECKED BY:

DEPTH (ft bgs)	SAMPLES			PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
	Sample ID and Interval	Recovery				
0					Asphalt.	0
1		100%	0.0		Tan fine sand. Dry	1
2		100%	0.0			2
3		100%	0.0			3
4		100%	0.0			4
5		100%	0.0			5
6		100%	0.1			6
7		100%	0.1			7
8		100%	0.2			8
9		100%	0.2			9
10	204-SB-4-8-10	100%	0.2			10
11			0.0		Light brown silty clay. Dry.	11
12						12

End of Boring

BORING LOCATION: Parcel #204, Fayetteville, NC	PROJECT NUMBER: 2016.0054.NDOT
DRILLING CONTRACTOR: Regional Probing Services	DATE STARTED: 10/26/2016 DATE FINISHED: 10/26/2016
DRILLING METHOD: Direct Push BOREHOLE DIAMETER: 2.25"	TOTAL DEPTH (ft bgs): 12 ft bgs SCREEN INTERVAL (ft bgs): NA
DRILLING EQUIPMENT: Geoprobe 5410	NORTHING: NA EASTING: NA
SAMPLING METHOD: Macro Core	INITIAL DTW: NA FINAL DTW: NA
LOGGED BY: Samuel McIntyre	CHECKED BY:

DEPTH (ft bgs)	SAMPLES			PID (ppm)	DESCRIPTION OF MATERIALS	DEPTH (ft bgs)
	Sample ID and Interval	Recovery				
0					Asphalt.	0
1		100%	53.9		Tan fine sand. Dry	1
2		100%				2
3			28.1			3
4	204-SB-5-4-6					4
5		100%	71.6			5
6		100%				6
7			36.1			7
8	204-SB-5-8-10					8
9		100%	17.6			9
10						10

End of Boring

ATTACHMENT D



PHOTO 1 - VIEW OF SOIL BORING LOOKING NORTHEAST



PHOTO 2 - VIEW OF SOIL BORING LOOKING EAST



PHOTO 3 - VIEW OF SOIL BORING LOOKING NORTHEAST



PHOTO 4 - VIEW OF SOIL BORING LOOKING SOUTHEAST



PHOTO 5 - VIEW OF SOIL BORING LOOKING EAST

ATTACHMENT E



Hydrocarbon Analysis Results

Client: NCDOT
Address: Site 204: 4537 Raeford Road
 Fayetteville, NC

Samples taken 10/26/2016
Samples extracted 10/26/2016
Samples analysed 10/26/2016

Contact:

Operator Candy Elliott

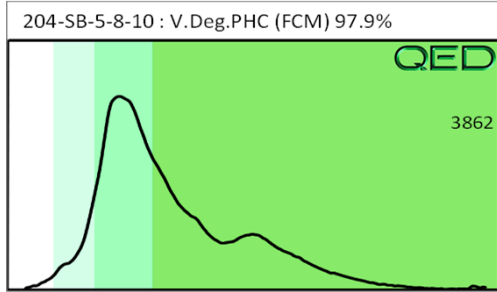
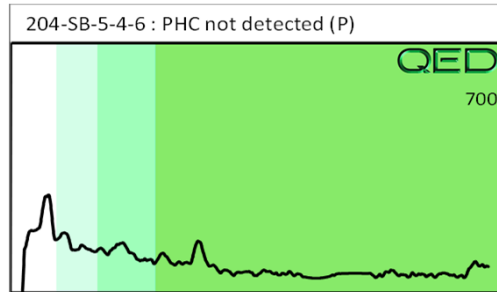
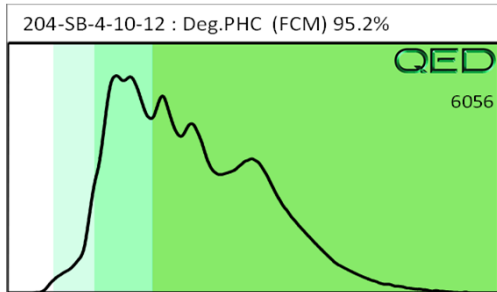
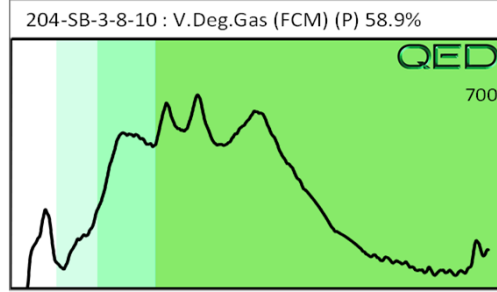
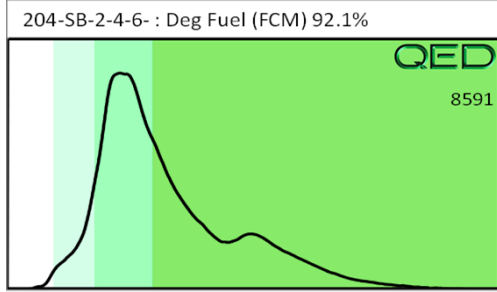
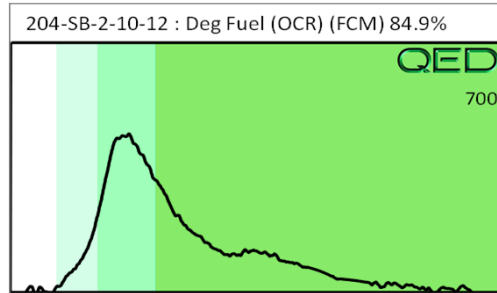
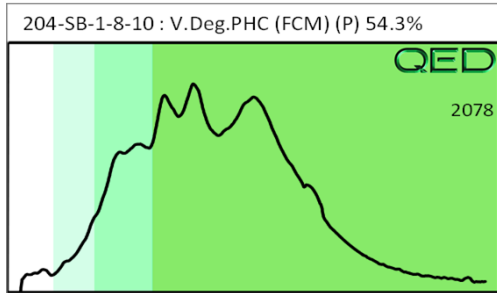
Project: 2016.0054.NDOT

											U04049		
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	204-SB-1-8-10	23.2	<0.58	<0.58	2.4	2.4	1.6	0.09	0.004	0	71.1	28.9	V.Deg.PHC (FCM) (P) 54.3%
s	204-SB-2-4-6-	25.4	<1.3	<0.63	17.1	17.1	7.5	0.37	0.007	0	87.7	12.3	Deg Fuel (FCM) 92.1%
s	204-SB-2-10-12	22.4	<0.56	<0.56	1	1	<0.11	<0.02	<0.002	0	79.2	20.8	Deg Fuel (OCR) (FCM) 84.9%
s	204-SB-3-8-10	6.5	<0.16	0.26	0.16	0.42	0.15	<0.005	<0.001	66.5	25	8.5	V.Deg.Gas (FCM) (P) 58.9%
s	204-SB-4-10-12	24.6	<0.62	<0.62	16.1	16.1	5.3	0.62	0.046	0	79.5	20.5	Deg.PHC (FCM) 95.2%
s	204-SB-5-4-6	25.2	<0.63	<0.63	<0.63	<0.63	<0.13	<0.02	<0.003	0	0	100	PHC not detected (P)
	204-SB-5-8-10	23.4	<0.58	<0.58	6	6	3	0.14	0.002	0	86.6	13.4	V.Deg.PHC (FCM) 97.9%
Initial Calibrator QC check											OK		

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

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

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



File Review Reports
Golden of Raeford, LLC Property (Parcel #204)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina
State Project: U-4405
WBS Element 39049.1.1



November 22, 2005

Kimley-Horn and Associates, Inc.
4651 Charlotte Park Drive, Suite 300
Charlotte, North Carolina 28217

ATTENTION: Mr. Eric Riedinger

Reference: **LIMITED SOIL AND GROUNDWATER SAMPLING SERVICES**
Proposed Wal-Mart SuperCenter Property
Raeford Road
Fayetteville, North Carolina
Job No. 1051-05-508B

Dear Mr. Riedinger:

S&ME, Inc. (S&ME) is pleased to present the findings of our limited soil and groundwater sampling services conducted on the above referenced property in accordance with our Proposal No EPRO-05-10-06 (revised) dated November 4, 2005.

PROJECT INFORMATION

S&ME is currently performing a Phase I Environmental Site Assessment and a Geotechnical Subsurface Exploration, which were authorized by you for the above referenced property (Figure 1). An existing gasoline/convenience store with an automotive garage, which is identified as a Leaking Underground Storage Tank site (Jim's Texaco), adjoins the subject property to the northeast.

Based on our review of files maintained by the North Carolina Department of Environment and Natural Resources, three groundwater monitoring wells (MW-1 through MW-3) were installed to assess groundwater quality at the Jim's Texaco site in the early 1990s. Free product was measured in MW-1 and MW-2, which were installed on the gasoline station's property. High concentrations of petroleum constituents, which exceeded the North Carolina groundwater quality

standards, were reported in the remaining well (MW-3), which is actually located on the subject property near the existing Wachovia Bank. In 1991, high levels of oil and grease were also detected in a soil sample collected from an underground waste oil tank located behind the garage on the gasoline station's property. The waste oil tank appears to be located near one of the subject property lines. Groundwater at the gasoline station is reported to flow to the northeast away from the subject property.

The following services were provided by S&ME for the purpose of screening the subject site for petroleum impacts stemming from the existing gasoline service station adjoining the property to the northeast.

SUBSURFACE INVESTIGATION

On November 8, 2005, S&ME personnel installed one temporary, two-inch diameter, groundwater monitoring well (TW-1) on the subject property. The temporary well was located on the subject property near the existing underground waste oil tank located behind the adjoining gasoline service station's garage. The well was installed with a drill rig using hollow-stem augering techniques. The approximate location of the well is shown in Figure 2.

A soil boring was extended to approximately 25 feet below the land surface (bls) at TW-1. A PVC standpipe was installed in the borehole to a depth of approximately 24 feet bls with a screened interval between 14 and 24 feet bls.

Soil samples were collected at approximately five-foot depth intervals to a depth of approximately 15 feet bls during the installation of TW-1. The soil samples were visually classified and field scanned with an Organic Vapor Analyzer (OVA) for the presence of volatile organic compounds (VOCs).

The soils encountered at the well location primarily consisted of sand to a depth of approximately 20 feet bls. Medium to coarse sand with some clay was encountered from a depth of approximately 23.5 to 25 feet bls. Groundwater was encountered at TW-1 at a depth of approximately 19 feet bls.

One soil sample was selected from TW-1 at a depth of approximately 13.5 to 15 feet bls. and forwarded to Enco Laboratories in Cary, North Carolina. The soil sample was analyzed for Total Petroleum Hydrocarbons by EPA Methods 5030/3550 plus Oil and Grease by EPA Method 9071.

Upon completion, the well was developed and sampled using a disposable bailer. The groundwater sample was forwarded to Enco Laboratories in Cary, North Carolina and analyzed for volatile organics by EPA Method 8260. After the sampling activities were completed, the well casing was removed and the boring was backfilled with grout.

On November 18, 2005, permission was granted by Mr. Jim Sanderson, owner of the Jim's Texaco site, to sample MW-3, which is located on the subject property. On November 18, 2005, S&ME personnel sampled MW-3. This groundwater sample was also forwarded to Enco Laboratories in Cary, North Carolina and analyzed for volatile organics by EPA Method 8260.

LABORATORY ANALYTICAL RESULTS

Soil Screening

A review of the soil field screening data shows that measurable OVA readings were observed from a depth of approximately 3.5 to 15 feet bls. However, no petroleum odors were noted in the soil samples collected at TW-1. Table 1 summarizes the soil field screening data for the collected soil samples.

Laboratory results for the collected soil sample show that Diesel Range Organics were detected at TW-1 at a concentration of 4 milligrams per kilogram (mg/Kg), which is below the North Carolina Reportable Concentration level of 10 mg/Kg. All other analyzed constituents were below the method detection limits. Table 2 summarizes the laboratory analytical results for the collected soil sample.

Groundwater Quality

Laboratory results show that MTBE, Benzene, Toluene, Ethyl benzene and Xylenes were detected in the groundwater sample collected at TW-1. MTBE was detected at a concentration of 6,500 µg/L which exceeds the 2L Groundwater Quality Standard of 200 µg/L. Benzene was detected at a concentration of 14,000 µg/L which exceeds the 2L Groundwater Quality Standard of 1 µg/L. Toluene was detected at a concentration of 47,000 µg/L which exceeds the 2L Groundwater Quality Standard of 1,000 µg/L. Ethyl benzene was detected at a concentration of 3,700 µg/L which exceeds the 2L Groundwater Quality Standard of 550 µg/L. Xylenes were detected at a concentration of 36,000 µg/L which exceeds the 2L Groundwater Quality Standards of 530 µg/L.

Laboratory results show that Benzene, Ethyl benzene and Xylenes were detected in the groundwater sample collected at MW-3. Benzene was detected at a concentration of 160 µg/L which exceeds the 15A NCAC, 2L Groundwater Quality Standard of 1 µg/L. Xylenes were detected at a concentration of 2,090 µg/L which exceeds the 2L Groundwater Quality Standards of 530 µg/L. Ethyl benzene was detected at a concentration of 82 µg/L which is below the 2L Groundwater Quality Standard of 550 µg/L.

According to the Preliminary Assessment Report dated October 15, 1992 completed by UTTS/Environmental, petroleum constituents were detected in the groundwater sample collected at MW-3 at significantly higher concentrations than detected in the November 8, 2005 sample. In 1992, Benzene was detected at a concentration of 2,756 µg/L. Toluene was detected at a concentration of 10,348 µg/L. Xylenes were detected at a concentration of 1,557 µg/L. MTBE was

detected at a concentration of 1,382 µg/L. 1,4-Dichlorobenzene was detected at a concentration of 423 µg/L. 1,2-Dichlorobenzene was detected at a concentration of 424 µg/L. Naphthalene was detected at a concentration of 58 µg/L.

Table 3 summarizes the laboratory analytical results for the collected groundwater samples and the analytical results of the groundwater sample collected at MW-3 in 1992. Copies of the laboratory reports for the soil and groundwater samples collected on November 8, 2005 are included in Appendix I.

CONCLUSION

Diesel Range Organics were detected in the soil sample collected at TW-1 at a concentration of 4 mg/Kg, which is below the North Carolina Reportable Concentration level of 10 mg/Kg. Several petroleum compounds were detected in the groundwater samples collected at TW-1 and MW-3 at concentrations which exceed the 2L Groundwater Quality Standards. Although the concentrations of petroleum compounds detected in the groundwater sample at MW-3 were significantly lower than those detected in 1992, the concentrations of several compounds remain above the 2L Groundwater Quality Standards.

Based on the analytical results, it appears that the Jim's Texaco site has impacted the subject property.

The purpose of this soil and groundwater sampling program was to screen the site for petroleum impacts stemming from the existing gasoline service station adjoining the property to the northeast. No data was collected nor is any representation made regarding areas of the site other than the specific sampling locations or for other contaminants.

This letter report is solely intended for Wal-Mart Stores, Inc. and Kimley-Horn and Associates, Inc. for this project. No other use is authorized by S&ME, Inc.


**Limited Soil and Groundwater Sampling Services
Proposed Wal-Mart SuperCenter, Raeford Road, Fayetteville, N.C.**


**S&ME Job No. 1051-05-508B
November 22, 2005**

S&ME appreciates having the opportunity to provide our services to you. Should you have any questions, please do not hesitate to contact us at your convenience.

Very truly yours,

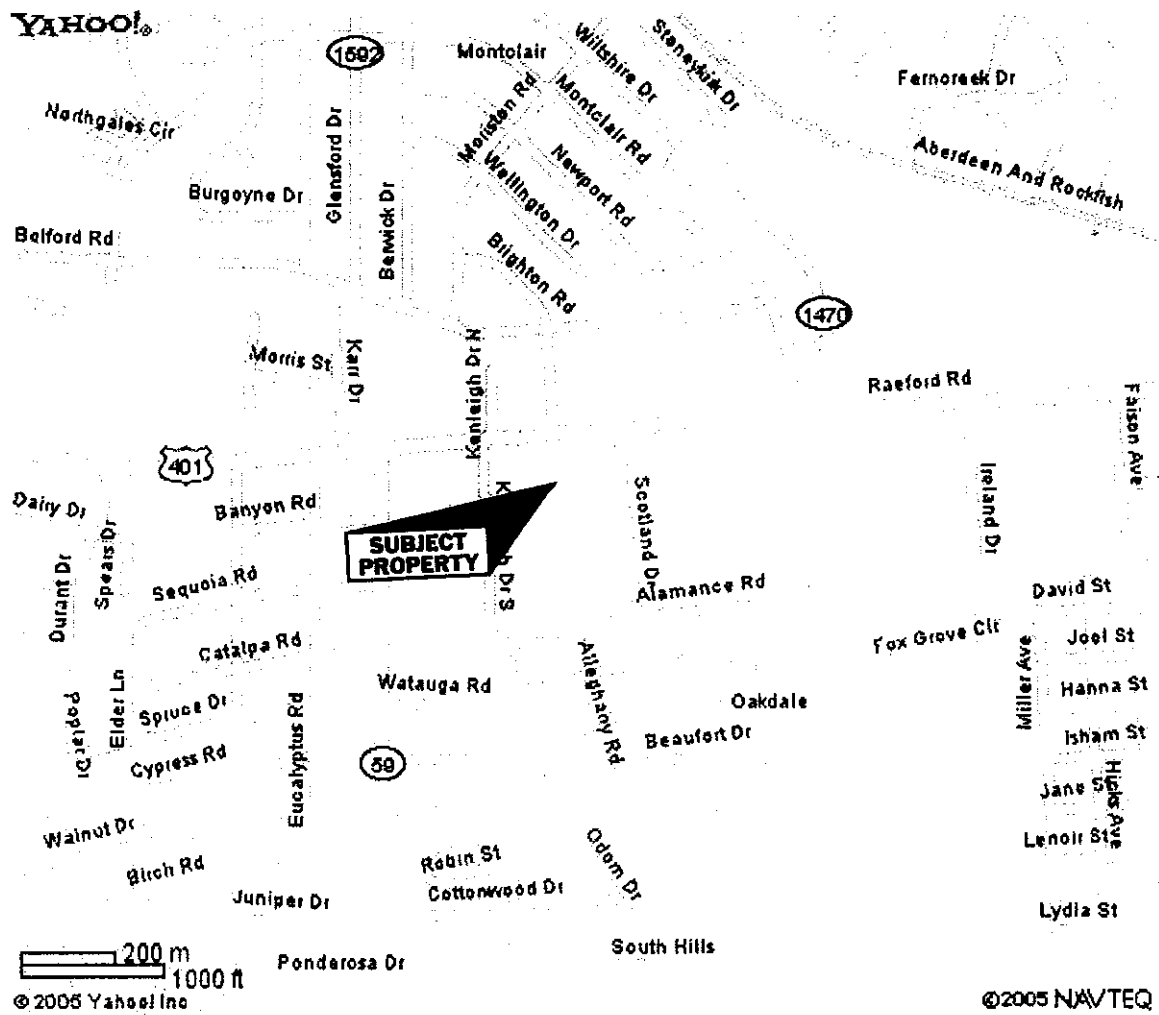
S&ME, INC.


Jamie T. Honeycutt
Environmental Staff Professional


Wayne Watterson, P.E.
Senior Engineer



YAHOO!



SUBJECT PROPERTY

200 m
1000 ft
© 2005 Yahoo! Inc

© 2005 NAV/TEQ

Scale: As Shown

Job No :	1051-05-508B
Date:	11/21/2005
Ref:	Yahoo Maps

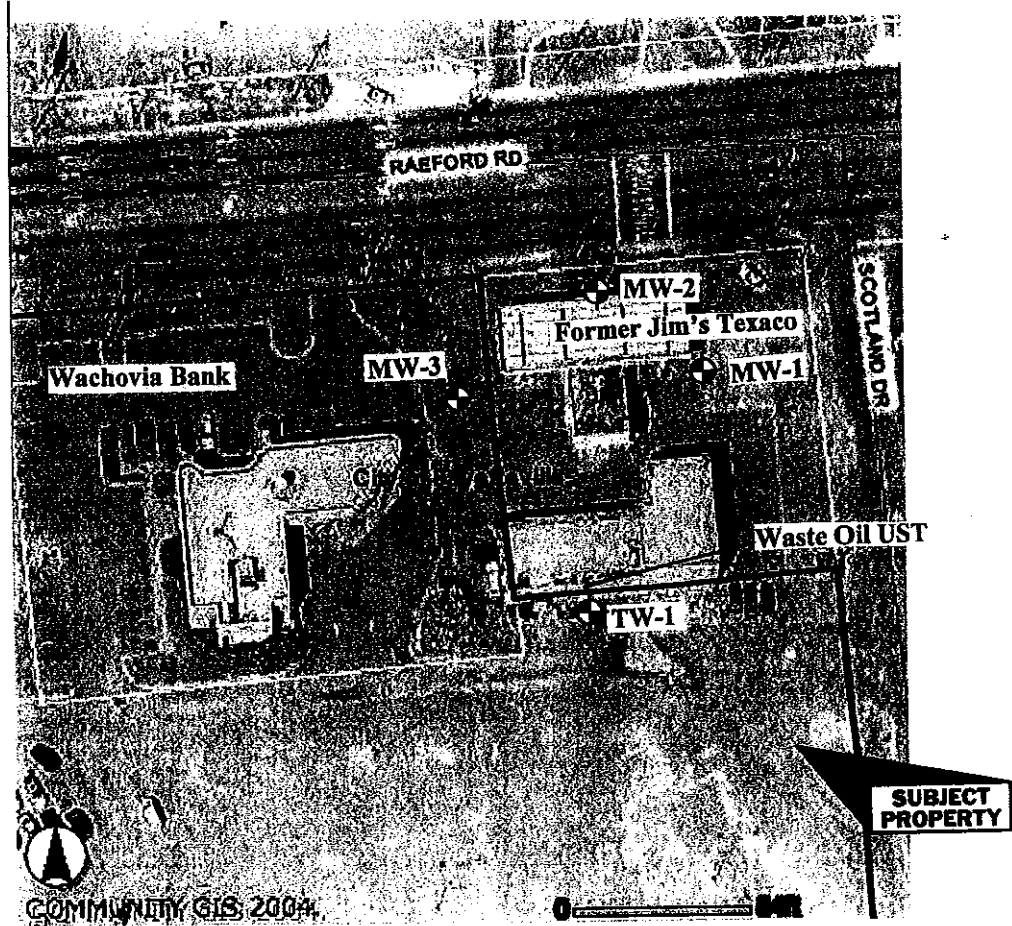



SITE VICINITY MAP
 Sampling Services
 Proposed Wal-Mart SuperCenter
 Raeford Road
 Fayetteville, North Carolina

Figure No:
 1



Map shows the Northeast corner of the subject property



 Approximate Well Location

Scale: As Shown

Job No : 1051-05-508B

Date: 11/21/2005

Ref: 2001 Cumberland Co.
Aerial Tax Map



SAMPLE LOCATION MAP
Sampling Services
Proposed Wal-Mart SuperCenter
Raeford Road
Fayetteville, North Carolina

Figure No:

2

Table 1

OVA Readings
Limited Soil and Groundwater Sampling Services

Proposed Wal-Mart SuperCenter Property
Raeford Road
Fayetteville, North Carolina
Job No. 1051-05-508B

Location	Depth (ft.)	OVA Reading (ppm)
TW-1	0 - 3.5	0
	3.5 - 5	2
	8.5 - 10	52
	13.5 - 15	74

Notes:
ppm = parts per million
ft.: feet

Table 2

Summary of Soil Quality Data
Limited Soil and Groundwater Sampling Services

Proposed Wal-Mart SuperCenter Property
Raeford Road
Fayetteville, North Carolina
Job No. 1051-05-508B

Analysis Compound	TW-1	Reportable Concentration
	13.5' - 15'	
<u>EPA Method 5030</u> Gasoline Range Organics	BDL	10
<u>EPA Method 3550</u> Diesel Range Organics	4	10
<u>EPA Method 9071</u> Oil and Grease	BDL	NA

All quantities expressed in mg/Kg milligrams per kilograms (parts per million)

BDL: below method detection limits

NA: Not applicable

Constituents not listed were below the detection limit of the analytical method.

Regulatory standards as set forth in "Guidelines for Assessment and Corrective Action, North Carolina Underground Storage Tank Section"

Analytical results greater than applicable standards are given in bold print.

Table 3

Summary of Groundwater Quality Data
 Limited Soil and Groundwater Sampling Services

Proposed Wal-Mart SuperCenter Property
 Raeford Road
 Fayetteville, North Carolina
 Job No. 1051-05-508B

Compound	TW-1	MW-3	MW-3	2L Regulatory Standards
	11-8-05	11-8-05	9-28-92	
MTBE	6,500	BDL	1,382	200
Benzene	14,000	160	2,756	1
Toluene	47,000	BDL	10,348	1,000
Ethyl benzene	3,700	82	BDL	550
M,P,O-Xylenes	36,000	2,090	1,557	530
Naphthalene	BDL	BDL	58	21
1,4-Dichlorobenzene	BDL	BDL	423	75
1,2-Dichlorobenzene	BDL	BDL	424	620

All quantities expressed in µg/L micrograms per liter (parts per billion)

Analytical results of groundwater samples collected at MW-3 collected in 1992 were obtained from the Preliminary Assessment Report dated October 15, 1992 completed by TTS/Environmental.

BDL: below method detection limits

Regulatory standards as set forth in 15A NCAC 2L, "Classifications and Standards Applicable to the Groundwaters of North Carolina" or in guidance documents issued by the NCDENR.

Analytical results greater than applicable standards are given in bold print.

Environmental Conservation Laboratories, Inc.
1015 Passport Way
Cary, North Carolina 27513-2042
919 / 677-1669
Fax 919 / 677-9846
www.encolabs.com



DHRS Certification No. E82277

CLIENT : S&ME, Inc.
ADDRESS: 409 Chicago Dr.
Suite 116
Fayetteville, NC 28306

REPORT # : CRY19035
DATE SUBMITTED: November 9, 2005
DATE REPORTED : November 16, 2005

PAGE 1 OF 11

ATTENTION: Mr. Jamie Honeycutt

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

REFERENCE: 1051-05-508A

Raeford Rd.

11/08/05

CRY19035-1 : TW-1 @ 14:15
CRY19035-2 : TW-1 @ 15:30
CRY19035-3 : MW-3 @ 15:00

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. This data has been produced in accordance with NELAC Standards (June, 2003). This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

Note: Analytical values are reported on a dry weight basis.

PROJECT MANAGER

A handwritten signature in cursive script that reads "Chuck Smith".

Chuck Smith

ENCO LABORATORIES

REPORT # : CRY19035

DATE REPORTED: November 16, 2005

REFERENCE : 1051-05-508A

PROJECT NAME : Raeford Rd.

PAGE 2 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

	<u>TW-1</u>	<u>TW-1</u>	<u>Units</u>
Dichlorodifluoromethane	NR	800 U D1	ug/L
Chloromethane	NR	400 U D1	ug/L
Vinyl Chloride	NR	400 U D1	ug/L
Bromomethane	NR	800 U D1	ug/L
Chloroethane	NR	800 U D1	ug/L
Trichlorofluoromethane	NR	400 U D1	ug/L
1,1-Dichloroethene	NR	400 U D1	ug/L
Methylene Chloride	NR	2000 U D1	ug/L
t-1,2-Dichloroethene	NR	400 U D1	ug/L
Methyl tert-butyl ether	NR	6500 D1	ug/L
1,1-Dichloroethane	NR	400 U D1	ug/L
c-1,2-Dichloroethene	NR	400 U D1	ug/L
Chloroform	NR	400 U D1	ug/L
1,1,1-Trichloroethane	NR	400 U D1	ug/L
Carbon tetrachloride	NR	400 U D1	ug/L
Benzene	NR	14000 D1	ug/L
1,2-Dichloroethane	NR	400 U D1	ug/L
Trichloroethene	NR	400 U D1	ug/L
1,2-Dichloropropane	NR	400 U D1	ug/L
Bromodichloromethane	NR	400 U D1	ug/L

NR = Analysis not requested for this sample.

U = Compound was analyzed for but not detected to the level shown.

D1 = Analyte value determined from a 1:400 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 3 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>TW-1</u>	<u>TW-1</u>	<u>Units</u>
2-Chloroethyl vinyl ether	NR	2400 U D1	ug/L
c-1,3-Dichloropropene	NR	400 U D1	ug/L
Toluene	NR	47000 D1	ug/L
t-1,3-Dichloropropene	NR	400 U D1	ug/L
1,1,2-Trichloroethane	NR	400 U D1	ug/L
Tetrachloroethene	NR	400 U D1	ug/L
Dibromochloromethane	NR	400 U D1	ug/L
Chlorobenzene	NR	400 U D1	ug/L
Ethylbenzene	NR	3700 D1	ug/L
m-Xylene & p-Xylene	NR	25000 D1	ug/L
o-Xylene	NR	11000 D1	ug/L
Styrene	NR	400 U D1	ug/L
Bromoform	NR	400 U D1	ug/L
1,1,2,2-Tetrachloroethane	NR	400 U D1	ug/L
1,3-Dichlorobenzene	NR	400 U D1	ug/L
1,4-Dichlorobenzene	NR	400 U D1	ug/L
1,2-Dichlorobenzene	NR	400 U D1	ug/L
Naphthalene	NR	800 U D1	ug/L
<u>Surrogate:</u>		<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane		117	73-138
D8-Toluene		103	77-118
Bromofluorobenzene		110	70-130
Date Analyzed		11/16/05 09:06	

NR = Analysis not requested for this sample.

U = Compound was analyzed for but not detected to the level shown.

D1 = Analyte value determined from a 1:400 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 4 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8015 MODIFIED -
 DIESEL RANGE ORGANICS

	<u>TW-1</u>	<u>TW-1</u>	<u>Units</u>
DRO (C10-C24)	4.	NR	mg/Kg
<u>Surrogate:</u>	<u>% RECOV</u>		<u>LIMITS</u>
o-Terphenyl	106		34-140
Date Prepared	11/09/05 12:30		
Date Analyzed	11/10/05 13:22		

EPA METHOD 8015 MODIFIED -
 GASOLINE RANGE ORGANICS

	<u>TW-1</u>	<u>TW-1</u>	<u>Units</u>
GRO (C6-C10)	4. U D2	NR	mg/Kg
<u>Surrogate:</u>	<u>% RECOV</u>		<u>LIMITS</u>
2,5-Dibromotoluene	84		59-168
Date Analyzed	11/10/05 14:07		

MISCELLANEOUS

	<u>METHOD</u>	<u>TW-1</u>	<u>TW-1</u>	<u>Units</u>
Oil and Grease	9071B	1.1 U	NR	mg/Kg
Date Prepared		11/11/05 08:00		
Date Analyzed		11/14/05 13:00		
Percent Solids	ENCO WETS	72 92.9	NR	%
Date Analyzed		11/10/05 09:45		

NR = Analysis not requested for this sample.

U = Compound was analyzed for but not detected to the level shown.

D2 = Analyte value determined from a 1:88 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 5 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

	<u>MW-3</u>	<u>LAB BLANK</u>	<u>Units</u>
Dichlorodifluoromethane	80. U D3	2. U	ug/L
Chloromethane	40. U D3	1. U	ug/L
Vinyl Chloride	40. U D3	1. U	ug/L
Bromomethane	80. U D3	2. U	ug/L
Chloroethane	80. U D3	2. U	ug/L
Trichlorofluoromethane	40. U D3	1. U	ug/L
1,1-Dichloroethene	40. U D3	1. U	ug/L
Methylene Chloride	200 U D3	5. U	ug/L
t-1,2-Dichloroethene	40. U D3	1. U	ug/L
Methyl tert-butyl ether	40. U D3	1. U	ug/L
1,1-Dichloroethane	40. U D3	1. U	ug/L
c-1,2-Dichloroethene	40. U D3	1. U	ug/L
Chloroform	40. U D3	1. U	ug/L
1,1,1-Trichloroethane	40. U D3	1. U	ug/L
Carbon tetrachloride	40. U D3	1. U	ug/L
Benzene	160 D3	1. U	ug/L
1,2-Dichloroethane	40. U D3	1. U	ug/L
Trichloroethene	40. U D3	1. U	ug/L
1,2-Dichloropropane	40. U D3	1. U	ug/L
Bromodichloromethane	40. U D3	1. U	ug/L

U = Compound was analyzed for but not detected to the level shown.
 D3 = Analyte value determined from a 1:40 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 6 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>MW-3</u>	<u>LAB BLANK</u>	<u>Units</u>
2-Chloroethyl vinyl ether	240 U D3	6. U	ug/L
c-1,3-Dichloropropene	40. U D3	1. U	ug/L
Toluene	40. U D3	1. U	ug/L
t-1,3-Dichloropropene	40. U D3	1. U	ug/L
1,1,2-Trichloroethane	40. U D3	1. U	ug/L
Tetrachloroethene	40. U D3	1. U	ug/L
Dibromochloromethane	40. U D3	1. U	ug/L
Chlorobenzene	40. U D3	1. U	ug/L
Ethylbenzene	82. D3	1. U	ug/L
m-Xylene & p-Xylene	1600 D3	2. U	ug/L
o-Xylene	490 D3	1. U	ug/L
Styrene	40. U D3	1. U	ug/L
Bromoform	40. U D3	1. U	ug/L
1,1,2,2-Tetrachloroethane	40. U D3	1. U	ug/L
1,3-Dichlorobenzene	40. U D3	1. U	ug/L
1,4-Dichlorobenzene	40. U D3	1. U	ug/L
1,2-Dichlorobenzene	40. U D3	1. U	ug/L
Naphthalene	80. U D3	2. U	ug/L
<u>Surrogate:</u>	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	93	109	73-138
D8-Toluene	100	110	77-118
Bromofluorobenzene	120	116	70-130
Date Analyzed	11/15/05 15:05	11/15/05 13:46	

U = Compound was analyzed for but not detected to the level shown.
 D3 = Analyte value determined from a 1:40 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 7 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8015 MODIFIED -
 DIESEL RANGE ORGANICS

	<u>MW-3</u>	<u>LAB BLANK</u>	<u>Units</u>
DRO (C10-C24)	NR	3. U	mg/Kg
<u>Surrogate:</u>		<u>% RECOV</u>	<u>LIMITS</u>
o-Terphenyl		100	34-140
Date Prepared		11/09/05 12:30	
Date Analyzed		11/10/05 09:59	

EPA METHOD 8015 MODIFIED -
 GASOLINE RANGE ORGANICS

	<u>MW-3</u>	<u>LAB BLANK</u>	<u>Units</u>
GRO (C6-C10)	NR	5. U D4	mg/Kg
<u>Surrogate:</u>		<u>% RECOV</u>	<u>LIMITS</u>
2,5-Dibromotoluene		93	59-168
Date Analyzed		11/10/05 07:49	

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>MW-3</u>	<u>LAB BLANK</u>	<u>Units</u>
Oil and Grease	9071B	NR	1.0 U	mg/Kg
Date Prepared			11/11/05 08:00	
Date Analyzed			11/14/05 13:00	

NR = Analysis not requested for this sample.
 U = Compound was analyzed for but not detected to the level shown.
 D4 = Analyte value determined from a 1:100 dilution.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 8 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

	<u>LAB BLANK</u>	<u>Units</u>
Dichlorodifluoromethane	2. U	ug/L
Chloromethane	1. U	ug/L
Vinyl Chloride	1. U	ug/L
Bromomethane	2. U	ug/L
Chloroethane	2. U	ug/L
Trichlorofluoromethane	1. U	ug/L
1,1-Dichloroethene	1. U	ug/L
Methylene Chloride	5. U	ug/L
t-1,2-Dichloroethene	1. U	ug/L
Methyl tert-butyl ether	1. U	ug/L
1,1-Dichloroethane	1. U	ug/L
c-1,2-Dichloroethene	1. U	ug/L
Chloroform	1. U	ug/L
1,1,1-Trichloroethane	1. U	ug/L
Carbon tetrachloride	1. U	ug/L
Benzene	1. U	ug/L
1,2-Dichloroethane	1. U	ug/L
Trichloroethene	1. U	ug/L
1,2-Dichloropropane	1. U	ug/L
Bromodichloromethane	1. U	ug/L

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 9 OF 11

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>LAB BLANK</u>	<u>Units</u>
2-Chloroethyl vinyl ether	6. U	ug/L
c-1,3-Dichloropropene	1. U	ug/L
Toluene	1. U	ug/L
t-1,3-Dichloropropene	1. U	ug/L
1,1,2-Trichloroethane	1. U	ug/L
Tetrachloroethene	1. U	ug/L
Dibromochloromethane	1. U	ug/L
Chlorobenzene	1. U	ug/L
Ethylbenzene	1. U	ug/L
m-Xylene & p-Xylene	2. U	ug/L
o-Xylene	1. U	ug/L
Styrene	1. U	ug/L
Bromoform	1. U	ug/L
1,1,2,2-Tetrachloroethane	1. U	ug/L
1,3-Dichlorobenzene	1. U	ug/L
1,4-Dichlorobenzene	1. U	ug/L
1,2-Dichlorobenzene	1. U	ug/L
Naphthalene	2. U	ug/L
<u>Surrogate:</u>	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	122	73-138
D8-Toluene	107	77-118
Bromofluorobenzene	121	70-130
Date Analyzed	11/16/05 08:39	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : CRY19035
DATE REPORTED: November 16, 2005
REFERENCE : 1051-05-508A
PROJECT NAME : Raeford Rd.

PAGE 10 OF 11

LABORATORY CERTIFICATIONS

Laboratory Certification: NCDENR:591

All analyses reported with this project were analyzed by the facility indicated unless identified below.

PARAMETER

Oil & Grease, SW-846 Method 9071B

LAB CERT #'s

NCDENR:442

ENCO LABORATORIES

REPORT # : CRY19035
 DATE REPORTED: November 16, 2005
 REFERENCE : 1051-05-508A
 PROJECT NAME : Raeford Rd.

PAGE 11 OF 11

QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY</u> <u>LCS/MS/MSD</u>	<u>LCS</u> <u>LIMITS</u>	<u>MS/MSD</u> <u>LIMITS</u>	<u>RPD</u> <u>MS/MSD</u>	<u>RPD</u> <u>LIMITS</u>
<u>EPA Method 8260</u>					
1,1-Dichloroethene	92/ 83/ 86	64-139	36-177	4	30
Benzene	73/ 70/ 75	69-115	53-150	7	23
Trichloroethene	108/104/104	74-118	64-124	<1	25
Toluene	93/ 94/ 92	77-117	40-161	2	23
Chlorobenzene	96/ 98/ 96	76-118	44-128	2	22
<u>EPA Method 8015 MODIFIED</u>					
<u>DRO (C10-C24)</u>	85/ 82/ 83	49-102	14-162	1	31
<u>EPA Method 8015 MODIFIED</u>					
<u>GRO (C6-C10)</u>	89/ 98/ 98	51-115	45-162	<1	24
<u>MISCELLANEOUS</u>					
Oil and Grease, 9071B	*83/ 71/ 81	90-114	68-120	13	15

* = Recovery outside historical limits.
 < = Less Than
 MS = Matrix Spike
 MSD = Matrix Spike Duplicate
 LCS = Laboratory Control Standard
 RPD = Relative Percent Difference



ENVIRONMENTAL CONSERVATION LABORATORIES

4810 Executive Park Court, Suite 211
 Jacksonville, Florida 32216-6069
 Ph. (904) 296-3007 • Fax (904) 296-6210

10207 General Drive
 Orlando, Florida 32824-8529
 Ph. (407) 826-5314 • Fax (407) 850-6945

1015 Passport Way
 Cary, North Carolina 27513
 Ph. (919) 677-1669 • Fax (919) 677-9846

ENCO CompQAP No.: 960038G/0

CHAIN OF CUSTODY RECORD

PROJECT REFERENCE: Raeford Rd
 PROJECT NO: 1051-05-508A

PO NUMBER

MATRIX TYPE

REQUIRED ANALYSIS

PAGE 1 OF 1

PROJECT LOC: (State) NC
 SAMPLE(S) NAME: *Towiet Honeycutt*
 PHONE: (910) 323-1091
 FAX: (910) 323-3499

CLIENT NAME: S&M, Inc.
 CLIENT PROJECT MANAGER: Mr. Jaime Honeycutt

CLIENT ADDRESS (CITY, STATE, ZIP): 409 Chicago Dr. Suite 116 Fayetteville, NC 28306

STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION	SURFACE WATER	GROUND WATER	WASTEWATER	DRINKING WATER	SOIL/SOLID/SEDIMENT	NONAQUEOUS LIQUID (oil solvent, etc.)	AIR	SLUDGE	OTHER	NUMBER OF CONTAINERS SUBMITTED	PRESERVATIVE	REMARKS
1	11-8-05	2:15	X		TW-1					X					1	1	5 Business Day
2	11-8-05	3:30	K		TW-1					X					2	2	Towiet Honeycutt
3	11-8-05	3:00	K		NW-3					X					0	0	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	

SAMPLE KIT PREPARED BY: *Amber...* DATE: *11/8/05* TIME: *5:11* RELINQUISHED BY: (SIGNATURE)

JACKSONVILLE DORLANDO *W. CHERRY* DATE: *11/8/05* TIME: *6:00pm* RECEIVED BY: (SIGNATURE)

RELINQUISHED BY (SIGNATURE): *Jaime Honeycutt* DATE: DATE TIME: TIME RECEIVED BY: (SIGNATURE)

RECEIVED FOR LABORATORY BY (SIGNATURE): *Ry OA* DATE: *11/9/05* TIME: *12:04* CUSTODY INTACT: YES NO ENCO LOG NO: *CR19635* REMARKS:

STANDARD REPORT DELIVERY
 EXPEDITED REPORT DELIVERY (surcharge)

Date Due: _____

***A*dvantage *E*nvironmental
Consultants, LLC**

PHASE II ENVIRONMENTAL SITE ASSESSMENT

**Vacant Raeford Road Sunoco Station
4537 Raeford Road
Fayetteville, North Carolina**

**AEC Project No. 06-017
March 6, 2006**

Prepared for:

**Mr. Mervis Samuels
BB&T
9658 Baltimore Avenue, Suite 207
College Park, Maryland 20740**

On behalf of:

**Empire Petroleum Marketing LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855**

Prepared by:

**Advantage Environmental Consultants, LLC
Jessup 8610 Washington Blvd, Suite 217
Jessup, Maryland 20794
Phone (301) 776-0500
(301) 776-0500 • FAX (301) 776-1123**

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	2
1.1 Introduction and Purpose	2
1.2 Site Location and Description	2
1.3 Site Topography and Hydrology	3
2.0 INVESTIGATION METHODS	4
2.1 Introduction	4
2.2 Soil Sampling Methodology	4
2.3 Groundwater Sampling Methodology	4
2.4 Sample Handling and Analysis	5
3.0 REGIONAL AND LOCAL GEOLOGY AND HYDROLOGY	6
4.0 INVESTIGATION ACTIVITY RESULTS	7
4.1 Soil Sample Analytical Results	7
4.2 Groundwater Sample Analytical Results	8
5.0 CONCLUSIONS	9
5.1 Conclusions	9

APPENDICES

APPENDIX A FIGURES

APPENDIX B BORING LOGS

APPENDIX C LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTATION

FIGURES

FIGURE 1: SITE VICINITY MAP

FIGURE 2: BORING LOCATION MAP

FIGURE 3: SOIL QUALITY MAP

FIGURE 4: GROUNDWATER QUALITY MAP

EXECUTIVE SUMMARY

Advantage Environmental Consultants, LLC. (AEC) was contracted by BB&T to perform a subsurface investigation at 4537 Raeford Road, in Fayetteville, NC (hereinafter referred to as the "Site"). The subsurface investigation was performed as part of a due diligence study prior to possible acquisition of the Site. A Phase I Environmental Site Assessment was also conducted simultaneously with this Phase II Subsurface Investigation.

AEC installed six soil borings and collected water samples from three of the borings and soil samples from four of the borings. AEC also gauged three existing monitoring wells which were reportedly installed by the owner in 1992.

Liquid phase hydrocarbon (LPH) was found to exist in 2 of the 3 existing monitoring wells at thicknesses of approximately 1.5 inches and 13 inches. The results of the soil and groundwater sampling indicated environmental impact throughout the majority of the site.

According to the North Carolina Department of the Environment and Natural Resources (DENR), an active regulatory case has existed at the site since 1992. According to conversations with the DENR, a Comprehensive Site Assessment was requested from the Site owner. A CSA has reportedly not been completed and remains an outstanding issue. Based on the currently known environmental conditions at the site, the DENR has ranked the site as an intermediate priority.

Significant costs associated with the assessment and clean-up of this site are expected.

Due to the contamination known to exist at the Site, it is likely that UST upgrading, UST removal, or any future development activity will encounter contaminated soil and groundwater that will result in additional project costs. These costs are typically not reimbursed through the UST reimbursement program.

Although the Site is under active enforcement by the DENR, this will not prohibit the Site's current or future use as a gasoline service station. This statement, of course, assumes that the tanks are in compliance with state regulation and any physical non-compliance issues are corrected prior to their operation.

1.0 INTRODUCTION

1.1 Introduction and Purpose

Advantage Environmental Consultants, LLC (AEC) was contracted by BB&T to perform a subsurface investigation at the vacant Raeford Road Sunoco station, located at 4537 Raeford Road, in Fayetteville, NC (hereinafter referred to as the "Site"). The subsurface investigation was performed to determine if the soil and/or groundwater have been impacted by the historical operations on the Site. A Site Vicinity Map showing the approximate location is included as Figure 1 in Appendix A.

Six soil borings were advanced at locations throughout the Site chosen based on their proximity to potential on-site sources of environmental impact.

An AEC Field Geologist logged the geologic conditions and field screened the entire soil core of each boring for volatile organic compounds (VOCs) using a photoionization detector (PID). A total of four soil samples were collected for laboratory analysis based on elevated PID readings or evidence of impact in soil. Groundwater samples were collected at three locations. Three groundwater monitoring wells were observed on the site as well as four tank pit monitoring wells, as noted on Figure 2 in Appendix A. The three monitoring wells were gauged and liquid petroleum hydrocarbons (LPH) were noted in MW-1 and MW-2. Approximately 1.5 inches of LPH was noted in MW-1, 13 inches of LPH was noted in MW-2, and a strong gasoline odor in MW-3. The tank pit monitoring wells were not accessible at the time of this investigation.

Soil samples, when appropriate, were analyzed for Volatile Petroleum Hydrocarbons (VPH) per MADEP VPH: Aliphatics/Aromatics and Volatile Organic Compounds (VOCs) per EPA analytical method 8260.

Groundwater samples collected from the borings were analyzed for: VPH per MADEP VPH: Aliphatics/Aromatics, and VOCs per EPA analytical method 8260.

1.2 Site Location and Description

The Site is an approximate 0.53-acre parcel that is improved with a vacant gasoline filling station and automobile service shop. Improvements at the Site consist of a convenience store, an automobile service shop with five service bays, four gasoline dispenser islands beneath an overhead canopy, and three 10,000-gallon underground storage tanks (USTs) and the related piping system. The on-site convenience store building was constructed in 1986 and comprises a reported total of 1,362 square feet of space. The automobile service shop building was constructed in 1984 and comprises a reported total of 1,890 square feet. Remaining areas of the Site are developed with an asphalt-paved parking lot and landscaping. A Site Map is included as Figure 2 in Appendix A.

1.3 Site Topography and Hydrology

AEC reviewed a copy of the United States Geological Survey (USGS) 7.5 Minute Series, Fayetteville, NC Topographic Quadrangle map dated 1987. According to the map, the elevation of the Site is approximately 200 feet above mean sea level (msl). The area on and around the Site slopes south, towards Buckhead Creek, located approximately 2,700 feet southeast of the Site. The Site is illustrated with two solid black rectangles, indicating the on-site structures. Surrounding areas to the east, west and south are illustrated as commercial properties, while the area north of the Site is shaded red, indicating dense urban development. No surface bodies of water were illustrated on the Site.

2.0 INVESTIGATION METHODS

2.1 Introduction

Six geoprobe borings were advanced for this study. The boring locations were selected based on their proximity to potential on-site sources of environmental impact. Boring locations are shown on Figure 2 in Appendix A.

Soil samples were collected from four of the six borings. The criteria for selecting the soil samples was based on elevated PID readings or evidence of impact in soil. In general, the highest PID readings were observed directly above the water table. Soil samples were collected from SB1 at 21 feet, SB3 at 16 feet, SB4 at 11, and SB5 at 20 feet. Groundwater samples were collected during this investigation from borings SB1, SB3, and SB4.

Each of the soil and groundwater samples collected from the borings was analyzed for VPH per MADEP VPH: Aliphatics/Aromatics and VOCs per EPA analytical method 8260.

