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9307 Monroe Road, Suite K
Charlotte, North Carolina 28270
T 704.846.8853 F 704.846.3271
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REMEDIAL INVESTIGATION WORKPLAN

FOR

R.D. PATE ESTATE

101 East Main Street
Pikeville, Wayne County, North Carolina

SITE ID: NONCD0002795

Latitude: 35° 29' 51.46" North Longitude: 77° 58' 59.91" West

September 15, 2010

PREPARED FOR
Mr. Will Crews, Vice President
Personal Trust Specialist
Branch Banking & Trust Company
Wealth Management Division
P. O. Box 2907
223 West Nash Street
Wilson, North Carolina 27894-2907
(252) 246-4548

FORMER UST OWNER/OPERATOR AND CURRENT PROPERTY OWNER
Richard David Pate
P.O. Box 54
Pikeville, North Carolina 27863

EA Project No. 07-7019.5

Gary K. Sawyer, L.G., RSM
Principal
NC License No. 1337

NORTH CAROLINA LICENSED SEAL 1337 GEOLOGIST GARY K. SAWYER

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1.0 INTRODUCTION

This Remedial Investigation (RI) Workplan describes a Phase One Remedial Investigation to be completed at the R. D. Pate Estate site located in Pikeville, Wayne County, North Carolina (hereinafter referred to as "the Project," Subject Site or Site). The purpose of this Remedial Investigation Work Plan is to describe the approach and methods to be used to assess environmental contamination at the R. D. Pate Estate site. The R. D. Pate Estate Trust currently owns the site, and has entered into an Administrative Agreement with the North Carolina Department of Environment and Natural Resources (NCDENR) to implement a voluntary remedial action under the Registered Environmental Consultant (REC) Program. A copy of the Administrative Agreement is attached. EnviroAssessments (EA) is the REC assigned to this project, and Gary K. Sawyer, P.G. (NC #1337) is the designated Registered Site Manager (RSM) for the remedial action. This Work Plan reports the results of previous assessments at the site and describes the tasks necessary to assess the identified areas of potential concern.

The objective of the investigation is to assess areas of the site that may pose a potential threat to human health and the environment. Previous assessment activities at the site have identified soil and groundwater impact from volatile organic compounds (VOCs). Potential sources of soil and groundwater impact at the Project are a former on-site UST system (previously addressed closure through the NCDENR UST Division) and solvents used at the site during its operation as an automotive repair facility (subject of this investigation).

Also included in this Work Plan is a Field Sampling and Analysis Plan (Appendix A), a Quality Assurance Project Plan (Appendix B), and a Site Health and Safety Plan (Appendix C).

2.0 SITE BACKGROUND INFORMATION

2.1 Site Ownership and History

The subject site is owned by Richard David Pate and consists of approximately 0.12 acres. The Project is located in an urban area at 101 East Main Street in Pikeville, Wayne County, North Carolina. The Project location is depicted on the attached Site Location Map, **Figure 1**. The property contains one approximately 3,397 square foot one-story building constructed in phases throughout the 1940s and 1950s. Historically, the Project operated as an automotive repair facility and service station from the late 1940s to 1992; prior