2.2 Soil Sampling Methodology

Drilling activities were performed on February 16, 2006. Sample cores were collected continuously using 1.5-inch, inside-diameter, stainless steel macro-core samplers with new acetate liners. Cores were collected in four feet intervals by using a truck-mounted hydraulic press to drive the sampler through the stratum. All sampling equipment was decontaminated in the field using non-phosphate liquinox and distilled water prior to use. AEC contracted Environmental Probing of Clayton, North Carolina to perform the drilling activities. Copies of the boring logs for this investigation are included in Appendix C.

Upon retrieval, each soil sample was screened using a PID. Petroleum hydrocarbon odors were noted in each of the borings. Following the screening, a total of four soil samples, chosen based on elevated PID readings, evidence of impact in soil, or within man-made fill layers, were collected for laboratory analysis. Samples were placed in appropriate laboratory-supplied containers and preserved as necessary. Once collected, the samples were placed on ice in a cooler to await shipment to the laboratory.

2.3 Groundwater Sampling Methodology

Temporary groundwater monitoring wells were installed in borings SB1, SB3, and SB4. Wells were constructed of new one-inch-diameter PVC screen and casing. Each well used 10 feet of slotted screen, and unslotted riser up to grade.

Groundwater samples from the three temporary wells were collected using new dedicated HDPE tubing and a peristaltic pump. The sample from each well was placed in appropriate laboratory supplied containers and preserved as necessary. Once collected, the samples were placed on ice in a cooler to await shipment to the laboratory. Upon completion of the groundwater sampling in each boring, the temporary PVC well was removed from the boring and the holes were backfilled with the drill cuttings.

2.4 Sample Handling and Analysis

Samples were packaged for shipment using strict chain-of-custody procedures. The cooler was packed with individually wrapped sample containers and ice and sealed with laboratory provided custody seals and shipping tape. Samples were shipped to Test America Analytical Testing Corporation of Nashville, Tennessee for analysis.

3.0 REGIONAL AND LOCAL GEOLOGY AND HYDROLOGY

Review of the Generalized Geologic Map of North Carolina (http://gis.enr.state.nc.us/sid/bin/index.plx?client=zGeologic_Maps&site=9AM) indicated that the Site is underlain by a Triassic formation known as the Dan River Group, which consists of mudstone, sandstone and conglomerates. Depth to bedrock is estimated to be more than five feet below ground surface.

Shallow groundwater flow generally follows topography. Based on the drilling of the site groundwater ranges from 16.5 to 21.5 feet below ground surface (bgs) and flow in a direction similar to surface drainage patterns (i.e., to the south). Precise groundwater depths and flow directions can be determined through the installation and survey of groundwater monitoring wells. Based on the review of the soil, geologic, and hydrogeologic information, AEC concludes that the potential of on-site soils for contaminant or leachate migration is moderate.

4.0 INVESTIGATION ACTIVITY RESULTS

4.1 Soil Sample Analytical Results

The soil analytical results revealed elevated levels of VPH. Specifically, VPH was found in samples SB1 @ 21' and SB4 @ 11'. Samples SB3 @ 16' and SB5 @ 20' were below detection limits (bdl) for VPH. It should be noted that the detection limit is defined as the minimum concentration of the compound that can be reliably quantified by the laboratory performing the analysis per the recognized method. In addition to the VPH exceedances, several VOCs were also detected. The most significant were Benzene, n-butylbenzene, and Naphthalene. Most of the VOC analytes listed below are common petroleum constituents. Soil analytical results are illustrated on Figure 3 in Appendix A.

**Table 1: Soil Sample Analytical Results
Vacant Raeford Road Sunoco Station
4537 Raeford Road, Fayetteville, NC
February 16, 2005**

Analyte	SB1 @ 21'	SB3 @ 16'	SB4 @ 11'	SB5 @ 20'	NC DENR Commercial Cleanup Levels
Benzene	1.37	0.021	28.9	0.005	200
sec-Butylbenzene	0.655	bdl	97.1	bdl	4,088
n-Butylbenzene	3.00	bdl	364	bdl	4,088
Ethylbenzene	9.48	0.012	206	0.002	40,000
Isopropylbenzene	1.61	bdl	293	bdl	40,880
p-Isopropyltoluene	0.331	bdl	40	bdl	not listed
Methyl tert-Butyl Ether (MTBE)	0.234	0.110	bdl	0.086	4,088
Naphthalene	5.23	0.016	505	0.008	1,635
n-Propylbenzene	5.24	0.002	93.6	0.001	4,088
Toluene	26.9	0.036	351	0.013	82,000
1,3,5-Trimethylbenzene	9.70	0.009	189	0.003	20,440
1,2,4-Trimethylbenzene	31.0	0.030	585	0.012	20,440
Xylenes, Total	52.6	0.066	1,080	0.015	200,000
C5 - C8 Aliphatic Hydrocarbons, Unadjusted	134	bdl	4,160	bdl	not listed
C9 - C10 Aromatic Hydrocarbons	136	bdl	1,850	bdl	not listed
C9 - C12 Aliphatic Hydrocarbons, Unadjusted	392	bdl	4,470	bdl	not listed
C9 - C12 Aliphatic Hydrocarbons	256	bdl	2,260	bdl	not listed

All analytes reported in mg/kg

bdl = denotes results below analytical detection level

All analyte levels are compared to the North Carolina Department of Environment and Natural Resource (NC DENR) "Guidelines for Assessment and Corrective Action", Dated July 1, 2001

Copies of the completed laboratory analytical reports and chain-of-custody forms are provided in Appendix C.

4.2 Groundwater Sample Analytical Results

The groundwater analytical results revealed elevated levels of VPH. Specifically, VPH was found in samples SB1 W, SB3 W, and SB4 W. In addition to the VPH exceedances, several VOCs were also detected. The most significant were Benzene, Toluene, and Xylenes. Most of the VOC analytes listed below are common petroleum constituents. Copies of the completed laboratory analytical reports and chain-of-custody forms are provided in Appendix C.

**Table 2: Soil Sample Analytical Results
Vacant Raeford Road Sunoco Station
4537 Raeford Road, Fayetteville, NC
February 16, 2005**

Analyte	SB1 W	SB3 W	SB4 W	NC DENR Groundwater Quality Standards
Benzene	14,500	9,050	1,120	1
sec-Butylbenzene	24	bdl	bdl	70
Chloroform	7.09	1.16	bdl	0.00019
1,2-Dibromoethane	15.5	bdl	bdl	0.0004
Ethylbenzene	2,250	2,970	1,470	29
2-Hexanone	61	bdl	bdl	280
Isopropylbenzene	194	91.3	168	70
p-Isopropyltoluene	11.3	11.0	8.55	not listed
Methyl tert-Butyl Ether (MTBE)	737	286	3.86	200
Methylene Chloride	bdl	bdl	10.2	5
Naphthalene	270	191	213	21
n-Propylbenzene	413	146	189	70
Toluene	25,700	27,900	15,500	1,000
1,1,2-Trichloroethane	bdl	bdl	8.30	not listed
1,3,5-Trimethylbenzene	794	580	349	350
1,2,4-Trimethylbenzene	2,490	2,190	1,300	350
Xylenes, Total	11,500	15,600	7,820	530
C5 - C8 Aliphatic Hydrocarbons, Unadjusted	117,000	47,000	45,700	not listed
C9 - C10 Aromatic Hydrocarbons	12,700	4,070	5,170	not listed
C9 - C12 Aliphatic Hydrocarbons, Unadjusted	42,600	20,200	21,300	not listed
C9 - C12 Aliphatic Hydrocarbons	29,900	16,100	16,100	not listed

All analytes in µg/L

bdl = denotes results below analytical detection level

bold denoted exceeding NC DENR Groundwater Quality Standards

All analyte levels are compared to the North Carolina Department of Environment and Natural Resource (NC DENR) "Guidelines for Assessment and Corrective Action", Dated July 1, 2001

5.0 CONCLUSIONS

5.1 Conclusions

Liquid phase hydrocarbon (LPH) was found to exist in 2 of the 3 existing monitoring wells at thicknesses of approximately 1.5 inches and 13 inches. The results of the soil and groundwater sampling indicated environmental impact throughout the majority of the site.

According to the North Carolina Department of the Environment and Natural Resources (DENR), an active regulatory case has existed at the site since 1992. According to conversations with the DENR, a Comprehensive Site Assessment (CSA) was requested from the Site owner. A CSA has reportedly not been completed and remains an outstanding issue. Based on the currently known environmental conditions at the site, the DENR has ranked the site as an intermediate priority.

Significant costs associated with the assessment and clean-up of this site are expected.

Due to the contamination known to exist at the Site, it is likely that UST upgrading, UST removal, or any future development activity will encounter contaminated soil and groundwater that will result in additional project costs. These costs are typically not reimbursed through the UST reimbursement program.

Although the Site is under active enforcement by the DENR, this will not prohibit the Site's current or future use as a gasoline service station. This statement, of course, assumes that the tanks are in compliance with state regulation and any physical non-compliance issues are corrected prior to their operation.

APPENDIX A
FIGURES

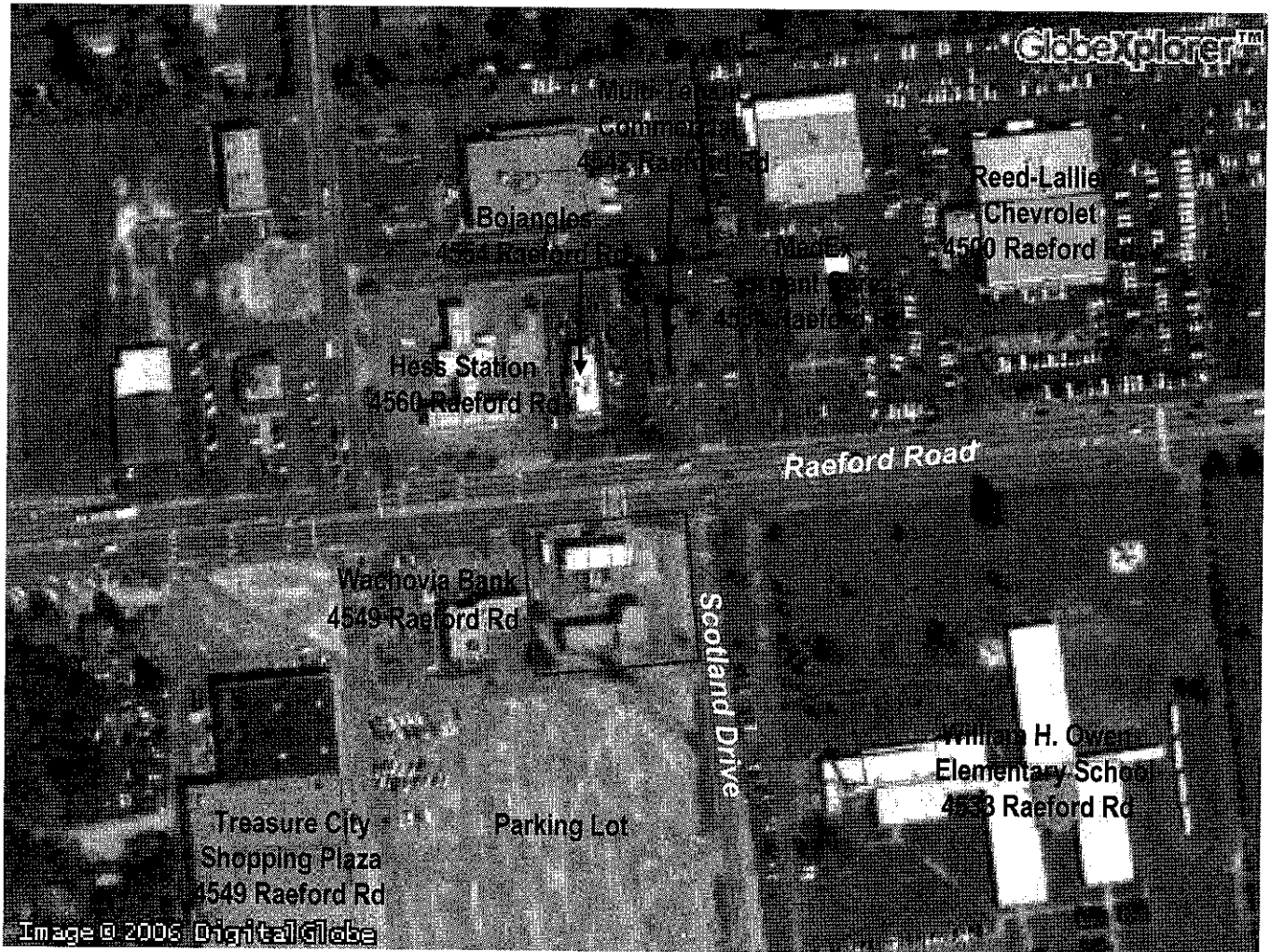


Figure 1 - Site Plan
 Vacant Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina

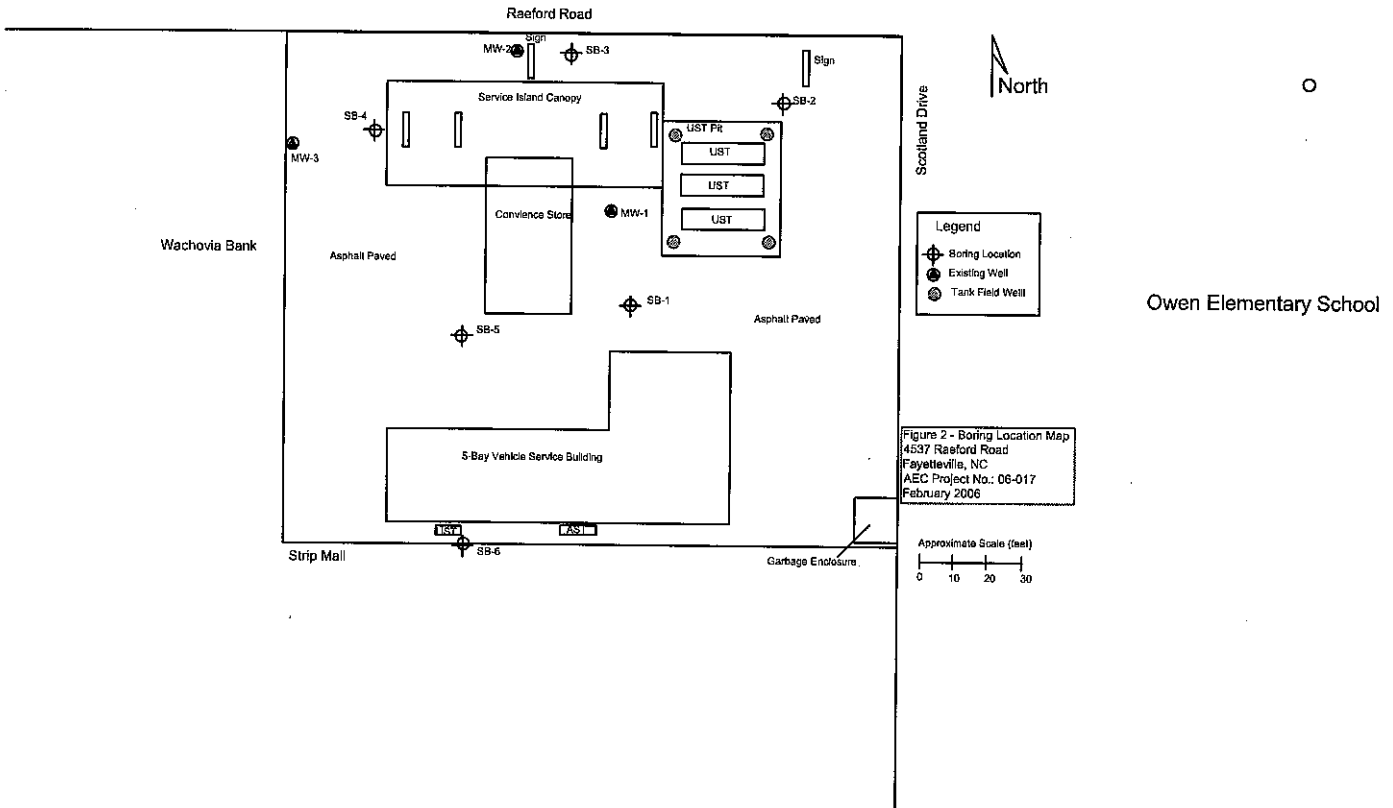
ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

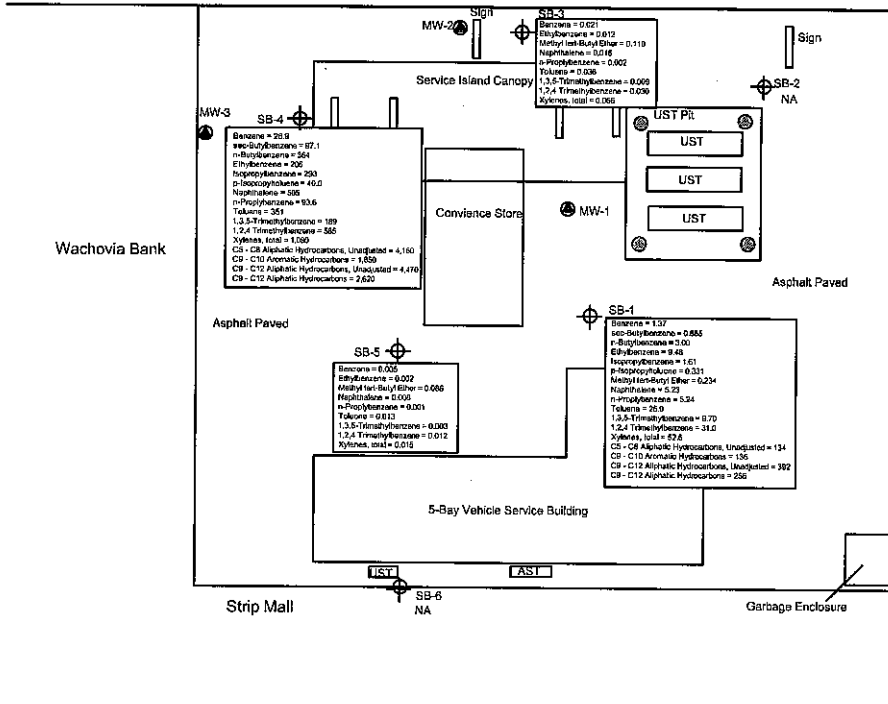
AEC Project No.:
06-017

Report Date:
3/6/06

Drawn By:
LAK



Raeferd Road

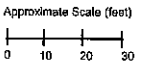


Legend

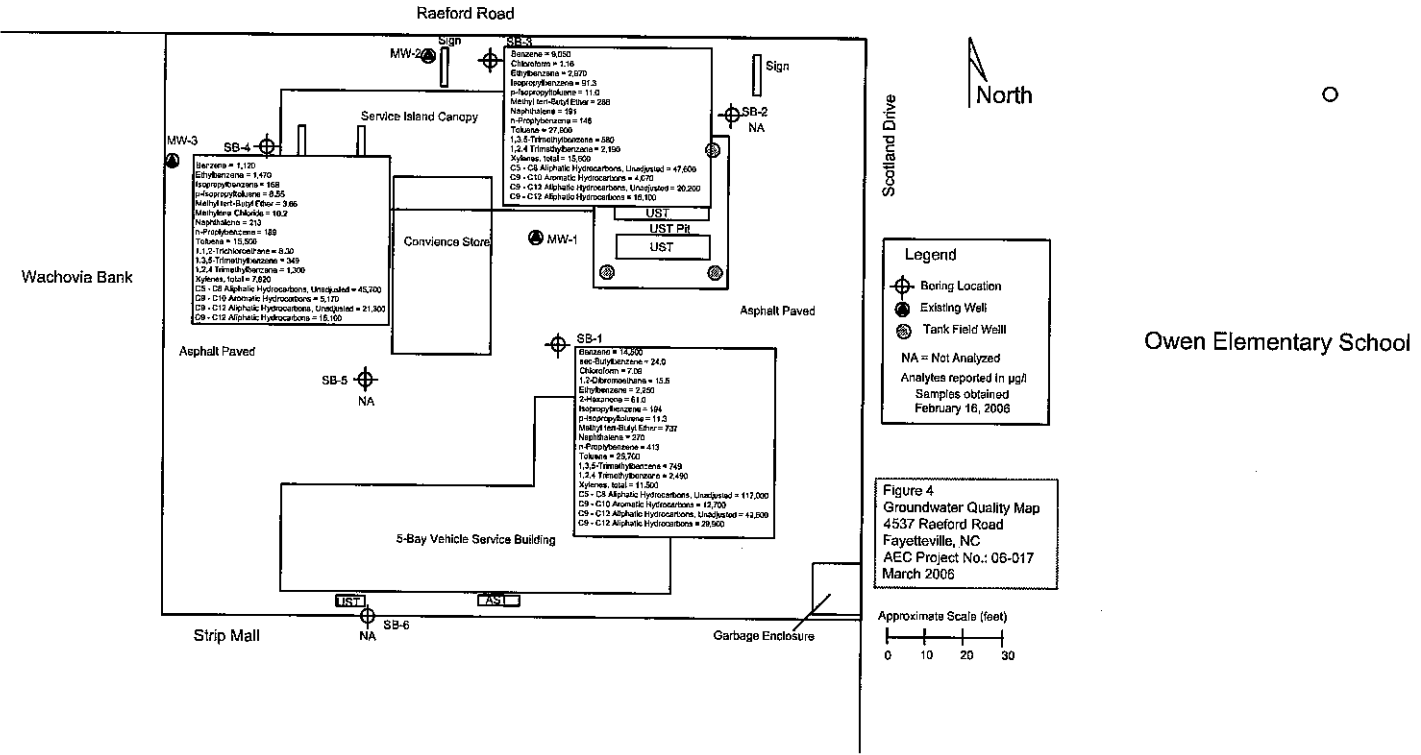
- Boring Location
- Existing Well
- Tank Field Well
- NA = Not Analyzed

Analytes reported in mg/kg
Samples obtained February 16, 2005

Figure 3 - Soil Quality Map
4537 Raeford Road
Fayetteville, NC
AEC Project No.: 06-017
March 2005



Owen Elementary School

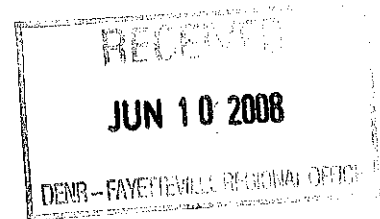


APPENDIX B
BORING LOGS

ADVANTAGE
ENVIRONMENTAL
CONSULTANTS, LLC.

June 4, 2008

Mr. James Brown
North Carolina Department of Environment and Natural Resources
UST Section
225 Green Street, Suite 714
Fayetteville, North Carolina 28301



Re: **Phase II Limited Site Assessment**
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, North Carolina 28304
Groundwater Incident Number: 9788
Facility ID #0-025474

Dear Mr. Brown:

Advantage Environmental Consultants, LLC. (AEC) is pleased to provide this Phase II Limited Site Assessment (LSA) for the former Jim's Texaco/Raeford Road Sunoco Station in Fayetteville, North Carolina. If you have any questions, please feel free to call me at (615) 376-3022.

Sincerely,

Advantage Environmental Consultants, LLC

Handwritten signature of William M. Liebe in black ink.

William M. Liebe, P.G.
Senior Project Manager

Handwritten signature of Michael J. Robertson in black ink.

Michael J. Robertson, P.G.
Principal

Cc: Travis Booth – Raeford Road Holdings, LLC

REC-11
JUN 10 2008

DEM - FAYETTEVILLE REGIONAL CENTER

**PHASE II LIMITED SITE ASSESSMENT
PREPARED IN RESPONSE TO A LEAKING UNDERGROUND STORAGE
TANK LOCATED AT:
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
4537 RAEFORD ROAD
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA**

**GROUNDWATER INCIDENT NUMBER: 9788
NCDENR-UST SECTION FACILITY ID # 0-025474**

June 4, 2008

Responsible Party:

Raeform Road Holdings, LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855
(301) 921-9200

Current Property Owner:

Raeform Road Holdings, LLC
15729 Crabbs Branch Way
Rockville, Maryland 20855
(301) 921-9200

Consultant:

Advantage Environmental Consultants, LLC
277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
(615) 376-3022

Release Discovery Date: April 27, 1992
Cause of Release: Underground Storage Tanks
UST Sizes and Contents: (3) 10,000-gallon gasoline, (1) 150-gallon waste oil
Latitude: 35° 02' 35"N, Longitude: 78° 57' 22"W

List of Appendices

Section A Figures

- Figure 1** Topographic Map With Site Location
- Figure 2** Adjacent Property Ownership, Receptor Location, and Zoning Map
- Figure 3** Site Map with Utilities, UST, Soil Sample, and Monitoring Well Locations
- Figure 4** Groundwater Contaminant Map 5-01-08
- Figure 5** Site Map with Groundwater Hydraulic Gradient 5-01-08

Section B Tables/Well Construction Logs

- Table 1** UST Information/Ownership
- Table 2** Adjacent Property Ownership
- Table 3** Summary of Analytical Data – Groundwater
- Table 4** Summary of Monitoring/Supply Well Construction Information

Section C Water Supply Well Information Forms

Section D Laboratory Reports

Site History

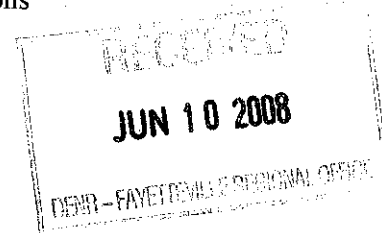
The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of an approximately 0.53 acre parcel of land currently owned by Raeford Road Holdings, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline. Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. A small, out-of-use, waste oil UST is located immediately south of this building.

The Site's existing UST systems were installed during January 1987, and include three 10,000-gallon gasoline tanks. The installation date of the 150-gallon waste oil UST could not be ascertained.

The Site also once contained three 1,000-gallon gasoline USTs that were last owned and operated by Mr. James Sanderson. The installation date of these USTs could not be ascertained but are believed to have been installed in the early 1960s. These three USTs were removed in January 1987 and replaced by the tank systems that are currently being used on the Site.

See **Figure 3** for the Site map indicating the UST system locations.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. This case (Groundwater Incident Number 9788) has been open since that time, and no additional assessment or remediation has occurred at the Site. Mr. Sanderson has received at least four Notices of Violation (NOVs) since 1992 and has also been subject to civil penalties for failure to comply with UST regulations during this time. Therefore, a Limited Site Assessment (LSA) has never been completed and submitted to the North Carolina Department of Environment and Natural Resources (NCDENR).



Phase II Limited Site Assessment
Raeford Road Sunoco (Former Jim's Texaco)
Fayetteville, Cumberland County, North Carolina

Raeford Road Holdings, LLC purchased the Site from Mr. Sanderson on April 24, 2006. In response, NCDENR issued a March 18, 2008 NORR letter to the owner of the UST systems requiring them to comply with the reporting requirements of 15A NCAC 2L .0115(C)(4).

The remaining sections of this report have been compiled to achieve compliance with the requirements of 15A NCAC 2L .0115.

Phase II Limited Site Assessment Report

A. Site Identification

DATE OF REPORT: June 4, 2008
Facility I.D.: 0-025474 UST Incident Number (if known): 9788
Site Name: Raeford Road Sunoco (Former Jim's Texaco)
Site Location: 4537 Raeford Road
Nearest City/Town: Fayetteville County: Cumberland

UST Owner: Raeford Road Holdings, LLC
Address: 15729 Crabbs Branch Way, Rockville, MD 20855 Phone: (301) 921-9200

UST Operator: Raeford Road Holdings, LLC
Address: 15729 Crabbs Branch Way, Rockville, MD 20855 Phone: (301) 921-9200

Property Owner: Raeford Road Holdings, LLC
Address: 15729 Crabbs Branch Way, Rockville, MD 20855 Phone: (301) 921-9200

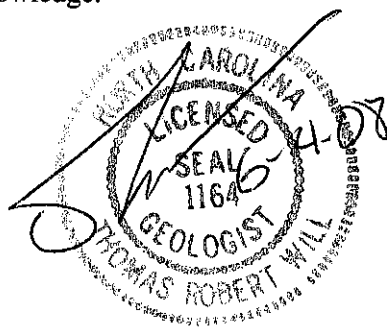
Property Occupants: Sunoco & Diamond Autosport
Address: 4537 Raeford Road, Fayetteville, NC 28304 Phone: (301) 921-9200

Consultant/Contractor: Advantage Environmental Consultants
Address: 277 Wilson Pike Circle, Brentwood, TN 37027 Phone: (615) 376-3022

Release Information

Date Discovered: April 27, 1992
Latitude: 35° 02' 35"N Longitude: 78° 57' 22"W
Estimated Quantity of Release: unknown
Cause of UST Release: underground storage tanks
Source of Release (e.g., Piping/UST): underground storage tanks/piping?
Sizes and contents of UST system(s) from which the release occurred: (3) 10,000-gallon gasoline UST's?

I, Thomas R. Will a Licensed Geologist do certify that the information contained in this report is correct and accurate to the best of my knowledge.



(Please Affix Seal and Signature)

B. Risk Characterization

Submit the following questionnaire in its entirety. Answer all questions completely. Attach additional pages as needed to fully explain answers. Base answers/explanations on information known or required to be obtained during the Limited Site Assessment.

NOTE: *Source area means point of release from a UST system.*

Limited Site Assessment Risk Classification and Land Use Form

Part I – Groundwater/Surface Water/Vapor Impacts

High Risk

1. Has the release contaminated any water supply well including any well used for non-drinking purposes? YES NO
2. Is a water supply well used for drinking water located within 1,000 feet of the source area of the release? YES NO
3. Is a water supply well not used for drinking water (e.g., irrigation, washing cars, industrial cooling water, filling swimming pools) located within 250 feet of the source area of the release? YES NO
4. Does groundwater within 500 feet of the source area of the release have the potential for future use (there is no other source of water supply other than the groundwater)? YES NO
5. Do vapors from the release pose a threat of explosion because of accumulation of the vapors in a confined space or pose any other serious threat to public health, public safety or the environment? YES NO

If yes, describe.

6. Are there any other factors that would cause the release to pose an imminent danger to public health, public safety, or the environment? YES NO
- If yes, describe.
-

Intermediate Risk

6. Is a surface water body located within 500 feet of the source area of the release? YES NO
- If YES, does the maximum groundwater contaminant concentration exceed the surface water quality standards and criteria found in 15A NCAC 2B .0200 by a factor of 10? YES NO

7. Is the source area of the release located within an approved or planned wellhead protection area as defined in 42 USC 300h-7(e)? YES NO
- If yes, describe.

8. Is the release located in the Coastal Plain physiographic region as designated on a map entitled "Geology of North Carolina" published by the Department in 1985? YES NO

If YES, is the source area of the release located in an area in which there is recharge to an unconfined or semi-confined deeper aquifer that is being used or may be used as a source of drinking water? YES NO

If YES, describe. Cape Fear Aquifer

Do the levels of groundwater contamination for any contaminant exceed the gross contamination levels (see Table 9) established by the Department? YES NO

Part II - Land Use

Property Containing Source Area of Release

The questions below pertain to the property containing the source area of the release.

1. Does the property contain one or more primary or secondary residences (permanent or temporary)? YES NO

Describe. No, the property is occupied by a Sunoco gasoline station and Diamond Autosports.

Does the property contain a school, daycare center, hospital, playground, park, recreation area, church, nursing home, or other place of public assembly? YES NO

Describe.

2. Does the property contain a commercial (e.g., retail, warehouse, office/business space, etc.) or industrial (e.g., manufacturing, utilities, industrial research and development, chemical/petroleum bulk storage, etc.) enterprise, an inactive commercial or industrial enterprise, or is the land undeveloped? YES NO

Describe.

Do children visit the property? YES NO
Explain. The property contains a convenience store that children can visit with adults.

Is access to the property reliably restricted consistent with its use (e.g., by fences, security personnel or both)? YES NO

Explain.

3. Do pavement, buildings, or other structures cap the contaminated soil? YES NO
Describe. The area where the contamination is centered is an asphalt paved parking lot, under the in use product dispensers and canopy.

If yes, what mechanisms are in place or can be put into place to ensure that the contaminated soil will remain capped in the foreseeable future?

The contamination will likely remain capped due to the fact that the property contains an active convenient store and the contamination is centered under the in use dispensers and canopy.

4. What is the zoning status of the property? The Site is zoned as C1P (shopping center district) by Cumberland County and is occupied by a gasoline station/convenience store and Diamond Autosports.

5. Is the use of the property likely to change in the next 20 years? YES NO
Explain. The property will continue to be used as a gasoline station/convenience store and auto detail/repair shop well into the future.

Property Surrounding Source Area of Release

The questions below pertain to the area within 1,500 feet of the source area of the release (excludes property containing source area of the release):

1. What is the distance from the source area of the release to the **nearest** primary or secondary residence (permanent or temporary)? The nearest off-site private residence is located approximately 500 feet north of the release area.
2. What is the distance from the source area of the release to the **nearest** school, daycare center, hospital, playground, park, recreation area, church, nursing home or other place of public assembly? The William H. Owen Elementary School is located approximately 250 feet southeast of the release area.
3. What is the zoning status of properties in the surrounding area? The surrounding properties within 1,500 feet of the Site are zoned by Cumberland County as "C1P" (Shopping Center District) or "R10" (Residential District) See **Figure 2**.
4. Briefly characterize the use and activities of the land in the surrounding area. The surrounding area within 500-feet of the source area is used primarily for commercial purposes with a school to the southeast. Residential areas are located further to the north.

C. Receptor Information

1. Water Supply Wells (Complete and attach Table B-5 and attach map showing well locations)

The Site and immediate surrounding area are located within the City of Fayetteville and are supplied water by the Fayetteville Public Works Commission (PWC). AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. Completed "Water Supply Well Information" surveys are included in **Section C**.

2. Public Water Supplies

Are public water supplies available within 1,500 feet of the source area of the release? YES NO
If yes, where is the location of the nearest public water lines and the source(s) of the public water supply. (indicate on map) Describe.

There are no public water supplies located within 1,500 feet of the source area.

3. Surface Water

Identify all surface water bodies (e.g., ditch, pond, stream, lake, river) within 500-feet of the source area of the release. This information must be shown on the USGS topographic map.

There are no surface water bodies located within 500-feet of the source area. (See **Section A, Figure 1.**)

4. Wellhead Protection Areas

Identify all planned or approved wellhead protection areas (e.g., ditch, pond, stream, lake, river) within 1,500 feet of the source area of the release. This information must be shown on the USGS topographic map. Wellhead protection areas are defined in 42 USC 300h-7(e).

On May 15, 2008, AEC reviewed the NCDENR-Wellhead Protection Program files for the presence of wellhead protection areas within 1,500-feet of the Site. None were found to be located within 1,500-feet of the source area.

5. Describe Deep Aquifers in the Coastal Plain Physiographic Region

The Site is located within the Coastal Plain Physiographic Region as defined by the Geologic Map Of North Carolina, 1985, published by the *Department of Natural Resources and Community Development, Division of Land Resources, North Carolina Geologic Survey*.

The North Carolina Department of Water Resources, Division of Groundwater publication, "*Geology and Ground-water Resources of the Fayetteville Area*"¹ describes the Site and nearby areas as being underlain by a surficial sand aquifer which is in turn underlain by the sand and clay strata of the Cretaceous sand aquifer. The surficial sand aquifer is only 10 to 50-feet thick in Cumberland County and water yields are small. Water quality is good in this aquifer.

¹ *Geology and Groundwater in the Fayetteville Area, North Carolina*. North Carolina Department of Water Resources, Division of Groundwater, Bull. 2.

As stated above underlying the surficial sand aquifer is the Cretaceous sand and clay aquifers which are associated with the Middendorf formation. Wells tapping this aquifer may yield more than 2 gpm per foot of depth. Where the Cretaceous clay is the chief aquifer, yields of wells are much less. The surficial sand aquifer noted above is also productive, but over much of the county sand of this aquifer is not distinguishable from that of the underlying Cretaceous sand aquifer. The Cretaceous sand aquifer thickness in Cumberland County ranges from approximately 100-feet in the northwestern corner of the county to nearly 350-feet in thickness at the county's southeastern edge.

The Site and some surrounding properties within 1,500-feet obtain their potable water from the City of Fayetteville which obtains water from available surface water sources.

6. Describe Subsurface Structures

There are no subsurface structures located in close proximity to the UST area.

7. Property Owners and Occupants

Section B, Table 2 provides a listing the names and addresses of 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.

Property ownership information was obtained through the Cumberland County GIS Department. The Site itself is owned by Raeford Road Holdings, LLC (Parcel ID# 0417-30-2524). The Site itself and most of the surrounding properties are zoned as C1P (shopping center district) by Cumberland County. The property northeast of the Site across Raeford Road is owned by Dominic and Michelle Marangi and is occupied by Atlas Chiropractor (Parcel ID# 0417-30-3814). The property north of the Site across Raeford Road is owned by Loyd Properties, LLC and is occupied by Bojangles (Parcel ID# 0417-30-2803). The property northwest of the Site across Raeford Road is owned by Walter Williams and is occupied by Wilco-Hess (Parcel ID# 0417-30-0820). The property west and south of the Site is owned by Mitchell Properties of Florence, Inc. and is occupied by Wachovia Bank and a vacant shopping center (Parcel ID# 0416-29-9999). Finally, the property east and southeast of the Site across Scotland Drive is owned by Cumberland County Board of Education and is occupied by William H. Owen Elementary School (Parcel ID# 0417-30-7111) which is zoned R10 (residential district).

Zoning information for the Site and the surrounding properties was acquired through the Cumberland County GIS website. (See **Section A, Figure 2** for adjacent property ownership and zoning information.)

D. Site Geology and Hydrogeology

Describe the soil and geology encountered at the site. Discuss the effects of soil and geological characteristics on the migration and attenuation of contaminants. Include information obtained during assessment activities (e.g., lithologic descriptions made during drilling, probe surveys, tank closure, etc). If a Phase II investigation is required include a discussion of groundwater flow direction and hydraulic gradient (vertical and horizontal).

The Soil Survey of Cumberland County, North Carolina² identifies the soils of the Site as being Urban Land. These soils are classified as areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. Soil materials have been disturbed by cutting, filling, or other mechanical disturbances.

The Geologic Map of North Carolina³ describes the Site as being underlain by the Cretaceous-age Middendorf Formation. The Middendorf Formation consists of "sand, sandstone, and mudstone, gray to pale gray with an orange cast, mottled; clay balls and iron-cemented concretions common, beds laterally discontinuous, cross-bedding common."

AEC conducted three soil borings on April 30, 2008 utilizing 6-inch diameter hollow stem augers. The borings were performed to facilitate the installation of three groundwater monitoring wells. Soils encountered in the borings consisted of dry brown silty sand to depths ranging from 17 to 19 feet below land surface. Below this silty sand the soil changed to orange sand with some silt. The soil started to show signs of moisture at an approximate depth of 25 feet. The three monitoring wells were each installed to a depth of 30 feet.

Data obtained from gauging the three existing monitoring wells and three recently installed monitoring wells on May 1, 2008 was plotted in order to determine the local hydraulic gradient across the Site as presented in **Section A, Figure 5**. Free product was observed in monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Therefore, the groundwater elevation in MW-1 and MW-2 was adjusted for free product. Overall, groundwater hydraulic gradient appears to flow to the south through the Site, with the highest groundwater elevation measured in monitoring well MW-3, while the lowest elevation was observed in monitoring well MW-6. The hydraulic gradient appears to mimic the local topography which is lower to the south.

² Soil Survey Cumberland County North Carolina. United States Department of Agriculture, Soil Conservation Service, in cooperation with the North Carolina Department of Natural Resources and Community Development, North Carolina Agricultural Research Service, North Carolina Agricultural Extension Service, and the Cumberland County Board of Commissioners, November 1970.

³ Reference: Geologic Map of North Carolina, Department of Natural Resources and Community Development, Division of Land Resources, 1985 edition.

E. Soil Sample Results

E.1 Phase II Environmental Site Assessment (February 16, 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the four soil samples at concentrations below the applicable NCDENR Industrial/Commercial Cleanup Levels. The Phase II ESA, completed by AEC and dated March 6, 2006, has been submitted to the NCDENR.

F. Groundwater Investigation

F.1 Phase II Limited Site Assessment (May 1, 2008)

AEC returned to the Site on May 1, 2008 in order to sample the monitoring wells designated as MW-4, MW-5, and MW-6 that were installed on April 30, 2008. These wells were placed in strategic locations throughout the Site in order to provide the most accurate way to identify the groundwater contamination plume and local groundwater gradient. Monitoring wells MW-4, MW-5, and MW-6 were installed to a depth of 30 feet beneath surface grade, with the 0.0010 slotted PVC well screens placed at a depth of 15 to 30 feet below land surface and completed with solid PVC casing placed from 0 to 15 feet below land surface. All permanent monitoring wells were constructed using 2" diameter PVC slotted screens and solid PVC riser pipe. **Section B, Table 4** provides a summary of the monitoring well construction data, while the Well Construction Records for MW-4 through MW-6 are located in the back of **Section B**.

In addition, AEC sampled existing monitoring well MW-3 on May 1, 2008. Free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Therefore, groundwater samples were not obtained from monitoring wells MW-1 and MW-2. The samples collected from these wells were submitted to Shealy Environmental of West Columbia, SC for chemical analysis for VOCs by EPA Method 8260 and VPH by the MADEP-VPH method. The purpose of the sampling event was for completion of this Phase II LSA.

All of the sampling activities described above were completed using new disposable bailers and nitrile sampling gloves. All of the monitoring wells were developed using disposable PVC bailers prior to collecting groundwater samples.

F.2 Phase II Investigation Groundwater Sample Analytical Results (May 1, 2008)

As previously mentioned, groundwater samples were not collected from monitoring wells MW-1 and MW-2 due to the presence of free product. Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-4, MW-5, and MW-6; ethylbenzene in MW-4, MW-5, and MW-6; isopropyl benzene in MW-4; MTBE in MW-4, MW-5, and MW-6; n-propylbenzene in MW-4, MW-5, and MW-6; naphthalene in MW-4, MW-5, and MW-6; toluene in MW-4, MW-5, and MW-6; 1,3,5 trimethylbenzene in MW-4; 1,2,4 trimethylbenzene in MW-4, MW-5, and MW-6; and total xylenes in MW-4, MW-5, and MW-6. Benzene was also found in groundwater samples in MW-4 and MW-6 at concentrations exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Data for the MADEP-VPH analyses showed C5-C8 aliphatic hydrocarbons (380-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 420-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analysis also revealed C9-C18 aliphatic hydrocarbons in groundwater samples collected from MW-3, MW-4, and MW-5; however, only the sample from MW-5 was in excess of the maximum allowable concentration in groundwater of 4,200-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analyses showed C19-C36 aliphatic hydrocarbons (350-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 42,000-ug/l as set forth in 15A NCAC 2L .0202. Finally, data for the MADEP-VPH analysis showed C9-C22 aromatic hydrocarbons in each of the four groundwater samples collected. These levels are in excess of its maximum allowable concentration in groundwater of 210-ug/l as set forth in 15A NCAC 2L .0202.

Phase II Limited Site Assessment
Raeford Road Sunoco (Former Jim's Texaco)
Fayetteville, Cumberland County, North Carolina

A Site map showing concentrations of selected groundwater contaminants has been prepared and can be found in **Section A, Figure 4. Section B, Table 3** is a summary of analytical results for this Phase II sampling event. Laboratory reports for this Phase II sampling event is presented in **Section C**.

F.3 Phase II Investigation Free Product Recovery (April 30, 2008)

On April 30, 2008, free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.34 feet and 1.98 feet, respectively. AEC hand-bailed approximately seven gallons of groundwater and free product from each of these two wells on April 30, 2008. The total amount of product recovered was approximately 1 gallon from MW-1 and 1.5 gallons from MW-2. The next day (May 1, 2008) free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively.

G. Conclusions and Recommendations

Discuss the risk criteria that apply to the release and identify any other site-specific factors related to the release that may pose a risk to human health and the environment. Also, discuss any site-specific conditions or possible actions that could result in lowering the level of risk posed by the release.

ECE has completed this Phase II LSA in order to comply with NCGS 143-215.84, NCAC 15A, 2L .0106(g) and the NCDENR Underground Storage Tank Section's, "*Guidelines for Assessment and Corrective Action*", Effective July 1, 2001.

Analytical results for the groundwater samples collected for completion of this Phase II LSA detected several targeted parameters in one or more groundwater samples at concentrations in excess of their maximum allowable levels in groundwater as set forth in the Groundwater Quality Standards of 15A NCAC 2L .0202. Benzene was also found in MW-4 and MW-5 at concentrations that exceed its GCL.

The risk criteria pertaining to the release at the Site include the following: 1) there are no potable water supply wells located within 1,500-feet of the source area; 2) there are no surface water bodies located within 500-feet of the Site; 3) the Site is used for commercial purposes, and is currently in use as a convenience store; 4) the Site is surrounded by only commercial properties; 5) the Site is located in the Coastal Plain Physiographic Province; and 6) free product is present at the Site.

The Site will likely continue to be ranked as "intermediate risk" due to the fact that free product is present at the Site and there are no significant receptors. Due to the presence of free product, AEC recommends that monthly aggressive fluid-vapor recovery (AFVR) events be performed as an abatement measure to withdraw or remove free product and vapors that pose a threat to human health and the environment. Subsequent to multiple monthly AFVR events, AEC recommends that additional groundwater assessment be completed and a Comprehensive Site Assessment (CSA) prepared for review by the NCDENR-RRO.

H. Limitations

This report has been prepared for the exclusive use of Raeford Road Holdings, LLC and/or their designees, successors or assigns. It has been prepared in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. AEC's conclusions and recommendations are based on information supplied by others, together with AEC's own site observations. Although AEC cannot be responsible for the accuracy of data supplied by others, AEC has no reason to suspect that any of the information is inaccurate. The observations described herein are based upon conditions readily visible on the site at the time of AEC's visit(s).

AEC cannot assume responsibility for the person(s) in charge of the site, nor otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. It is the responsibility of the responsible party to notify the appropriate local, state or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety or the environment.

REFERENCES

Geologic Map of North Carolina, Department of Natural Resources and Community Development, Division of Land Resources

Guidelines For Assessment and Corrective Action. North Carolina Department of Environment and Natural Resources, Underground Storage Tank Section, July 1, 2007.

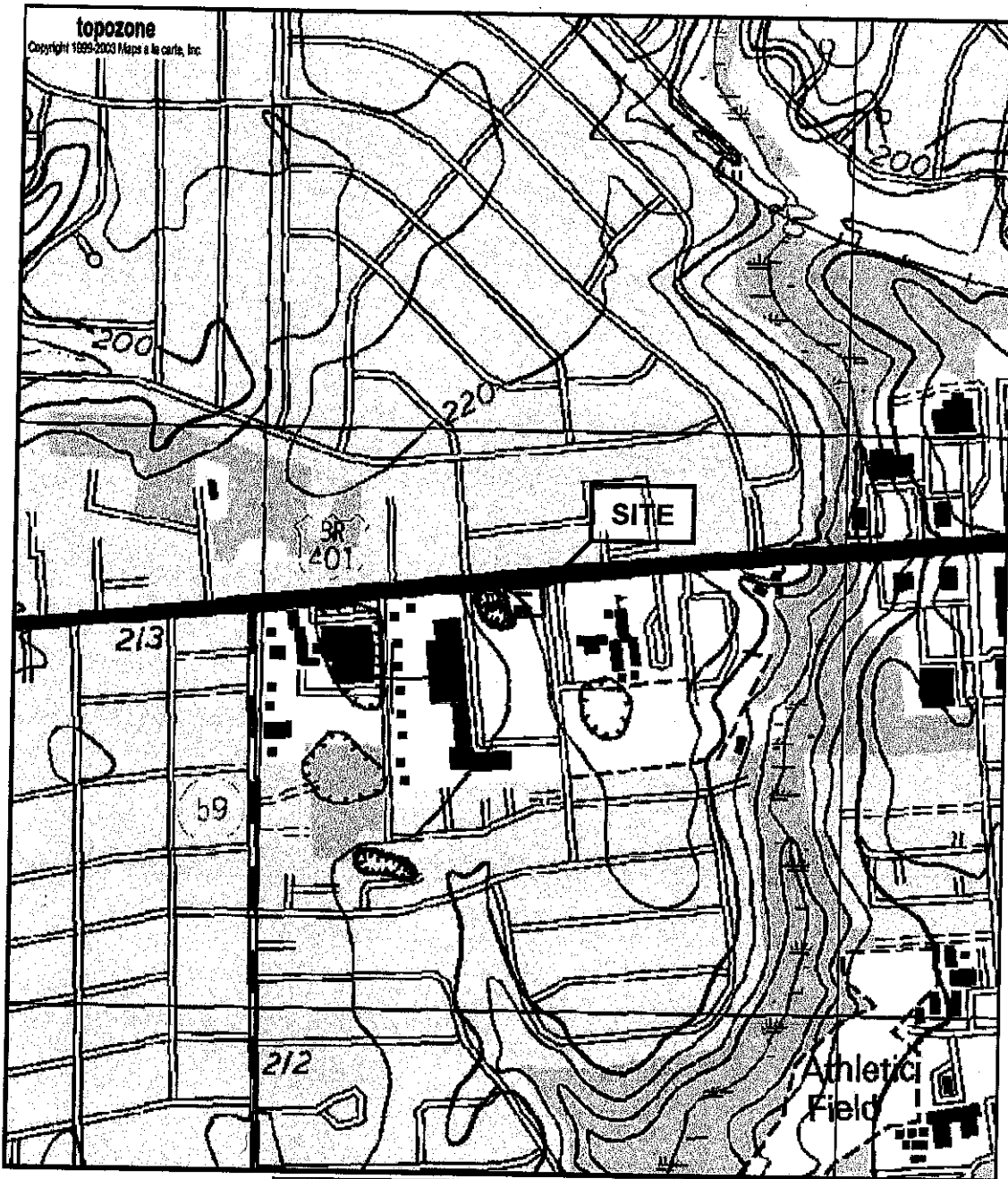
North Carolina Administrative Code, Title 15, Subchapter 2L, Sections .0100, .0115 and .0200.

North Carolina Department of Environment and Natural Resources, Division of Waster Management, UST Section.

Soil Survey of Cumberland County, North Carolina. United States Department of Agriculture, Soil Conservation Service.

Cumberland County GIS Website (<http://imaps.co.cumberland.nc.us/imaps/>)

SECTION A
FIGURES



0 0.1 0.2 0.3 0.4 0.5 km
 0 0.09 0.18 0.27 0.36 0.45 mi
 Map center is 35° 02' 35"N, 78° 57' 22"W (WGS84/NAD83)
Fayetteville quadrangle
 Projection is UTM Zone 17 NAD83 Datum

M*
 G
 M=-8.449
 G=1.174

ADVANTAGE
 ENVIRONMENTAL
CONSULTANTS, LLC

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

Figure 1 – Topographic Map
 Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina

AEC Project No.:
08-030N

Report Date:
5/29/08

Drawn By:
WML



ADVANTAGE
ENVIRONMENTAL
CONSULTANTS, LLC

8610 Baltimore Washington Boulevard, Suite 217
 Jessup, MD 20794
 Phone: 301-776-0500 Fax 301-776-1123

Figure 2 – Adjacent Properties
 Raeford Road Sunoco Station
 4537 Raeford Road
 Fayetteville, North Carolina

AEC Project No.:
08-030N

Report Date:
5/29/08

Drawn By:
WML

Raeferd Road

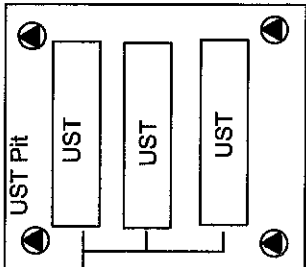
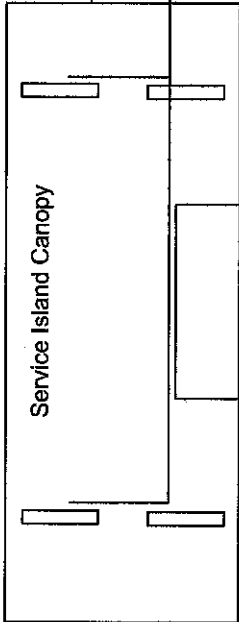
MW-2



Sign

Sign

Service Island Canopy



Convenience Store

MW-1



Asphalt Paved

MW-4

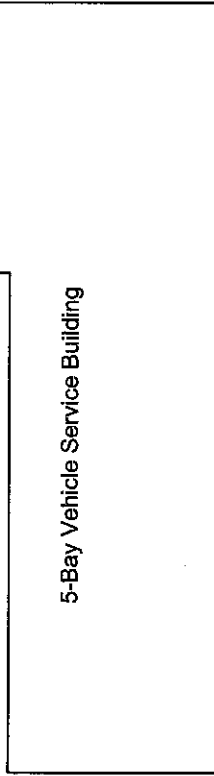


Asphalt Paved

MW-5



5-Bay Vehicle Service Building

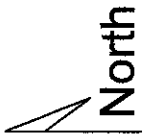


UST

AST

Garbage Enclosure

MW-6



Scotland Drive

Legend

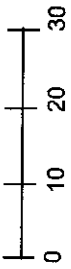
- New Well
- Existing Well
- Tank Field Well

Utilities

- Electric
- Water
- Gas
- Petroleum

Figure 3 - Site Map
 4537 Raeferd Road
 Fayetteville, NC
 AEC Project No.: 08-030N
 May 2008

Approximate Scale (feet)



Raeferd Road

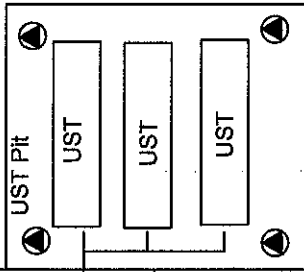
Sign

MW-2

1.67' Free Product

B - 68
 E - 23
 T - 86
 X - 250
 M - 12
 TPH - 3810

Service Island Canopy



Convenience Store

MW-1

2.14' Free Product

Asphalt Paved

B - 8300
 E - 2000
 T - 22000
 X - 11000
 M - 2000
 TPH - 710

MW-4

5-Bay Vehicle Service Building

UST

AST

Garbage Enclosure

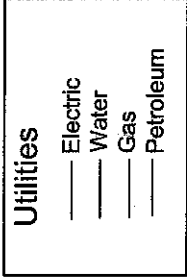
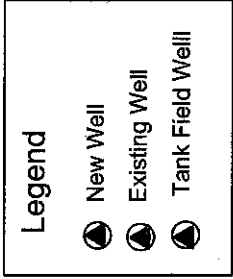
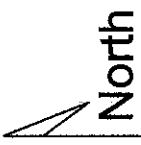
B - 2000
 E - 670
 T - 2100
 X - 3200
 M - 1400
 TPH - 5230

Asphalt Paved

MW-5

B - 5300
 E - 1300
 T - 14000
 X - 6000
 M - 1200
 TPH - 330

MW-6

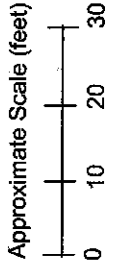


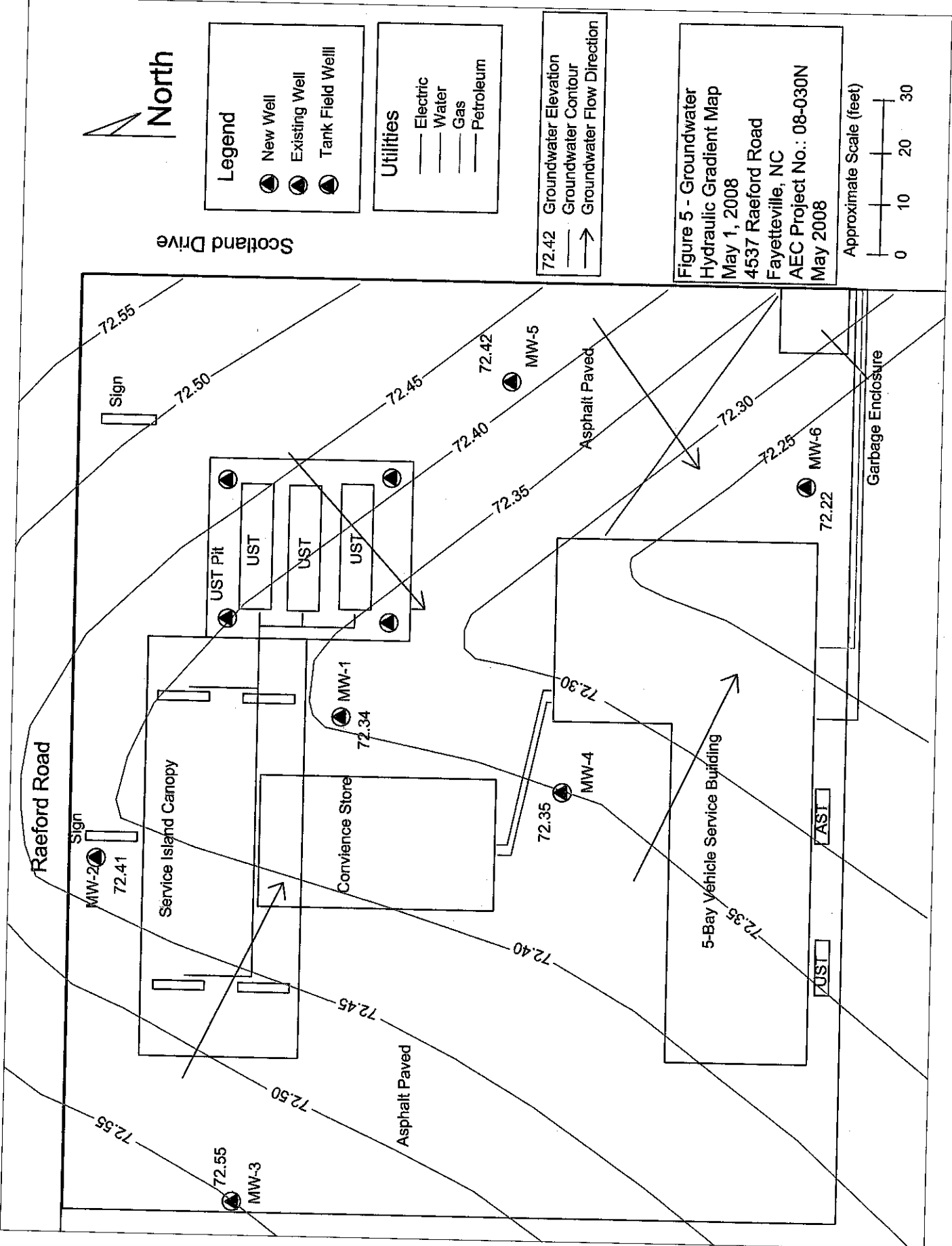
Concentrations in ug/L

B - Benzene
 E - Ethylbenzene
 T - Toluene
 X - Xylene
 M - MTBE
 TPH - VPH + EPH

Scotland Drive

Figure 4 - Groundwater Contaminant Map
 May 1, 2008
 4537 Raeferd Road
 Fayetteville, NC
 AEC Project No.: 08-030N
 May 2008





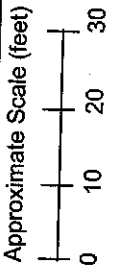
North

- Legend**
- New Well
 - Existing Well
 - Tank Field Well

- Utilities**
- Electric
 - Water
 - Gas
 - Petroleum

- 72.42 Groundwater Elevation
- Groundwater Contour
- Groundwater Flow Direction

Figure 5 - Groundwater Hydraulic Gradient Map
 May 1, 2008
 4537 Raeford Road
 Fayetteville, NC
 AEC Project No.: 08-030N
 May 2008



Raeford Road

Scotland Drive

72.55
72.50
72.45
72.40
72.35
72.30
72.25
72.22
72.35
72.30
72.40
72.45
72.50
72.55

Sign
Sign
MW-2 72.41
MW-3 72.55
MW-1 72.34
MW-4 72.35
MW-5 72.42
MW-6 72.25

UST Pit
UST
UST
UST

Service Island Canopy
Convenience Store
5-Bay Vehicle Service Building
Garbage Enclosure

Asphalt Paved
Asphalt Paved

SECTION B
TABLES/WELL CONSTRUCTION LOGS

Table 1

UST Information
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina 28304

UST ID #	Last Contents	Previous Contents	Capacity (gallons)	Construction Details	Descriptions of Associated Piping	Date Tank Installed	Status of UST	Was release associated with UST
T-1	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-2	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-3	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-4	Waste Oil	Waste Oil	150	Steel	Steel	unknown	Not in Use	No
Removed Tank 1	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 2	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 3	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown

Table 1 (Continued)

Site History – UST Owner and Operator Information
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina 28304

UST ID Number	Name of Owner	Dates of Ownership (mm/dd/yy to mm/dd/yy)
0-025474	Raeford Road Holdings, LLC	04/24/06 to present
	Name of Operator	Dates of Operation (mm/dd/yy to mm/dd/yy)
	Raeford Road Holdings, LLC	04/24/06 to present
Street Address		
15729 Crabbs Branch Way		
City	State	Zip
Rockville	MD	20855
	Telephone Number	(301) 921-9200

UST ID Number	Name of Owner	Dates of Ownership (mm/dd/yy to mm/dd/yy)
0-025474	James & Norma Sanderson	11/14/86 to 04/24/06
	Name of Operator	Dates of Operation (mm/dd/yy to mm/dd/yy)
	James & Norma Sanderson	11/14/86 to 04/24/06
Street Address		
PO Box 40301		
City	State	Zip
Fayetteville	NC	28309
	Telephone Number	(910) 223-0357

Prior ownership could not be readily ascertained. However, the property has operated as a gasoline service station since the early 1960s and Mr. Sanderson has reportedly owned or leased the property since approximately 1970.

Table 2
Adjacent Property Ownership Information
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina 28304

NC Parcel #	Property Location (Occupant)	Property Owners Name/Address	Location
0417-30-2524	Raeford Road Sunoco 4537 Raeford Road Fayetteville, NC 28304	Raeford Road Holdings, LLC 15729 Crabbs Branch Way Rockville, MD 20855	Site
0417-30-3814	Atlas Chiropractor	Dominic & Michelle Marangi 99 Village Drive Jacksonville, NC 28546	Adjacent property across Raeford Road and northeast of the site
0417-30-2803	Bojangles	Loyd Properties, LLC 4140 Ferncreek Drive Fayetteville, NC 28314	Adjacent property across Raeford Road and north of the Site
0417-30-0820	Wilco-Hess	Walter Williams 207 Crown Point Road Greenville, NC 27834	Adjacent property across Raeford Road and northwest of the Site
0416-29-9999	Wachovia Bank & Vacant Shopping Center	Mitchell Properties of Florence PO Box 1418 Florence, SC 29503	Adjacent property west and south of the Site
0417-30-7111	William H. Owen Elementary School	Cumberland County Board of Ed PO Box 2357 Fayetteville, NC 28302	Adjacent property across Scotland Drive and east and southeast of the Site

Table 3

Summary of Analytical Data – Groundwater
 EPA Method 8260
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina 28304

Well ID	Analytical Method >	Contaminant of Concern >	Date Collected m/dd/yy	Sample ID	Benzene		Chloroform		Ethylbenzene		Isopropyl Benzene		MTBE		n-Propyl Benzene		Naphthalene		p-Isopropyltoluene		Sec-Butylbenzene		Toluene		1,3,5-Trimethylbenzene		1,2,4-Trimethylbenzene		Total Xylenes		
					FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP	FP
MW-1	5/01/08	MW-1	68	1.0	23	10	12	29	19	2.9	4.6	86	76	200	250																
MW-2	5/01/08	MW-2	8300	ND	2000	100	2000	280	450	ND	ND	22000	520	2100	11000																
MW-3	5/01/08	MW-3	2000	ND	670	35	1400	71	200	ND	ND	2100	150	600	3200																
MW-4	5/01/08	MW-4	5300	ND	1300	63	1200	120	250	ND	ND	14000	220	900	6000																
MW-5	5/01/08	MW-5																													
MW-6	5/01/08	MW-6																													
2L Standard (ug/l)					1	70	550	200	70	21	NA	70	1000	350	530																
GCL (ug/l)					5000	190	84500	200000	300000	15500	NA	8500	257500	25000	28500	87500															

FP – Free Product

Results are in ug/l

ND – None Detected

NA – None Available

Bold results indicate exceedence of 2L Standards

Bold and shaded results indicate exceedence of GCL

Table 3
 Summary of Analytical Data – Groundwater
 EPA Method MADEP-EPH and MADEP-VPH
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina 28304

Well ID	Analytical Method >		MADEP-VPH	MADEP-EPH MADEP-VPH	MADEP-EPH	MADEP-EPH MADEP-VPH
	Contaminant of Concern >	Sample ID				
	Date Collected m/dd/yy					
MW-1	5/01/08	MW-1	C5-C8 Aliphatics	C9-C18 Aliphatics	C19-C36 Aliphatics	C9-C22 Aromatics
MW-2	5/01/08	MW-2				
MW-3	5/01/08	MW-3				
MW-4	5/01/08	MW-4				
MW-5	5/01/08	MW-5				
MW-6	5/01/08	MW-6				
2L Standard (ug/l)						
GCL (ug/l)			420	4,200	42,000	210
			NA	NA	NA	NA

FP – Free Product
 Results are in ug/l
 ND – None Detected
 NA – None Available
Bold results indicate exceedence of 2L Standards



NON RESIDENTIAL WELL CONSTRUCTION RECORD

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

WELL CONTRACTOR CERTIFICATION # 2865

1. WELL CONTRACTOR:

Leo H. Charbonneau
Well Contractor (Individual) Name

J+L Drilling Inc.
Well Contractor Company Name

STREET ADDRESS 109 Greg St.
Four Oaks NC 27524
City or Town State Zip Code

919-989-8856
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) _____

STATE WELL PERMIT #(if applicable) _____

DWQ or OTHER PERMIT #(if applicable) _____

WELL USE (Check Applicable Box) Monitoring Municipal/Public

Industrial/Commercial Agricultural Recovery Injection

Irrigation Other (list use) mw-4

DATE DRILLED 4/30/08

TIME COMPLETED 10:00 AM PM

3. WELL LOCATION:

CITY: Fayetteville COUNTY Cumberland

4537 RAEFORD Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other _____
(check appropriate box)

LATITUDE N 30° 02.574'

LONGITUDE W 078° 57.356'

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)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) _____

NAME OF FACILITY SUNOCO

STREET ADDRESS 4537 RAEFORD Rd.

Fayetteville NC
City or Town State Zip Code

CONTACT PERSON _____

MAILING ADDRESS _____

City or Town State Zip Code

Area code - Phone number _____

5. WELL DETAILS:

a. TOTAL DEPTH: 30.0'

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: 22.7 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -1.5 FT. Above Land Surface*

*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____

6. CASING: Depth Diameter Thickness/Weight Material
From -1.5 To 15.0 Ft. 2 Sch 40 PVC
From _____ To _____ Ft. _____ _____
From _____ To _____ Ft. _____ _____

7. GROUT: Depth Material Method
From 12.0 To 14.0 Ft. Portland Soured
From 0 To 12.0 Ft. Cement Portland
From _____ To _____ Ft. _____ _____

8. SCREEN: Depth Diameter Slot Size Material
From 15.0 To 30.0 Ft. 2 in. -10 in. PVC
From _____ To _____ Ft. _____ in. _____ in. _____
From _____ To _____ Ft. _____ in. _____ in. _____

9. SAND/GRAVEL PACK: Depth Size Material
From 14.0 To 30.0 Ft. #2 SAND
From _____ To _____ Ft. _____ _____
From _____ To _____ Ft. _____ _____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>10.0</u>	<u>DARK GRAY silt</u>
<u>10</u>	<u>20.0</u>	<u>ORANGE BROWN silty silt</u>
<u>20.0</u>	<u>30.0</u>	<u>DARK GRAY ORANGE BROWN silty silt</u>

11. REMARKS:

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

Leo H. Charbonneau 5/4/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Leo H. Charbonneau
PRINTED NAME OF PERSON CONSTRUCTING THE WELL



WELL CONTRACTOR CERTIFICATION # 2865

1. WELL CONTRACTOR:

Leo H. Charbonneau
Well Contractor (Individual) Name
J+L Drilling Inc.
Well Contractor Company Name
STREET ADDRESS 109 Greg St.
Four Oaks NC 27524
City or Town State Zip Code
919-989-8856
Area code - Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) _____
STATE WELL PERMIT #(if applicable) _____
DWQ OR OTHER PERMIT #(if applicable) _____
WELL USE (Check Applicable Box) Monitoring Municipal/Public
Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) mw-5
DATE DRILLED 4/30/08
TIME COMPLETED 2:00 AM PM

3. WELL LOCATION:

CITY: Fayetteville COUNTY Cumberland
4537 RAEFORD Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
TOPOGRAPHIC / LAND SETTING:
 Slope Valley Flat Ridge Other _____
(check appropriate box)
LATITUDE N 35° 02.574' May be in degrees, minutes, seconds or in a decimal format
LONGITUDE W 078° 57.339'
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)

4. FACILITY - is the name of the business where the well is located.

FACILITY ID #(if applicable) _____
NAME OF FACILITY SUNOCO
STREET ADDRESS 4537 RAEFORD Rd
Fayetteville NC
City or Town State Zip Code
CONTACT PERSON _____
MAILING ADDRESS _____
City or Town State Zip Code
Area code - Phone number _____

5. WELL DETAILS:

a. TOTAL DEPTH: 30.0'
b. DOES WELL REPLACE EXISTING WELL? YES NO
c. WATER LEVEL Below Top of Casing: 22.7 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -1.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____
f. DISINFECTION: Type _____ Amount _____
g. WATER ZONES (depth):
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____

6. CASING:		Depth	Diameter	Thickness/Weight	Material
From	<u>-1.5</u>	To	<u>150</u>	<u>2</u>	<u>Sch 40 PUC</u>
From	_____	To	_____	_____	_____
From	_____	To	_____	_____	_____

7. GROUT:		Depth	Material	Method
From	<u>2.0</u>	To	<u>14.0</u>	<u>Bentonite poured</u>
From	<u>0</u>	To	<u>12.0</u>	<u>cement poured</u>
From	_____	To	_____	_____

8. SCREEN:		Depth	Diameter	Slot Size	Material
From	<u>15.0</u>	To	<u>30.0</u>	<u>2 in. -10 in.</u>	<u>PUC</u>
From	_____	To	_____	_____	_____
From	_____	To	_____	_____	_____

9. SAND/GRAVEL PACK:		Depth	Size	Material
From	<u>14.0</u>	To	<u>30.0</u>	<u>#2 SAND</u>
From	_____	To	_____	_____
From	_____	To	_____	_____

10. DRILLING LOG		Formation Description
From	<u>0 - 10.0</u>	<u>DARK GRAY silt</u>
From	<u>10 - 20.0</u>	<u>ORANGE BROWN silty silt</u>
From	<u>20.0 - 30.0</u>	<u>tan clay with brown sand</u>
From	_____	_____
From	_____	_____

11. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.
[Signature] 5/4/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE
Leo H. Charbonneau
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

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



WELL CONTRACTOR CERTIFICATION # 2865

1. WELL CONTRACTOR:

Leo H. Charbonneau
Well Contractor (Individual) Name
J+L Drilling Inc.
Well Contractor Company Name
STREET ADDRESS 109 Greg St.
Four Oaks NC 27524
City or Town State Zip Code
919-989-8856
Area code- Phone number

2. WELL INFORMATION:

SITE WELL ID #(if applicable) _____
STATE WELL PERMIT #(if applicable) _____
DWQ or OTHER PERMIT #(if applicable) _____

WELL USE (Check Applicable Box) Monitoring Municipal/Public
Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use) MW 6

DATE DRILLED 4/30/08
TIME COMPLETED 4:30 AM PM

3. WELL LOCATION:

CITY: Fayetteville COUNTY Cumberland
4537 Overwood Rd.
(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

Slope Valley Flat Ridge Other _____
(check appropriate box)

LATITUDE N 35° 02.571' May be in degrees, minutes, seconds or in a decimal format
LONGITUDE W 078° 57.358'

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)

4. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable) _____
NAME OF FACILITY SUNOCO
STREET ADDRESS 4537 Overwood Rd.
Fayetteville NC
City or Town State Zip Code
CONTACT PERSON _____
MAILING ADDRESS _____
City or Town State Zip Code

Area code - Phone number _____

5. WELL DETAILS:

a. TOTAL DEPTH: 30.0'
b. DOES WELL REPLACE EXISTING WELL? YES NO
c. WATER LEVEL Below Top of Casing: 22.7 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): _____ METHOD OF TEST _____

f. DISINFECTION: Type _____ Amount _____

g. WATER ZONES (depth):
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____
From _____ To _____ From _____ To _____

6. CASING: Depth Diameter Thickness/Weight Material
From -.5 To 13.0 Ft. 2 Sch 40 PVC
From _____ To _____ Ft. _____ _____
From _____ To _____ Ft. _____ _____

7. GROUT: Depth Material Method
From 2.0 To 14.0 Ft. Bentonite pour
From 0 To 12.0 Ft. cement pour
From _____ To _____ Ft. _____ _____

8. SCREEN: Depth Diameter Slot Size Material
From 15.0 To 30.0 Ft. 2 in. 10 in. PVC
From _____ To _____ Ft. _____ in. _____ in. _____
From _____ To _____ Ft. _____ in. _____ in. _____

9. SAND/GRAVEL PACK: Depth Size Material
From 14.0 To 30.0 Ft. #2 sand
From _____ To _____ Ft. _____ _____
From _____ To _____ Ft. _____ _____

10. DRILLING LOG

From	To	Formation Description
<u>0</u>	<u>10.0</u>	<u>DARK GRAY silt</u>
<u>10</u>	<u>20.0</u>	<u>ORANGE BROWN silt</u>
<u>20.0</u>	<u>30.0</u>	<u>DARK GRAY silt</u>

11. REMARKS:

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

Leo H. Charbonneau 5/4/08
SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE
Leo H. Charbonneau
PRINTED NAME OF PERSON CONSTRUCTING THE WELL

PROJECT: RAEFORD ROAD SUNOCO	SHEET 1 OF 1	BORING NO. MW-4	ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC			
SITE LOCATION 4537 RAEFORD ROAD FAYETTEVILLE, NC	LOCATION N: E:	ELEVATION:	JOB NO: 08-030N			
DRILL CONTRACTOR: J&L DRILLING INC.	ENG/GEO: WILLIAM LIEBE	DATE BEGUN: 4/30/08 DATE FINISHED: 4/30/08				
DRILL RIG: TRUCK-MOUNTED HOLLOW STEM AUGER DRILLER: LEO CHARBONNEAU	WEATHER: SUNNY 50 DEGREES	GROUNDWATER (DEPTH/ELEV): 23 FEET TOP OF ROCK (DEPTH/ELEV): NOT ENCOUNTERED				
HOLE SIZE: 8 INCH	DRILL METHOD: HOLLOW STEM	DRILL FLUID:				
SOIL CLASSIFICATION	DEPTH OF LAB SAMPLE	SAMPLE TYPE	RECOVERY	GROUNDWATER	PID READING (PPM)	
0 TO 0.5 FEET - ASPHALT/GRAVEL 0.5 FEET TO 2 FEET - BROWN SILTY SAND 2 FEET TO 6 FEET - GRAY SILTY SAND 6 TO 10 FEET - BROWN SILTY SAND			GOOD		0 120	STRONG ODOR NO WATER
10 TO 18 FEET - BROWN SILTY SAND 18 TO 20 FEET - ORANGE SAND WITH SILT			GOOD		160 380	ODOR NO WATER
20 TO 30 FEET - ORANGE SAND WITH SILT			GOOD	23 FEET	10,000+	SLIGHT ODOR WATER AT +/- 23 FEET
BORING TERMINATED AT 30 FEET						

SAMPLER TYPE: SS = SPLIT SPOON, ST = SHELBY TUBE, R = ROCK CORE, MC = MACRO CORE, O = OTHER

PROJECT: RAEFORD ROAD SUNOCO	SHEET 1 OF 1	BORING NO. MW-5	ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC
SITE LOCATION 4537 RAEFORD ROAD FAYETTEVILLE, NC	LOCATION N: E:	ELEVATION:	JOB NO: 08-030N
DRILL CONTRACTOR: J&L DRILLING INC.	ENG/GEO: WILLIAM LIEBE	DATE BEGUN: 4/30/08 DATE FINISHED: 4/30/08	
DRILL RIG: TRUCK-MOUNTED HOLLOW STEM AUGER DRILLER: LEO CHARBONNEAU	WEATHER: SUNNY 50 DEGREES	GROUNDWATER (DEPTH/ELEV): 23 FEET TOP OF ROCK (DEPTH/ELEV): NOT ENCOUNTERED	
HOLE SIZE: 8 INCH	DRILL METHOD: HOLLOW STEM	DRILL FLUID:	
SOIL CLASSIFICATION	DEPTH OF LAB SAMPLE	SAMPLE TYPE	RECOVERY
SURFACE ELEVATION			GROUNDWATER
0 TO 0.5 FEET - ASPHALT/GRAVEL			PID READING (PEN)
0.5 FEET TO 10 FEET - BROWN SILTY SAND		GOOD	40 140
10 TO 19 FEET - BROWN SILTY SAND			1,520
19 TO 20 FEET - ORANGE SAND WITH SILT		GOOD	10,000+
20 TO 30 FEET - ORANGE SAND WITH SILT		GOOD	23 FEET 1,640
BORING TERMINATED AT 30 FEET			

SAMPLER TYPE: SS = SPLIT SPOON, ST = SHELBY TUBE, R = ROCK CORE, MC = MACRO CORE, O = OTHER

PROJECT: RAEFORD ROAD SUNOCO	SHEET 1 OF 1	BORING NO. MW-6	ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC			
SITE LOCATION 4537 RAEFORD ROAD FAYETTEVILLE, NC	LOCATION N: E:	ELEVATION:	JOB NO: 08-030N			
DRILL CONTRACTOR: J&L DRILLING INC.	ENG/GEO: WILLIAM LIEBE	DATE BEGUN: 4/30/08 DATE FINISHED: 4/30/08				
DRILL RIG: TRUCK-MOUNTED HOLLOW STEM AUGER DRILLER: LEO CHARBONNEAU	WEATHER: SUNNY 50 DEGREES	GROUNDWATER (DEPTH/ELEV): 23 FEET TOP OF ROCK (DEPTH/ELEV): NOT ENCOUNTERED				
HOLE SIZE: 8 INCH	DRILL METHOD: HOLLOW STEM	DRILL FLUID:				
SOIL CLASSIFICATION	DEPTH OF LAB SAMPLE	SAMPLE TYPE	RECOVERY	GROUNDWATER	PID READING (PPM)	
0 TO 0.5 FEET - ASPHALT/GRAVEL 0.5 FEET TO 10 FEET - BROWN SILTY SAND			GOOD		60 120	NO ODOR NO WATER
10 TO 19 FEET - BROWN SILTY SAND 19 TO 20 FEET - ORANGE SAND WITH SILT			GOOD		400 260	NO ODOR NO WATER
20 TO 30 FEET - ORANGE SAND WITH SILT			GOOD	23 FEET	860	NO ODOR WATER AT +/- 23 FEET
BORING TERMINATED AT 30 FEET						

SAMPLER TYPE: SS = SPLIT SPOON, ST = SHELBY TUBE, R = ROCK CORE, MC = MACRO CORE, O = OTHER

SECTION C
WATER SUPPLY WELL INFORMATION FORMS

Figure 18 Water Supply Well Information Survey

Incident Number: 0-025474		Incident Name: Former Jim's Texaco	
Please Provide the Following Information (to the best of your knowledge)			
Name and telephone number of person completing the survey		Lenny W. ... 910-426-2872	
Address of property receiving survey		4142 Rector Road	
City		Fayetteville	
County		Cumberland	
What is the source of your drinking water? <u>Public Water</u> / Water Supply Well / Stream Intake / Other (please explain below)			
Is there a water supply well on this property? <u>Yes</u> / No If "No" disregard remaining questions and return survey			
Name and address of owner(s) of property with water supply well			
How many water supply wells are on your property?			
What is the well(s) used for? (check all that apply) Drinking <input type="checkbox"/> , Irrigation <input type="checkbox"/> , Swimming Pool <input type="checkbox"/> , Water Livestock <input type="checkbox"/> , Other (specify) <input type="checkbox"/> , You do not use the Well <input type="checkbox"/>			
How many residences are connected to the well (list addresses below)?			
How deep is the well(s)?		Date well was installed?	
What is the casing depth of the well(s)?			
What is the screen interval of the well(s)?			
Additional water supply well information:			
Please return completed survey to <u>Advantage Environmental Consultants</u> by <u>May 15, 2008</u> using one of the following methods:			
1. Fax to	(615) 376-3034		
2. Mail to	Advantage Environmental Consultants 277 Wilson Pike Circle, Suite 201 Brentwood, Tennessee 37027		
3. Telephone	(615) 376-3022		
4. E-mail to	bliebe@aec-env.com		
If you have any questions, please contact the consultant indicated above or the UST Section Fayetteville, NC Office at (910) 433-3346			

Figure 18 Water Supply Well Information Survey

Incident Number: 0-025474		Incident Name: Former Jim's Texaco	
Please Provide the Following Information (to the best of your knowledge)			
Name and telephone number of person completing the survey		James Wright 910-424-6515	
Address of property receiving survey		4554 Rector Road	
City		Fayetteville	
County		Crawford	
What is the source of your drinking water? <u>Public Water</u> / Water Supply Well / Stream Intake / Other (please explain below)			
Is there a water supply well on this property? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If "No" disregard remaining questions and return survey			
Name and address of owner(s) of property with water supply well			
How many water supply wells are on your property?			
What is the well(s) used for? (check all that apply) Drinking <input type="checkbox"/> Irrigation <input type="checkbox"/> Swimming Pool <input type="checkbox"/> Water Livestock <input type="checkbox"/> Other (specify) <input type="checkbox"/> You do not use the Well <input type="checkbox"/>			
How many residences are connected to the well (list addresses below)?			
How deep is the well(s)?		Date well was installed?	
What is the casing depth of the well(s)?			
What is the screen interval of the well(s)?			
Additional water supply well information:			
Please return completed survey to <u>Advantage Environmental Consultants</u> by <u>May 15, 2008</u> using one of the following methods:			
1. Fax to	(615) 376-3034		
2. Mail to	Advantage Environmental Consultants 277 Wilson Pike Circle, Suite 201 Brentwood, Tennessee 37027		
3. Telephone	(615) 376-3022		
4. E-mail to	bliebe@aec-env.com		
If you have any questions, please contact the consultant indicated above or the UST Section Fayetteville, NC Office at (910) 433-3346			

Figure 18 Water Supply Well Information Survey

Incident Number: 0-025474		Incident Name: Former Jim's Texaco	
Please Provide the Following Information (to the best of your knowledge)			
Name and telephone number of person completing the survey		Shawn Nash, 910-483-3000	
Address of property receiving survey		4560 Quaker Road	
City		Fayetteville	
		County	
		Cumberland	
What is the source of your drinking water? <u>Public Water</u> / Water Supply Well / Stream Intake / Other (please explain below)			
Is there a water supply well on this property? Yes / <u>No</u> If "No" disregard remaining questions and return survey			
Name and address of owner(s) of property with water supply well			
How many water supply wells are on your property?			
What is the well(s) used for? (check all that apply) Drinking <input type="checkbox"/> , Irrigation <input type="checkbox"/> , Swimming Pool <input type="checkbox"/> , Water Livestock <input type="checkbox"/> , Other (specify) _____ , You do not use the Well <input type="checkbox"/> .			
How many residences are connected to the well (list addresses below)?			
How deep is the well(s)?		Date well was installed?	
What is the casing depth of the well(s)?			
What is the screen interval of the well(s)?			
Additional water supply well information:			
Please return completed survey to <u>Advantage Environmental Consultants</u> by <u>May 15, 2008</u> using one of the following methods:			
1. Fax to	(615) 376-3034		
2. Mail to	Advantage Environmental Consultants 277 Wilson Pike Circle, Suite 201 Brentwood, Tennessee 37027		
3. Telephone	(615) 376-3022		
4. E-mail to	bliebe@aec-env.com		
If you have any questions, please contact the consultant indicated above or the UST Section Fayetteville, NC Office at (910) 433-3346			

Figure 18 Water Supply Well Information Survey

Incident Number: 0-025474		Incident Name: Former Jim's Texaco	
Please Provide the Following Information (to the best of your knowledge)			
Name and telephone number of person completing the survey		Tim Gonyea 910-678-2262	
Address of property receiving survey		48-48 Rackett Road Wachovia Bank	
City		Fayetteville	
County		Cumberland	
What is the source of your drinking water? <u>Public Water</u> / Water Supply Well / Stream Intake / Other (please explain below)			
Is there a water supply well on this property? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If "No" disregard remaining questions and return survey			
Name and address of owner(s) of property with water supply well			
How many water supply wells are on your property?			
What is the well(s) used for? (check all that apply) Drinking _____, Irrigation _____, Swimming Pool _____, Water Livestock _____, Other (specify) _____, You do not use the Well _____.			
How many residences are connected to the well (list addresses below)?			
How deep is the well(s)?		Date well was installed?	
What is the casing depth of the well(s)?			
What is the screen interval of the well(s)?			
Additional water supply well information:			
Please return completed survey to <u>Advantage Environmental Consultants</u> by <u>May 15, 2008</u> using one of the following methods:			
1. Fax to	(615) 376-3034		
2. Mail to	Advantage Environmental Consultants 277 Wilson Pike Circle, Suite 201 Brentwood, Tennessee 37027		
3. Telephone	(615) 376-3022		
4. E-mail to	bliebe@aec-env.com		
If you have any questions, please contact the consultant indicated above or the UST Section Fayetteville, NC Office at (910) 433-3346			

Figure 18 Water Supply Well Information Survey

Incident Number: 0-025474		Incident Name: Former Jim's Texaco	
Please Provide the Following Information (to the best of your knowledge)			
Name and telephone number of person completing the survey		Willie Merrick 910-425-6163	
Address of property receiving survey		W.M. Owen Elementary School	
City		Fayetteville	
County		Currituck	
What is the source of your drinking water? <u>Public Water</u> / Water Supply Well / Stream Intake / Other (please explain below)			
Is there a water supply well on this property? Yes <input type="checkbox"/> <u>No</u> If "No" disregard remaining questions and return survey			
Name and address of owner(s) of property with water supply well			
How many water supply wells are on your property?			
What is the well(s) used for? (check all that apply) Drinking <input type="checkbox"/> , Irrigation <input type="checkbox"/> , Swimming Pool <input type="checkbox"/> , Water Livestock <input type="checkbox"/> , Other (specify) _____, You do not use the Well <input type="checkbox"/>			
How many residences are connected to the well (list addresses below)?			
How deep is the well(s)?		Date well was installed?	
What is the casing depth of the well(s)?			
What is the screen interval of the well(s)?			
Additional water supply well information:			
Please return completed survey to <u>Advantage Environmental Consultants</u> by <u>May 15, 2008</u> using one of the following methods:			
1. Fax to	(615) 376-3034		
2. Mail to	Advantage Environmental Consultants 277 Wilson Pike Circle, Suite 201 Brentwood, Tennessee 37027		
3. Telephone	(615) 376-3022		
4. E-mail to	bliebe@aec-env.com		
If you have any questions, please contact the consultant indicated above or the UST Section Fayetteville, NC Office at (910) 433-3346			

July 19, 2013

Mr. James Brown
North Carolina Department of Environment and Natural Resources
UST Section
225 Green Street, Suite 714
Fayetteville, North Carolina 28301

RECEIVED
JUL 23 2013

DIVISION OF WASTE MANAGEMENT
FAYETTEVILLE REGIONAL OFFICE

Re: **Comprehensive Site Assessment**
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, North Carolina 28304
Groundwater Incident Number: 9788
Facility ID #0-025474

Dear Mr. Brown:

Advantage Environmental Consultants, LLC. (AEC) is pleased to provide this Comprehensive Site Site Assessment (CSA) for the former Jim's Texaco/Raeford Road Sunoco Station in Fayetteville, North Carolina. If you have any questions, please feel free to call me at (615) 376-3022.

Sincerely,

Advantage Environmental Consultants, LLC



William M. Liebe, P.G.
Senior Project Manager



Michael J. Robertson, P.G.
Principal

Cc: Travis Booth – Raeford Road Holdings, LLC

10/20/13
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
FAYETTEVILLE REGIONAL OFFICE

**COMPREHENSIVE SITE ASSESSMENT
PREPARED IN RESPONSE TO A LEAKING UNDERGROUND
STORAGE TANK(S) AT:
RAEFORD ROAD SUNOCO (FORMER JIM'S TEXACO)
FAYETTEVILLE, CUMBERLAND COUNTY, NORTH CAROLINA**

**NCDENR-UST SECTION INCIDENT NUMBER: 9788
NCDENR-UST SECTION FACILITY ID# 0-025474**

July 19, 2013

Responsible Party:

Raeford Road Holdings, LLC
9055 Comprint Court, Suite 200
Gaithersburg, Maryland 20877
(301) 921-9200

Current Property Owner:

Raeford Road Holdings, LLC
9055 Comprint Court, Suite 200
Gaithersburg, Maryland 20877
(301) 921-9200

Consultant:

Advantage Environmental Consultants, LLC
277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
(615) 376-3022

Release Discovery Date: April 27, 1992
Cause of Release: Underground Storage Tanks
UST Size and Contents: (3) 10,000-gallon gasoline USTs, & (1) 150-gallon waste oil UST
Latitude: N 35° 02' 35", Longitude: W 78° 57' 22"

Comprehensive Site Assessment

A SITE INFORMATION

A.1 Site Identification

DATE OF REPORT: July 19, 2013
Facility I.D.: 0-025474 UST Incident Number 9788
Site Name: Raeford Road Sunoco (Former Jim's Texaco)
Site Location: 4537 Raeford Road
Nearest City/Town: Fayetteville County: Cumberland
Location Method: Topographic Maps
Latitude: N 35° 02' 35" Longitude: W 78° 57' 22"

A.2 Contact Information

UST Owner: Raeford Road Holdings, LLC
Address: 9055 Comprint Court, Gaithersburg, MD 20877 Phone: (301) 921-9200

UST Operator: Raeford Road Holdings, LLC
Address: 9055 Comprint Court, Gaithersburg, MD 20877 Phone: (301) 921-9200

Property Owner: Raeford Road Holdings, LLC
Address: 9055 Comprint Court, Gaithersburg, MD 20877 Phone: (301) 921-9200

Property Occupants: Sunoco & Diamond Autosport
Address: 4537 Raeford Road, Fayetteville, NC 28304 Phone: (301) 921-9200

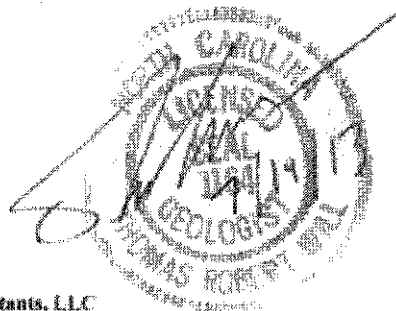
Consultant/Contractor: Advantage Environmental Consultants
Address: 277 Wilson Pike Circle, Brentwood, TN 37027 Phone: (615) 376-3022

Analytical Laboratory: Environmental Conservation Laboratories
Address: 102-A Woodwinds Industrial Court, Cary, NC 27511 Phone: (919) 467-3090

A.3 Release Information

Date Discovered: April 27, 1992
Estimated Quantity of Release: unknown
Cause of Release: Underground Storage Tanks
Source of Release (e.g., Piping/UST): UST/Piping?
Sizes and contents of UST system from which the release occurred): (3) 10,000-gallon gasoline USTs?

I, Thomas R. Will a North Carolina Licensed Geologist do certify that the information contained in this report is correct and accurate to the best of my knowledge.



B EXECUTIVE SUMMARY

The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Raeford Road Holdings, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline. Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. A small, out-of-use, waste oil UST is located immediately south of this building.

The Site's existing UST systems were installed during January 1987, and include three 10,000-gallon gasoline tanks. The installation date of the 150-gallon waste oil UST could not be ascertained. The Site also once contained three 1,000-gallon gasoline USTs that were last owned and operated by Mr. James Sanderson. The installation date of these USTs could not be ascertained but are believed to have been installed in the early 1960s. These three USTs were removed in January 1987 and replaced by the tank systems that are currently being used on the Site. See **Section A, Figure 2** for the Site map indicating the UST system location.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. This case (Groundwater Incident Number 9788) has been open since that time, and no additional assessment or remediation has occurred at the Site until 2008. Mr. Sanderson received at least four Notices of Violation (NOVs) since 1992 and has also been subject to civil penalties for failure to comply with UST regulations during this time.

Raeford Road Holdings, LLC purchased the Site from Mr. Sanderson on April 24, 2006. In response, NCDENR issued a March 18, 2008 NORR letter to the owner of the UST systems requiring them to comply with the reporting requirements of 15A NCAC 2L .0115(C)(4). A Phase II Limited Site Assessment (LSA) was then completed and submitted to the NCDENR on June 4, 2008. The LSA revealed the presence of approximately 2.14" and 1.67" of free phase petroleum product in the form of gasoline in monitoring wells MW-1 and MW-2, respectively on May 1, 2008. In response, Aggressive Fluid Vapor Recovery (AFVR) events were completed in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013.

Due to the on-going presence of free phase petroleum product, the NCDENR issued a March 27, 2013 NORR letter to Raeford Road Holdings, LLC directing them to comply with the requirements of 15A NCAC 2N .0706, 15A NCAC 2L .0106(c) and 2L .0106(g).

Raeford Road Holdings, LLC responded by contracting with Advantage Environmental Consultants, LLC (AEC) in order to complete this Comprehensive Site Assessment (CSA) report.

B.1 Initial Abatement/Emergency Response Information

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. A NORR letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. These initial abatement measures were apparently not performed.

B.2 Receptor Information

AEC completed a walkthrough of all properties located within a 1,000 foot radius of the Site for the Phase II LSA completed on June 4, 2008. AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. The completed well survey did not identify the presence of water supply wells located within a 1,000 foot radius of the Site.

There are no surface water bodies located within 500 feet of the release area and the source area is not located within a wellhead protection area. The Site is located in the Coastal Plain Physiographic province. However, the Site and some surrounding properties within 1,500-feet obtain their potable water from the City of Fayetteville which obtains water from available surface water sources.

B.3 Sampling/Investigation Results

Phase II Environmental Site Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the four soil samples at concentrations below the applicable NCDENR Industrial/Commercial Cleanup Levels.

AEC also collected three groundwater samples from temporary wells. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the three groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards. The Phase II ESA, completed by AEC and dated March 6, 2006, was submitted to the NCDENR.

Phase II Limited Site Assessment Activities (April & May 2008)

AEC mobilized to the Site on April 30 and May 1, 2008 for the purpose of conducting field assessment activities necessary to determine a "worse case scenario" for the presence of petroleum contamination in the groundwater on the Site. In conducting this assessment, AEC installed three additional monitoring wells designated as MW-4, MW-5, and MW-6 (monitoring wells MW-1, MW-2, and MW-3 were previously installed in 1992). Free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Therefore, groundwater samples were only collected from monitoring wells MW-3, MW-4, MW-5, and MW-6.

The samples collected from these wells were submitted for chemical analysis for VOCs by EPA Method 8260 and VPH by the MADEP-VPH method. Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-4, MW-5, and MW-6; ethylbenzene in MW-4, MW-5, and MW-6; isopropyl benzene in MW-4; MTBE in MW-4, MW-5, and MW-6; n-propylbenzene in MW-4, MW-5, and MW-6; naphthalene in MW-4, MW-5, and MW-6; toluene in MW-4, MW-5, and MW-6; 1,3,5 trimethylbenzene in MW-4; 1,2,4 trimethylbenzene in MW-

4, MW-5, and MW-6; and total xylenes in MW-4, MW-5, and MW-6. Benzene was also found in groundwater samples in MW-4 and MW-6 at concentrations exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Data for the MADEP-VPH analyses showed C5-C8 aliphatic hydrocarbons (380-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 420-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analysis also revealed C9-C18 aliphatic hydrocarbons in groundwater samples collected from MW-3, MW-4, and MW-5; however, only the sample from MW-5 was in excess of the maximum allowable concentration in groundwater of 4,200-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analyses showed C19-C36 aliphatic hydrocarbons (350-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 42,000-ug/l as set forth in 15A NCAC 2L .0202. Finally, data for the MADEP-VPH analysis showed C9-C22 aromatic hydrocarbons in each of the four groundwater samples collected. These levels are in excess of its maximum allowable concentration in groundwater of 210-ug/l as set forth in 15A NCAC 2L .0202.

Due to the presence of free product, AEC recommended that AFVR events be performed as an abatement measure to withdraw or remove free product and vapors that pose a threat to human health and the environment. The Phase II ESA, completed by AEC, was submitted to the NCDENR on June 4, 2008.

Aggressive Fluid Vapor Recovery Events (October 2008 to April 2013)

Due to the presence of free phase petroleum product at the Site, Aggressive Fluid Vapor Recovery (AFVR) events were completed on October 14, 2008, March 10, 2009, October 14, 2009, April 27, 2010, August 7, 2012, and April 22, 2013. A Summary of Free Product Thickness Measurements in Monitoring Wells is included in **Section B, Table 6**.

A combined total of 10,519 gallons of water were recovered from MW-1, MW-2, MW-4 and MW-6, during the six AFVR events, approximately 76 gallons of which were determined to be gasoline. Also, AEC calculated that a total of approximately 33.66 gallons of gasoline being removed as VOC emissions during the six AFVR events. Therefore, a total of approximately 109.66 gallons of gasoline were removed as a result of these six AFVR events.

The first six AFVR events appeared to be fairly effective in removing a significant amount of the remaining free phase petroleum product. However, product thicknesses have rebounded between 2011 and April 2013. At some sites this can be explained by fluctuations in the groundwater table elevations, however based on a review of historical groundwater elevations no more than one foot of variation was noted between the lowest and highest recorded elevations.

Comprehensive Site Assessment Soil Investigation

AEC mobilized to the Site on June 4, 2013 for the purpose of conducting field assessment activities necessary to complete assessment of petroleum contamination in the soils of the Site. In conducting this assessment, AEC advanced a series of ten soil borings, SB-1 through SB-10. Soils encountered while completing the soil borings consisted of dry to moist tan-orange-brown clayey to sandy silt to 20-feet below land surface. The soil samples were collected for laboratory analysis at depths of 8 to 10-feet and 18 to 20-feet below land surface in each soil boring.

The borings were located in order to surround the suspected contaminant source area (UST and product dispenser locations). The exact locations of these ten soil borings are shown in **Section A, Figure 2**. These samples were submitted to Environmental Conservation Laboratories of Cary, NC (NCDENR-DWQ certification # 591) for laboratory analysis of VOCs by EPA Methods 8260 and VPH by MADEP-VPH.

The analytical results for EPA Method 8260 revealed the presence of numerous VOCs at detectable levels in each soil sample. Few VOCs in certain soil samples exceeded their Soil to Groundwater Maximum Soil Contaminant Concentrations (MSCCs) as set forth in *The Guidelines*. The constituents and samples exceeding their respective Soil to Groundwater MSCC include benzene in SB-1 at 18-20 feet, SB-2 at 8-10 feet, SB-2 at 18-20 feet, SB-4 at 18-20 feet, SB-5 at 8-10 feet, SB-6 at 8 to 10 feet, SB-6 at 18-20 feet, SB-7 at 8-10 feet, and SB-8 at 8-10 feet; naphthalene in SB-1 at 8-10 feet, SB-9 at 8-10 feet, and SB-10 at 18-20 feet; 4-isopropyltoluene in SB-9 at 8-10 feet; n-propylbenzene in SB-9 at 8-10 feet; and MTBE in SB-4 at 18-20 feet. It should be noted that none of the detected VOCs exceeded the Residential or Industrial Commercial MSCCs.

The analytical results for the VPH analysis detected the presence of C5-C8 aliphatics, C9-C12 aliphatics or C9-C10 aromatics in samples SB-1 at 8-10 feet and SB-10 at 18-20 feet at concentrations in excess of their Soil to Groundwater MSCCs as set forth in *The Guidelines*. The detected VPH did not exceed the Residential or Industrial Commercial MSCCs. A summary

of these soil analytical results is included in **Table 3** in **Section B** while the laboratory report can be found in **Section E**.

The detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. The elevated concentrations are largely related to the presence of free phase petroleum product on the groundwater beneath the Site, especially those samples collected at depth (18-20 feet). These soil analytical results do not define the lateral extent of soil contamination to the Soil to Groundwater MSCCs in the northern and southern directions. This is because the most recently obtained soil data shows that petroleum contaminated soils may underlie the NCDOT right of ways under the northern adjacent Raeford Road. Further, the areas to the south contain a large amount of buried utilities which will prohibit additional assessment activities in this direction. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs have been adequately defined. Further, the remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

Comprehensive Site Assessment Groundwater Investigation

AEC mobilized to the Site on June 3-6, 2013 in order to install five additional permanent monitoring wells designated as MW-7, MW-7D, MW-8, MW-9, and MW-10. MW-10 is located on the eastern adjacent W.H. Owen Elementary School property. MW-7D is the deep Type III well. AEC returned to the Site on June 7, 2013 in order to sample the eleven monitoring wells (MW-1 through MW-10 and MW-7D) for completion of this CSA. The groundwater samples collected from the monitoring wells were submitted for analysis by EPA Methods 6200B (volatile organic compounds), 504.1 (EDB), 3030c (total lead), and the MADEP-VPH method. It is important to note that free phase petroleum product was observed in monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6. Therefore, these five wells were not sampled during the CSA.

Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-7, MW-8, MW-9, and MW-10; ethylbenzene in MW-7; isopropyl benzene in MW-7; n-butylbenzene in MW-7; n-propylbenzene in MW-7; MTBE in MW-7, MW-9, and MW-10; naphthalene in MW-7, MW-9, and MW-10; toluene in MW-7; 1,3,5 trimethylbenzene in MW-7; 1,2,4

trimethylbenzene in MW-7; and total xylenes in MW-7 and MW-9. Benzene was also found in the groundwater sample in MW-7 at a concentration exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Groundwater samples analyzed by MADEP-VPH revealed the presence of the targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: C5-C8 aliphatic hydrocarbons in MW-3, MW-7, and MW-9; C9-C12 aliphatic hydrocarbons in MW-7; and C9-C10 aromatic hydrocarbons in MW-3, MW-7, and MW-9. EDB was only detected in the sample from MW-7 at a concentration exceeding its maximum allowable concentration in groundwater. Lead was only detected in the sample from MW-7 at a concentration well below its maximum allowable concentration in groundwater.

In summary, data for the groundwater samples obtained from wells MW-3, MW-7, MW-8, MW-9, and MW-10 showed the presence of one or more targeted contaminants at levels above their maximum allowable concentrations in groundwater as defined by 15A NCAC 2L .0202. The results for this groundwater sampling event showed that the lateral extent of the groundwater contaminant plume was adequately defined in the horizontal direction to the Gross Contaminant Levels (GCLs) set forth in *The Guidelines*.

Isoconcentration maps for benzene, MTBE, and naphthalene have been prepared and can be found in **Section A, Figures 4 through 6**. **Section B, Table 4** is a summary of the combined analytical results for all of the sampling events. Laboratory reports for the June 7, 2013 sampling event are presented in **Section E**.

Upon review of the data obtained by the CSA activities described above, it can be stated that while the horizontal extent of the groundwater contaminant plume has not been defined to the 15A NCAC 2L Standards it has successfully been defined to Gross Contaminant Levels (GCLs) which will be the target groundwater cleanup levels for this incident .

The vertical extent of groundwater contamination was addressed through installation of deep well MW-7D on June 5, 2013. MW-7D was installed immediately adjacent to MW-7 and it is screened from 60 to 70 feet below land surface. Analytical results for a groundwater sample collected from this well on June 7, 2013 indicated the presence of only C9-C10 aromatic hydrocarbons at a concentration of 2.8 ug/l which is well below the 15N NCAC 2L 0202 standard of 200 ug/l, respectively. It is possible that this contaminant was carried down from

above. Based on these results, the vertical extent of groundwater contamination appears to be defined.

B.4 Site Specific Conditions Related to Risk Classification

Currently the Site is classified as "intermediate risk" due to the presence of free phase petroleum product and at least one exceedence of the GCLs. While the removal of free phase petroleum product is required, the only way to lower the current risk classification from "intermediate" to "low" and close out the incident is to also eliminate all exceedences of GCLs in the groundwater.

B.5 Conclusions/Recommendations

Chemical contaminants at levels in excess of the Soil to Groundwater MSCCs were detected in soil samples collected in the vicinity of the UST system. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs has been adequately defined. Free phase petroleum product is present in on-Site wells MW-1, MW-2, MW-4, MW-5, and MW-6. In addition, chemical contaminants at levels in excess of the 15A NCAC 2L .0202 Water Quality Standards were detected in the groundwater in on-Site wells MW-3, MW-7, MW-8, and MW-9 and off-Site well MW-10.

AEC believes that consideration should first be given to removing free phase petroleum product from beneath the Site. Because there are no environmentally sensitive receptors in the vicinity of the Site, the removal will help to lower the risk classification to "low risk". The removal of free product will also likely reduce concentrations of VOCs and VPH in Site soils and groundwater as well as eliminate future GCL exceedences. Based on the low levels of petroleum contamination in Site soils, AEC believes the removal of free product will be sufficient to address soil impacts. Following free product removal, AEC believes that an evaluation of the processes of natural attenuation and biodegradation for addressing the groundwater contaminants should be completed in order to address any remaining GCL exceedences. If it is determined that this is not a viable option then one or more active groundwater cleanup options will need to be considered.

The subject release will remain classified as "intermediate risk" due to the continued presence of free phase petroleum product and exceedences of GCLs. The removal of free product and GCL exceedences must be completed in order to eventually lower the classification to "low risk"

which may result in the incident being closed out by the NCDENR. Therefore, AEC recommends the use of either additional AFVR events or possibly a more aggressive Mobile Multi Phase Extraction (MMPE). AEC recommends that Raeford Road Holdings, LLC submit a copy of this CSA to the NCDENR, Division of Water Quality, Fayetteville Regional Office, to the attention of Mr. James Brown.

Table of Contents

A SITE INFORMATION.....2

A.1 SITE IDENTIFICATION2

A.2 CONTACT INFORMATION2

A.3 RELEASE INFORMATION2

B EXECUTIVE SUMMARY3

B.1 INITIAL ABATEMENT/EMERGENCY RESPONSE INFORMATION4

B.2 RECEPTOR INFORMATION4

B.3 SAMPLING/INVESTIGATION RESULTS5

B.4 SITE SPECIFIC CONDITIONS RELATED TO RISK CLASSIFICATION10

B.5 CONCLUSIONS/RECOMMENDATIONS10

C SITE HISTORY AND SOURCE CHARACTERIZATION.....14

D RECEPTOR INFORMATION.....18

D.1 WATER SUPPLY WELLS18

D.2 PUBLIC WATER SUPPLIES.....18

D.3 SURFACE WATER18

D.4 WELLHEAD PROTECTION AREAS.....18

D.5 DEEP AQUIFERS IN THE COASTAL PLAIN PHYSIOGRAPHIC REGION18

D.6 SUBSURFACE STRUCTURES19

D.7 LAND USE19

E SITE GEOLOGY AND HYDROGEOLOGY.....21

F SOIL SAMPLE RESULTS23

F.1 PHASE II ENVIRONMENTAL SITE ASSESSMENT ACTIVITIES (FEBRUARY 2006)23

F.2 COMPREHENSIVE SITE ASSESSMENT SOIL ACTIVITIES (JUNE 2013).....23

G GROUNDWATER SAMPLING ACTIVITIES.....25

G.1 LOCATION AND INSTALLATION OF MONITORING WELLS25

G.2 GROUNDWATER SAMPLING DATES26

G.3 VERTICAL EXTENT OF GROUNDWATER CONTAMINATION (JUNE 7, 2013).....28

H FREE PRODUCT INVESTIGATION/RECOVERY.....30

I HYDROGEOLOGIC INVESTIGATION.....31

I.1 HORIZONTAL GROUNDWATER HYDRAULIC GRADIENT.....31

I.2 VERTICAL GROUNDWATER HYDRAULIC GRADIENT31

I.3 AQUIFER TESTING.....31

J DISCUSSION33

J.1 NATURE AND EXTENT OF CONTAMINATION.....33

J.2 CONTAMINANT MIGRATION AND POTENTIALLY AFFECTED RECEPTORS.....33

J.3 LOWERING RISK CLASSIFICATION.....34

J.4 APPLICABLE CLEANUP LEVELS.....34

K CONCLUSIONS AND RECOMMENDATIONS.....35

L REFERENCES.....37

LIMITATIONS.....38

List of Appendices

Section A Figures

- Figure 1** U.S.G.S. Topographic Map – Site Location Map
- Figure 2** Soil Borings and UST System Locations
- Figure 3** Monitoring Well Location Map
- Figure 4** Benzene Groundwater Isoconcentration Map
- Figure 5** MTBE Groundwater Isoconcentration Map
- Figure 6** Naphthalene Groundwater Isoconcentration Map
- Figure 7** Soil/groundwater Cross-Section Location Map
- Figure 8** Soil/groundwater Cross-Section A-A'
- Figure 9** Soil/groundwater Cross-Section B-B'
- Figure 10** Groundwater Hydraulic Gradient Map (June 7, 2013)

Section B Tables

- Table 1** UST Information
- Table 2** Adjacent Property Ownership Information
- Table 3** Summary of Analytical Data - Soil
- Table 4** Summary of Analytical Data - Groundwater
- Table 5** Summary of Monitoring and Supply Well Construction Data
- Table 6** Summary of Free Product Thickness Measurements

Section C Well Construction Records

Section D Aquifer Slug Test Results

Section E Laboratory Reports

C SITE HISTORY AND SOURCE CHARACTERIZATION

The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Raeford Road Holdings, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline. Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. A small, out-of-use, waste oil UST is located immediately south of this building.

The Site's existing UST systems were installed during January 1987, and include three 10,000-gallon gasoline tanks. The installation date of the 150-gallon waste oil UST could not be ascertained. The Site also once contained three 1,000-gallon gasoline USTs that were last owned and operated by Mr. James Sanderson. The installation date of these USTs could not be ascertained but are believed to have been installed in the early 1960s. These three USTs were removed in January 1987 and replaced by the tank systems that are currently being used on the Site. See **Section A, Figure 2** for the Site map indicating the UST system location.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. This case (Groundwater Incident Number 9788) has been open since that time, and no additional assessment or remediation has occurred at the Site until 2008. Mr. Sanderson received at least four Notices of Violation (NOVs) since 1992 and has also been subject to civil penalties for failure to comply with UST regulations during this time.

Raeford Road Holdings, LLC purchased the Site from Mr. Sanderson on April 24, 2006. In response, NCDENR issued a March 18, 2008 NORR letter to the owner of the UST systems requiring them to comply with the reporting requirements of 15A NCAC 2L .0115(C)(4). A Phase II Limited Site Assessment (LSA) was then completed and submitted to the NCDENR on June 4, 2008. The LSA revealed the presence of approximately 2.14" and 1.67" of free phase petroleum product in the form of gasoline in monitoring wells MW-1 and MW-2, respectively on May 1, 2008. In response, Aggressive Fluid Vapor Recovery (AFVR) events were completed in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013.

Due to the on-going presence of free phase petroleum product, the NCDENR issued a March 27, 2013 NORR letter to Raeford Road Holdings, LLC directing them to comply with the requirements of 15A NCAC 2N .0706, 15A NCAC 2L .0106(c) and 2L .0106(g).

Raeford Road Holdings, LLC responded by contracting with Advantage Environmental Consultants, LLC (AEC) in order to complete this Comprehensive Site Assessment (CSA) report.

Assessment Activities Completed to Date

Phase II Environmental Site Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the four soil samples at concentrations below the applicable NCDENR Industrial/Commercial Cleanup Levels.

AEC also collected three groundwater samples from temporary wells. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the three groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards. The Phase II ESA, completed by AEC and dated March 6, 2006, was submitted to the NCDENR.

Phase II Limited Site Assessment Activities (April & May 2008)

AEC mobilized to the Site on April 30 and May 1, 2008 for the purpose of conducting field assessment activities necessary to determine a "worse case scenario" for the presence of petroleum contamination in the groundwater on the Site. In conducting this assessment, AEC installed three additional monitoring wells designated as MW-4, MW-5, and MW-6 (monitoring wells MW-1, MW-2, and MW-3 were previously installed in 1992). Free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Therefore, groundwater samples were only collected from monitoring wells MW-3, MW-4, MW-5, and MW-6.

The samples collected from these wells were submitted for chemical analysis for VOCs by EPA Method 8260 and VPH by the MADEP-VPH method. Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-4, MW-5, and MW-6; ethylbenzene in MW-4, MW-5, and MW-6; isopropyl benzene in MW-4; MTBE in MW-4, MW-5, and MW-6; n-propylbenzene in MW-4, MW-5, and MW-6; naphthalene in MW-4, MW-5, and MW-6; toluene in MW-4, MW-5, and MW-6; 1,3,5 trimethylbenzene in MW-4; 1,2,4 trimethylbenzene in MW-4, MW-5, and MW-6; and total xylenes in MW-4, MW-5, and MW-6. Benzene was also found in groundwater samples in MW-4 and MW-6 at concentrations exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Data for the MADEP-VPH analyses showed C5-C8 aliphatic hydrocarbons (380-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 420-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analysis also revealed C9-C18 aliphatic hydrocarbons in groundwater samples collected from MW-3, MW-4, and MW-5; however, only the sample from MW-5 was in excess of the maximum allowable concentration in groundwater of 4,200-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analyses showed C19-C36 aliphatic hydrocarbons (350-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 42,000-ug/l as set forth in 15A NCAC 2L .0202. Finally, data for the MADEP-VPH analysis showed C9-C22 aromatic hydrocarbons in each of the four groundwater samples collected. These levels are in excess of its maximum allowable concentration in groundwater of 210-ug/l as set forth in 15A NCAC 2L .0202.

Due to the presence of free product, AEC recommended that AFVR events be performed as an abatement measure to withdraw or remove free product and vapors that pose a threat to human health and the environment. The Phase II ESA, completed by AEC, was submitted to the NCDENR on June 4, 2008.

Aggressive Fluid Vapor Recovery Events (October 2008 to April 2013)

Due to the presence of free phase petroleum product at the Site, Aggressive Fluid Vapor Recovery (AFVR) events were completed on October 14, 2008, March 10, 2009, October 14, 2009, April 27, 2010, August 7, 2012, and April 22, 2013. A Summary of Free Product Thickness Measurements in Monitoring Wells is included in **Section B, Table 6**.

A combined total of 10,519 gallons of water were recovered from MW-1, MW-2, MW-4 and MW-6, during the six AFVR events, approximately 76 gallons of which were determined to be gasoline. Also, AEC calculated that a total of approximately 33.66 gallons of gasoline being removed as VOC emissions during the six AFVR events. Therefore, a total of approximately 109.66 gallons of gasoline were removed as a result of these six AFVR events.

The first six AFVR events appeared to be fairly effective in removing a significant amount of the remaining free phase petroleum product. However, product thicknesses have rebounded between 2011 and April 2013. At some sites this can be explained by fluctuations in the groundwater table elevations, however based on a review of historical groundwater elevations no more than one foot of variation was noted between the lowest and highest recorded elevations.

D RECEPTOR INFORMATION

D.1 Water Supply Wells

AEC completed a walkthrough of all properties located within a 1,000 foot radius of the Site for the Phase II LSA completed on June 4, 2008. AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. The completed well survey did not identify the presence of water supply wells located within a 1,000 foot radius of the Site.

D.2 Public Water Supplies

The Site and immediate surrounding area are located within the City of Fayetteville and are supplied water by the Fayetteville Public Works Commission (PWC).

D.3 Surface Water

There are no surface water bodies located within 500-feet of the source area. (See **Section A, Figure 1.**)

D.4 Wellhead Protection Areas

On June 26, 2013, ECE reviewed the NCDENR-Wellhead Protection Program files for the presence of wellhead protection areas within 1,500-feet of the Site. None were found to be located within 1,500-feet of the source area.

D.5 Deep Aquifers in the Coastal Plain Physiographic Region

The Site is located within the Coastal Plain Physiographic Region as defined by the Geologic Map Of North Carolina, 1985, published by the *Department of Natural Resources and Community Development, Division of Land Resources, North Carolina Geologic Survey.*

The North Carolina Department of Water Resources, Division of Groundwater publication, "*Geology and Ground-water Resources of the Fayetteville Area*"¹ describes the Site and nearby

areas as being underlain by a surficial sand aquifer which is in turn underlain by the sand and clay strata of the Cretaceous sand aquifer. The surficial sand aquifer is only 10 to 50-feet thick in Cumberland County and water yields are small. Water quality is good in this aquifer.

The underlying surficial sand aquifer is the Cretaceous sand and clay aquifers which are associated with the Middendorf formation. Wells tapping this aquifer may yield more than 2 gpm per foot of depth. Where the Cretaceous clay is the chief aquifer, yields of wells are much less. The surficial sand aquifer noted above is also productive, but over much of the County sand of this aquifer is not distinguishable from that of the underlying Cretaceous sand aquifer. The Cretaceous sand aquifer thickness in Cumberland County ranges from approximately 100-feet in the northwestern corner of the county to nearly 350-feet in thickness at the county's southeastern edge.

The Site and some surrounding properties within 1,500-feet obtain their potable water from the City of Fayetteville which obtains water from available surface water sources.

D.6 Subsurface Structures

There are no known subsurface structures located on the Site.

D.7 Land Use

The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Raeford Road Holdings, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline. Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site.

Property ownership information was obtained through the Cumberland County GIS Department. The Site itself is owned by Raeford Road Holdings, LLC (Parcel ID# 0417-30-2524, 0417-30-2320, and 0417-30-2049). The Site itself and most of the surrounding properties are zoned as C1P (shopping center district) by Cumberland County. The property northeast of the Site across Raeford Road is owned by Dominic and Michelle Marangi and is occupied by Atlas Chiropractor (Parcel ID# 0417-30-3814). The property north of the Site across Raeford Road is owned by Loyd Properties, LLC and is occupied by Bojangles (Parcel ID# 0417-30-2803). The

property northwest of the Site across Raeford Road is owned by Walter Williams and is occupied by Wilco-Hess (Parcel ID# 0417-30-0820). The property west and south of the Site is owned by Mitchell Properties of Florence, Inc. and is occupied by Wachovia Bank and a vacant shopping center (Parcel ID# 0416-29-9999). Finally, the property east and southeast of the Site across Scotland Drive is owned by Cumberland County Board of Education and is occupied by William H. Owen Elementary School (Parcel ID# 0417-30-7111) which is zoned R10 (residential district). See **Section B, Table 2** for more detailed information regarding adjacent property owners.

E SITE GEOLOGY AND HYDROGEOLOGY

The Site and Cumberland County lie east and south of the "fall zone", which is considered to be the border between the Piedmont and Coastal Plain Physiographic Provinces. East and south of the fall zone the sedimentary rocks which underlie the Coastal Plain thicken to the southeast over an irregular basement of rock consisting largely of slate in Cumberland County. The primary water bearing aquifers in the area include the surficial Middendorf Formation, which is underlain by the Black Creek Formation followed by the Tuscaloosa Formation and finally basement rock composed of slate.

The Soil Survey of Cumberland County, North Carolina identifies the soils of the Site as being Urban Land. These soils are classified as areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. Soil materials have been disturbed by cutting, filling, or other mechanical disturbances.

The Geologic Map of North Carolina describes the Site as being underlain by the Cretaceous-age Middendorf Formation. The Middendorf Formation consists of "sand, sandstone, and mudstone, gray to pale gray with an orange cast, mottled; clay balls and iron-cemented concretions common, beds laterally discontinuous, cross-bedding common."

The thickness of this formation ranges from 1 to 50 feet, with the formation becoming thicker toward the west. Formation thickness in central Cumberland County averages approximately 30 feet. Sand in the Middendorf Formation furnishes more water to wells than any other unit in the Fayetteville area. The permeability of this material is moderate, with well yields of 10 to 50 gpm common.

The underlying Black Creek Formation is described by "Geology and Groundwater in the Fayetteville Area²" as black or dark gray thinly laminated clay and lenses of sand. It contains abundant mica and lignite, as well as iron sulfides. The formation thickens from a feather edge along its western margin to about 200 feet to the east. The average formation thickness in the Fayetteville area is generally less than 40 feet. Because of its wide extent and shallow depth and the presence of sand lenses, the Black Creek Formation is the source of water for a large number of wells in the Fayetteville area. Yields of wells tapping this formation range from 50 gpm in smaller wells to 500 gpm in large diameter wells

² Reference: "Geology and Groundwater in the Fayetteville Area" North Carolina Department of Water Resources, Division of Groundwater. Bull. 2

The Tuscaloosa Formation which underlies the Black Creek Formation is described by "Geology and Groundwater in the Fayetteville Area" as gray to white sand and gravel and lenses of clay. Quartz is the major constituent of the sand and gravel. The sand is coarse, crossbedding is common and clay beds are common. The Tuscaloosa thickens to the southeast and obtains a thickness of about 250 feet south of Cumberland County; however formation thickness in the Fayetteville area is expected to be closer to 150 feet. The Tuscaloosa is capable of yielding large supplies of groundwater, but, it is not widely used as a source of water since overlying formations are also capable of producing an abundant water supply.

Soils encountered while completing the soil borings and monitoring wells for this CSA consisted of dry to moist tan-orange-brown clayey to sandy silt to 22-feet below land surface (bls). From 22 to 38-feet bls the soils consisted of a wet orange-tan-gray silty sand. From 38 to 46 feet bls the soils consisted of a stiff gray clay and from 46 to 57 feet bls the soils consisted of gray sands with clay lenses. Finally, from 57 to 70 feet the soils consisted of gray sand.

Groundwater elevations across the Site and surrounding properties have varied between 20 to 23-feet beneath surface grade, dependent upon seasonal fluctuations. Hydraulic gradient through the area has been determined to flow generally to the southeast. See **Section A, Figures 7, 8 and 9** for geologic cross section maps. Groundwater in the monitoring wells installed for completion of this CSA stabilized between 20.10 and 22.54 feet beneath surface grade.

F SOIL SAMPLE RESULTS

F.1 Phase II Environmental Site Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II ESA. The soil samples were analyzed for VOCs by EPA Method 8260 and for VPH by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the four soil samples at concentrations below the applicable NCDENR Industrial/Commercial Cleanup Levels.

F.2 Comprehensive Site Assessment Soil Activities (June 2013)

AEC mobilized to the Site on June 4, 2013 for the purpose of conducting field assessment activities necessary to complete assessment of petroleum contamination in the soils of the Site. In conducting this assessment, AEC advanced a series of ten soil borings, SB-1 through SB-10. Soils encountered while completing the soil borings consisted of dry to moist tan-orange-brown clayey to sandy silt to 20-feet below land surface. The soil samples were collected for laboratory analysis at depths of 8 to 10-feet and 18 to 20-feet below land surface in each soil boring.

The borings were located in order to surround the suspected contaminant source area (UST and product dispenser locations). The exact locations of these ten soil borings are shown in **Section A, Figure 2**.

These samples were submitted to Environmental Conservation Laboratories of Cary, NC (NCDENR-DWQ certification # 591) for laboratory analysis of VOCs by EPA Methods 8260 and VPH by MADEP-VPH.

The analytical results for EPA Method 8260 revealed the presence of numerous VOCs at detectable levels in each soil sample. Few VOCs in certain soil samples exceeded their Soil to Groundwater Maximum Soil Contaminant Concentrations (MSCCs) as set forth in *The Guidelines*. The constituents and samples exceeding their respective Soil to Groundwater MSCC include benzene in SB-1 at 18-20 feet, SB-2 at 8-10 feet, SB-2 at 18-20 feet, SB-4 at 18-20 feet, SB-5 at 8-10 feet, SB-6 at 8 to 10 feet, SB-6 at 18-20 feet, SB-7 at 8-10 feet, and SB-8 at 8-10 feet; naphthalene in SB-1 at 8-10 feet, SB-9 at 8-10 feet, and SB-10 at 18-20 feet; 4-isopropyltoluene in SB-9 at 8-10 feet; n-propylbenzene in SB-9 at 8-10 feet; and MTBE in SB-4

at 18-20 feet. It should be noted that none of the detected VOCs exceeded the Residential or Industrial Commercial MSCCs.

The analytical results for the VPH analysis detected the presence of C5-C8 aliphatics, C9-C12 aliphatics or C9-C10 aromatics in samples SB-1 at 8-10 feet and SB-10 at 18-20 feet at concentrations in excess of their Soil to Groundwater MSCCs as set forth in *The Guidelines*. The detected VPH did not exceed the Residential or Industrial Commercial MSCCs. A summary of these soil analytical results is included in **Table 3** in **Section B** while the laboratory report can be found in **Section E**.

Discussion

The detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. The elevated concentrations are largely related to the presence of free phase petroleum product on the groundwater beneath the Site, especially those samples collected at depth (18-20 feet). These soil analytical results do not define the lateral extent of soil contamination to the Soil to Groundwater MSCCs in the northern and southern directions. This is because the most recently obtained soil data shows that petroleum contaminated soils may underlie the NCDOT right of ways under the northern adjacent Raeford Road. Further, the areas to the south contain a large amount of buried utilities which will prohibit additional assessment activities in this direction. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs have been adequately defined. Further, the remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

G GROUNDWATER SAMPLING ACTIVITIES

G.1 Location and Installation of Monitoring Wells

AEC mobilized to the Site on April 30 and May 1, 2008 for the purpose of conducting field assessment activities necessary to determine a worse case scenario for the maximum concentrations of the petroleum contamination in the groundwater on the Site. In conducting this assessment, AEC installed three additional monitoring wells designated as MW-4, MW-5, and MW-6 (monitoring wells MW-1, MW-2, and MW-3 were previously installed in 1992). Soils encountered in the borings consisted of asphalt and gravel from land surface to 1 foot below land surface. From 1 to 10 feet soils consisted of dry to moist tan-orange-brown clayey to sandy silt to 22-foot bls. From 22 to 30-foot bls the soils consisted of a wet orange-tan-gray silty sand. The borings completed as monitoring wells MW-4, MW-5, and MW-6 were installed to a total depth of 30 feet beneath surface grade with fifteen feet of 0.0010 slotted PVC well screen placed from 15 to 30 feet below land surface and completed with solid PVC casing placed from 0 to 15 feet below land surface.

The third set of monitoring wells was drilled during the week of June 3, 2013 and included the installation of monitoring wells MW-7 through MW-10 for the CSA activities. These wells were placed in strategic locations on the southernmost portions of the Site and neighboring property to the east, across Scotland Drive in order to complete definition of the groundwater contamination plume and local groundwater gradient. Monitoring wells MW-6 through MW-10 were installed to a total depth of 30 feet beneath surface grade with fifteen feet of 0.0010 slotted PVC well screen placed from 15 to 30 feet below land surface and completed with solid PVC casing placed from 0 to 15 feet below land surface.

The vertical assessment of groundwater contamination included the installation of deep monitoring well MW-7D. MW-7D was completed as a Type III well with 4" I.D. outer casing placed from land surface to 42 feet below land surface and 2" I.D. inner casing running from land surface to 60 feet below land surface. Finally, a 10 foot screen section was attached to the inner casing of MW-7D and installed from 60 to 70 feet below land surface. Soils encountered while completing MW-7D included dry to moist tan-orange-brown clayey to sandy silt to 22-foot bls. From 22 to 38-foot bls the soils consisted of a wet orange-tan-gray silty sand. From 38 to 46 feet bls the soils consisted of a stiff gray clay and from 46 to 57 feet bls the soils consisted of gray sands with clay lenses. Finally, from 57 to 70 feet the soils consisted of gray sand.

Well construction records for all of the monitoring wells installed for completion of this CSA are included in **Section C. Section A, Figures 2 and 3** displays all of the permanent monitoring well locations. Finally, **Section B, Table 5** is a summary of monitoring well construction data for all wells.

G.2 Groundwater Sampling Dates

Phase II Environmental Site Assessment Activities (February 2006)

AEC collected three groundwater samples from temporary wells during the 2006 Phase II ESA. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the MADEP-VPH test. Certain petroleum constituents (VOCs) and VPH were detected in each of the four groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards.

Phase II Limited Site Assessment Activities (April & May 2008)

AEC mobilized to the Site on April 30 and May 1, 2008 for the purpose of conducting field assessment activities necessary to determine a "worse case scenario" for the presence of petroleum contamination in the groundwater on the Site. In conducting this assessment, AEC installed three additional monitoring wells designated as MW-4, MW-5, and MW-6 (monitoring wells MW-1, MW-2, and MW-3 were previously installed in 1992). Free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Therefore, groundwater samples were only collected from monitoring wells MW-3, MW-4, MW-5, and MW-6.

The samples collected from these wells were submitted for chemical analysis for VOCs by EPA Method 8260 and VPH by the MADEP-VPH method. Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-4, MW-5, and MW-6; ethylbenzene in MW-4, MW-5, and MW-6; isopropyl benzene in MW-4; MTBE in MW-4, MW-5, and MW-6; n-propylbenzene in MW-4, MW-5, and MW-6; naphthalene in MW-4, MW-5, and MW-6; toluene in MW-4, MW-5, and MW-6; 1,3,5 trimethylbenzene in MW-4; 1,2,4 trimethylbenzene in MW-

4, MW-5, and MW-6; and total xylenes in MW-4, MW-5, and MW-6. Benzene was also found in groundwater samples in MW-4 and MW-6 at concentrations exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Data for the MADEP-VPH analyses showed C5-C8 aliphatic hydrocarbons (380-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 420-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analysis also revealed C9-C18 aliphatic hydrocarbons in groundwater samples collected from MW-3, MW-4, and MW-5; however, only the sample from MW-5 was in excess of the maximum allowable concentration in groundwater of 4,200-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analyses showed C19-C36 aliphatic hydrocarbons (350-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 42,000-ug/l as set forth in 15A NCAC 2L .0202. Finally, data for the MADEP-VPH analysis showed C9-C22 aromatic hydrocarbons in each of the four groundwater samples collected. These levels are in excess of its maximum allowable concentration in groundwater of 210-ug/l as set forth in 15A NCAC 2L .0202.

Comprehensive Site Assessment Groundwater Investigation June 7, 2013 Groundwater Monitoring Event

The next groundwater sampling event occurred during June 2013 after the NCDENR instructed Raeford Road Holdings, LLC to complete this CSA and therefore AEC was subsequently contracted in order to complete this assessment. AEC mobilized to the Site on June 3-6, 2013 in order to install five additional permanent monitoring wells designated as MW-7, MW-7D, MW-8, MW-9, and MW-10. MW-10 is located on the eastern adjacent W.H. Owen Elementary School property. MW-7D is the deep Type III well. AEC returned to the Site on June 7, 2013 in order to sample the eleven monitoring wells (MW-1 through MW-10 and MW-7D) for completion of this CSA. The groundwater samples collected from the monitoring wells were submitted for analysis by EPA Methods 6200B (volatile organic compounds), 504.1 (EDB), 3030c (total lead), and the MADEP-VPH method. It is important to note that free phase petroleum product was observed in monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6. Therefore, these five wells were not sampled during the CSA.

Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-7, MW-8,

MW-9, and MW-10; ethylbenzene in MW-7; isopropyl benzene in MW-7; n-butylbenzene in MW-7; n-propylbenzene in MW-7; MTBE in MW-7, MW-9, and MW-10; naphthalene in MW-7, MW-9, and MW-10; toluene in MW-7; 1,3,5 trimethylbenzene in MW-7; 1,2,4 trimethylbenzene in MW-7; and total xylenes in MW-7 and MW-9. Benzene was also found in the groundwater sample in MW-7 at a concentration exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Groundwater samples analyzed by MADEP-VPH revealed the presence of the targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: C5-C8 aliphatic hydrocarbons in MW-3, MW-7, and MW-9; C9-C12 aliphatic hydrocarbons in MW-7; and C9-C10 aromatic hydrocarbons in MW-3, MW-7, and MW-9. EDB was only detected in the sample from MW-7 at a concentration exceeding its maximum allowable concentration in groundwater. Lead was only detected in the sample from MW-7 at a concentration well below its maximum allowable concentration in groundwater.

In summary, data for the groundwater samples obtained from wells MW-3, MW-7, MW-8, MW-9, and MW-10 showed the presence of one or more targeted contaminants at levels above their maximum allowable concentrations in groundwater as defined by 15A NCAC 2L .0202. The results for this groundwater sampling event showed that the lateral extent of the groundwater contaminant plume was not adequately defined in the horizontal directions.

Isoconcentration maps for benzene, MTBE, and naphthalene have been prepared and can be found in **Section A, Figures 4 through 6**. **Section B, Table 4** is a summary of the combined analytical results for all of the sampling events. Laboratory reports for the June 7, 2013 sampling event are presented in **Section E**.

Upon review of the data obtained by the CSA activities described above, it is evident that the horizontal extent of the groundwater contaminant plume has not been defined to the 15A NCAC 2L Standards. However, the horizontal extent of groundwater contamination has been defined to the GCLs which are the targeted assessment and cleanup standards for this incident.

G.3 Vertical extent of Groundwater Contamination (June 7, 2013)

The vertical extent of groundwater contamination was addressed through installation of deep well MW-7D on June 5, 2013. MW-7D was installed immediately adjacent to MW-7 and it is

screened from 60 to 70 feet below land surface. Analytical results for a groundwater sample collected from this well on June 7, 2013 indicated the presence of only C9-C10 aromatic hydrocarbons at a concentration of 2.8 ug/l which is well below the 15N NCAC 2L 0202 standard of 200 ug/l, respectively. It is possible that this contaminant was carried down from above. Based on these results, the vertical extent of groundwater contamination appears to be defined.

H FREE PRODUCT INVESTIGATION/RECOVERY

In 1992, free phase petroleum product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 0.9 feet and 0.48 feet, respectively. No additional information regarding free product thicknesses between 1992 and 2008 was available. On April 30, 2008, free phase petroleum product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14 feet and 1.67 feet, respectively. Due to the presence of free phase petroleum product at the Site, Aggressive Fluid Vapor Recovery (AFVR) events were completed by AEC on October 14, 2008, March 10, 2009, October 14, 2009, April 27, 2010, August 7, 2012, and April 22, 2013.

A combined total of 10,519 gallons of water were recovered from MW-1, MW-2, MW-4 and MW-6, during the six AFVR events, approximately 76 gallons of which were determined to be gasoline. Also, AEC calculated that a total of approximately 33.66 gallons of gasoline being removed as VOC emissions during the six AFVR events. Therefore, a total of approximately 109.66 gallons of gasoline were removed as a result of these six AFVR events.

The first six AFVR events appeared to be fairly effective in removing a significant amount of the remaining free phase petroleum product. However, product thicknesses have rebounded between 2011 and April 2013. At some sites this can be explained by fluctuations in the groundwater table elevations, however based on a review of historical groundwater elevations no more than one foot of variation was noted between the lowest and highest recorded elevations.

During the June 7, 2013 groundwater sampling event performed during this CSA, free product was observed in five of the previously existing monitoring wells. The measured free product thicknesses were 1.7 feet in MW-1, 1.6 feet in MW-2, 1.6 feet in MW-4, 1.2 feet in MW-5, and 0.6 feet in MW-6. A Summary of Free Product Thickness Measurements in Monitoring Wells is included in **Section B, Table 6**.

I. HYDROGEOLOGIC INVESTIGATION

I.1 Horizontal Groundwater Hydraulic Gradient

Data obtained from the gauging of wells on, and related to, the Site were recorded and are presented on the groundwater hydraulic gradient map presented in **Figure 10**. Overall, groundwater hydraulic gradient has been determined to flow to the southeast. Utilizing current hydraulic gradient data obtained from the Site, AEC has calculated the horizontal gradient to be 0.008 ft/ft (June 7, 2013).

I.2 Vertical Groundwater Hydraulic Gradient

The vertical gradient of groundwater flow was also assessed by measuring the groundwater elevations in well nest MW-7/MW-7D on June 7, 2013. Using these measurements, AEC calculated the vertical hydraulic gradient to be 0.04 ft/ft downward.

I.3 Aquifer Testing

Rising and falling head tests (slug tests) were conducted on monitoring wells MW-7, MW-8, and MW-9 on June 7, 2013. The purpose of the testing was to assess the values of horizontal hydraulic conductivity (K) of the water table aquifer at various locations.

The tests were performed using a 1-inch diameter, 5.5-foot long PVC slug to create an instantaneous change in the water level (head) at each selected well. A Solinst Levelogger Model 3001 pressure transducer was used to measure water level fluctuations during each test. The pressure transducer was attached to a laptop computer in order to download the data in real time. The depth to water from the top of the PVC well casing was measured prior to insertion of the pressure transducer and slug. Water levels were also measured by hand at various times during each test, and at the completion of each test, to verify the electronic data.

Rising and falling head tests were conducted during the field investigation. Falling head tests consisted of rapidly lowering the PVC slug into the well and simultaneously initiating a logarithmic recording interval on the data logger at two second intervals. Rising head tests were conducted by removing the slug and initiating a new logarithmic recording step on the data logger at two second intervals.

The slug test data were analyzed using the Bouwer and Rice method, which accounts for the effects of partial well penetration and changing aquifer thickness (water table conditions). The surficial aquifer thickness was estimated from boring logs to be approximately fifteen feet thick. A packing porosity of 25 percent for the well filter pack was assumed. The results of the slug test data analyses using the Bouwer and Rice method is summarized on the table below:

WELL	BOUWER AND RICE METHOD CONDUCTIVITY (feet/day)	TYPE OF TEST
MW-7	0.966	Falling Head
MW-7	1.064	Rising Head
MW-8	0.5124	Rising Head
MW-9	2.255	Falling Head
MW-9	1.225	Rising Head

The hydraulic conductivity values for the water table aquifer obtained as a result of this investigation averaged on the order of 1 feet per day (ft/day). The geometric average of the hydraulic conductivity estimate for MW- 7, MW-8, and MW-9 using the Bouwer and Rice method is 1.08 ft/day. These values are consistent with a sandy water table aquifer. Time vs. head curves for the slug tests summarized above are included in **Section D**.

J DISCUSSION

J.1 Nature and Extent of Contamination

The nature of the contamination at the Site is the presence of petroleum hydrocarbons in the form of gasoline and related chemical additives which are attributed to a release from gasoline UST systems discovered in 1992. The UST system(s) located at the Site released an undetermined amount of gasoline and have contaminated the soils and groundwater of the Site. Free phase petroleum product is present in on-Site wells MW-1, MW-2, MW-4, MW-5, and MW-6. In addition, chemical contaminants at levels in excess of the 15A NCAC 2L .0202 Water Quality Standards were detected in the groundwater in on-Site wells MW-3, MW-7, MW-8, and MW-9 and off-Site well MW-10.

Chemical contaminants at levels in excess of the Soil to Groundwater MSCCs were detected in soil samples collected in the vicinity of the UST system. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs had been adequately defined. Further, the remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

It is important to note that the current UST system has undergone periodic leak testing for the USTs and product lines. The USTs were tightness tested approximately 4 months ago and the product lines were leak tested approximately 6 months ago. The USTs and lines all tested tight at that time.

J.2 Contaminant Migration and Potentially Affected Receptors

Contaminants related to the release are expected to continue to migrate with groundwater flow through the Site, to the southeast through the source area. The lateral migration of the plume is directly related to the groundwater flow through the area, the soil matrix through which migration will occur, and to the presence of structures in contact with the groundwater and/or product at the Site. No water supply wells are located within a 1,000 foot radius of the release area. Several contaminant plume maps for individual contaminants of concern are depicted on **Figures 4 through 6** in **Section A**. Due to the established direction of contaminated groundwater migration it is not likely that the release will impact the eastern adjacent school or any other environmentally sensitive receptors.

J.3 Lowering Risk Classification

Currently the Site is classified as “intermediate risk” due to the presence of free phase petroleum product and one or more exceedences of GCLs. The removal of free phase petroleum product and subsequent lowering of groundwater contaminant levels to below GCLs will result in lowering the current risk classification from “intermediate” to “low” at which time the NCDENR can consider the incident for close out.

J.4 Applicable Cleanup Levels

Until free product is removed, the Site will remain classified as “intermediate risk” and the applicable cleanup level for the petroleum-contaminated soils will be Soil to Groundwater MSCCs as set forth in *The Guidelines*. Further, the cleanup level for petroleum-contaminated groundwater will be the GCLs as set forth in *The Guidelines*. Once free product is removed and no exceedence of any GCLs remain the Site will be classified as “low risk” and the applicable cleanup level for the petroleum-contaminated soils will be either the Residential or Industrial/Commercial MSCCs as set forth in *The Guidelines*. Further, the cleanup level for petroleum-contaminated groundwater will be the GCLs for constituents of concern as set forth in *The Guidelines*.

K CONCLUSIONS AND RECOMMENDATIONS

AEC has completed this Comprehensive Site Assessment in order to comply with N.C.G.S. 143-215.84, NCAC 15A, 2L .0106(c), 15A NCAC 2N .0706 and the NCDENR's "*Guidelines for Assessment and Corrective Action for UST Releases*" prepared by the North Carolina Underground Storage Tank Section effective July 15, 2008, Change 2 Effective October 1, 2012

Chemical contaminants at levels in excess of the Soil to Groundwater MSCCs were detected in soil samples collected in the vicinity of the UST system. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs has been adequately defined. Free phase petroleum product is present in on-Site wells MW-1, MW-2, MW-4, MW-5, and MW-6. In addition, chemical contaminants at levels in excess of their 15A NCACN 2L .0202 standards were detected in the groundwater in on-Site wells MW-3, MW-7, MW-8, and MW-9 and off-Site well MW-10.

Remedial Alternatives

AEC believes that consideration should first be given to removing free phase petroleum product from beneath the Site followed by the lowering of groundwater contaminant levels to below GCLs. Because there are no environmentally sensitive receptors in the vicinity of the Site, the incident can then be reclassified to "low risk" and closed out. Removal of free product will reduce concentrations of VOCs and VPH in Site soils and groundwater. Based on the low levels of petroleum contamination in Site soils, AEC believes the removal of free product will be sufficient to address soil impacts. Following free product removal, AEC believes that an evaluation of the processes of natural attenuation and biodegradation for addressing the residual groundwater contaminants should be completed. If it is determined that this is not a viable option then one or more active groundwater cleanup options will need to be considered.

Recommendations

The subject release will remain classified as "intermediate risk" due to the continued presence of free phase petroleum product and GCL exceedences in groundwater. The removal of free product and elimination of GCL exceedences will drop the classification to "low risk" thereby allowing the incident to be closed out. Therefore, AEC recommends the use of either additional AFVR events or possibly a more aggressive Mobile Multi Phase Extraction (MMPE).

Comprehensive Site Assessment
Raeford Road Sunoco
4537 Raeford Road, Fayetteville NC

Finally, AEC recommends that Raeford Road Holdings, LLC submit a copy of this CSA to the NCDENR, Division of Water Quality, Fayetteville Regional Office, to the attention of Mr. James Brown.

L REFERENCES

Geologic Map of North Carolina, Department of Natural Resources and Community Development, Division of Land Resources, 1985.

"Guidelines for Assessment and Corrective Action for UST Releases" prepared by the North Carolina Underground Storage Tank Section effective July 15, 2008, Change 2 Effective October 1, 2012

North Carolina Administrative Code, Title 15, Subchapter 2L, Section .0100, 0115 and .0200.

North Carolina Department of Environment and Natural Resources, Division of Waster Management, UST Section.

Cumberland County GIS Website (<http://imaps.co.cumberland.nc.us/imaps/>)

LIMITATIONS

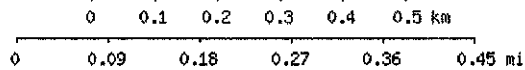
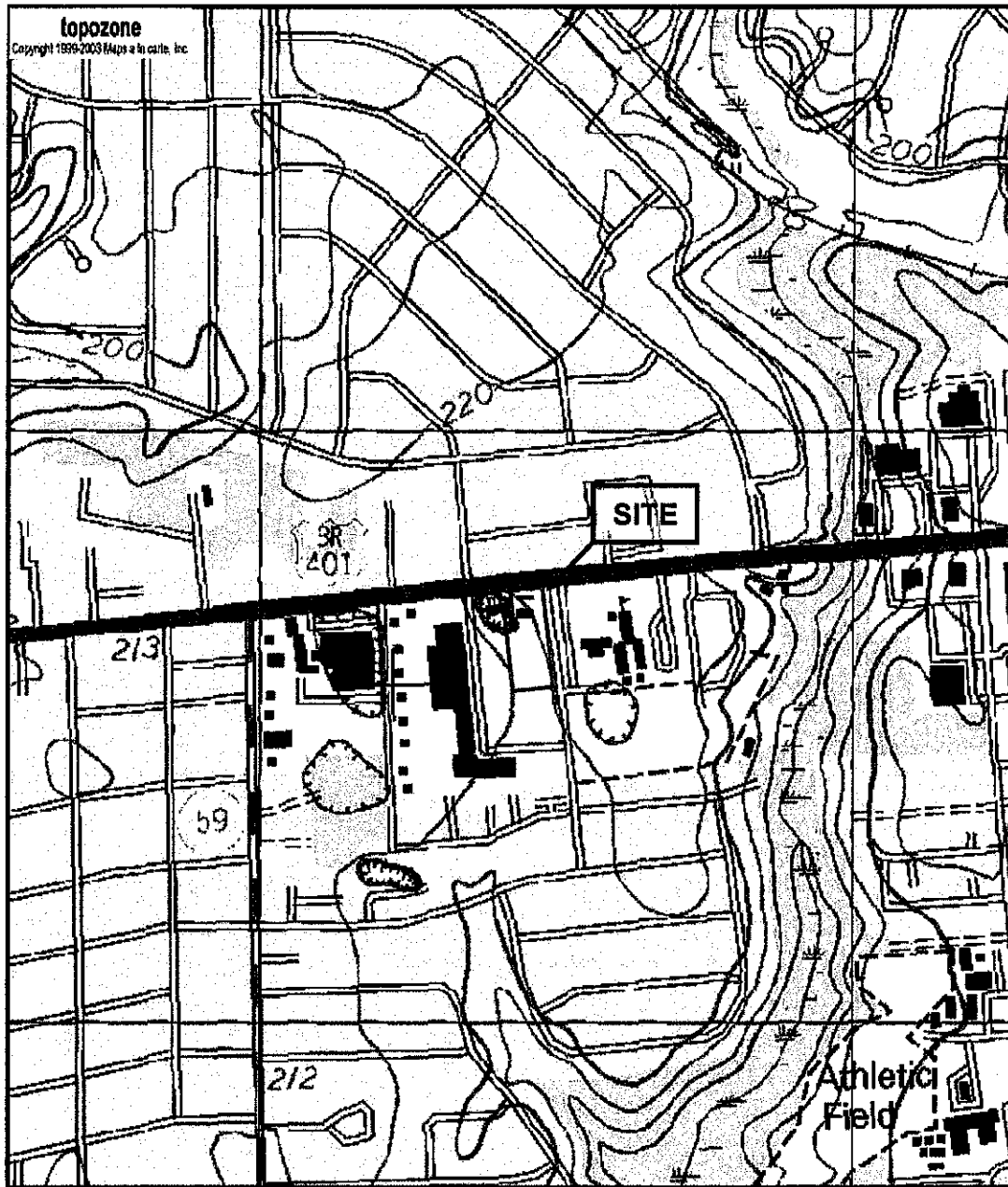
This report has been prepared for the exclusive use of Raeford Road Holdings, LLC and/or their designees, successors or assigns. It has been prepared in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. AEC's conclusions and recommendations are based on information supplied by others, together with AEC's own site observations. Although AEC cannot be responsible for the accuracy of data supplied by others, AEC has no reason to suspect that any of the information is inaccurate. The observations described herein are based upon conditions readily visible on the site at the time of AEC's visit(s).

AEC cannot assume responsibility for the person(s) in charge of the site, nor otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. It is the responsibility of the responsible party to notify the appropriate local, state or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety or the environment.

SECTION A

FIGURES





Map center is 35° 02' 35"N, 78° 57' 22"W (WGS84/NAD83)
Fayetteville quadrangle
 Projection is UTM Zone 17 NAD83 Datum

M=8.449
 G=1.174



277 Wilson Pike Circle, Suite 201
 Brentwood, Tennessee 37027
 Phone: 615-376-3022 Fax: 615-376-3034

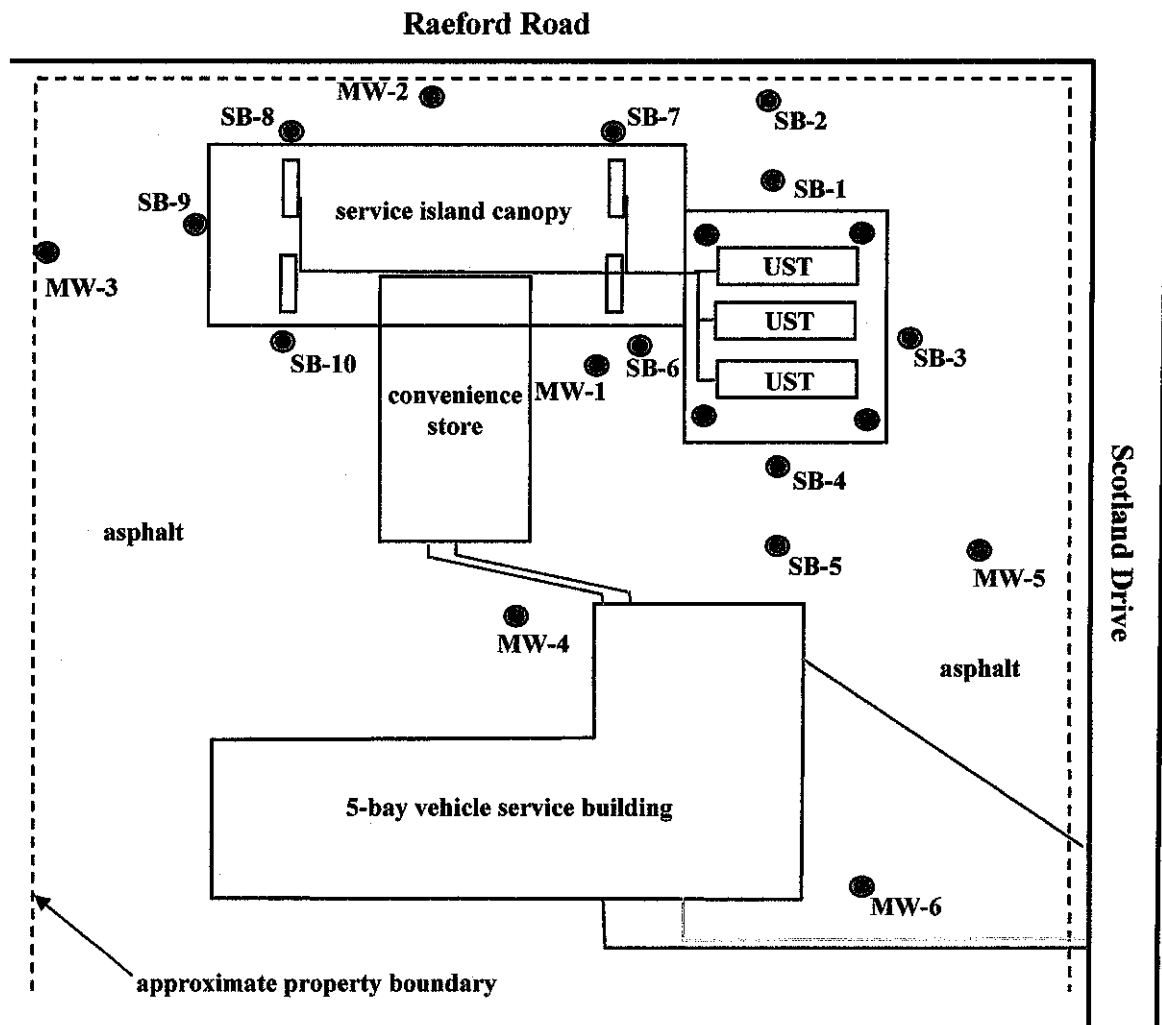
Figure 1 – Topographic Map
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina

AEC Project No.:
13-059N

Report Date:
7/13

Drawn By:
WML

FIGURE 2 SOIL BORING AND UST SYSTEM LOCATIONS



↑ N

- - tank field well
- - monitoring well
- - soil boring location

Utilities

- electric
- water
- gas
- petroleum

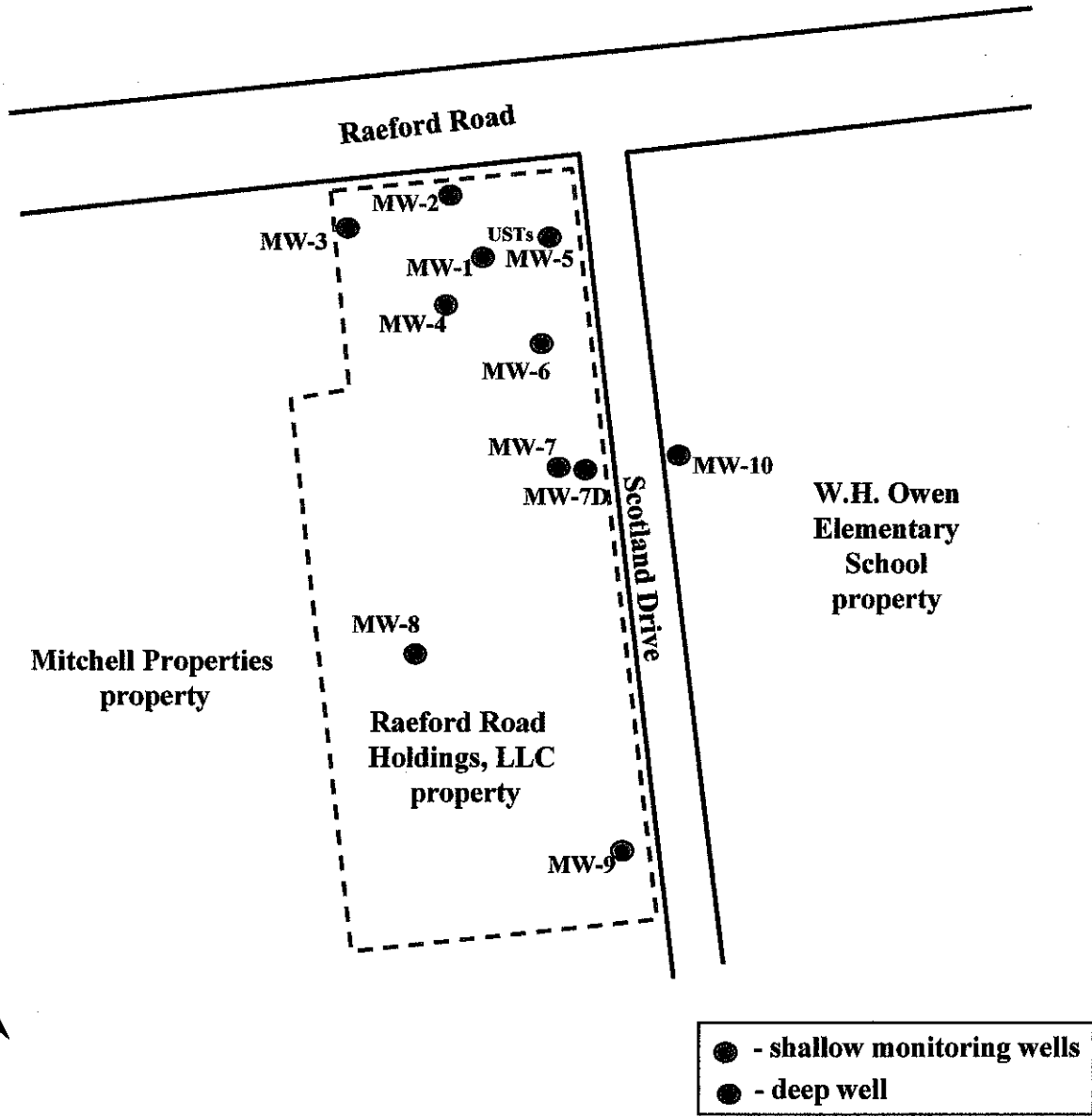


277 Wilson Pike Circle, Suite 201
 Brentwood, Tennessee 37027
 Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=30'	WML

FIGURE 3 MONITORING WELL LOCATION MAP



277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

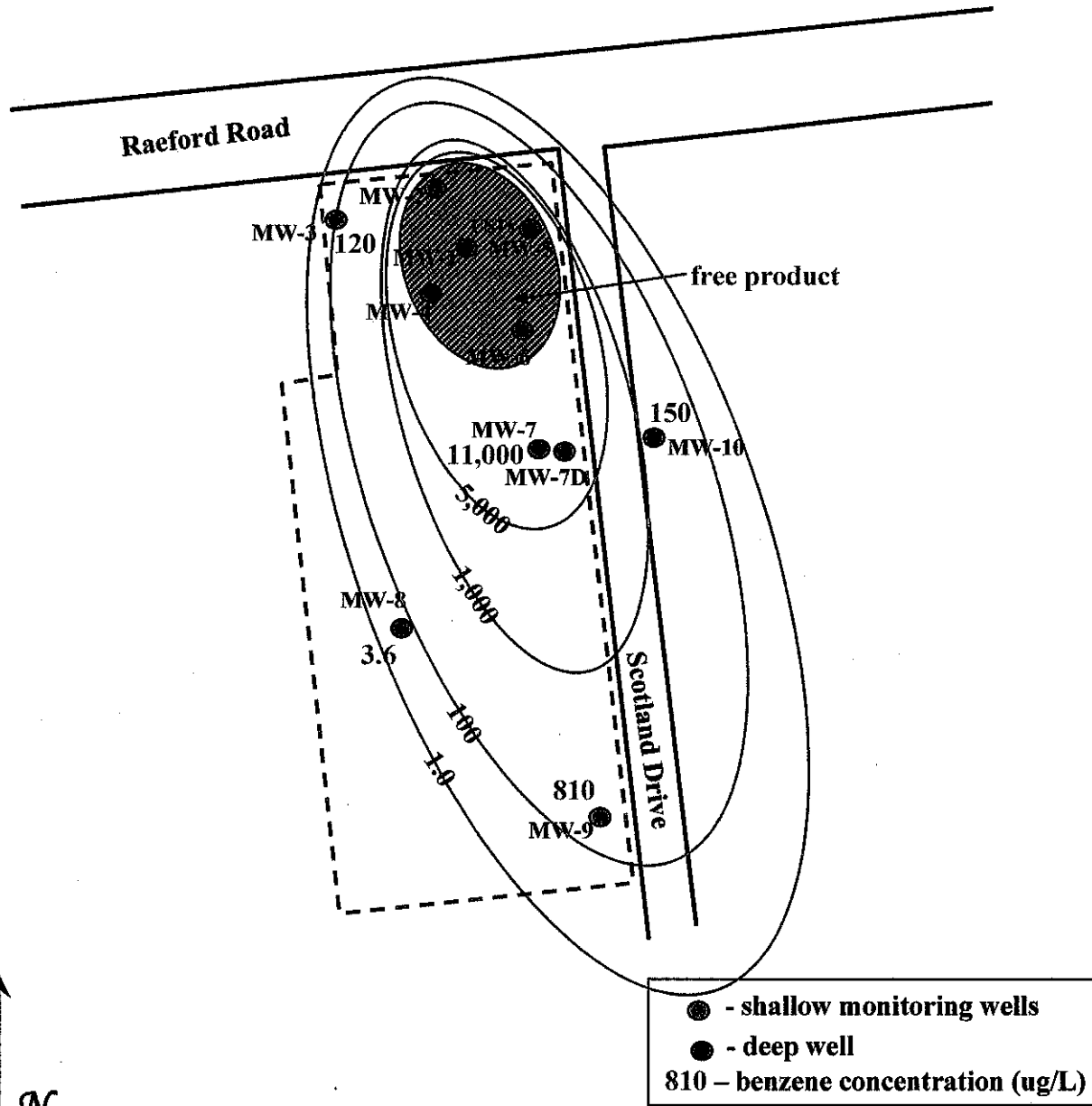
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:
13-059N

Scale:
1"=150'

Drawn By:
WML

FIGURE 4 BENZENE GROUNDWATER ISOCONCENTRATION MAP



277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

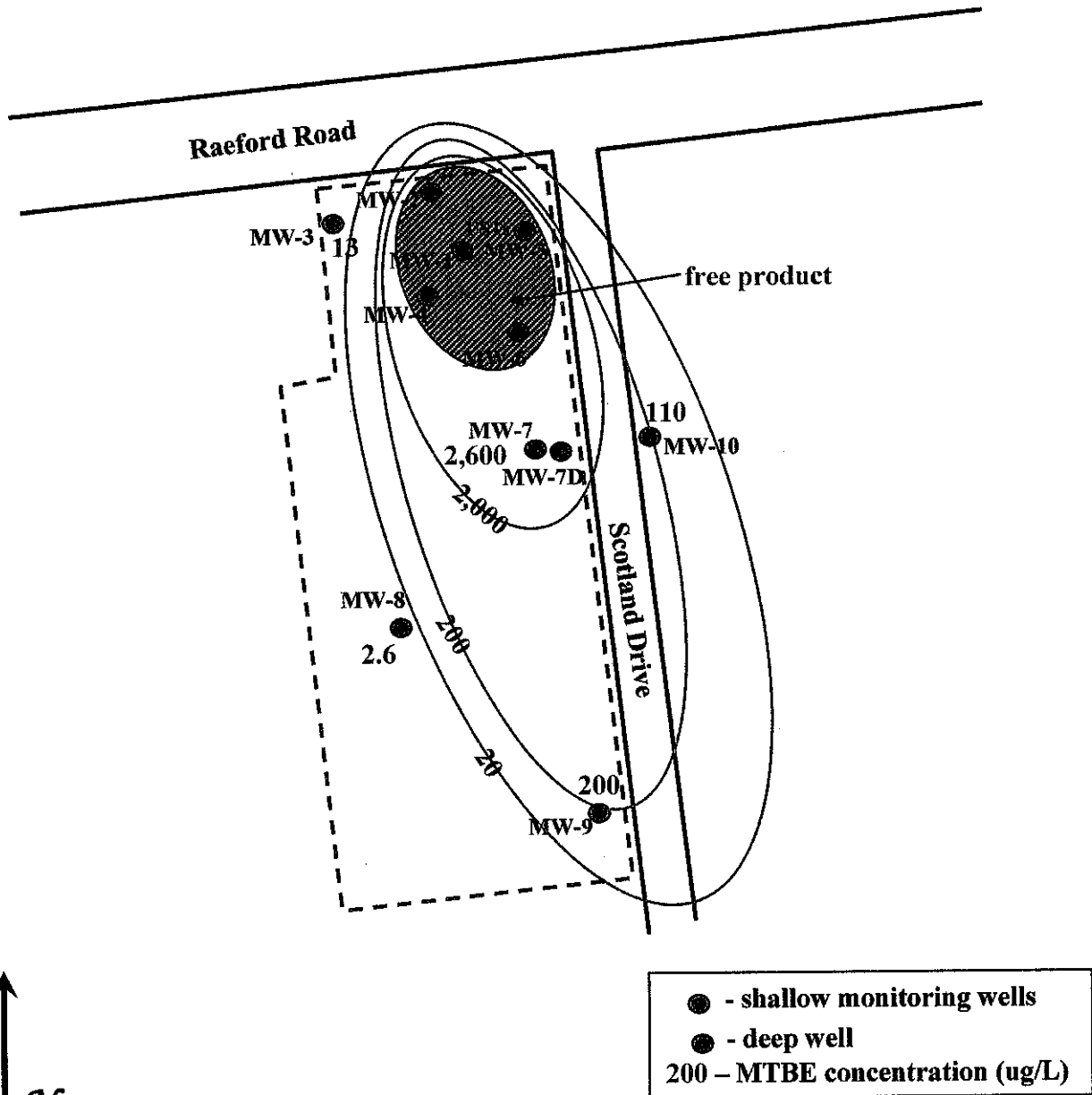
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:
13-059N

Scale:
1"=150'

Drawn By:
WML

FIGURE 5 MTBE GROUNDWATER ISOCONCENTRATION MAP



● - shallow monitoring wells
 ● - deep well
 200 - MTBE concentration (ug/L)



277 Wilson Pike Circle, Suite 201
 Brentwood, Tennessee 37027
 Phone: 615-376-3022 Fax: 615-376-3034

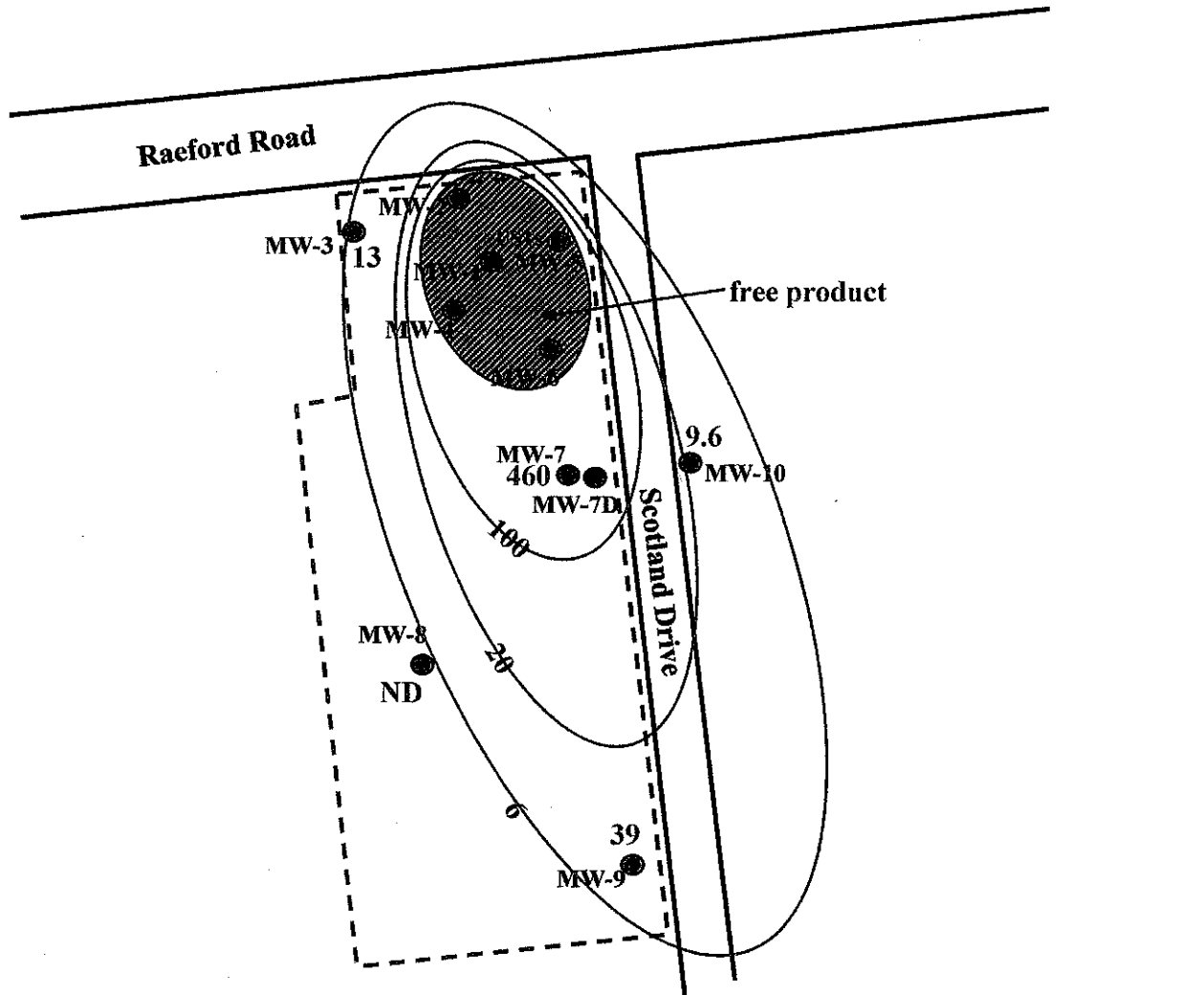
Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 13-059N

Scale:
 1"=150'

Drawn By:
 WML

FIGURE 6 NAPHTHALENE GROUNDWATER ISOCONCENTRATION MAP



- - shallow monitoring wells
- - deep well
- 200 - Naphthalene concentration (ug/L)

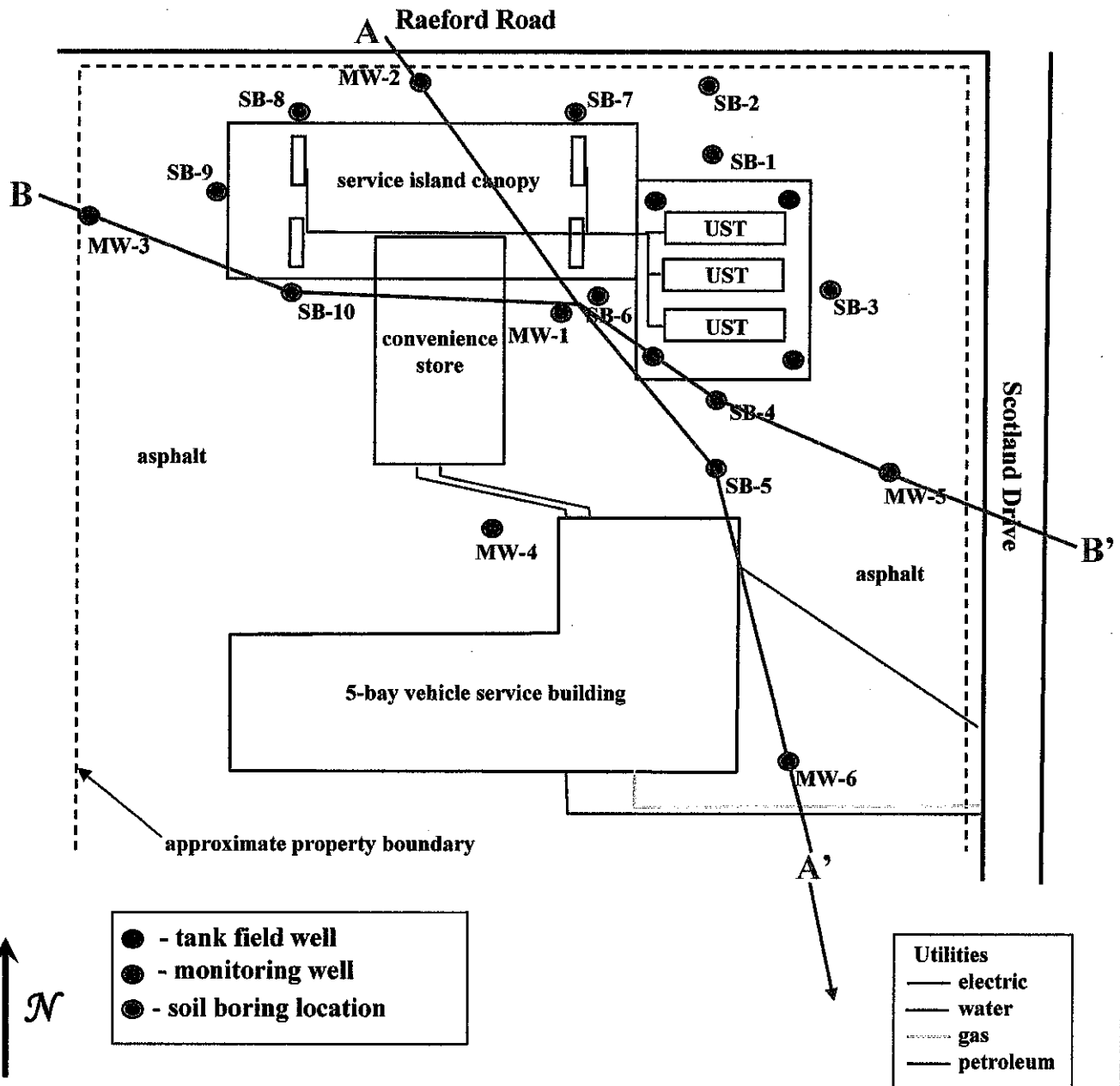


277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=150'	WML

FIGURE 7A SOIL/GROUNDWATER CROSS-SECTION LOCATION MAP

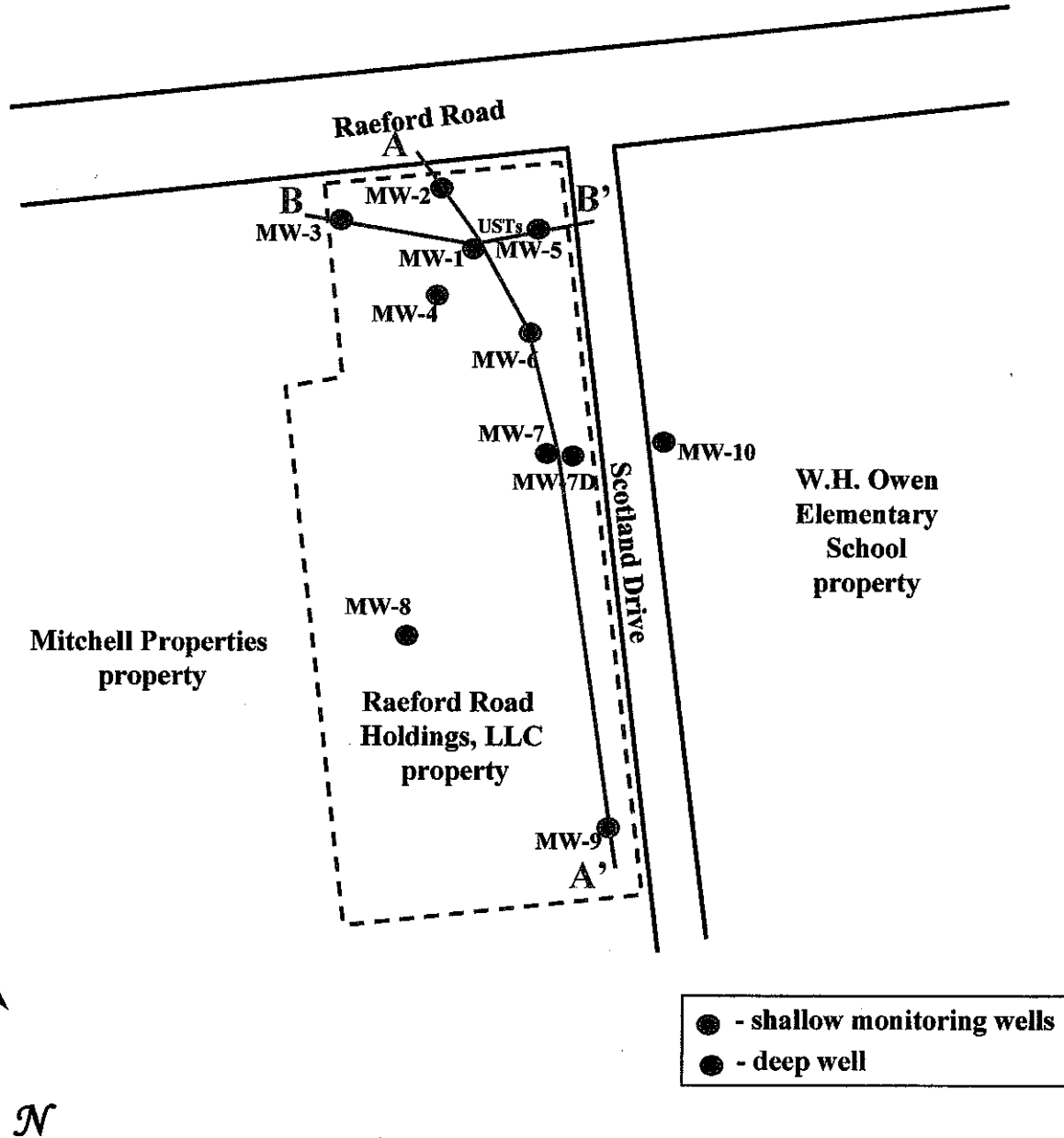


277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=30'	WML

FIGURE 7B SOIL/GROUNDWATER CROSS-SECTION LOCATION MAP



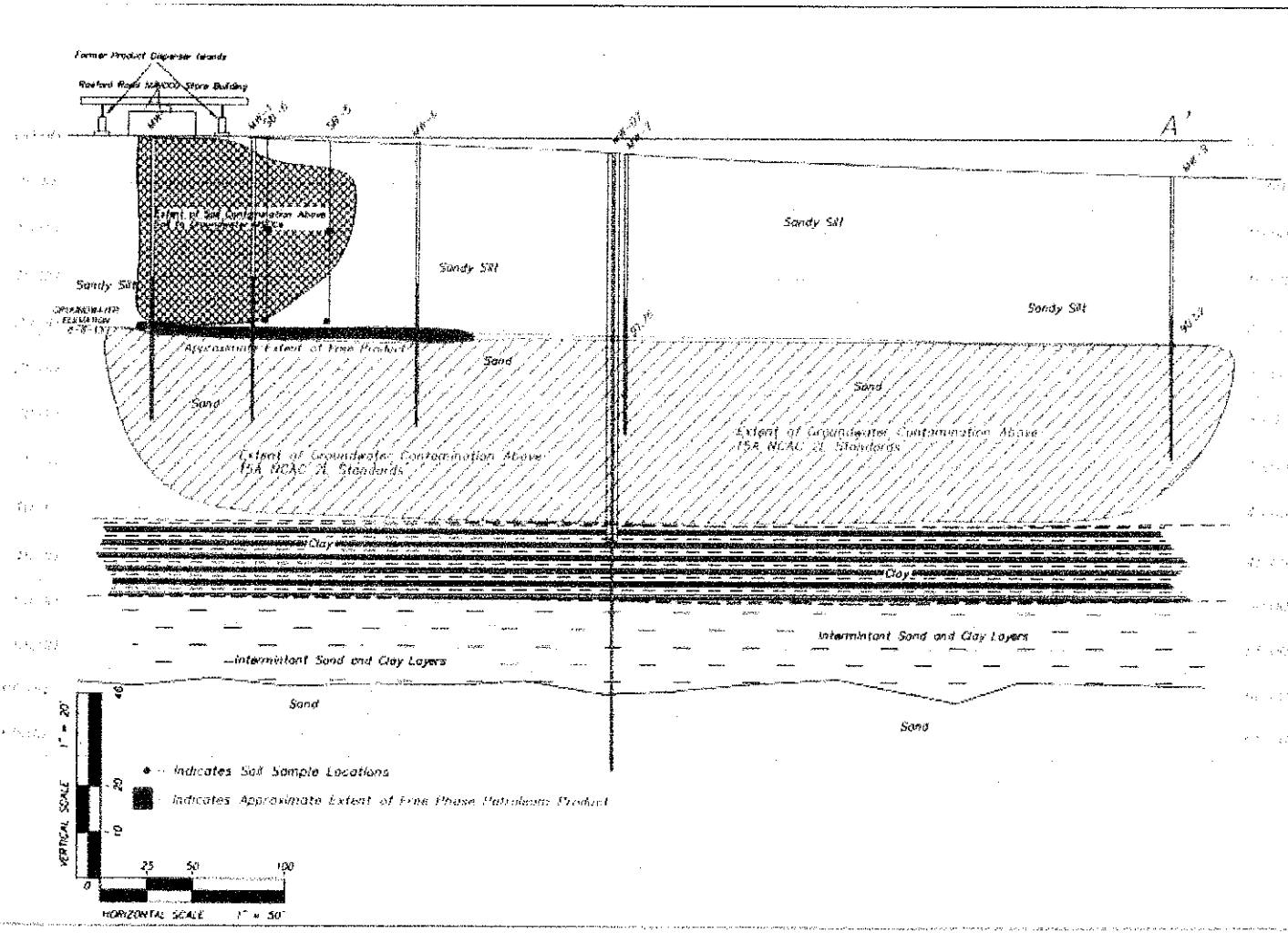
277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

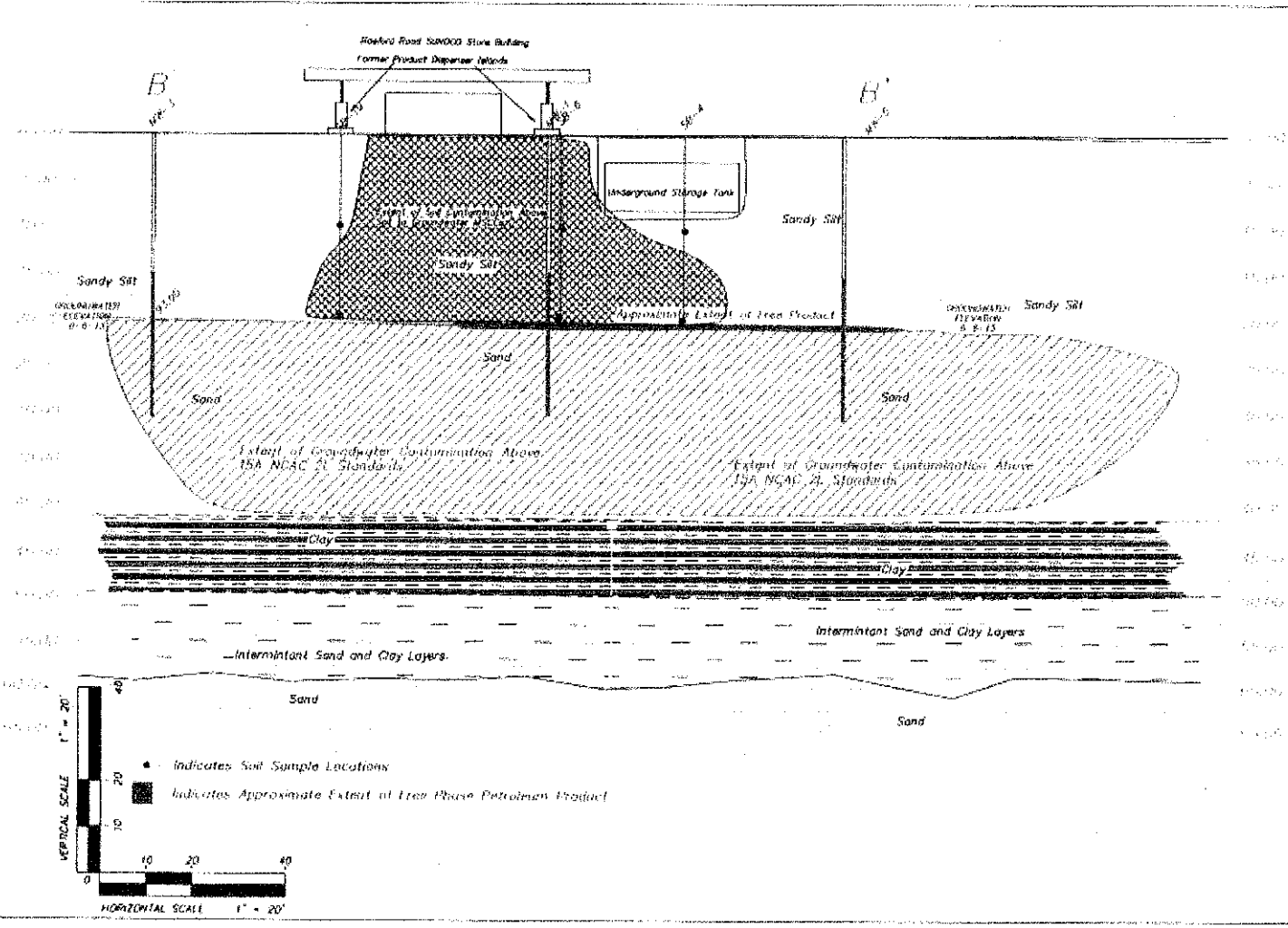
AEC Project No.:
13-059N

Scale:
1"=150'

Drawn By:
WML

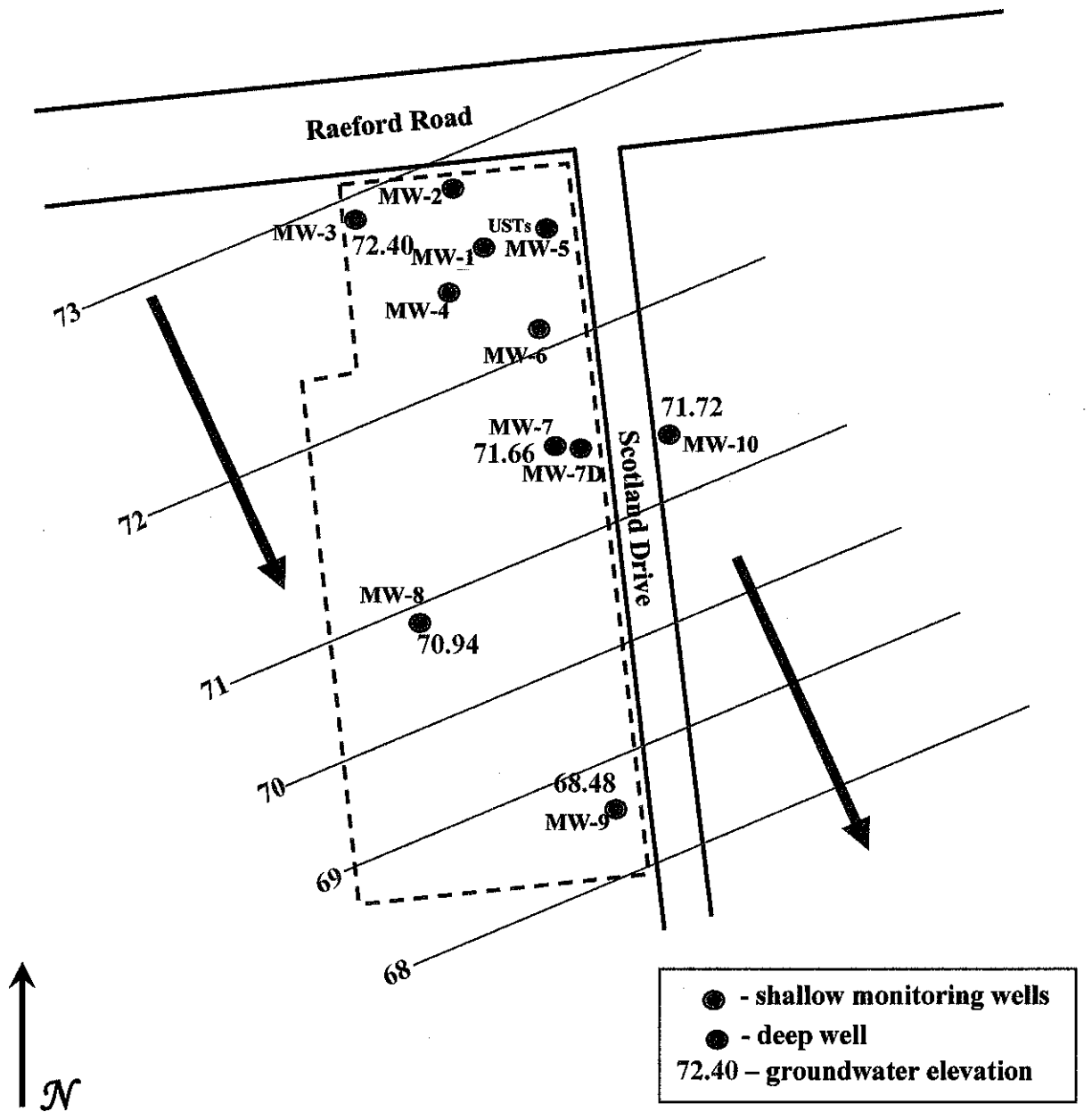


NOTES	Advantage Environmental Consultants PROJECT NO. 7/16/13	
	DATE: 7/16/13	TRM
FIGURE B SOIL/GROUNDWATER CROSS-SECTION A - A' Roaford Road SUNDCO 4517 Roaford Road Fayetteville, Cumberland County North Carolina		
PREP. BY: TRM	REV. BY: TRM	SCALE: As Shown



NOTES	SCALE	CAD FILE:	PREP BY	TRW	DATE	PROJECT NO.
	As Shown	Roaford X-Section	TRW	TRW	7/16/13	
FIGURE 9 SOIL/GROUNDWATER CROSS-SECTION B - E' Roaford Road SUNOCO 4637 Roaford Road Fayetteville Cumberland County North Carolina						
Advantage Environmental Consultants						

FIGURE 10 GROUNDWATER HYDRAULIC GRADIENT MAP (6/07/13)



277 Wilson Pike Circle, Suite 201
Brentwood, Tennessee 37027
Phone: 615-376-3022 Fax: 615-376-3034

Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
13-059N	1"=150'	WML

SECTION B

TABLES

Table 1

UST Information
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina 28304

UST ID #	Last Contents	Previous Contents	Capacity (gallons)	Construction Details	Descriptions of Associated Piping	Date Tank Installed	Status of UST	Was release associated with UST
T-1	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-2	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-3	Gasoline	Gasoline	10,000	Steel	Double-Wall Fiberglass	1/87	In Use	unknown
T-4	Waste Oil	Waste Oil	150	Steel	Steel	unknown	Not in Use	No
Removed Tank 1	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 2	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown
Removed Tank 3	Gasoline	Gasoline	10,000	Steel	Steel	unknown	Removed 1/87	unknown

Table 2
 Adjacent Property Ownership Information
 Raeford Road Sunoco (Former Jim's Texaco)
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina 28304

NC Parcel #	Property Location (Occupant)	Property Owners Name/Address	Location
0417-30-2524 0417-30-2320 0417-30-2049	Raeford Road Sunoco 4537 Raeford Road Fayetteville, NC 28304	Raeford Road Holdings, LLC 9055 Comprint Court, Ste 200 Gaithersburg, MD 20877	Site
0417-30-3814	Atlas Chiropractor	Dominic & Michelle Marangi 99 Village Drive Jacksonville, NC 28546	Adjacent property across Raeford Road and northeast of the site
0417-30-2803	Bojangles	Loyd Properties, LLC 4140 Ferncreek Drive Fayetteville, NC 28314	Adjacent property across Raeford Road and north of the Site
0417-30-0820	Wilco-Hess	Walter Williams 207 Crown Point Road Greenville, NC 27834	Adjacent property across Raeford Road and northwest of the Site
0416-29-9999	Wachovia Bank & Vacant Shopping Center	Mitchell Properties of Florence PO Box 1418 Florence, SC 29503	Adjacent property west and south of the Site
0417-30-7111	William H. Owen Elementary School	Cumberland County Board of Ed PO Box 2357 Fayetteville, NC 28302	Adjacent property across Scotland Drive and east and southeast of the Site

Table 3
 Summary of Analytical Data – Soil
 EPA Method 8260
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260
Sample ID	Contaminant of Concern >		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene	MTBE	Total Xylenes
	Date Collected m/dd/yy	Sample Depth (ft)															
SB-1	6/04/13	8-10'	7.3	2.2	5.7	ND	ND	ND	ND	1.6	0.51	0.52	ND	ND	ND	ND	2.6
SB-1	6/04/13	18-20'	0.053	0.014	0.015	ND	ND	0.047	0.002	0.020	0.0026	0.0074	0.08	ND	0.26	0.068	0.27
SB-2	6/04/13	8-10'	0.014	0.0037	0.028	ND	ND	0.0068	ND	0.0056	0.00072	0.001	0.0092	ND	0.030	0.061	0.037
SB-2	6/04/13	18-20'	0.0081	ND	0.035	0.0085	ND	0.00057	ND	0.0014	ND	ND	0.001	ND	0.0024	0.014	0.0019
SB-3	6/04/13	8-10'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00038	ND	ND	0.004	ND
SB-3	6/04/13	18-20'	ND	ND	0.020	ND	ND	0.00044	ND	ND	ND	ND	0.00087	ND	0.0014	0.004	0.00081
SB-4	6/04/13	8-10'	ND	ND	0.014	ND	ND	ND	ND	ND	ND	ND	0.00044	ND	ND	ND	ND
SB-4	6/04/13	18-20'	0.140	0.040	ND	ND	ND	0.170	ND	ND	ND	ND	0.650	ND	1.7	0.150	0.96
SB-5	6/04/13	8-10'	0.0031	0.001	ND	ND	ND	0.005	ND	ND	ND	0.00064	0.036	ND	0.021	0.0098	0.025
SB-5	6/04/13	18-20'	0.00052	ND	0.016	0.0047	ND	0.00059	ND	ND	ND	ND	0.0033	ND	0.0048	0.013	0.0016
Soil to Groundwater MSCC			8.5	8.3	24	16	0.12	4.9	1.7	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6
Residential MSCC			782	782	14000	9385	100	1560	1564	313	626	626	18	626	1200	350	3129
Industrial/Commercial MSCC			20440	20440	360000	245280	4000	40000	40880	8176	16350	16350	164	16350	32000	3100	81760

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3 (continued)
 Summary of Analytical Data – Soil
 MADEP Methods VPH
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			MADEP VPH	MADEP VPH	MADEP VPH					
Sample ID	Contaminant of Concern >		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics					
	Date Collected m/dd/yy	Sample Depth (ft)								
SB-1	6/04/13	8-10'	50	404	299					
SB-1	6/04/13	18-20'	0.66	ND	0.483					
SB-2	6/04/13	8-10'	ND	ND	0.274					
SB-2	6/04/13	18-20'	ND	ND	ND					
SB-3	6/04/13	8-10'	ND	ND	ND					
SB-3	6/04/13	18-20'	ND	ND	ND					
SB-4	6/04/13	8-10'	ND	1.47	0.710					
SB-4	6/04/13	18-20'	6.81	2.49	1.12					
SB-5	6/04/13	8-10'	ND	ND	ND					
SB-5	6/04/13	18-20'	ND	ND	ND					
Soil to Groundwater MSCC			68	540	31					
Residential MSCC			939	1500	469					
Industrial/Commercial MSCC			24258	40000	12264					

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3
Summary of Analytical Data – Soil
 EPA Method 8260
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Analytical Method >			8260	8260	8270	8270	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	
Sample ID	Contaminant of Concern >		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene	MTBE	Total Xylenes
	Date Collected m/dd/yy	Sample Depth (ft)															
SB-6	6/04/13	8-10'	0.0049	0.0021	0.019	ND	ND	0.0049	ND	0.0011	ND	0.0005	0.035	ND	0.014	0.049	0.015
SB-6	6/04/13	18-20'	0.016	0.0073	0.087	0.040	ND	0.0071	0.00047	0.028	0.0013	0.0015	0.019	ND	0.059	0.026	0.053
SB-7	6/04/13	8-10'	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	0.0083	ND	0.0027	0.0071	0.0029
SB-7	6/04/13	18-20'	0.0016	0.00049	0.040	ND	ND	0.0014	ND	0.0025	ND	ND	0.0025	ND	0.0058	0.020	0.0069
SB-8	6/04/13	8-10'	0.0072	0.0031	0.018	ND	ND	0.0062	0.00092	ND	ND	0.00076	0.011	ND	0.0077	0.022	0.035
SB-8	6/04/13	18-20'	0.0091	0.0025	0.023	ND	ND	0.0044	0.00052	0.0014	ND	0.0015	0.0021	ND	0.022	0.0069	0.028
SB-9	6/04/13	8-10'	5.1	2.5	0.890	ND	0.220	0.570	0.450	0.350	0.980	1.7	ND	0.410	ND	ND	0.720
SB-9	6/04/13	18-20'	0.0014	0.00048	0.058	ND	ND	ND	ND	0.0018	ND	ND	ND	ND	ND	0.0028	0.0008
SB-10	6/04/13	8-10'	.00095	0.00036	0.033	0.0052	ND	ND	ND	ND	ND	ND	ND	ND	.00045	ND	0.002
SB-10	6/04/13	18-20'	0.850	0.250	0.760	ND	ND	0.100	ND	0.720	0.088	0.120	ND	ND	0.230	ND	0.660
Soil to Groundwater MSCC			8.5	8.3	24	16	0.12	4.9	1.7	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6
Residential MSCC			782	782	14000	9385	100	1560	1564	313	626	626	18	626	1200	350	3129
Industrial/Commercial MSCC			20440	20440	360000	245280	4000	40000	40880	8176	16350	16350	164	16350	32000	3100	81760

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 3 (continued)
 Summary of Analytical Data – Soil
 MADEP Methods VPH
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Analytical Method >			MADEP VPH	MADEP VPH	MADEP VPH					
Sample ID	Contaminant of Concern >		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics					
	Date Collected m/dd/yy	Sample Depth (ft)								
SB-6	6/04/13	8-10'	ND	ND	ND					
SB-6	6/04/13	18-20'	ND	ND	0.312					
SB-7	6/04/13	8-10'	ND	ND	ND					
SB-7	6/04/13	18-20'	1.85	1.65	1.07					
SB-8	6/04/13	8-10'	ND	ND	ND					
SB-8	6/04/13	18-20'	ND	ND	ND					
SB-9	6/04/13	8-10'	0.912	ND	0.933					
SB-9	6/04/13	18-20'	ND	ND	ND					
SB-10	6/04/13	8-10'	ND	ND	ND					
SB-10	6/04/13	18-20'	4.51	60	35.5					
Soil to Groundwater MSCC			68	540	31					
Residential MSCC			939	1500	469					
Industrial/Commercial MSCC			24258	40000	12264					

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 4
 Summary of Analytical Data – Groundwater
 EPA Method 504.1/6200b
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Analytical Method >			504.1	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	6200b	
Well ID	Contaminant of Concern >		1,2-Dibromoethane	Benzene	Chloroform	Ethylbenzene	Isopropyl Benzene	MTBE	n-Butyl Benzene	n-Propyl Benzene	Naphthalene	Toluene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	Total Xylenes
	Date Collected m/dd/yy	Sample ID													
MW-3	6/07/13	MW-3	ND	120	ND	46	5.8	13	4.0	16	13	280	58	150	400
MW-7	6/07/13	MW-7	1.2	11,000	ND	2,400	140	2,600	120	270	460	32,000	510	2,000	14,000
MW-7D	6/07/13	MW-7D	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-8	6/07/13	MW-8	ND	3.6	3.6	ND	ND	2.6	ND	ND	ND	ND	ND	ND	ND
MW-9	6/07/13	MW-9	ND	810	ND	61	9.1	200	6.9	8.2	39	290	27	89	510
MW-10	6/07/13	MW-10	ND	150	ND	16	2.0	110	1.4	3.3	9.6	2.2	ND	3.6	15
2L Standard (ug/l)			0.02	1	70	600	70	20	70	70	6	600	400	400	500
GCL (ug/l)			50	5,000	70,000	84,500	25,000	20,000	6,900	30,000	6,000	260,000	25,000	28,500	85,500

Results are in ug/l

Bold results indicate exceedence of 2L Standards

Bold and shaded results indicate exceedence of GCL

Table 4 (continued)
 Summary of Analytical Data – Groundwater
 EPA Methods 6010c/MADEP-VPH
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Analytical Method >					6010c		MADEP VPH	MADEP VPH	MADEP VPH	
Well ID	Contaminant of Concern >				Total Lead		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 aromatics	
	Date Collected m/dd/yy	Sample ID								
6/07/13	6/07/13	6/07/13			ND		865	628	940	
6/07/13	6/07/13	6/07/13			3.79		57,400	16,700	5,800	
6/07/13	6/07/13	6/07/13			ND		ND	ND	2.8	
6/07/13	6/07/13	6/07/13			ND		6.4	ND	ND	
6/07/13	6/07/13	6/07/13			ND		1,590	572	330	
6/07/13	6/07/13	6/07/13			ND		246	33.1	43	
2L Standard (ug/l)					15		400	700	200	
GCL (ug/l)					15,000		NRS	NRS	NRS	

Results are in ug/l
 Bold results indicate exceedence of 2L Standards
 Bold and shaded results indicate exceedence of GCL

Table 6

**Raeford Road Sunoco (Former Jim's Texaco)
Summary of Free Product Thickness Measurements in Monitoring Wells
Product Thickness Displayed in Feet**

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
5/1/08	2.14	1.67	NP	NP	NP	NP
10/14/08	0.56	0.66	NP	0.14	NP	0.54
11/7/08	0.19	0.21	NP	0.17	NP	0.23
3/10/09	0.25	0.05	NP	0.40	NP	0.24
7/23/09	0.03	Sheen	NP	0.10	NP	Sheen
10/14/09	NP	0.01	NP	NP	NP	0.20
3/3/10	NP	NP	NP	NP	NP	0.10
4/27/10	NP	0.02	NP	0.01	NP	0.01
6/28/10	NP	NP	NP	NP	NP	NP
12/21/10	NP	NP	NP	NP	NP	NP
7/13/11	NP	0.33	NP	0.38	NP	0.30
8/7/12	2.90	3.00	NP	2.70	NP	1.30
11/30/12	0.93	1.80	NP	0.50	NP	0.75
4/22/13	2.05	2.15	NP	2.25	NP	1.85
6/7/13	1.7	1.6	NP	1.6	1.2	0.6

NP – no product observed

AFVR event performed on October 14, 2008 and report submitted on November 5, 2008

AFVR event performed on March 10, 2009 and report submitted on March 24, 2009

AFVR event performed on October 14, 2009 and report submitted on November 2, 2009

AFVR event performed on April 27, 2010 and report submitted on May 12, 2010

AFVR event performed on August 7, 2012 and report submitted on August 29, 2012

AFVR event performed on April 22, 2013 and report submitted on May 9, 2013

SECTION C

WELL CONSTRUCTION RECORDS



WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: 6/5/13 Well ID# MW-7

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.042525 N **78.955563** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: one

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 30' (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: NA (ft.)
If water level is above casing, use "+"

11. Borehole diameter: 8 (in.)

12. Well construction method: Auger
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES:

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

James D. Barker 6/27/13
Signature of Certified Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:	
<input type="checkbox"/> Agricultural	<input type="checkbox"/> Municipal/Public
<input type="checkbox"/> Geothermal (Heating/Cooling Supply)	<input type="checkbox"/> Residential Water Supply (single)
<input type="checkbox"/> Industrial/Commercial	<input type="checkbox"/> Residential Water Supply (shared)
<input type="checkbox"/> Irrigation	
Non-Water Supply Well:	
<input checked="" type="checkbox"/> Monitoring	<input type="checkbox"/> Recovery
Injection Well:	
<input type="checkbox"/> Aquifer Recharge	<input type="checkbox"/> Groundwater Remediation
<input type="checkbox"/> Aquifer Storage and Recovery	<input type="checkbox"/> Salinity Barrier
<input type="checkbox"/> Aquifer Test	<input type="checkbox"/> Stormwater Drainage
<input type="checkbox"/> Experimental Technology	<input type="checkbox"/> Subsidence Control
<input type="checkbox"/> Geothermal (Closed Loop)	<input type="checkbox"/> Tracer
<input type="checkbox"/> Geothermal (Heating/Cooling Return)	<input type="checkbox"/> Other (explain under #21 Remarks)

4. Date Well(s) Completed: 6/6/13 Well ID# MW-8

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.042448

N 78.955240

W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: **30'** (ft.)
For multiple wells list all depths if different (example - 3@200' and 2@100')

10. Static water level below top of casing: **NA** (ft.)
If water level is above casing, use "+"

11. Borehole diameter: **8** (in.)

12. Well construction method: **Auger**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

James D. Barker

Signature of Certified Well Contractor

6/27/13

Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
- Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
- Industrial/Commercial Residential Water Supply (shared)
- Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
- Aquifer Storage and Recovery Salinity Barrier
- Aquifer Test Stormwater Drainage
- Experimental Technology Subsidence Control
- Geothermal (Closed Loop) Tracer
- Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: 6/6/13 Well ID# MW-9

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.041734 N 78.955683 W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: one

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 30' (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: NA (ft.)

If water level is above casing, use "+"

11. Borehole diameter: 8 (in.)

12. Well construction method: Auger

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

James D. Barker 6/27/13
Signature of Certified Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: 6/6/13 Well ID# MW-10

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.040561 N 78.955548 W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: one

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: 30' (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: NA (ft.)
If water level is above casing, use "+"

11. Borehole diameter: 8 (in.)

12. Well construction method: Auger

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor: James D. Barker Date: 6/27/13

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

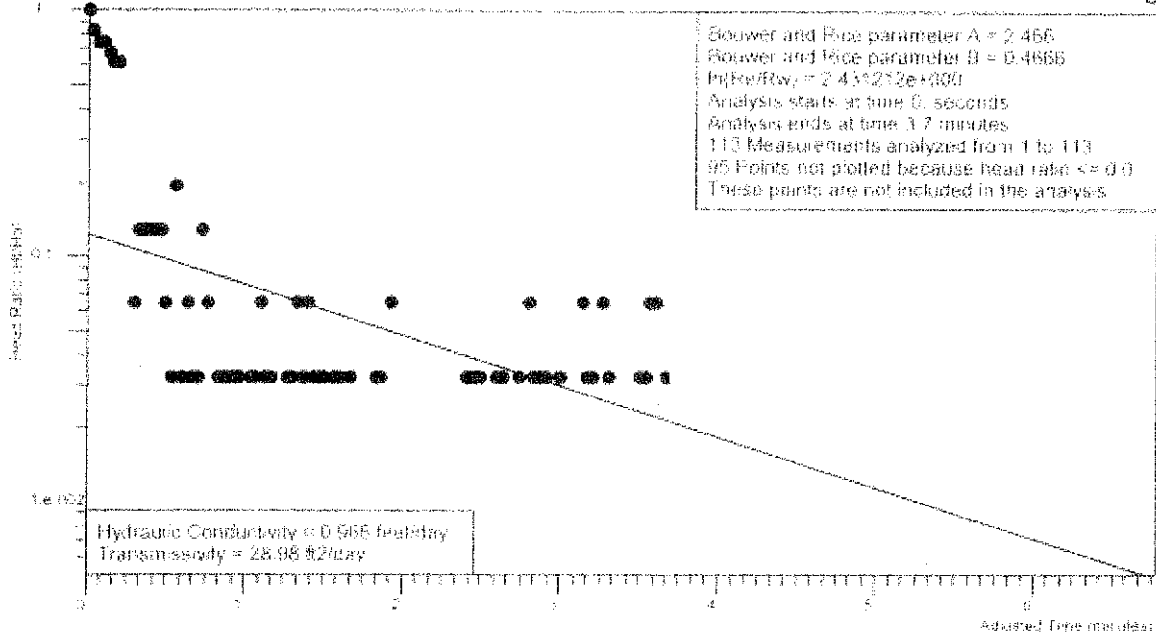
SECTION D

AQUIFER SLUG TEST RESULTS



MW-7 Falling Head Test June 7, 2013
Raeferd Road SUNOCO Fayetteville, North Carolina

Bouwer and Rice Graph
MW-7 Falling

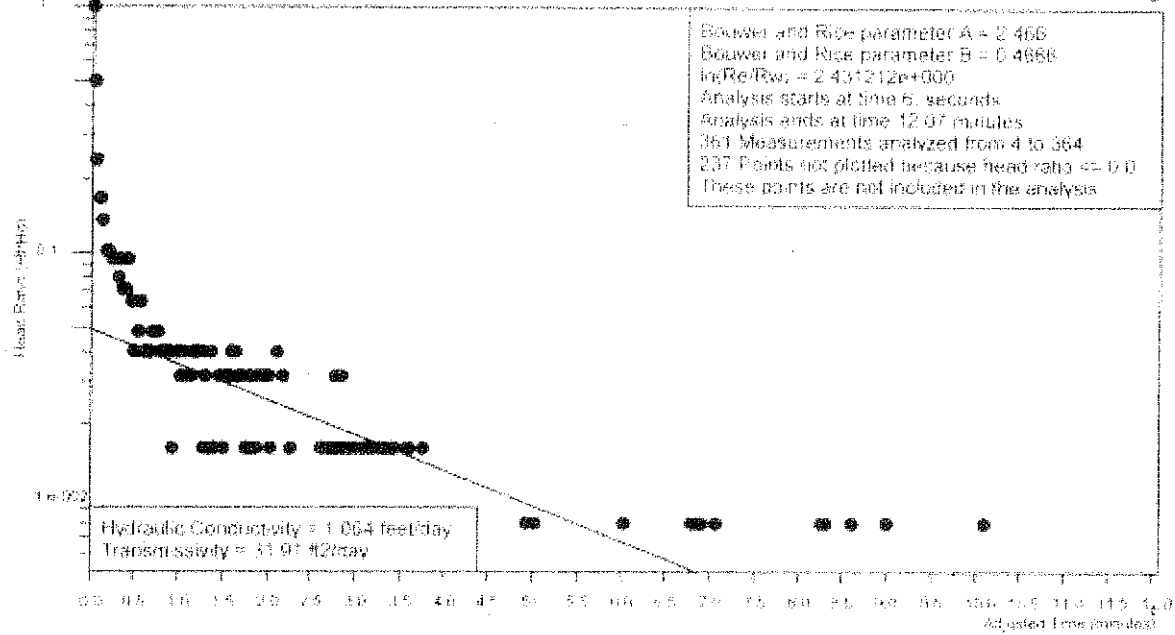


Client: Advantage Environmental
Analysis by Starpoint Software

Head 0.21 feet at 0. seconds

MW-7 Rising Head Test June 7, 2013
Raeford Road SUNOCO Fayetteville, North Carolina

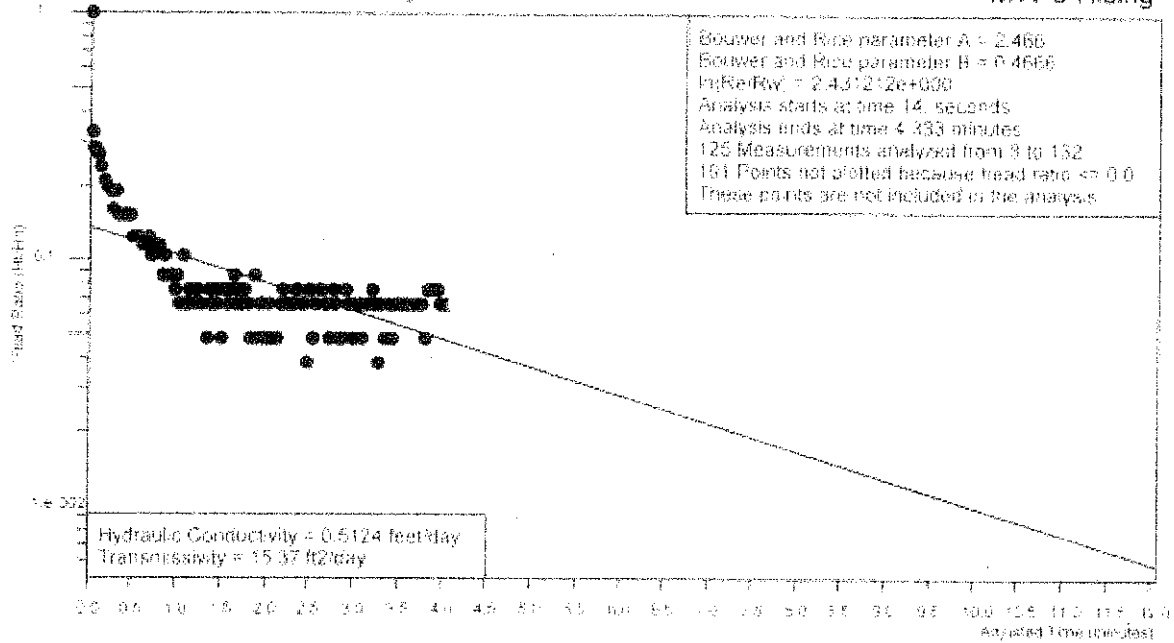
Bower and Rice Graph
MW-7 Rising



Client: Advantage Environmental
Analysis by Starpoint Software

MW-8 Rising Head Test June 7, 2013
Raeferd Road SUNOCO Fayetteville, North Carolina

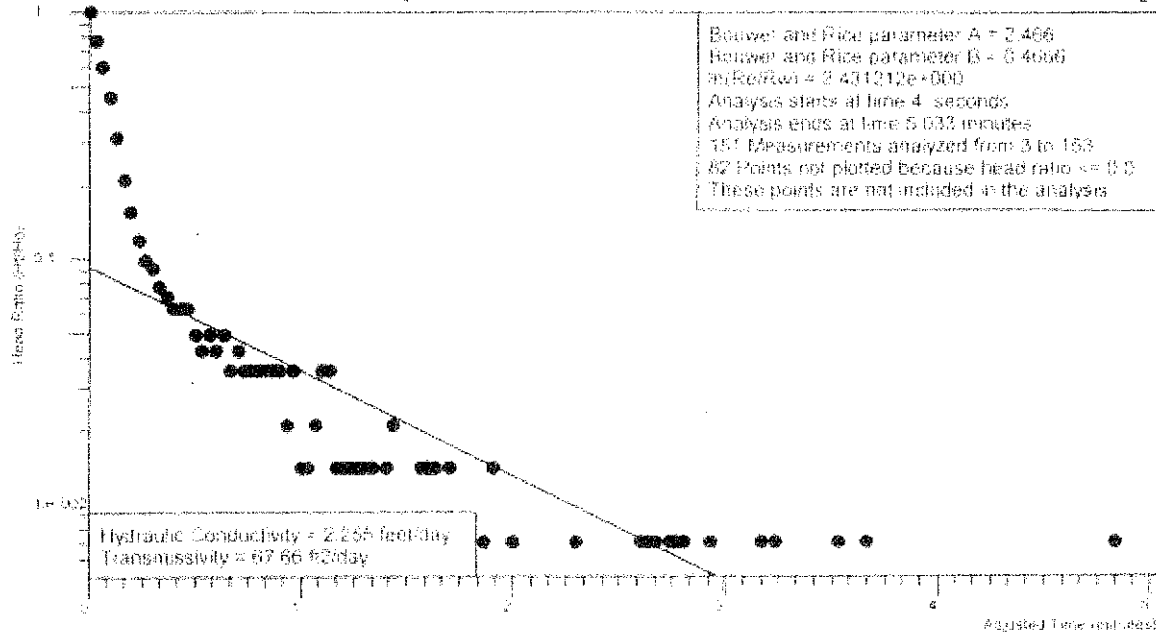
Bower and Rice Graph
MW-8 Rising



Client: Advantage Environmental
Analysis by Starpoint Software

MW-9 Rising Head Test June 7, 2013
Raeferd Road SUNOCO Fayetteville, North Carolina

Bouwer and Rice Graph
MW-9 Rising

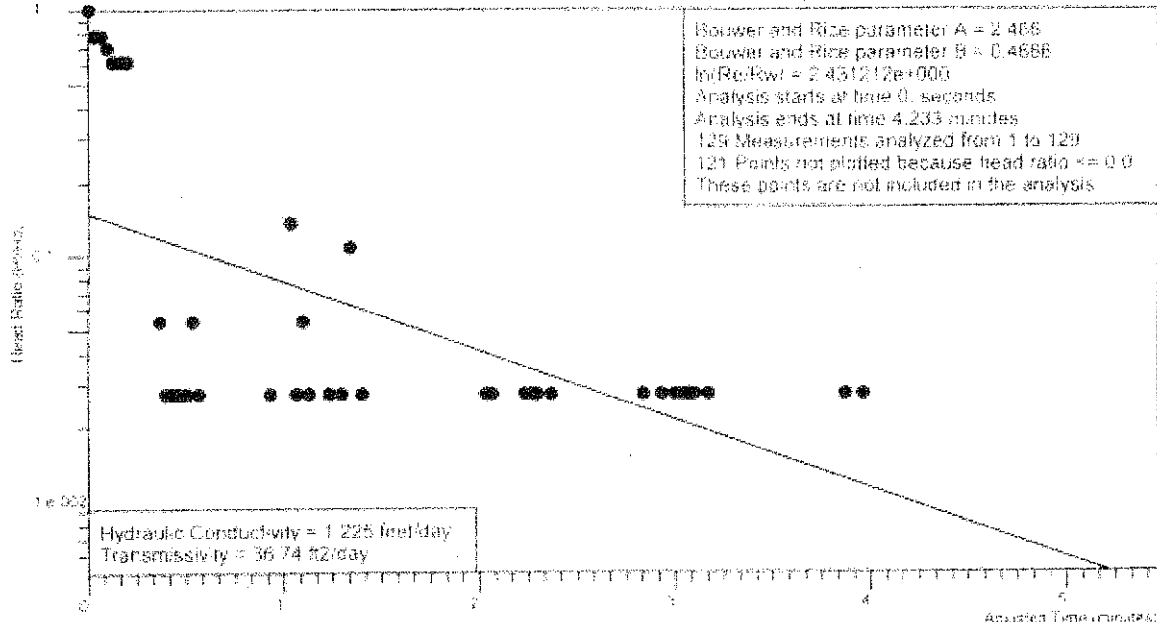


Client: Advantage Environmental
Analysis by Starpoint Software

h_0 is 1.43 feet at 4 seconds

MW-9 Falling Head Test June 7, 2013
Raeform Road SUNOCO Fayetteville, North Carolina

Bouwer and Rice Graph
MW-9 Falling



Client: Advantage Environmental
Analysis by Starpoint Software

Radius is 0.31 feet at 0. seconds



June 1, 2015

Mr. James W. Brown
North Carolina Department of Environment and Natural Resources
Fayetteville Regional Office
225 Green Street, Suite 714
Systel Building
Fayetteville, North Carolina 23801

**Subject: Corrective Action Plan
Raeford Road Sunoco
4735 Raeford Road
Fayetteville, North Carolina 28304
Case #9788
AEC Project No. 15-020R**

Dear Mr. Brown:

Advantage Environmental Consultants, LLC (AEC) has prepared a Corrective Action Plan (CAP) for the above-referenced property. This CAP includes Site observations, investigation information, soil and groundwater testing information, and report preparation. This report includes AEC's findings, conclusions, recommendations, and supporting documentation.

We appreciate the opportunity to be of service to you. If you should have any questions regarding this report, please contact Mr. Andrew Owens at (804) 454-0072.

Sincerely,

ADVANTAGE ENVIRONMENTAL CONSULTANTS, LLC

A handwritten signature in black ink, appearing to read 'Krista J. Tetrick', written over a horizontal line.

Krista J. Tetrick
Staff Scientist

A handwritten signature in black ink, appearing to read 'Andrew C. Owens', written over a horizontal line.

Andrew C. Owens, P.G.
Branch Manager

Attachments

CC: Mr. Jarrett Minkoff, Raeford Road Holdings, LLC

TABLE OF CONTENTS

A. Site Information	3
A.1 Site Identification.....	3
A.2 Contact Information.....	3
A.3 Release Information.....	3
B. Executive Summary	5
C. Site History and Source Characterization	11
D. Summary of Site Assessment Information	14
D.1 Assessment Activities Completed to Date	14
D.2 Geology and Hydrology of the Site and Region	17
D.3 Horizontal Groundwater Hydraulic Gradient	18
D.4 Vertical Groundwater Hydraulic Gradient.....	19
D.5 Aquifer Testing.....	19
D.6 Extent of Contamination.....	20
D.7 Maximum Contaminant Concentration Levels	20
D.8 Discussion	21
D.9 Applicable Cleanup Levels.....	22
D.10 Contaminant Migration and Potentially Affected Receptors	22
D.11 Lowering Risk Classification	22
E. Objectives of Corrective Action at the Site	23
F. Comprehensive Evaluation of Remedial Actions.....	24
F.1 Risk Reduction Mechanisms	24
F.2 Excavation.....	24
F.3 Natural Attenuation	24
F.4 Pump and Treat System.....	24
F.5 Aggressive Fluid Vapor Recovery (AFVR)	25
G. Public Notice	27
H. Conclusions and Recommendations.....	28
I. References.....	30
<u>Section A Figures</u>	

- Figure 1 USGS Topographic Map – Site Location Map
- Figure 2 Site Map
- Figure 3 Soil Concentration Maps
- Figure 4 Groundwater Elevation Map
- Figure 5 Groundwater Isoconcentration Maps
- Figure 6 Free Product Thickness Map
- Figure 7 Land Use Map

Section B Tables

- Table 1 Site History
- Table 2 Public and Private Water Supply Well and Other Receptors
- Table 3 Field Screening Results (Not Used)
- Table 4 Summary of Soil Sampling Results
- Table 5 Summary of Groundwater and Surface Sampling Results
- Table 6 Monitoring and Remediation Well Construction Information
- Table 7 Free Product Recovery Information
- Table 8 Cumulative Volume of Free Product Recovered from Site
- Table 9 Current and Historical Groundwater Elevations
- Table 10 Land Use
- Table 11 Remediation Schedule and Cleanup Progress Milestones
- Table 12 Cost Estimate for each Evaluated Remedial Option

LIST OF APPENDICES

- Appendix A – Site Specific Health and Safety Plan (HASP)
- Appendix B – Copies of Permits (Not Used)
- Appendix C – Geologic Logs for borings (Not Used)
- Appendix D – Copies of NORR requiring CAP
- Appendix E – Cost Estimate Documentation (Not Used)
- Appendix F – Specifications for Remedial System Layout
- Appendix G – Pilot Test Data and Calculations (Not Used)
- Appendix H – List of Local Authorities and Land Owners Notified (Not Used)

A. Site Information

A.1 Site Identification

DATE OF REPORT: June 1, 2015
Facility I.D.: 0-025474 UST Incident Number 9788
Site Risk/Priority Rank Intermediate
Site Name: Raeford Road Sunoco (Former Jim's Texaco)
Site Address: 4537 Raeford Road
Nearest City/Town: Fayetteville Zip Code 28304 County: Cumberland
Location Method: Topographic Maps
Description of Geographical Data Point Northwest Corner of Site property
Location Method (GPS, topographical map, other) Topographic Maps
Latitude: N 35° 02' 35" Longitude: W 78° 57' 22"

A.2 Contact Information

UST Owner: Raeford Road Holdings, LLC
Address: 9055 Comprint Court, Gaithersburg, MD 20877 Phone: (301) 921-9200

UST Operator: Raeford Road Holdings, LLC
Address: 9055 Comprint Court, Gaithersburg, MD 20877 Phone: (301) 921-9200

Property Owner: Golden of Raeford, LLC (Parcel ID# 0417-30-2524)
Address: 383 Thorncliff Drive, Raeford, NC 23876 Phone:

Property Owner: Anderson Raeford Corner, LLC (Parcel ID# 0417-30-2320 and 0417-30-2049)
Address: 9101 Glenwood Avenue, Raleigh, NC 27617 Phone:

Property Occupants: Sunoco & Diamond Autosport
Address: 4537 Raeford Road, Fayetteville, NC 28304 Phone: (301) 921-9200

Consultant/Contractor: Advantage Environmental Consultants
Address: 12530 Iron Bridge Road Ste I, Chester VA 23831 Phone: (804) 454-0072

Analytical Laboratory: Environmental Conservation Laboratories
Address: 102-A Woodwinds Industrial Court, Cary, NC 27511 Phone: (919) 467-3090
State Certification No. 591

A.3 Release Information

Date Discovered: April 27, 1992
Estimated Quantity of Release: unknown

Cause of Release: Underground Storage Tanks

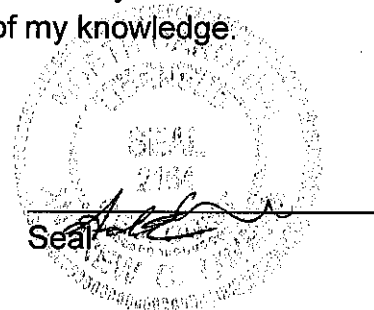
Source of Release (e.g., Piping/UST): UST/Piping

Sizes and contents of UST system from which the release occurred): (3) 10,000-gallon gasoline USTs

I, Andrew C. Owens, a North Carolina Licensed Geologist do certify that the information contained in this report is correct and accurate to the best of my knowledge.



Andrew C. Owens, PG
North Carolina License Number 2164



Advantage Environmental Consultants, LLC is licensed to practice geology in North Carolina. The certification number of the company is C528.

B. Executive Summary

The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Golden of Raeford, LLC and Anderson Raeford Corner, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline and Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. An out-of-use, 150-gallon waste oil UST is located immediately south of the Diamond Autosports building.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. An unknown quantity of gasoline was released from an unknown point in the UST system. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. These initial abatement measures were apparently not performed.

Phase II Environmental Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs and VPH) were detected in each of the four soil samples at concentrations below the applicable North Carolina Department of the Environment and Natural Resources (NCDENR) Industrial/Commercial Cleanup Levels.

AEC also collected three groundwater samples from temporary wells. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the Method for the Determination of volatile petroleum hydrocarbons (MADEP-VPH) test. Certain petroleum constituents (VOCs and VPH) were detected in each of the three groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards. The Phase II ESA, completed by AEC and dated March 6, 2006, was submitted to the NCDENR.

Phase II Limited Site Assessment

A Phase II Limited Site Assessment (LSA) was completed and submitted to the NCDENR on June 4, 2008. The LSA revealed the presence of approximately 2.14” and 1.67” of free phase petroleum product in the form of gasoline in monitoring well MW- 1 and MW-2, respectively on May 1, 2008. In response, Aggressive Fluid Vapor Recovery (AFVR) events were completed in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013.

Groundwater elevations across the Site and surrounding properties have varied between 20 to 23 feet beneath surface grade (bsg), dependent upon seasonal fluctuations. Hydraulic gradient through the area has been determined to flow generally to the southeast. See **Section A, Figure 2** for geologic cross section maps. Groundwater in the monitoring wells installed for completion of the Comprehensive Site Assessment (CSA) stabilized between 20.10 and 22.54 feet beneath surface grade.

Well Survey and Surface Water Body Investigation

AEC completed a walkthrough of all properties located within a 1,000-foot radius of the Site for the Phase II LSA completed on June 4, 2008. AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. The completed well survey did not identify the presence of water supply wells located within a 1,000-foot radius of the Site.

There are no surface water bodies located within 500 feet of the release area and the source area is not located within a wellhead protection area. The Site is located in the Coastal Plain Physiographic province. However, the Site and some surrounding properties within 1,500 feet obtain their potable water from the City of Fayetteville which obtains water from available surface water sources.

Comprehensive Site Assessment Soil Investigation

AEC mobilized to the Site on June 4, 2013 for the purpose of conducting field assessment activities necessary to complete assessment of petroleum contamination in the soils of the Site. In conducting this assessment, AEC advanced a series of ten soil borings, SB-1 through SB-10. Soils encountered while completing the soil borings consisted of dry to moist tan-orange-brown clayey to sandy silt to 20 feet below land surface (bls). The soil samples were collected for laboratory analysis at depths of 8 to 10 feet and 18 to 20 feet bls in each soil boring.

The borings were located in order to surround the suspected contaminant source area (UST and product dispenser locations). The exact locations of these ten soil borings are shown in **Section A, Figure 2**. These samples were submitted to Environmental Conservation Laboratories of Cary, NC (NCDENR-Division of Water Quality (DWQ) certification # 591) for laboratory analysis of VOCs by EPA Methods 8260 and VPH by MADEP-VPH.

The analytical results for EPA Method 8260 revealed the presence of numerous VOCs at detectable levels in each soil sample. Few VOCs in certain soil samples exceeded their Soil to Groundwater Maximum Soil Contaminant Concentrations (MSCCs) as set forth in *The Guidelines*. The constituents and samples exceeding their respective Soil to Groundwater MSCC include benzene in SB-1 at 18-20 feet, SB-2 at 8-10 feet, SB-2 at 18-20 feet, SB-4 at 18-20 feet, SB-5 at 8-10 feet, SB-6 at 8 to 10 feet, SB-6 at 18-20 feet, SB-7 at 8-10 feet, and SB-8 at 8-10 feet; naphthalene in SB-1 at 8-10 feet, SB-9 at 8-10 feet, and SB-10 at 18-20 feet; 4-isopropyltoluene in SB-9 at 8-10 feet; n-propylbenzene in SB-9 at 8-10 feet; and methyl tertiary-butyl ether (MTBE) in SB-4 at 18-20 feet. It should be noted that none of the detected VOCs exceeded the Residential or Industrial Commercial MSCCs.

The analytical results for the VPH analysis detected the presence of C5-C8 aliphatics, C9-C12 aliphatics or C9-C10 aromatics in samples SB-1 at 8-10 feet and SB-10 at 18-20 feet at concentrations in excess of their Soil to Groundwater MSCCs as set forth in *The Guidelines*. The detected VPH did not exceed the Residential or Industrial Commercial MSCCs. A summary of these soil analytical results is included in **Section B, Table 4**.

The detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. The elevated concentrations are largely related to the presence of free phase petroleum product on the groundwater beneath the Site, especially those samples collected at depth (18-20 feet). These soil analytical results do not define the lateral extent of soil contamination to the Soil to Groundwater MSCCs in the northern and southern directions. This is because the most recently obtained soil data shows that petroleum contaminated soils may underlie the North Carolina Department of Transportation (NCDOT) right of ways under the northern adjacent Raeford Road. Further, the areas to the south contain a large amount of buried utilities which will prohibit additional assessment activities in this direction. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs have been adequately defined. Further, the

remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

Comprehensive Site Assessment Groundwater Investigation

AEC mobilized to the Site on June 3-6, 2013 in order to install five additional permanent monitoring wells designated as MW-7, MW-7D, MW-8, MW-9, and MW-10. MW-10 is located on the eastern adjacent W.H. Owen Elementary School property. MW-7D is a deep Type III well. AEC returned to the Site on June 7, 2013 in order to sample the eleven monitoring wells (MW-1 through MW-10 and MW-7D) for completion of the Comprehensive Site Assessment (CSA) dated July 19, 2013. The groundwater samples collected from the monitoring wells were submitted for analysis by EPA Methods 8260, 504.1 1,2-Dibromoethane (EDB), 3030c (total lead), and the MADEP-VPH method. It is important to note that free phase petroleum product was observed in monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6. Therefore, these five wells were not sampled during the CSA.

Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-7, MW-8, MW-9, and MW-10; ethylbenzene in MW-7; isopropyl benzene in MW-7; n-butylbenzene in MW-7; n-propylbenzene in MW-7; MTBE in MW-7, MW-9, and MW-10; naphthalene in MW-7, MW-9, and MW-10; toluene in MW-7; 1,3,5 Trimethylbenzene in MW-7; 1,2,4 Trimethylbenzene in MW-7; and total xylenes in MW-7 and MW-9. Benzene was also found in the groundwater sample in MW-7 at a concentration exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Groundwater samples analyzed by MADEP-VPH revealed the presence of the targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: C5-C8 aliphatic hydrocarbons in MW-3, MW-7, and MW-9; C9-C12 aliphatic hydrocarbons in MW-7; and C9-C10 aromatic hydrocarbons in MW-3, MW-7, and MW-9. EDB was only detected in the sample from MW-7 at a concentration exceeding its maximum allowable concentration in groundwater. Lead was only detected in the sample from MW-7 at a concentration well below its maximum allowable concentration in groundwater.

In summary, data for the groundwater samples obtained from wells MW-3, MW-7, MW-8, MW-9, and MW-10 showed the presence of one or more targeted contaminants at levels above their maximum allowable concentrations in groundwater as defined by

15A NCAC 2L .0202. The results for this groundwater sampling event showed that the lateral extent of the groundwater contaminant plume was adequately defined in the horizontal direction to the Gross Contaminant Levels (GCLs) set forth in *The Guidelines*.

Isoconcentration maps for benzene, MTBE, and naphthalene have been prepared and can be found in **Section A, Figure 5**. **Section B, Table 4** is a summary of the combined analytical results for all of the sampling events.

Upon review of the data obtained by the CSA activities described above, it can be stated that while the horizontal extent of the groundwater contaminant plume has not been defined to the 15A NCAC 2L Standards it has successfully been defined to GCLs, which will be the target groundwater cleanup levels for this incident.

The vertical extent of groundwater contamination was addressed through installation of deep well MW-7D on June 5, 2013. MW-7D was installed immediately adjacent to MW-7 and it is screened from 60 to 70 feet below land surface. Analytical results for a groundwater sample collected from this well on June 7, 2013 indicated the presence of only C9-C10 aromatic hydrocarbons at a concentration of 2.8 ug/l which is well below the 15N NCAC 2L 0202 standard of 200 ug/l, respectively. It is possible that this contaminant was carried down from above. Based on these results, the vertical extent of groundwater contamination appears to be defined.

Contaminants related to the release are expected to continue to migrate with groundwater flow through the Site, to the southeast through the source area. The lateral migration of the plume is directly related to the groundwater flow through the area, the soil matrix through which migration will occur, and to the presence of structures in contact with the groundwater and/or product at the Site. No water supply wells are located within a 1,000-foot radius of the release area. Several contaminant plume maps for individual contaminants of concern are depicted in **Section A, Figures 5A, 5B, and 5C**. Due to the established direction of contaminated groundwater migration it is not likely that the release will impact the eastern adjacent school or any other environmentally sensitive receptors.

Currently the Site is classified as “intermediate risk” due to the presence of free phase petroleum product and at least one exceedence of the GCLs. While the removal of free phase petroleum product is required, the only way to lower the current risk classification from “intermediate” to “low” and close out the incident is to also eliminate all exceedences of GCLs in the groundwater.

The concentrations to which soil and groundwater must be remediated are outlined in Tables 4 and 5.

The removal of free product and GCL exceedences must be completed in order to eventually lower the classification to “low risk” which may result in the incident being closed out by the NCDENR. To accomplish this goal, AEC recommends quarterly AFVR events until groundwater sampling shows that free product has been removed to the maximum extent practical and groundwater sampling shows contaminant levels below the GCLs set forth in *The Guidelines*. Based on the low levels of petroleum contamination in Site soils, AEC believes the removal of free product will be sufficient to address soil impacts. Following free product removal, AEC believes that an evaluation of the processes of natural attenuation and biodegradation for addressing the residual groundwater contaminants may be considered. If it is determined that this is not a viable option then one or more active groundwater cleanup options, will need to be considered (eg In-Situ Chemical Oxidation (ISCO) or Air Sparging/Soil Vapor Extraction (AS/SVE)). The estimated cost per AFVR event is \$4,400.00.

AEC will review data collected during the AFVR events in order to evaluate the effectiveness of the selected remediation technology.

C. Site History and Source Characterization

The subject property (hereinafter is referred to as the "Site") is identified as the Raeford Road Sunoco (former Jim's Texaco) and is located at 4537 Raeford Road, Fayetteville, Cumberland County, North Carolina. (See **Section A, Figure 1** for Site location.) The Site consists of three contiguous parcels of land totaling approximately 2.44 acres. The Site is currently owned by Golden of Raeford, LLC and Anderson Raeford Corner, LLC, and is occupied by Raeford Road Sunoco which operates three petroleum Underground Storage Tanks (USTs) for the retail sale of gasoline and Diamond Autosports, an automobile detailing business, occupies the building on the southern portion of the Site. A small, out-of-use, waste oil UST is located immediately south of the Diamond Autosports building.

The Site's existing UST systems were installed in January 1987, and include three 10,000-gallon gasoline USTs. The installation date of the 150-gallon waste oil UST could not be ascertained. The Site also once contained three 1,000-gallon gasoline USTs that were last owned and operated by Mr. James Sanderson. The installation date of these USTs could not be ascertained but are believed to have been installed in the early 1960s. These three USTs were removed in January 1987 and replaced by the tank systems that are currently being used on the Site. See **Section A, Figure 2** for the Site map indicating the UST system location. See **Section B, Table 1** for UST information.

A petroleum release was first discovered during April of 1992 when free product was observed in two monitoring wells. A Notice of Regulatory Requirements (NORR) letter was sent to Mr. James Sanderson, owner of Jim's Texaco, on February 17, 1993 directing him to perform initial abatement measures and a comprehensive investigation of the release. This case (Groundwater Incident Number 9788) has been open since that time, and no additional assessment or remediation has occurred at the Site until 2008. Mr. Sanderson received at least four Notices of Violation (NOVs) since 1992 and has also been subject to civil penalties for failure to comply with UST regulations during this time.

Raeford Road Holdings, LLC purchased the Site from Mr. Sanderson on April 24, 2006. In response, North Carolina Department of the Environment and Natural Resources (NCDENR) issued a March 18, 2008 NORR letter to the owner of the UST systems requiring them to comply with the reporting requirements of 15A NCAC 2L .0115(C)(4). A Phase II Limited Site Assessment (LSA) was then completed and submitted to the NCDENR on June 4, 2008. The LSA revealed the presence of approximately 2.14" and

1.67" of free phase petroleum product in the form of gasoline in monitoring wells MW-1 and MW-2, respectively on May 1, 2008. In response, Aggressive Fluid Vapor Recovery (AFVR) events were completed in October 2008, March 2009, October 2009, April 2010, August 2012, and April 2013. The amount of product removed during these AFVR events is detailed in **Section B, Table 8**.

Due to the on-going presence of free phase petroleum product, the NCDENR issued a March 2, 2015 NORR letter to Raeford Road Holdings, LLC directing them to comply with the requirements of 15A NCAC 2N .0707, 15A NCAC 2L .0106(c) and 2L .0106(h).

Raeford Road Holdings, LLC responded by contracting with AEC in order to complete this Corrective Action Plan (CAP) report.

Property ownership information was obtained through the Cumberland County GIS Department. The Site itself is owned by Golden of Raeford, LLC (Parcel ID # 0417-30-2524) and Anderson Raeford Corner, LLC (Parcel ID # 0417-30-2320 and 0417-30-2049). The Site itself and most of the surrounding properties are zoned as C1P (shopping center district) by Cumberland County. The property northeast of the Site across Raeford Road is owned by Dominic and Michelle Marangi and is occupied by Atlas Chiropractor (Parcel ID# 0417-30-3814). The property north of the Site across Raeford Road is owned by Loyd Properties, LLC and is occupied by Bojangles (Parcel ID# 0417-30-2803). The property northwest of the Site across Raeford Road is owned by Walter Williams and is occupied by Wilco-Hess (Parcel ID# 0417-30-0820). The property west and south of the Site is owned by Mitchell Properties of Florence, Inc. and is occupied by a vacant commercial building and a vacant shopping center (Parcel ID# 0416-29-9999). Finally, the property east and southeast of the Site across Scotland Drive is owned by Cumberland County Board of Education and is occupied by William H. Owen Elementary School (Parcel ID# 0417-30-7111) which is zoned R10 (residential district). See **Section B, Table 10** for more detailed information regarding adjacent property owners.

Topography at the Site trends to the south toward Buckhead Creek. Buckhead Creek is located approximately 1,500 feet from the Site and is the closest surface water body. There are no surface water bodies located within 500 feet of the source area. (See **Section A, Figure 1**).

AEC observed two buildings at the Site, the convenience store building associated with the gasoline filling station and 5-bay vehicle service building occupied by Diamond Autosports located on the southern portion of the Site.

AEC completed a walkthrough of all properties located within a 1,000 foot radius of the Site for the Phase II LSA completed on June 4, 2008. AEC completed the well survey by interviewing property owners/tenants in the immediate vicinity of the source area and completing the well surveys. The completed well survey did not identify the presence of water supply wells located within a 1,000 foot radius of the Site.

The Site and immediate surrounding area are located within the City of Fayetteville and are supplied water by the Fayetteville Public Works Commission (PWC).

On June 26, 2013, AEC reviewed the NCDENR-Wellhead Protection Program files for the presence of wellhead protection areas within 1,500-feet of the Site. None were found to be located within 1,500-feet of the source area.

Reports previously submitted to the NCDENR include a Phase II Environmental Site Assessment dated March 6, 2006, a Phase II Limited Site Assessment dated June 4, 2008, and a CSA dated July 19, 2013.

The preparation of this CAP was required by a NORR dated March 2, 2015.

D. Summary of Site Assessment Information

D.1 Assessment Activities Completed to Date

Phase II Environmental Site Assessment Activities (February 2006)

AEC collected four soil samples at the Site on February 16, 2006 during a Phase II Environmental Site Assessment (ESA). The soil samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260 and for volatile petroleum hydrocarbons (VPH) by the MADEP-VPH test. Certain petroleum constituents (VOCs and VPH) were detected in each of the four soil samples at concentrations below the applicable NCDENR Industrial/Commercial Cleanup Levels.

AEC also collected three groundwater samples from temporary wells. The groundwater samples were analyzed for VOCs by EPA Method 8260 and for VPH by the MADEP-VPH test. Certain petroleum constituents (VOCs and VPH) were detected in each of the three groundwater samples at concentrations above the applicable NCDENR Groundwater Quality Standards. The Phase II ESA, completed by AEC and dated March 6, 2006, was submitted to the NCDENR.

Phase II Limited Site Assessment Activities (April & May 2008)

AEC mobilized to the Site on April 30 and May 1, 2008 for the purpose of conducting field assessment activities necessary to determine a "worst case scenario" for the presence of petroleum contamination in the groundwater on the Site. In conducting this assessment, AEC installed three additional monitoring wells designated as MW-4, MW-5, and MW-6 (monitoring wells MW-1, MW-2, and MW-3 were previously installed in 1992). Free product was observed in existing monitoring wells MW-1 and MW-2 at thicknesses of 2.14" and 1.67", respectively. Therefore, groundwater samples were only collected from monitoring wells MW-3, MW-4, MW-5, and MW-6.

The samples collected from these wells were submitted for chemical analysis for VOCs by EPA Method 8260 and VPH by the MADEP-VPH method. Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-4, MW-5, and MW-6; ethylbenzene in MW-4, MW-5, and MW-6; isopropyl benzene in MW-4; MTBE in MW-4, MW-5, and MW-6; n-propylbenzene in MW-4, MW-5, and MW-6;

naphthalene in MW-4, MW-5, and MW-6; toluene in MW-4, MW-5, and MW-6; 1,3,5 trimethylbenzene in MW-4; 1,2,4 trimethylbenzene in MW-4, MW-5, and MW-6; and total xylenes in MW-4, MW-5, and MW-6. Benzene was also found in groundwater samples in MW-4 and MW-6 at concentrations exceeding its respective GCL of 5,000 ug/l as set forth in The Guidelines.

Data for the MADEP-VPH analyses showed C5-C8 aliphatic hydrocarbons (380-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 420-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analysis also revealed C9-C18 aliphatic hydrocarbons in groundwater samples collected from MW-3, MW-4, and MW-5; however, only the sample from MW-5 was in excess of the maximum allowable concentration in groundwater of 4,200-ug/l as set forth in 15A NCAC 2L .0202. Data for the MADEP-VPH analyses showed C19-C36 aliphatic hydrocarbons (350-ug/l) in the groundwater sample collected from MW-3. This level is not in excess of its maximum allowable concentration in groundwater of 42,000-ug/l as set forth in 15A NCAC 2L .0202. Finally, data for the MADEP-VPH analysis showed C9-C22 aromatic hydrocarbons in each of the four groundwater samples collected. These levels are in excess of its maximum allowable concentration in groundwater of 210-ug/l as set forth in 15A NCAC 2L .0202.

Due to the presence of free product, AEC recommended that AFVR events be performed as an abatement measure to withdraw or remove free product and vapors that may pose a threat to human health and the environment. The Phase II ESA, completed by AEC, was submitted to the NCDENR on June 4, 2008.

Aggressive Fluid Vapor Recovery Events (October 2008 to April 2013)

Due to the presence of free phase petroleum product at the Site, Aggressive Fluid Vapor Recovery (AFVR) events were completed on October 14, 2008, March 10, 2009, October 14, 2009, April 27, 2010, August 7, 2012, and April 22, 2013. A Summary of Free Product Thickness Measurements in Monitoring Wells is included in **Section B, Table 8**.

A combined total of 10,519 gallons of water were recovered from MW-1, MW-2, MW-4 and MW-6, during the six AFVR events, approximately 73 gallons of which were determined to be gasoline. Also, AEC calculated that a total of approximately 33.56 gallons of gasoline being removed as VOC emissions during the six AFVR events.

Therefore, a total of approximately 109.66 gallons of gasoline were removed as a result of these six AFVR events.

The first six AFVR events appeared to have been fairly effective in removing a significant amount of the remaining free phase petroleum product. However, product thicknesses rebounded between 2011 and April 2013. At some sites this can be explained by fluctuations in the groundwater table elevations, however based on a review of historical groundwater elevations no more than one foot of variation was noted between the lowest and highest recorded elevations.

Comprehensive Site Assessment Groundwater Investigation June 7, 2013 Groundwater Monitoring Event

The next groundwater sampling event occurred during June 2013 after the NCDENR instructed Raeford Road Holdings, LLC to complete the CSA and therefore AEC was subsequently contracted in order to complete this assessment. AEC mobilized to the Site on June 3-6, 2013 in order to install five additional permanent monitoring wells designated as MW-7, MW-7D, MW-8, MW-9, and MW-10. MW-10 is located on the eastern adjacent W.H. Owen Elementary School property. MW-7D is a deep Type III well. AEC returned to the Site on June 7, 2013 in order to sample the eleven monitoring wells (MW-1 through MW-10 and MW-7D) for completion of the CSA. The groundwater samples collected from the monitoring wells were submitted for analysis by EPA Methods 6200B (volatile organic compounds), 504.1 EDB, 3030c (total lead), and the MADEP-VPH method. It is important to note that free phase petroleum product was observed in monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-6. Therefore, these five wells were not sampled during the CSA.

Groundwater samples analyzed by EPA Method 8260 revealed the presence of numerous targeted parameters at levels in excess of their maximum allowable limits in groundwater as set forth in 15A NCAC 2L .0202. These exceedances include: benzene in MW-3, MW-7, MW-8, MW-9, and MW-10; ethylbenzene in MW-7; isopropyl benzene in MW-7; n-butylbenzene in MW-7; n-propylbenzene in MW-7; MTBE in MW-7, MW-9, and MW-10; naphthalene in MW-7, MW-9, and MW-10; toluene in MW-7; 1,3,5 Trimethylbenzene in MW-7; 1,2,4 Trimethylbenzene in MW-7; and total xylenes in MW-7 and MW-9. Benzene was also found in the groundwater sample in MW-7 at a concentration exceeding its respective Gross Contaminant Level (GCL) of 5,000 ug/l as set forth in *The Guidelines*.

Groundwater samples analyzed by MADEP-VPH revealed the presence of the targeted parameters at levels in excess of their maximum allowable limits in groundwater as set

forth in 15A NCAC 2L .0202. These exceedances include: C5-C8 aliphatic hydrocarbons in MW-3, MW-7, and MW-9; C9-C12 aliphatic hydrocarbons in MW-7; and C9-C10 aromatic hydrocarbons in MW-3, MW-7, and MW-9. EDB was only detected in the sample from MW-7 at a concentration exceeding its maximum allowable concentration in groundwater. Lead was only detected in the sample from MW-7 at a concentration well below its maximum allowable concentration in groundwater.

In summary, data for the groundwater samples obtained from wells MW-3, MW-7, MW-8, MW-9, and MW-10 showed the presence of one or more targeted contaminants at levels above their maximum allowable concentrations in groundwater as defined by 15A NCAC 2L .0202. The results for this groundwater sampling event showed that the lateral extent of the groundwater contaminant plume was not adequately defined in the horizontal directions.

Isoconcentration maps for benzene, MTBE, and naphthalene have been prepared and can be found in **Section A, Figure 5. Section B, Table 5** is a summary of the combined analytical results for all of the sampling events.

Upon review of the data obtained by the CSA activities described above, it is evident that the horizontal extent of the groundwater contaminant plume has not been defined to the 15A NCAC 2L Standards. However, the horizontal extent of groundwater contamination has been defined to the GCLs, which are the targeted assessment and cleanup standards for this incident.

D.2 Geology and Hydrology of the Site and Region

The Geologic Map of North Carolina describes the Site as being underlain by the Cretaceous-age Middendorf Formation. The Middendorf Formation consists of "sand, sandstone, and mudstone, gray to pale gray with an orange cast, mottled; clay balls and iron-cemented concretions common, beds laterally discontinuous, cross-bedding common."

The thickness of this formation ranges from one to 50 feet, with the formation becoming thicker toward the west. Formation thickness in central Cumberland County averages approximately 30 feet. Sand in the Middendorf Formation furnishes more water to wells than any other unit in the Fayetteville area. The permeability of this material is moderate, with well yields of 10 to 50 gallons per minute (gpm) common.

The underlying Black Creek Formation is described by “Geology and Groundwater in the Fayetteville Area¹” as black or dark gray thinly laminated clay and lenses of sand. It contains abundant mica and lignite, as well as iron sulfides. The formation thickens from a feather edge along its western margin to about 200 feet to the east. The average formation thickness in the Fayetteville area is generally less than 40 feet. Because of its wide extent and shallow depth and the presence of sand lenses, the Black Creek Formation is the source of water for a large number of wells in the Fayetteville area. Yields of wells tapping this formation range from 50 gpm in smaller wells to 500 gpm in large diameter wells

The Tuscaloosa Formation which underlies the Black Creek Formation is described by “Geology and Groundwater in the Fayetteville Area” as gray to white sand and gravel and lenses of clay. Quartz is the major constituent of the sand and gravel. The sand is coarse, crossbedding is common and clay beds are common. The Tuscaloosa thickens to the southeast and obtains a thickness of about 250 feet south of Cumberland County; however formation thickness in the Fayetteville area is expected to be closer to 150 feet. The Tuscaloosa is capable of yielding large supplies of groundwater, but, it is not widely used as a source of water since overlying formations are also capable of producing an abundant water supply.

Soils encountered while completing the soil borings and monitoring wells for this CSA consisted of dry to moist tan-orange-brown clayey to sandy silt to 22 feet bls. From 22 to 38 feet bls the soils consisted of a wet orange-tan-gray silty sand. From 38 to 46 feet bls the soils consisted of a stiff gray clay and from 46 to 57 feet bls the soils consisted of gray sands with clay lenses. Finally, from 57 to 70 feet the soils consisted of gray sand.

D.3 Horizontal Groundwater Hydraulic Gradient

Data obtained from the gauging of wells on, and related to, the Site were recorded and are presented on the groundwater hydraulic gradient map presented in **Section A, Figure 4**. Overall, groundwater hydraulic gradient has been determined to flow to the southeast. Utilizing current hydraulic gradient data obtained from the Site, AEC has calculated the horizontal gradient to be 0.008 foot per foot (ft/ft) (June 7, 2013).

¹ Reference: “Geology and Groundwater in the Fayetteville Area” North Carolina Department of Water Resources, Division of Groundwater. Bull. 2

D.4 Vertical Groundwater Hydraulic Gradient

The vertical gradient of groundwater flow was also assessed by measuring the groundwater elevations in well nest MW-7/MW-7D on June 7, 2013. Using these measurements, AEC calculated the vertical hydraulic gradient to be 0.04 ft/ft downward.

D.5 Aquifer Testing

Rising and falling head tests (slug tests) were conducted on monitoring wells MW-7, MW-8, and MW-9 on June 7, 2013. The purpose of the testing was to assess the values of horizontal hydraulic conductivity (K) of the water table aquifer at various locations.

The tests were performed using a one-inch diameter, 5.5-foot long PVC slug to create an instantaneous change in the water level (head) at each selected well. A Solinst Levelogger Model 3001 pressure transducer was used to measure water level fluctuations during each test. The pressure transducer was attached to a laptop computer in order to download the data in real time. The depth to water from the top of the PVC well casing was measured prior to insertion of the pressure transducer and slug. Water levels were also measured by hand at various times during each test, and at the completion of each test, to verify the electronic data.

Rising and falling head tests were conducted during the field investigation. Falling head tests consisted of rapidly lowering the PVC slug into the well and simultaneously initiating a logarithmic recording interval on the data logger at two second intervals. Rising head tests were conducted by removing the slug and initiating a new logarithmic recording step on the data logger at two second intervals.

The slug test data were analyzed using the Bouwer and Rice method, which accounts for the effects of partial well penetration and changing aquifer thickness (water table conditions). The surficial aquifer thickness was estimated from boring logs to be approximately fifteen feet thick. A packing porosity of 25 percent for the well filter pack was assumed. The results of the slug test data analyses using the Bouwer and Rice method is summarized on the table below:

WELL	BOUWER AND RICE METHOD CONDUCTIVITY (feet/day)	TYPE OF TEST
MW-7	0.966	Falling Head
MW-7	1.064	Rising Head
MW-8	0.5124	Rising Head
MW-9	2.255	Falling Head
MW-9	1.225	Rising Head

The hydraulic conductivity values for the water table aquifer obtained as a result of this investigation averaged on the order of one foot per day (ft/day). The geometric average of the hydraulic conductivity estimate for MW- 7, MW-8, and MW-9 using the Bouwer and Rice method is 1.08 ft/day. These values are consistent with a sandy water table aquifer.

Contaminants related to the release are expected to continue to migrate with groundwater flow through the Site, to the southeast through the source area. The lateral migration of the plume is directly related to the groundwater flow through the area, the soil matrix through which migration will occur, and to the presence of structures in contact with the groundwater and/or product at the Site. No water supply wells are located within a 1,000-foot radius of the release area. Several contaminant plume maps for individual contaminants of concern are depicted in **Section A, Figure 5**. Due to the established direction of contaminated groundwater migration it is not likely that the release will impact the eastern adjacent school or any other environmentally sensitive receptors.

D.6 Extent of Contamination

According to the CSA, contamination may have migrated from the tank field to as far north as the subsurface beneath Raeford Road and as far east, southeast, and south-southeast to the Scotland Drive and elementary school property east of the Site.

D.7 Maximum Contaminant Concentration Levels

AEC mobilized to the Site on June 4, 2013 for the purpose of conducting field assessment activities necessary to complete assessment of petroleum contamination in the soils of the Site. In conducting this assessment, AEC advanced a series of ten soil borings, SB-1 through SB-10. Soils encountered while completing the soil borings consisted of dry to moist tan-orange-brown clayey to sandy silt to 20-feet below land

surface. The soil samples were collected for laboratory analysis at depths of 8 to 10 feet and 18 to 20 feet below land surface in each soil boring.

The borings were located in order to surround the suspected contaminant source area (UST and product dispenser locations). The exact locations of these ten soil borings are shown in **Section A, Figure 2**.

These samples were submitted to Environmental Conservation Laboratories of Cary, NC (NCDENR-DWQ certification # 591) for laboratory analysis of VOCs by EPA Methods 8260 and VPH by MADEP-VPH.

The analytical results for EPA Method 8260 revealed the presence of numerous VOCs at detectable levels in each soil sample. Few VOCs in certain soil samples exceeded their Soil to Groundwater Maximum Soil Contaminant Concentrations (MSCCs) as set forth in *The Guidelines*. The constituents and samples exceeding their respective Soil to Groundwater MSCC include benzene in SB-1 at 18-20 feet, SB-2 at 8-10 feet, SB-2 at 18-20 feet, SB-4 at 18-20 feet, SB-5 at 8-10 feet, SB-6 at 8 to 10 feet, SB-6 at 18-20 feet, SB-7 at 8-10 feet, and SB-8 at 8-10 feet; naphthalene in SB-1 at 8-10 feet, SB-9 at 8-10 feet, and SB-10 at 18-20 feet; 4-isopropyltoluene in SB-9 at 8-10 feet; n-propylbenzene in SB-9 at 8-10 feet; and MTBE in SB-4 at 18-20 feet. It should be noted that none of the detected VOCs exceeded the Residential or Industrial Commercial MSCCs.

The analytical results for the VPH analysis detected the presence of C5-C8 aliphatics, C9-C12 aliphatics or C9-C10 aromatics in samples SB-1 at 8-10 feet and SB-10 at 18-20 feet at concentrations in excess of their Soil to Groundwater MSCCs as set forth in *The Guidelines*. The detected VPH did not exceed the Residential or Industrial Commercial MSCCs. A summary of these soil analytical results is included in **Section B, Table 4**.

D.8 Discussion

The detectable concentrations of VOCs and VPH in the soil samples only slightly exceed their respective Soil to Groundwater MSCCs and are well below the Residential or Industrial Commercial MSCCs. The elevated concentrations are largely related to the presence of free phase petroleum product on the groundwater beneath the Site, especially those samples collected at depth (18-20 feet). These soil analytical results do not define the lateral extent of soil contamination to the Soil to Groundwater MSCCs in the northern and southern directions. This is because the most recently obtained soil

data shows that petroleum contaminated soils may underlie the NCDOT right of ways under the northern adjacent Raeford Road. Further, the areas to the south contain a large amount of buried utilities which will prohibit additional assessment activities in this direction. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs have been adequately defined. Further, the remediation/removal of free product beneath the Site will likely reduce concentrations of VOCs and VPH in Site soils.

D.9 Applicable Cleanup Levels

Until free product is removed, the Site will remain classified as “intermediate risk” and the applicable cleanup level for the petroleum-contaminated soils will be Soil to Groundwater MSCCs as set forth in *The Guidelines*. Further, the cleanup level for petroleum-contaminated groundwater will be the GCLs as set forth in *The Guidelines*. Once free product is removed and no exceedence of any GCLs remain the Site will be classified as “low risk” and the applicable cleanup level for the petroleum-contaminated soils will be either the Residential or Industrial/Commercial MSCCs as set forth in *The Guidelines*. Further, the cleanup level for petroleum-contaminated groundwater will be the GCLs for constituents of concern as set forth in *The Guidelines*.

D.10 Contaminant Migration and Potentially Affected Receptors

Contaminants related to the release are expected to continue to migrate with groundwater flow through the Site, to the southeast through the source area. The lateral migration of the plume is directly related to the groundwater flow through the area, the soil matrix through which migration will occur, and to the presence of structures in contact with the groundwater and/or product at the Site. No water supply wells are located within a 1,000-foot radius of the release area. Several contaminant plume maps for individual contaminants of concern are depicted in **Section A, Figure 5**. Due to the established direction of contaminated groundwater migration it is not likely that the release will impact the eastern adjacent school or any other environmentally sensitive receptors.

D.11 Lowering Risk Classification

Currently the Site is classified as “intermediate risk” due to the presence of free phase petroleum product and one or more exceedences of GCLs. The removal of free phase petroleum product and subsequent lowering of groundwater contaminant levels to below GCLs will result in lowering the current risk classification from “intermediate” to “low” at which time the NCDENR can consider the incident for close out.

E. Objectives of Corrective Action at the Site

The North Carolina Department of Environment and Natural Resources (NCDENR) sent a Notice of Regulatory Requirements (NORR) to Raeford Road Holdings, LLC, dated March 2, 2015, requiring the preparation of this Corrective Action Plan (CAP). A copy of the NORR is included in Appendix D.

The purpose of this CAP is to remediate known contaminants at the Site, including the removal of the free product at the Site and bring the contaminant concentrations in the subsurface to at or below the applicable cleanup level for the petroleum-contaminated soils will be Soil to Groundwater MSCCs as set forth in *The Guidelines*.

F. Comprehensive Evaluation of Remedial Actions

F.1 Risk Reduction Mechanisms

This remediation method involves connecting all water supply well users to an alternative water supply source, e.g. public water. As there are no water supply well users within 1,000 feet of the Site, this is not a viable remediation method.

F.2 Excavation

This remediation method involves the removal of all affected soils at the Site. Free product and affected groundwater are on the Site. Excavation would also require the relocation of the utilities on the southern portion of the Site. Additionally, AEC believes that the plume has migrated under the northern and eastern adjacent properties. Based on the presence of free product and contaminated groundwater in the subsurface, and the possible migration of the plume onto adjacent properties, this is not a reasonable remediation method.

F.3 Natural Attenuation

This remediation method involves allowing the contaminants to degrade naturally over time. Because there is currently free product in the subsurface, this process would likely result in plume migration. Based on the presence of free product in the subsurface, this is not a reasonable remediation method.

F.4 Pump and Treat System

This remediation method involves the installation of a continuous pump and continuous treatment system. The monitoring wells to be utilized would be connected via subsurface conduit and hoses to the treatment building. Based on AEC's previous installations of this type of system, it is estimated to cost between \$195,000 to \$215,000. Quarterly Operations and Maintenance (O&M) costs are estimated to cost between \$15,000 to \$20,000 every quarter. While this is an effective treatment option, based on the expense of this remediation method, this is not considered a reasonable remediation method.

F.5 Aggressive Fluid Vapor Recovery (AFVR)

This remediation method involves the use of a vacuum truck to extract free phase petroleum and impacted groundwater from the existing monitoring wells. This method has been successfully utilized in six previous AFVR events.

A combined total of 10,519 gallons of water and product has been recovered from MW-1, MW-2, MW-4 and MW-6, during the six AFVR events, approximately 76 gallons of which were determined by Shamrock Environmental personnel to be gasoline. Also, Advantage Environmental Consultants calculated that a total of approximately 33.66 gallons of gasoline were removed as VOC emissions during the six AFVR events. Therefore, a total of approximately 109.66 gallons of gasoline were removed as a result of these six AFVR events. The total cost for completing all six AFVR events was approximately \$21,500 therefore the total cost to remove the gasoline was on the order of \$195 per gallon.

The first six AFVR events appeared to be effective in removing a significant amount of the free phase petroleum product. However, product thicknesses have rebounded between 2011 and April 2013. At some sites this can be explained by fluctuations in the groundwater table elevations, however based on a review of historical groundwater elevations no more than one foot of variation was noted between the lowest and highest recorded elevations. Once the free product level in the wells is less than 0.01 feet, AFVR events will cease. In the event that free product is detected in the monitoring wells during subsequent gauging events, AFVR events will resume.

For this Site, AFVR events focus on two of the four wells at one time, based on the distance between the monitoring wells. MW-1 and MW-2 have extraction for approximately four hours, followed by extraction on MW-4 and MW-6 for approximately four hours. During the course of each event, Advantage Environmental Consultants measured a series of exhaust parameters including: temperature; air discharge velocity; relative humidity; and OVA measurements at timed intervals in order to estimate the total amount of product recovered and ultimately discharged as exhaust due to the processes of evaporation. The amount of groundwater and product removed during the previous six AFVR events is outlined in **Section B, Table 7**.

AEC proposes quarterly AFVR events until less than 0.01 feet of free product is observed for four consecutive quarters and the groundwater at the Site meets the applicable cleanup level for petroleum-contaminated groundwater in the Groundwater GCLs as set forth in *The Guidelines*. AEC anticipates that the removal of the free product at the Site will achieve this goal. Based on the observed rebounding of product

thicknesses in the monitoring wells from 2011 to 2013, the anticipated date of project completion is unknown. Once the free product has been removed, AEC proposes quarterly monitoring for the purpose of tracking the natural attenuation of the dissolved phase hydrocarbons at the Site.

G. Public Notice

Per the NORR, because natural attenuation or a cleanup to alternative standards is not proposed, a public notice is not required as part of this CAP. It should be noted that natural attenuation may be considered once free product has been removed to the maximum extent practical.

H. Conclusions and Recommendations

AEC has completed this Corrective Action Plan in order to comply with N.C.G.S. 143-215.84, NCAC 15A, 2L .0106(c), 15A NCAC 2N .0707, 15A NCAC 2L .0106(h), and the NCDENR's "Guidelines for Assessment and Corrective Action for UST Releases" prepared by the North Carolina Underground Storage Tank Section effective July 15, 2008, Change 2 Effective October 1, 2012

Chemical contaminants at levels in excess of the Soil to Groundwater MSCCs were detected in soil samples collected in the vicinity of the UST system. Based on the slight exceedences of the soil MSCCs, AEC believes the lateral extent of soil contamination above the Soil to Groundwater MSCCs has been adequately defined. Free phase petroleum product is present in on-Site wells MW-1, MW-2, MW-4, MW-5, and MW-6. In addition, chemical contaminants at levels in excess of their 15A NCAC 2L .0202 standards were detected in the groundwater in on-Site wells MW-3, MW-7, MW-8, and MW-9 and off-Site well MW-10.

Remedial Alternatives

AEC believes that consideration should first be given to removing free phase petroleum product from beneath the Site followed by the lowering of groundwater contaminant levels to below GCLs. Because there are no environmentally sensitive receptors in the vicinity of the Site, the incident can then be reclassified to "low risk" and closed out once these goals are achieved. Removal of free product will reduce concentrations of VOCs and VPH in Site soils and groundwater. Based on the low levels of petroleum contamination in Site soils, AEC believes the removal of free product will be sufficient to address soil impacts. Following free product removal, AEC believes that an evaluation of the processes of natural attenuation and biodegradation for addressing the residual groundwater contaminants may be considered. If it is determined that this is not a viable option then one or more active groundwater cleanup options, will need to be considered (eg In-Situ Chemical Oxidation (ISCO) or Air Sparging/Soil Vapor Extraction (AS/SVE)).

Recommendations

The subject release will remain classified as "intermediate risk" due to the continued presence of free phase petroleum product and GCL exceedences in groundwater. The removal of free product and elimination of GCL exceedences will drop the classification

to “low risk” thereby allowing the incident to be closed out. Therefore, AEC recommends the use of additional AFVR events.

I. References

Advantage Environmental Consultants, LLC, Comprehensive Site Assessment, dated July 19, 2013;

Geologic Map of North Carolina, Department of Natural Resources and Community Development, Division of Land Resources, 1985.

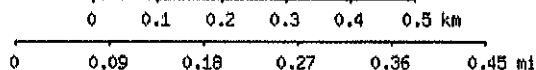
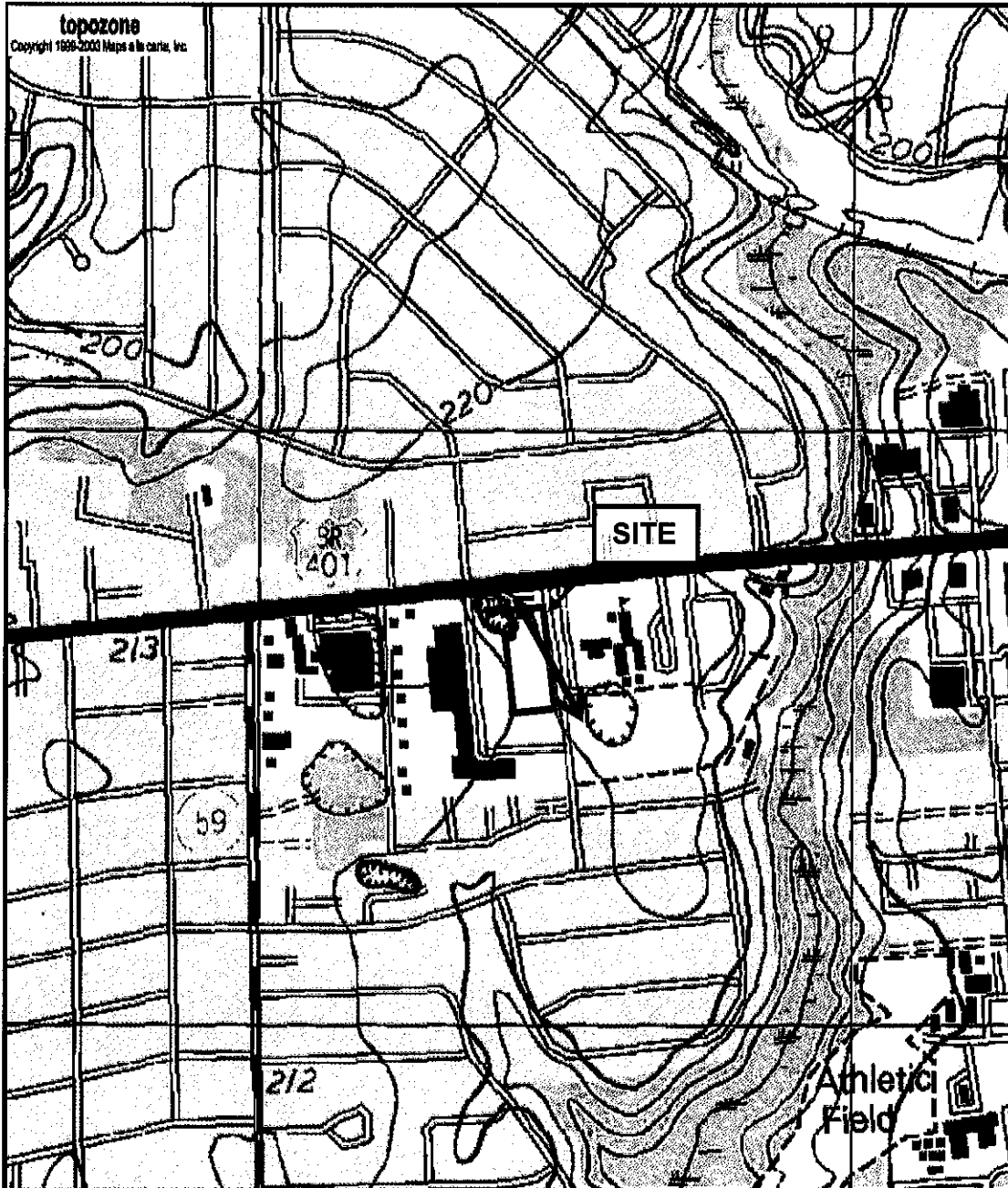
“Guidelines for Assessment and Corrective Action for UST Releases” prepared by the North Carolina Underground Storage Tank Section effective July 15, 2008, Change 2 Effective October 1, 2012

North Carolina Administrative Code, Title 15, Subchapter 2L, Section .0100, 0115 and .0200.

North Carolina Department of Environment and Natural Resources, Division of Waster Management, UST Section.

Cumberland County GIS Website (<http://imaps.co.cumberland.nc.us/imaps/>)

SECTION A
FIGURES



Map center is 35° 02' 35"N, 78° 57' 22"W (WGS84/NAD83)

Fayetteville quadrangle

Projection is UTM Zone 17 NAD83 Datum

M=-8.449
G=1.174



= Groundwater Flow Direction



= Site Location (approximate)



12530 Iron Bridge Road, Suite I
Chester, Virginia 23831
Phone: 804-454-0072 Fax: 804-454-0082

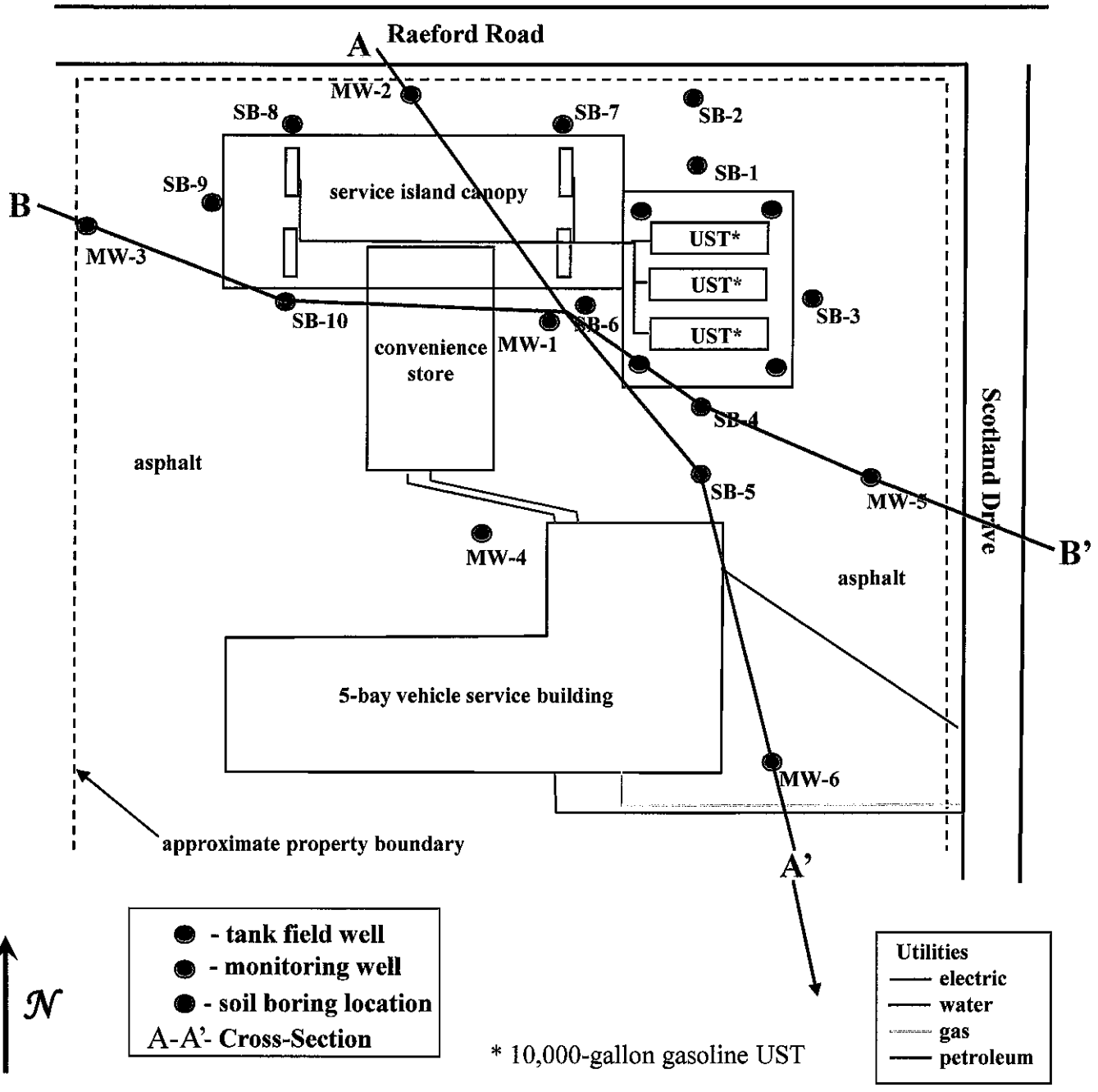
Figure 1 – Topographic Map
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina

AEC Project No.:
15-020R

Report Date:
June 2015

Drawn By:
WML

FIGURE 2A SITE MAP



12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

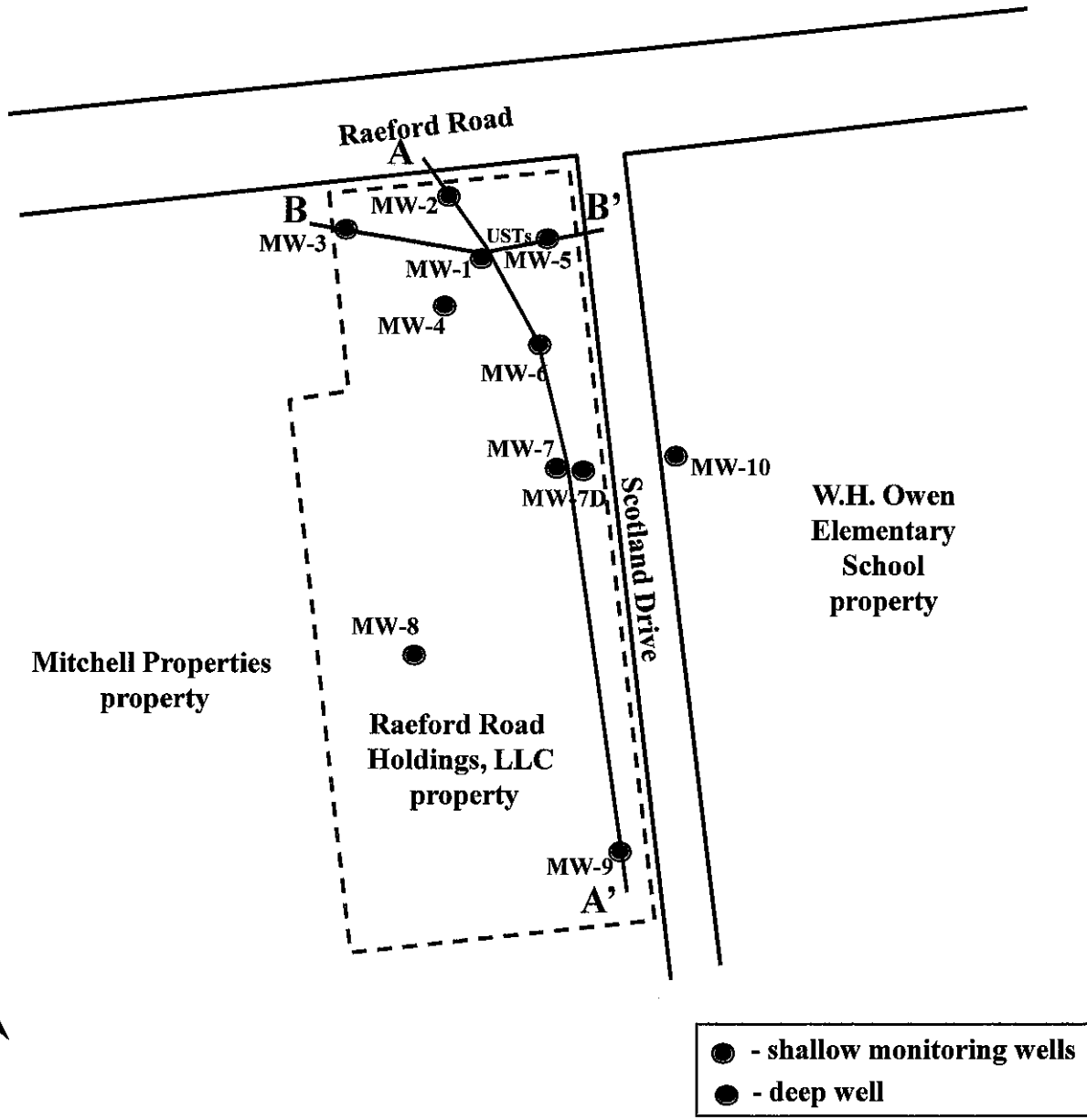
Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 15-020R

Scale:
 1"=30'

Drawn By:
 WML

FIGURE 2B SOIL/GROUNDWATER CROSS-SECTION LOCATION MAP



12530 Iron Bridge Road, Suite I
Chester, Virginia 23831
Phone: 804-454-0072 Fax: 804-454-0082

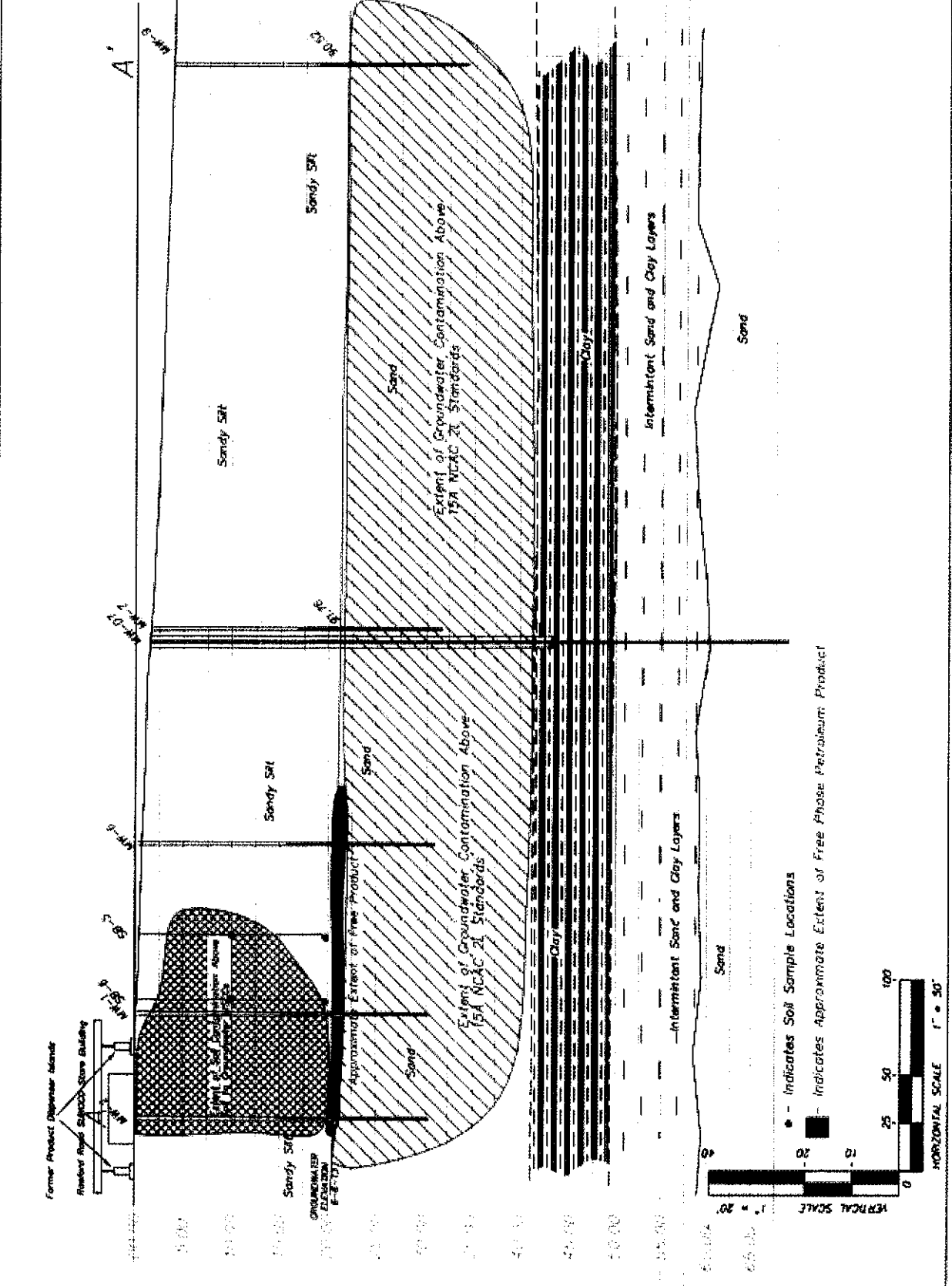
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:
15-020R

Scale:
1"=150'

Drawn By:
WML

FIGURE B
 SOIL/GROUNDWATER CROSS-SECTION A - A'
 Roford Road S.W.M.C.
 4537 Roford Road
 Fayetteville, Cumberland County North Carolina



SCALE AS SHOWN	CAD FILE: Roadford X-Spec	PREP BY: TRW	REV BY: TRW	DATE: 7/16/13	PROJECT NO.
NOTES		FIGURE 9 SOIL/GROUNDWATER CROSS-SECTION B - B' Roadford Road BUNOCO 4537 Roadford Road Fayetteville, Cumberland County North Carolina			
Advantage Environmental Consultants					

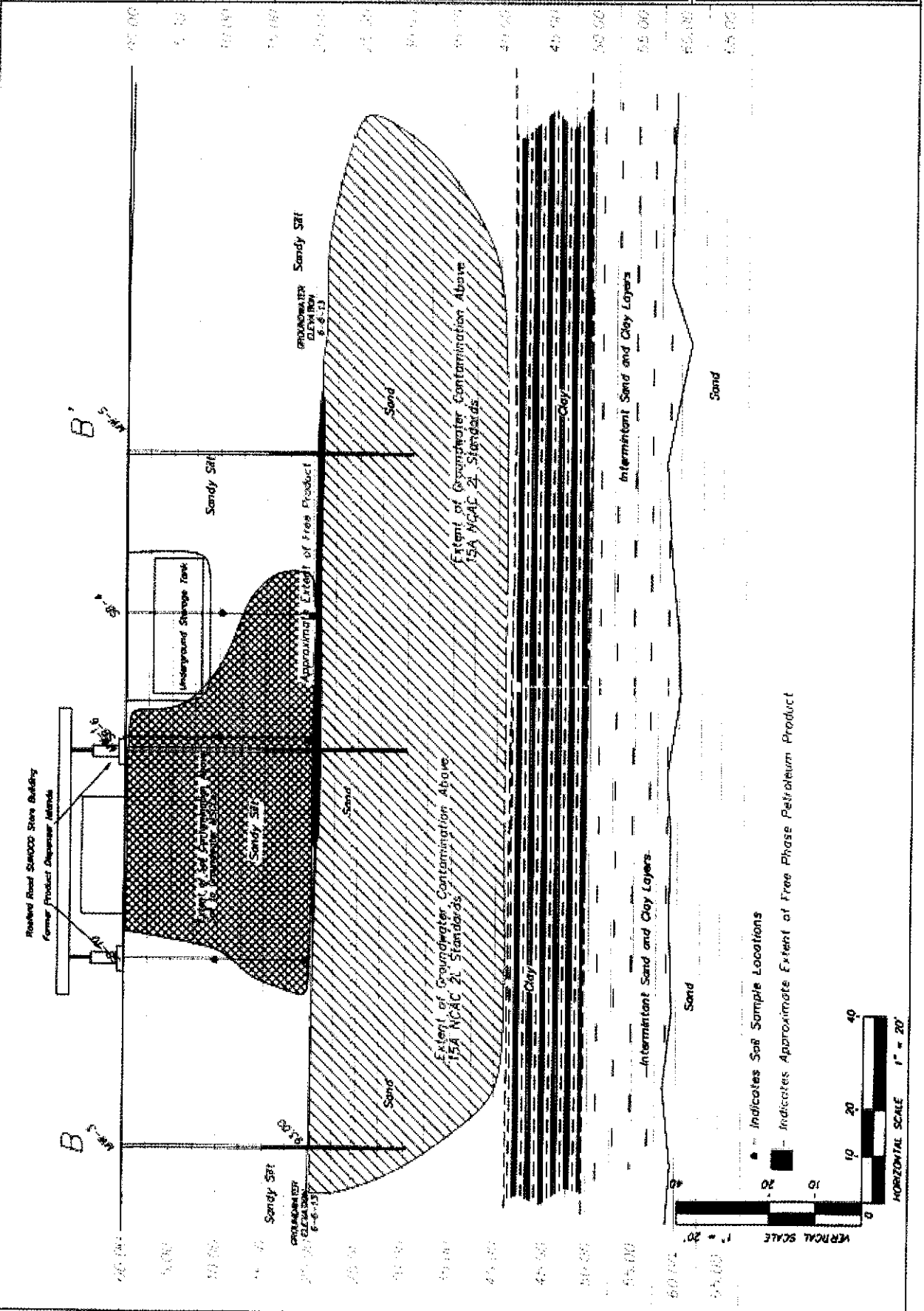
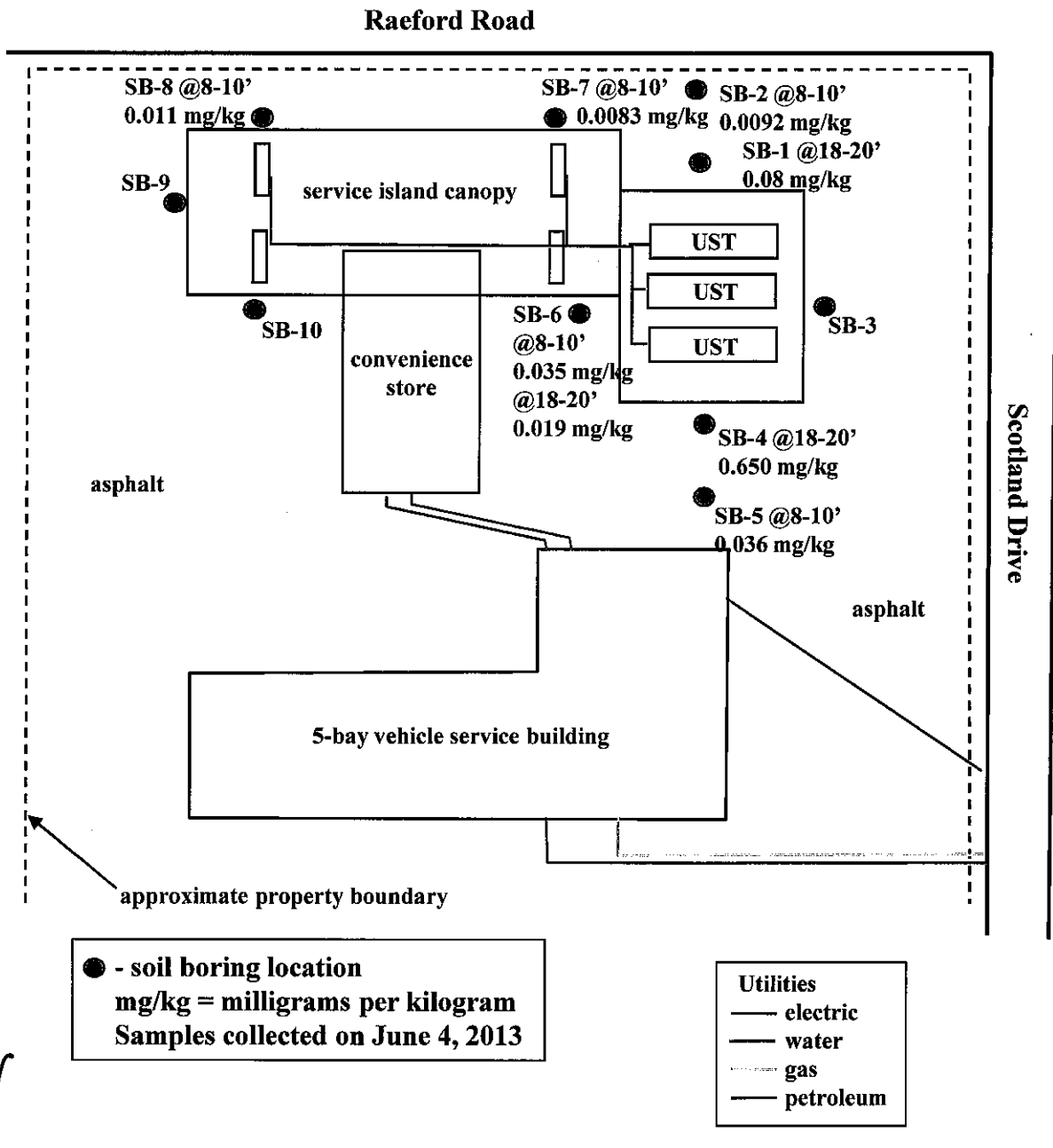


FIGURE 3A BENZENE SOIL ISOCONCENTRATION MAP



12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

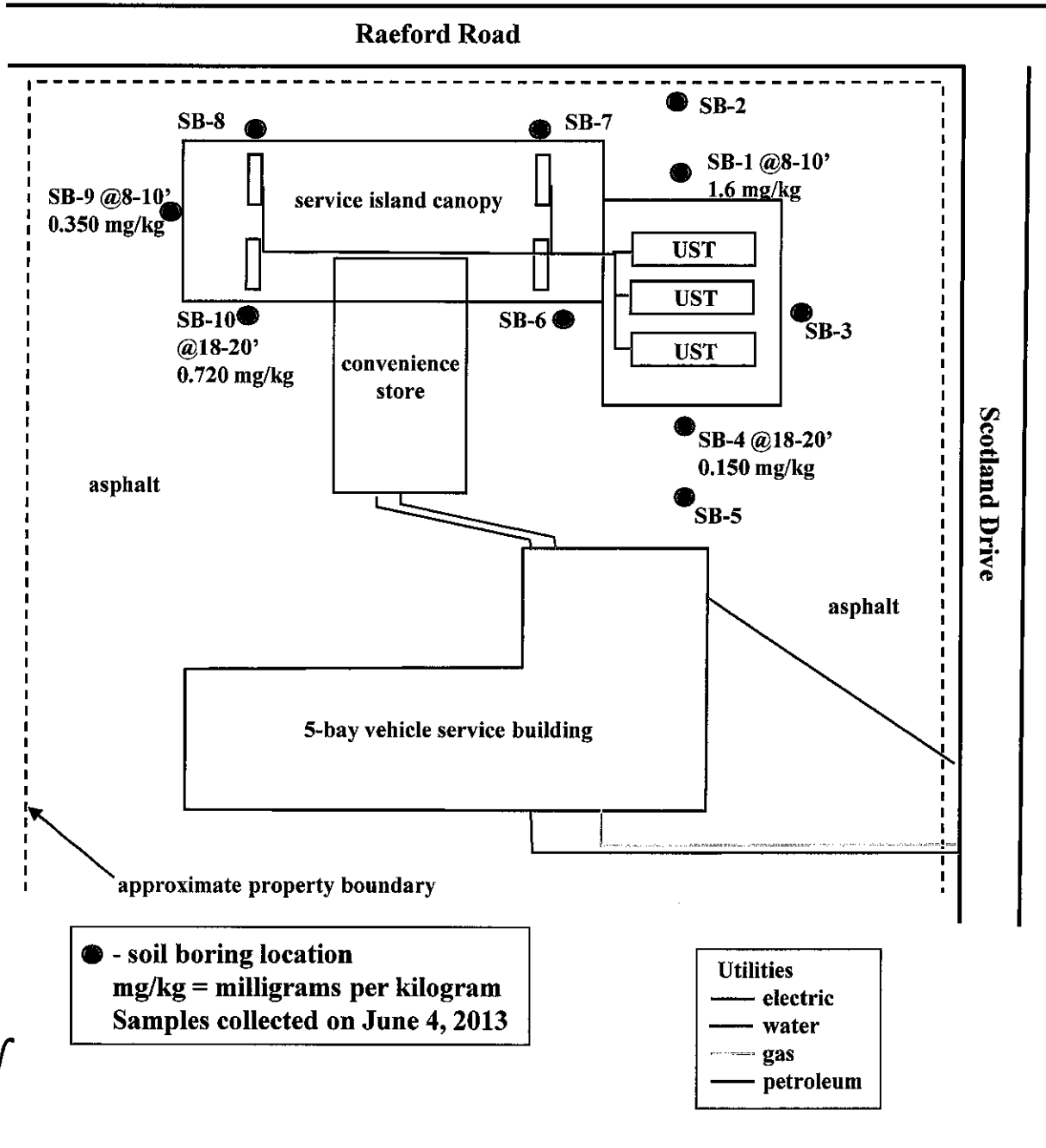
Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 15-020R

Scale:
 1"=30'

Drawn By:
 WML

FIGURE 3C NAPHTHALENE SOIL ISOCONCENTRATION MAP



12530 Iron Bridge Road, Suite 1
Chester, Virginia 23831
Phone: 804-454-0072 Fax: 804-454-0082

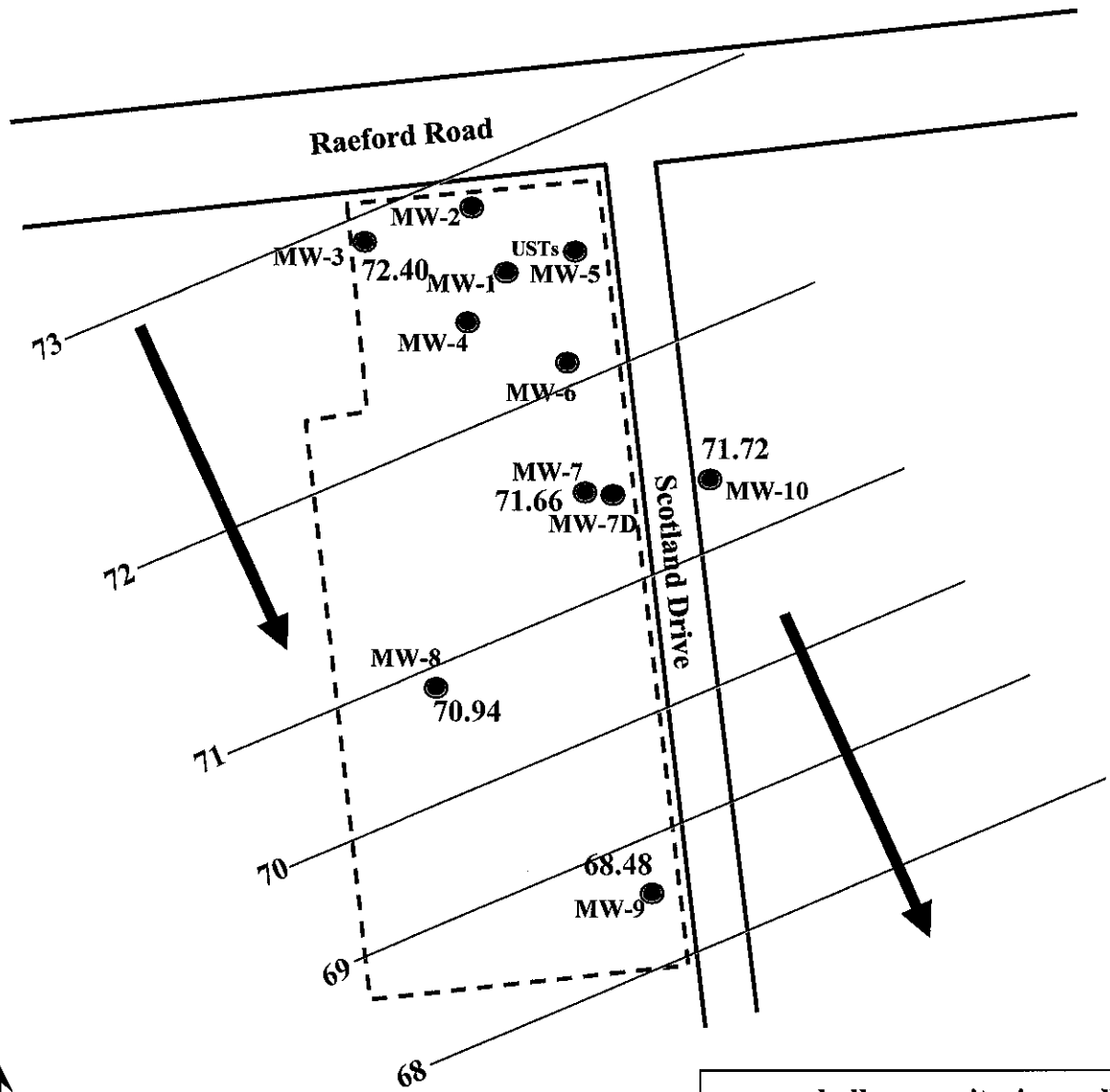
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, North Carolina 28304

AEC Project No.:
15-020R

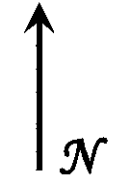
Scale:
1"=30'

Drawn By:
WML

FIGURE 4 GROUNDWATER HYDRAULIC GRADIENT MAP (6/07/13)



● - shallow monitoring wells
 ● - deep well
 72.40 – groundwater elevation

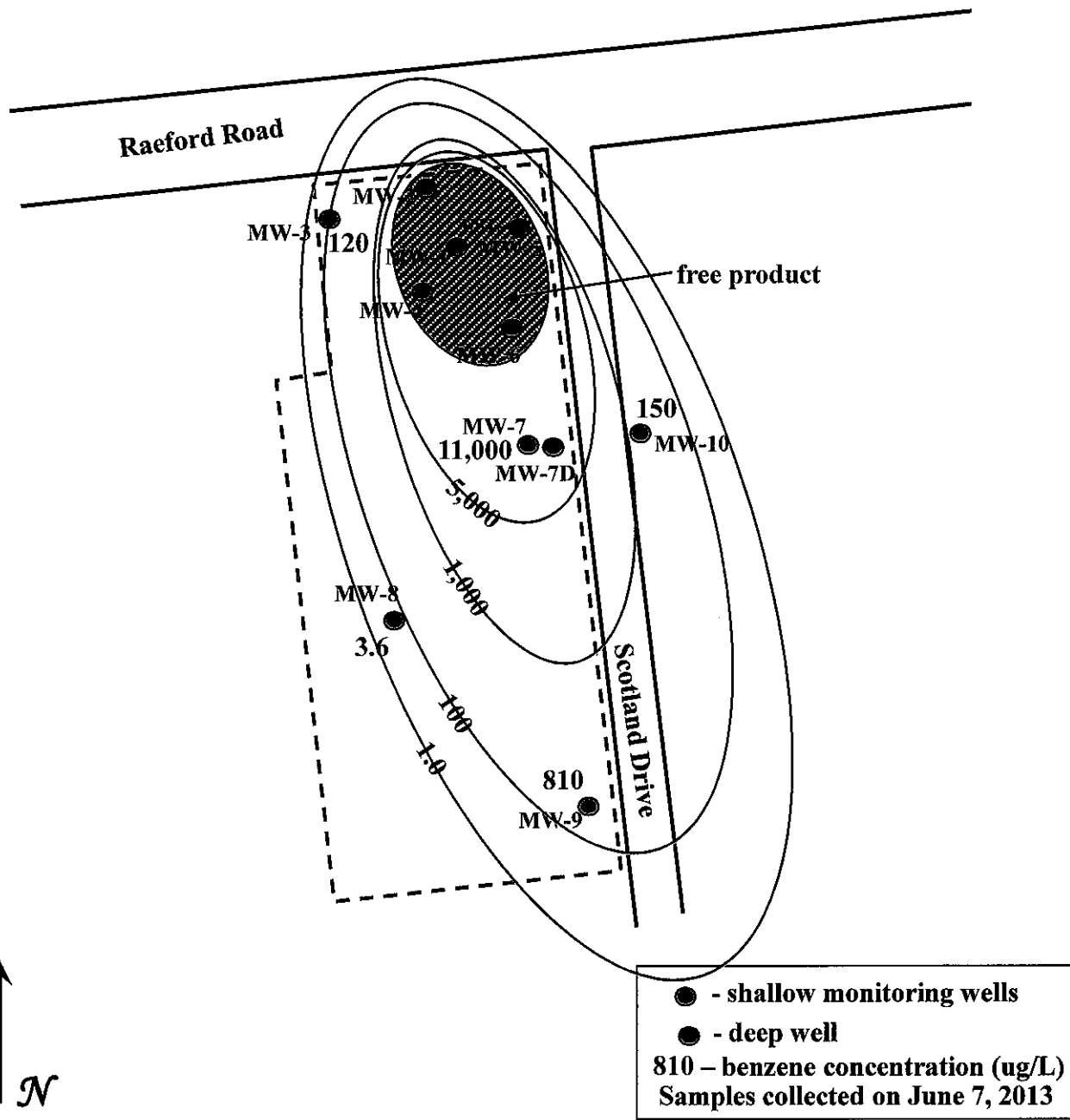


12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:	Scale:	Drawn By:
15-020R	1"=150'	WML

FIGURE 5A BENZENE GROUNDWATER ISOCONCENTRATION MAP

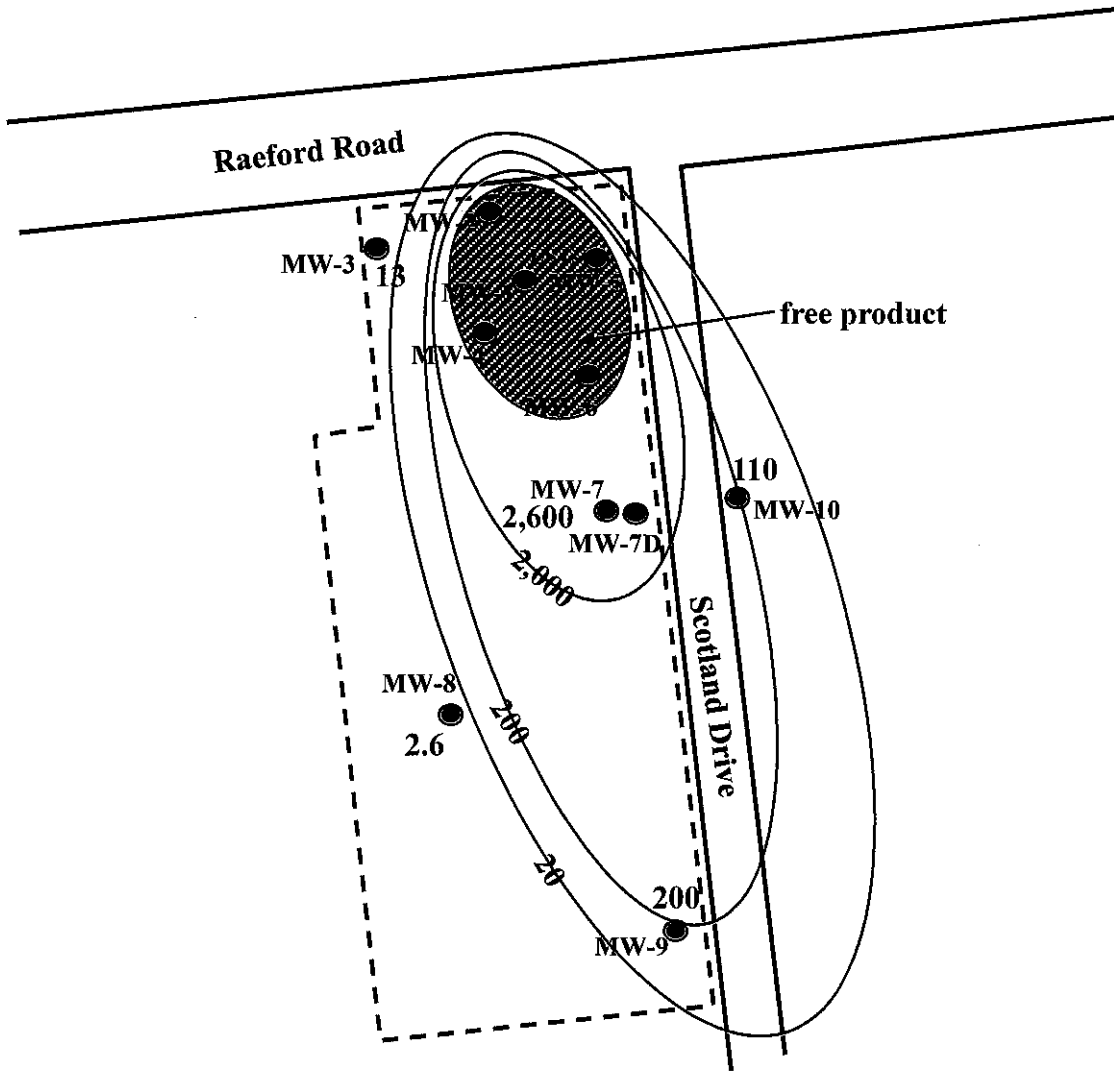


12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.: 15-020R	Scale: 1"=150'	Drawn By: WML
-----------------------------	-------------------	------------------

FIGURE 5B MTBE GROUNDWATER ISOCONCENTRATION MAP



● - shallow monitoring wells
 ● - deep well
 200 - MTBE concentration (ug/L)
 Samples collected on June 7, 2013



12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

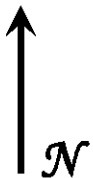
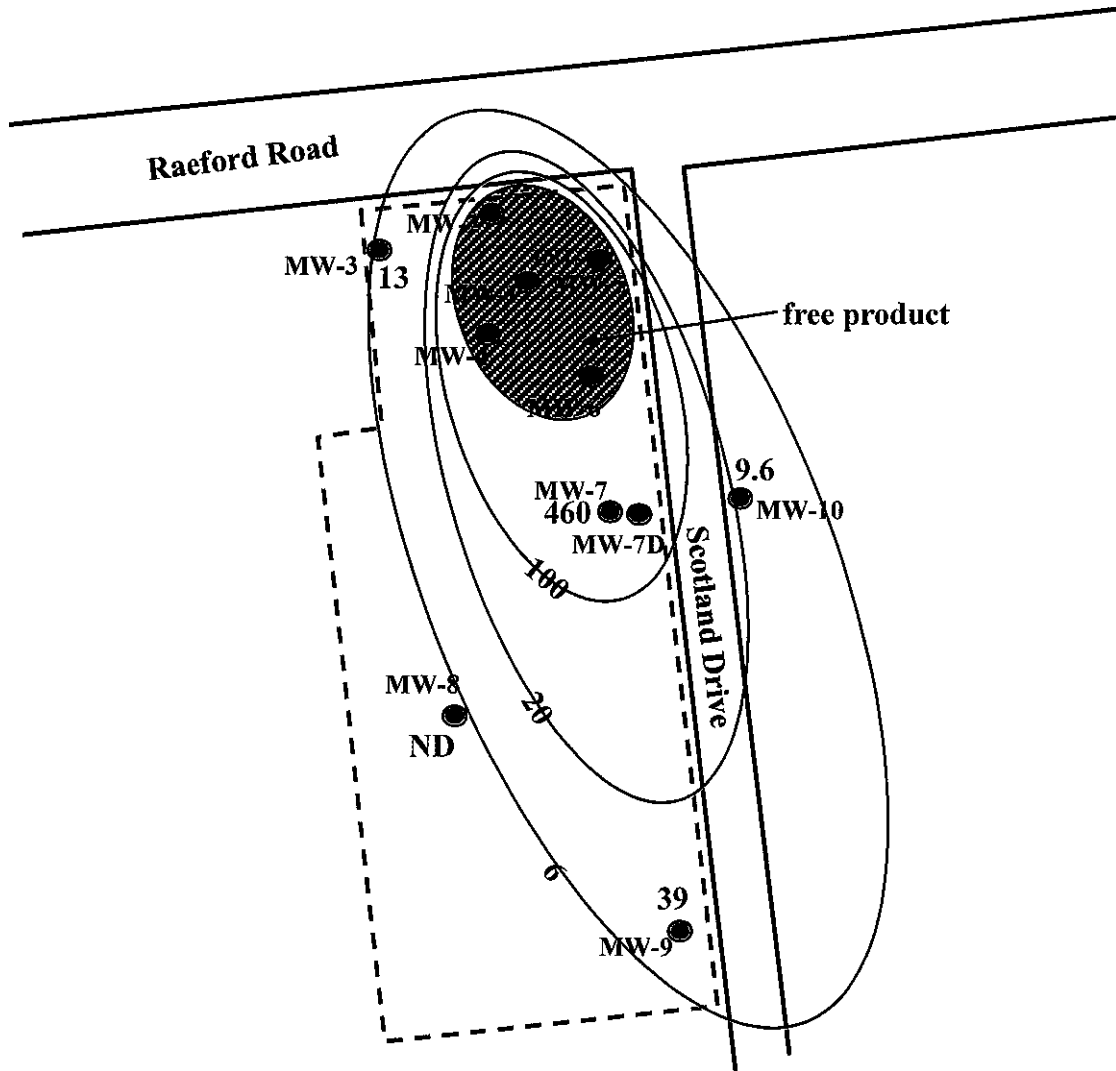
Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 15-020R

Scale:
 1"=150'

Drawn By:
 WML

FIGURE 5C NAPHTHALENE GROUNDWATER ISOCONCENTRATION MAP



● - shallow monitoring wells
 ● - deep well
 200 - Naphthalene concentration (ug/L)
 Samples collected on June 7, 2013



12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

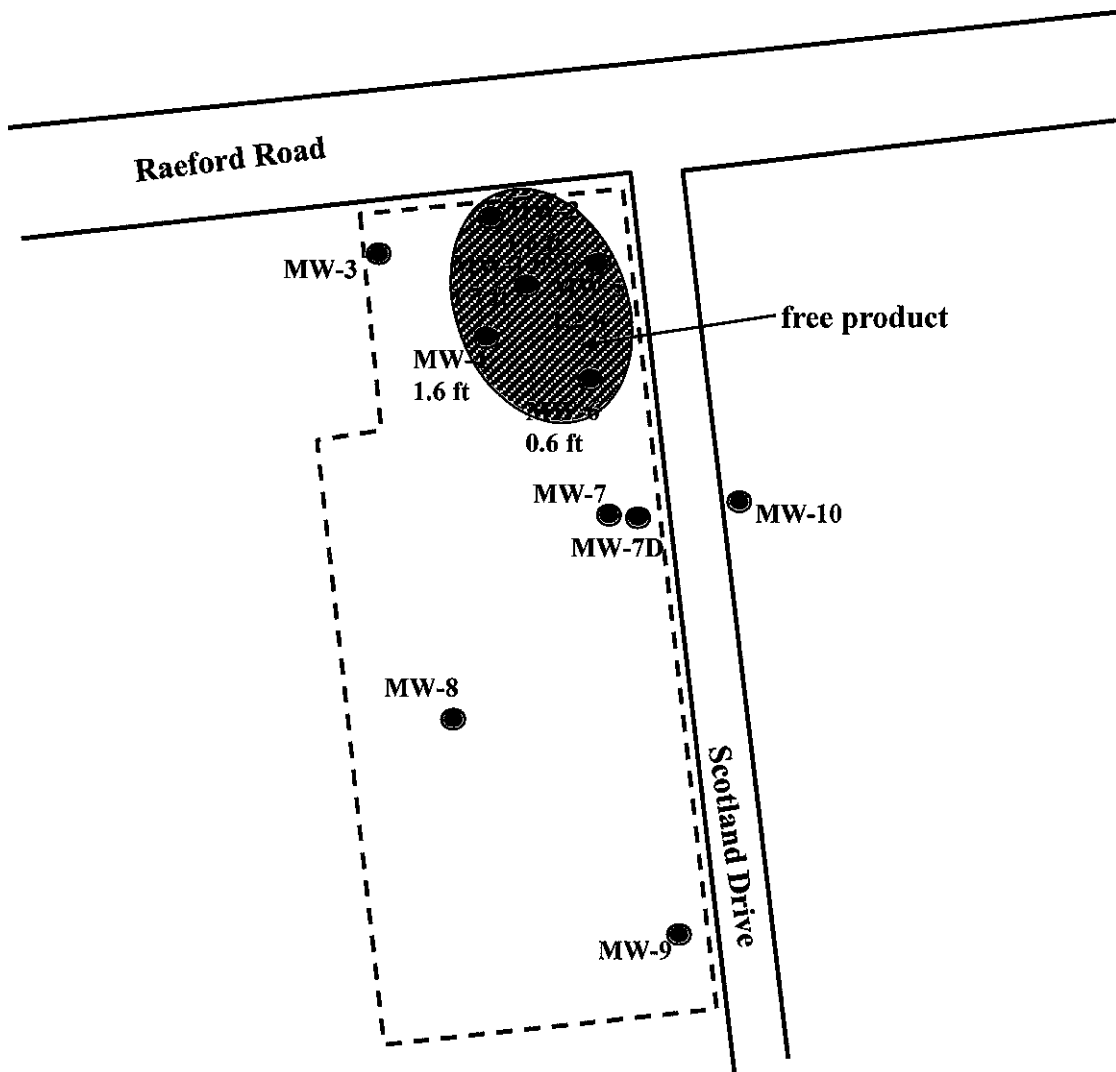
Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 15-020R

Scale:
 1"=150'

Drawn By:
 WML

FIGURE 6 FREE PRODUCT MAP



- - shallow monitoring wells
- - deep well
- 0.5 – Free Product Thickness (ft)
Measured on June 7, 2013

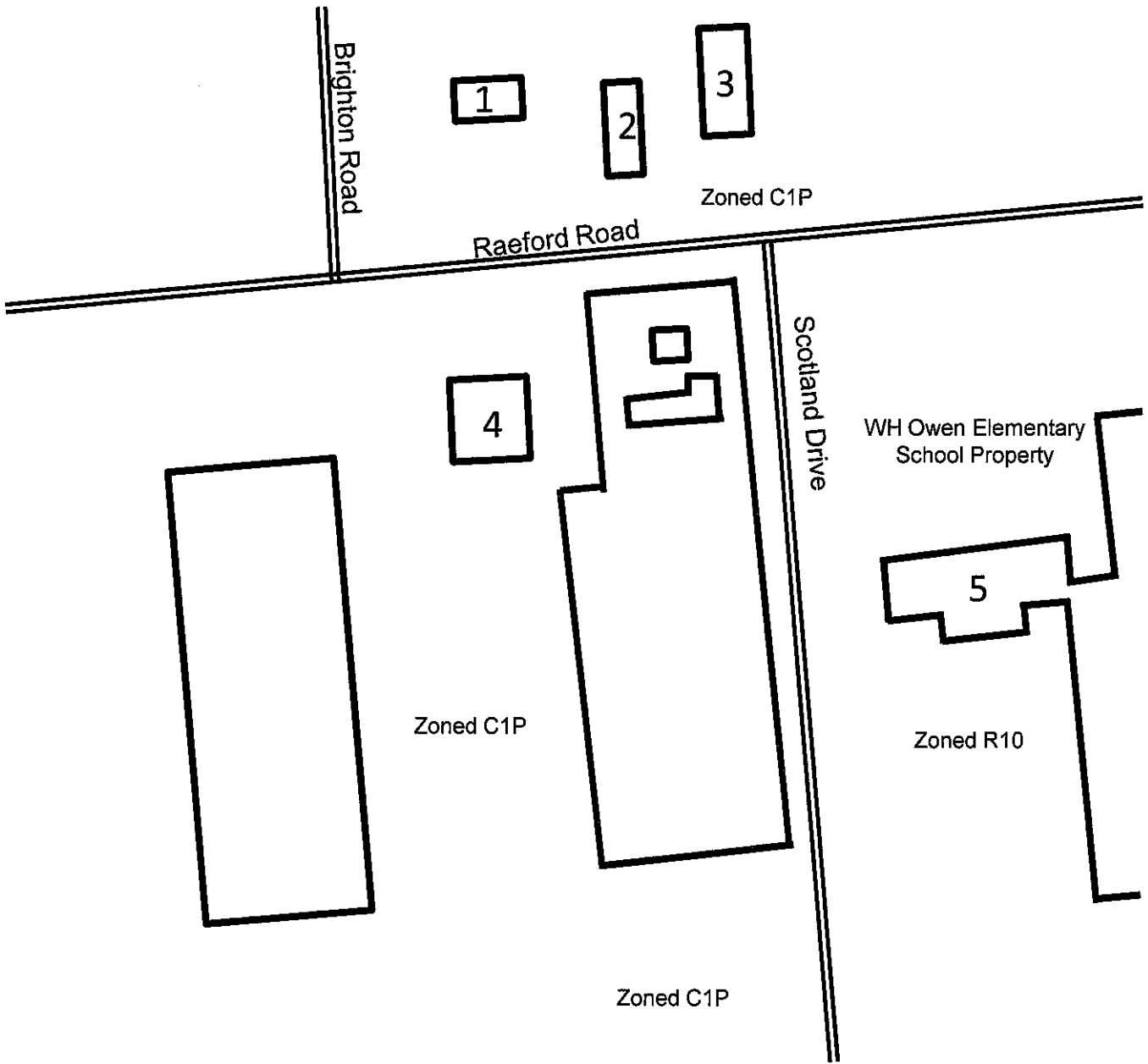


12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.: 15-020R	Scale: 1"=150'	Drawn By: WML
-----------------------------	-------------------	------------------

FIGURE 7 LAND USE MAP



— = Site Location (approximate)

1 = Map ID# (Keyed to Table 10)



12530 Iron Bridge Road, Suite I
 Chester, Virginia 23831
 Phone: 804-454-0072 Fax: 804-454-0082

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, North Carolina 28304

AEC Project No.:
 15-020R

Report Date:
 June 2015

Drawn By:
 KJT

SECTION B
TABLES

Table 1: Site History - UST/AST Owner/Operator and Other Responsible Party Information

Raeford Road Sunoco
4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Revision Date: June 1, 2015 Incident Number and Name: 9788 – Raeford Road Sunoco

UST ID Number	9788	Facility ID Number	0-025474
Name of Owner		Dates of Operation (mm/dd/yy to mm/dd/yy)	
Raeford Road Holdings, LLC		April 24, 2006-Present	
Street Address			
9055 Comprint Court, Suite 200			
City	State	Zip	Telephone Number
Gaithersburg	MD	20877	301-921-9200
Name of Operator		Dates of Operation (mm/dd/yy to mm/dd/yy)	
NA			
Street Address			
City	State	Zip	Telephone Number
Incident Number	9788		
Name of Other Responsible Party		Dates of Release(s) (mm/dd/yy to mm/dd/yy)	
NA		April 27, 1992	
Street Address			
City	State	Zip	Telephone Number

Table 2: Public and Private Water Supply Well and Other Receptor Information

Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Public and Private Water Supply Wells

Well #	Well Owner/ User (indicate which)	Address	Phone Number	Latitude/ Longitude *	Well Use	Well Depth (ft BGS) **	Type of Well	Well Casing Depth (ft. BGS)	Well Screen Interval (x to y ft. BGS)	Distance from source area of release (ft.)	Up or downgradient

Other Receptors

(Other public water supplies, reservoirs, supply lines, surface water bodies, wellhead protection areas, recharge areas for deep aquifers, subsurface structures)

Receptor ID	Description	Location	Latitude/ Longitude of any significant point(s)* (describe to left) (decimal degrees)	Contact	Phone Number	Usage	Up or down- gradient	Distance from source area of release (ft.)

* The location must be sufficiently accurate and precise to allow easy recovery of lost or damaged wells or replication of sampling points.

** Ft BGS = feet below ground surface

*** No public or private water wells or any other receptors are located within 1,500 feet of the Site

Table 3: Field Screening Results*
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina

*No field screenings were performed as part of the preparation of this Corrective Action Plan.

Table 4
Summary of Analytical Data -- Soil
EPA Method 8260
Raeford Road Sunoco
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina

Sample ID	Analytical Method	8260													Total Xylenes				
		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene		MTBE			
Date Collected m/dd/yy	Contaminant of Concern	Sample Depth (ft)																	
SB-1	6/04/13	8-10'	7.3	2.2	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6
SB-1	6/04/13	18-20'	0.053	0.014	0.015	ND	ND	ND	0.047	0.0026	0.0074	0.08	ND	ND	ND	0.26	0.068	0.27	
SB-2	6/04/13	8-10'	0.014	0.0037	0.028	ND	ND	ND	0.0068	0.00072	0.001	0.0092	ND	ND	ND	0.030	0.061	0.037	
SB-2	6/04/13	18-20'	0.0081	ND	0.035	0.0085	ND	ND	0.00057	ND	ND	0.0014	ND	ND	ND	0.0024	0.014	0.0019	
SB-3	6/04/13	8-10'	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00038	ND	ND	ND	0.004	ND	
SB-3	6/04/13	18-20'	ND	ND	0.020	ND	ND	ND	0.00044	ND	ND	ND	ND	ND	ND	0.0014	0.004	0.00081	
SB-4	6/04/13	8-10'	ND	ND	0.014	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
SB-4	6/04/13	18-20'	0.140	0.040	ND	ND	ND	ND	0.170	ND	ND	ND	ND	ND	ND	1.7	0.150	0.96	
SB-5	6/04/13	8-10'	0.0031	0.001	ND	ND	ND	ND	0.005	ND	ND	0.00064	0.036	ND	ND	0.021	0.0098	0.025	
SB-5	6/04/13	18-20'	0.00052	ND	0.016	0.0047	ND	ND	0.00059	ND	ND	ND	0.0033	ND	ND	0.0048	0.013	0.0016	
Soil to Groundwater MSCC			8.5	8.3	24	16	0.12	4.9	1.7	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6		
Residential MSCC			782	782	14000	9385	100	1560	1564	313	626	626	18	626	1200	350	3129		
Industrial/Commercial MSCC			20440	20440	360000	245280	4000	40000	40880	8176	16350	16350	164	16350	32000	3100	81760		

Results are in mg/kg
 Bold results indicate exceedence of Soil to Groundwater MSCC
 ND - Not Detected

Table 4
 Summary of Analytical Data – Soil
 EPA Method 8260
 Raeford Road Sunoco
 4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Sample ID	Analytical Method	8260										8270		8270		8260		8260		8260		8260		8260			
		1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Acetone	2-Butanone	4-Isopropyltoluene	Ethylbenzene	Isopropylbenzene	Naphthalene	n-Butylbenzene	n-Propylbenzene	Benzene	sec-Butylbenzene	Toluene	MTBE	Total Xylenes	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	
	Contaminant of Concern	8260	8260	8270	8270	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	8260	
	Date Collected m/d/d/yy	Sample Depth (ft)																									
SB-6	6/04/13	8-10'	0.0049	0.0021	0.019	ND	ND	0.0049	ND	0.0011	ND	0.0005	0.035	ND	0.014	0.049	0.015										
SB-6	6/04/13	18-20'	0.016	0.0073	0.087	0.040	ND	0.0071	0.00047	0.028	0.0013	0.0015	0.019	ND	0.059	0.026	0.053										
SB-7	6/04/13	8-10'	ND	ND	ND	ND	ND	0.001	ND	ND	ND	ND	0.0083	ND	0.0027	0.0071	0.0029										
SB-7	6/04/13	18-20'	0.0016	0.00049	0.040	ND	0.0014	ND	ND	0.0025	ND	ND	0.0025	ND	0.0058	0.020	0.0069										
SB-8	6/04/13	8-10'	0.0072	0.0031	0.018	ND	0.0062	0.00092	ND	ND	0.0077	0.00076	0.011	ND	0.0077	0.022	0.035										
SB-8	6/04/13	18-20'	0.0091	0.0025	0.023	ND	0.0044	0.00052	0.0014	0.350	0.980	1.7	0.0021	ND	0.022	0.0069	0.028										
SB-9	6/04/13	8-10'	5.1	2.5	0.890	ND	0.220	0.370	0.450	0.350	0.350	1.7	ND	0.410	ND	ND	0.720										
SB-9	6/04/13	18-20'	0.0014	0.00048	0.058	ND	ND	ND	ND	0.0018	ND	ND	ND	ND	ND	0.0028	0.0008										
SB-10	6/04/13	8-10'	0.0095	0.00036	0.033	0.052	ND	ND	ND	ND	ND	ND	ND	ND	0.0045	ND	0.002										
SB-10	6/04/13	18-20'	0.850	0.250	0.760	ND	ND	0.100	ND	0.720	0.088	0.120	ND	ND	0.230	ND	0.660										
Soil to Groundwater MSCC		8.5	8.3	24	16	0.12	4.9	1.7	4.3	0.16	4.3	1.7	0.0056	3.3	4.3	0.091	4.6										
Residential MSCC		782	782	14000	9385	100	1560	1564	626	313	626	626	18	626	1200	350	3129										
Industrial/Commercial MSCC		20440	20440	36000	24528	4000	40000	40880	16350	8176	16350	16350	164	16350	32000	3100	81760										

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND – Not Detected

Table 4 (continued)
 Summary of Analytical Data – Soil
 MADEP Methods VPH
 Raeford Road Sunoco

4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Analytical Method >		Contaminant of Concern >		MADEP VPH	MADEP VPH	MADEP VPH			
Sample ID	Date Collected m/dd/yy	Sample Depth (ft)		C5-C8 Aliphatics	C9-C12 Aliphatics	C9-C10 Aromatics			
SB-6	6/04/13	8-10'		ND	ND	ND			
SB-6	6/04/13	18-20'		ND	ND	0.312			
SB-7	6/04/13	8-10'		ND	ND	ND			
SB-7	6/04/13	18-20'		1.85	1.65	1.07			
SB-8	6/04/13	8-10'		ND	ND	ND			
SB-8	6/04/13	18-20'		ND	ND	ND			
SB-9	6/04/13	8-10'		0.912	ND	0.933			
SB-9	6/04/13	18-20'		ND	ND	ND			
SB-10	6/04/13	8-10'		ND	ND	ND			
SB-10	6/04/13	18-20'		4.51	60	35.5			
Soil to Groundwater MSCC				68	540	31			
Residential MSCC				939	1500	469			
Industrial/Commercial MSCC				24258	40000	12264			

Results are in mg/kg

Bold results indicate exceedence of Soil to Groundwater MSCC

ND - Not Detected

Table 6: Monitoring and Remediation Well Construction Information

Raeford Road Sunoco

4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

See Attached Pages

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: **6/5/13** Well ID# **MW-7**

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.042525 N **78.955563** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells ONEY with the same construction, you can submit one form.

9. Total well depth below land surface: **30'** (ft.)

For multiple wells list all depths if different (example- 30@200' and 20@100')

10. Static water level below top of casing: **NA** (ft.)

If water level is above casing, use "ft."

11. Borehole diameter: **8** (in.)

12. Well construction method: **Auger**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor: **James D. Barker** Date: **6/27/13**

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: **6/5/13** Well ID# **MW-7D**

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.042526 N **78.955562** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: **70'** (ft.)

For multiple wells list all depths if different (example: 3@200' and 2@100')

10. Static water level below top of casing: **NA** (ft.)

If water level is above casing, use "-"

11. Borehole diameter: **11" - outer** (in.)

12. Well construction method: **Auger(outer) Mud rotary(inner)**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
63 ft.	67 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	42 ft.	4 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	60 ft.	2 in.	Sch 40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
60 ft.	70 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	42 ft.	neat cement	tremmie - Bottom up
0 ft.	56 ft.	neat cement	tremmie - bottom up
56 ft.	58 ft.	bentonite	pour

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
58 ft.	70 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	38 ft.	Medium sands
38 ft.	46 ft.	Stiff gray clay
46 ft.	57 ft.	Fine to Medium sands some clay lenses
57 ft.	70 ft.	Fine sand
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor: **James D. Barker** Date: **6/27/13**

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
- Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
- Industrial/Commercial Residential Water Supply (shared)
- Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
- Aquifer Storage and Recovery Salinity Barrier
- Aquifer Test Stormwater Drainage
- Experimental Technology Subsidence Control
- Geothermal (Closed Loop) Tracer
- Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: **6/6/13** Well ID# **MW-8**

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.042448 N **78.955240** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells: ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: **30'** (ft.)

For multiple wells list all depths if different (example: 30@200' and 20@100')

10. Static water level below top of casing: **NA** (ft.)

If water level is above casing, use "m"

11. Borehole diameter: **8** (in.)

12. Well construction method: **Auger**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES						
FROM	TO	DESCRIPTION				
23 ft.	25 ft.					
ft.	ft.					
15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)						
FROM	TO	DIAMETER	THICKNESS	MATERIAL		
0 ft.	15 ft.	2 in.	Sch 40	PVC		
16. INNER CASING OR TUBING (geothermal closed-loop)						
FROM	TO	DIAMETER	THICKNESS	MATERIAL		
ft.	ft.	in.				
ft.	ft.	in.				
17. SCREEN						
FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL	
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC	
ft.	ft.	in.				
18. GROUT						
FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT			
0 ft.	11 ft.	neat cement	Pour			
11 ft.	13 ft.	bentonite	Pour			
ft.	ft.					
19. SAND/GRAVEL PACK (if applicable)						
FROM	TO	MATERIAL	EMPLACEMENT METHOD			
13 ft.	30 ft.	#2 sand	Pour			
ft.	ft.					
20. DRILLING LOG (attach additional sheets if necessary)						
FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)				
0 ft.	1 ft.	Asphalt/gravel				
1 ft.	22 ft.	Clayey Sandy/Silt				
22 ft.	30 ft.	Medium sands				
ft.	ft.					
ft.	ft.					
ft.	ft.					
ft.	ft.					
21. REMARKS						

22. Certification:

James D. Barker 6/27/13
Signature of Certified Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards, and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed-Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: **6/6/13** Well ID# **MW-9**

5a. Well Location:

Raeferd Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeferd Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.041734 N **78.955683** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: **30'** (ft.)

For multiple wells list all depths if different (example: 30@200' and 20@100')

10. Static water level below top of casing: **NA** (ft.)

If water level is above casing, use " "

11. Borehole diameter: **8** (in.)

12. Well construction method: **Auger**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
23 ft.	25 ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	15 ft.	2 in.	Sch 40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	11 ft.	neat cement	Pour
11 ft.	13 ft.	bentonite	Pour
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
13 ft.	30 ft.	#2 sand	Pour
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	1 ft.	Asphalt/gravel
1 ft.	22 ft.	Clayey Sandy/Silt
22 ft.	30 ft.	Medium sands
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

Signature of Certified Well Contractor: **James D. Barker** Date: **6/27/13**

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

James D. Barker

Well Contractor Name

3106A

NC Well Contractor Certification Number

Quantex, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well construction permits (i.e. County, State, Variance, etc.)

3. Well Use (check well use):

Water Supply Well:

- Agricultural Municipal/Public
 Geothermal (Heating/Cooling Supply) Residential Water Supply (single)
 Industrial/Commercial Residential Water Supply (shared)
 Irrigation

Non-Water Supply Well:

- Monitoring Recovery

Injection Well:

- Aquifer Recharge Groundwater Remediation
 Aquifer Storage and Recovery Salinity Barrier
 Aquifer Test Stormwater Drainage
 Experimental Technology Subsidence Control
 Geothermal (Closed Loop) Tracer
 Geothermal (Heating/Cooling Return) Other (explain under #21 Remarks)

4. Date Well(s) Completed: **6/6/13** Well ID# **MW-10**

5a. Well Location:

Raeford Rd. Sunoco

NA

Facility/Owner Name

Facility ID# (if applicable)

4537 Raeford Road, Fayetteville 28304

Physical Address, City, and Zip

Cumberland

NA

County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees: (if well field, one lat/long is sufficient)

35.040561 N **78.955548** W

6. Is (are) the well(s): Permanent or Temporary

7. Is this a repair to an existing well: Yes or No

If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: **one**

For multiple injection or non-water supply wells ONLY with the same construction, you can submit one form.

9. Total well depth below land surface: **30'** (ft.)

For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: **NA** (ft.)

If water level is above casing, use " "

11. Borehole diameter: **8** (in.)

12. Well construction method: **Auger**

(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ Method of test: _____

13b. Disinfection type: _____ Amount: _____

For Internal Use ONLY:

14. WATER ZONES					
FROM	TO	DESCRIPTION			
23 ft.	25 ft.				
ft.	ft.				
15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)					
FROM	TO	DIAMETER	THICKNESS	MATERIAL	
0 ft.	15 ft.	2 in.	Sch 40	PVC	
16. INNER CASING OR TUBING (geothermal closed-loop)					
FROM	TO	DIAMETER	THICKNESS	MATERIAL	
ft.	ft.	in.			
ft.	ft.	in.			
17. SCREEN					
FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
15 ft.	30 ft.	2 in.	0.010	Sch 40	PVC
ft.	ft.	in.			
18. GROUT					
FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT		
0 ft.	11 ft.	neat cement	Pour		
11 ft.	13 ft.	bentonite	Pour		
ft.	ft.				
19. SAND/GRAVEL PACK (if applicable)					
FROM	TO	MATERIAL	EMPLACEMENT METHOD		
13 ft.	30 ft.	#2 sand	Pour		
ft.	ft.				
20. DRILLING LOG (name additional sheets if necessary)					
FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)			
0 ft.	1 ft.	Asphalt/gravel			
1 ft.	22 ft.	Clayey Sandy/Silt			
22 ft.	30 ft.	Medium sands			
ft.	ft.				
ft.	ft.				
ft.	ft.				
ft.	ft.				
21. REMARKS					

22. Certification:

Signature of Certified Well Contractor: **James D. Barker** Date: **6/27/13**

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:

You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Quality, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Quality, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells: In addition to sending the form to the address(es) above, also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Table 7: Free Product Recovery Information
 Raeford Road Sunoco
 4537 Raeford Road
 Fayetteville, Cumberland County, North Carolina

Date (m/dd/yy)	Well ID #	Product Type (gas, diesel, etc.)	Free Product Recovery Method*	Product Thickness before Recovery (inches)	Product Thickness after Recovery (inches)	Amount of Vaporized Product	Amount of Liquid (Water and Product)	Amount of Liquid Product	Total Amount of Product Recovered (gallons)
10/14/08	MW-1	Gasoline	AFVR	0.56	0				
10/14/08	MW-2	Gasoline	AFVR	0.66	0				
10/14/08	MW-4	Gasoline	AFVR	0.14	0				
10/14/08	MW-6	Gasoline	AFVR	0.54	0				
10/14/08	Total	-	-	-	-	19.9 Gallons	2,288 Gallons	56 Gallons	75.9 Gallons
3/10/09	MW-1	Gasoline	AFVR	0.25	0				
3/10/09	MW-2	Gasoline	AFVR	0.05	0				
3/10/09	MW-4	Gasoline	AFVR	0.40	0				
3/10/09	MW-6	Gasoline	AFVR	0.24	0				
3/10/09	Total	-	-	-	-	2.34 Gallons	2,058 Gallons	10 Gallons	12.34 Gallons
10/14/09	MW-1	Gasoline	AFVR	No Product	0				
10/14/09	MW-2	Gasoline	AFVR	0.01	0				

Table 7: Free Product Recovery Information (Continued)

Date (m/dd/yy)	Well ID #	Product Type (gas, diesel, etc.)	Free Product Recovery Method*	Product Thickness before Recovery (inches)	Product Thickness after Recovery (inches)	Amount of Vaporized Product	Amount of Liquid (Water and Product)	Amount of Liquid Product	Total Amount of Product Recovered (gallons)
10/14/09	MW-4	Gasoline	AFVR	No Product	0				
10/14/09	MW-6	Gasoline	AFVR	0.20	0				
10/14/09	Total	-	-	-	-	4.94 Gallons	1,100 Gallons		4.94 Gallons
4/27/10	MW-1	Gasoline	AFVR	No Product	0				
4/27/10	MW-2	Gasoline	AFVR	0.02	0				
4/27/10	MW-4	Gasoline	AFVR	0.01	0				
4/27/10	MW-6	Gasoline	AFVR	0.01	0				
4/27/10	Total	-	-	-	-	2.69 Gallons	2,058 Gallons		2.69 Gallons
8/7/12	MW-1	Gasoline	AFVR	0.29	0				
8/7/12	MW-2	Gasoline	AFVR	0.30	0				
8/7/12	MW-4	Gasoline	AFVR	0.27	0				
8/7/12	MW-6	Gasoline	AFVR	0.13	0				
8/7/12	Total	-	-	-	-	2.26 Gallons	1,268 Gallons		2.26 Gallons
4/22/13	MW-1	Gasoline	AFVR	2.05	0				

Table 7: Free Product Recovery Information (Continued)

Date (m/dd/yy)	Well ID #	Product Type (gas, diesel, etc.)	Free Product Recovery Method*	Product Thickness before Recovery (inches)	Product Thickness after Recovery (inches)	Amount of Vaporized Product (gallons)	Amount of Liquid (Water and Product)	Amount of Liquid Product	Total Amount of Product Recovered (gallons)
4/22/13	MW-2	Gasoline	AFVR	2.15	0				
4/22/13	MW-4	Gasoline	AFVR	2.25	0				
4/22/13	MW-6	Gasoline	AFVR	1.85	0				
4/22/13	Total	-	-	-	-	1.43 Gallons	1,747 Gallons	7 Gallons	8.43 Gallons

Table 8: Cumulative Volume of Free Product Recovered from Site

Raeford Road Sunoco
4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Date of Recovery Event (m/d/yy)	Total Volume Recovered from Site During Current Recovery Event (gallons)	Cumulative Total of Volume Recovered to Date from All Recovery Events (gallons)
10/14/08	75.9	75.9
3/10/09	12.34	88.24
10/14/09	4.94	93.18
4/27/10	2.69	95.87
8/7/12	2.26	98.13
4/22/13	8.43	106.56

Table 10: Land Use

Raeford Road Sunoco
4537 Raeford Road

Fayetteville, Cumberland County, North Carolina

Map ID #	Date Determined	Land Use Feature (include zoning)	Location (complete street address if applicable)	Distance and Direction from Source Area
1	April 2013	C1P	Adjacent property located across Raeford Road northeast of the Site	Approximately 200 feet northwest
2	April 2013	C1P	Atlas Chiropractic, 4542 Raeford Road	Approximately 200 feet north
3	April 2013	C1P	Adjacent property located across Raeford Road north of the Site Bojangles, 4554 Raeford Road	Approximately 200 feet northeast
4	April 2013	C1P	Adjacent property located south and west of the Site Wachovia Bank, 4549 Raeford Road	Approximately 150 feet west
5	April 2013	R10	Adjacent property located across Scotland Drive northeast of the Site William H. Owen Elementary School, 4533 Raeford Road	Approximately 300 feet southeast

Table 11
Summary of Remediation Schedule and Cleanup Progress Milestones
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina 28304

Remediation Option	Cleanup Progress Milestone	Schedule
Aggressive Fluid Vapor Recovery	Removal of free product	Unknown
Aggressive Fluid Vapor Recovery	Contaminant levels below the GCLs set forth in <i>The Guidelines</i>	Unknown (to be monitored through quarterly monitoring)

Table 12
Cost Estimate for each evaluated Remedial Option
Raeford Road Sunoco (Former Jim's Texaco)
4537 Raeford Road
Fayetteville, Cumberland County, North Carolina 28304

Remedial Option	Estimated Cost
Risk Reduction Mechanisms	Not a viable remediation option
Excavation	Not a reasonable remediation option
Natural Attenuation	\$0
Pump and Treat System	Approximately \$195,000 to \$215,000 for installation and approximately \$15,000 to \$20,000 per quarter for operations and maintenance
Aggressive Fluid Vapor Recovery	Approximately \$4,400 per event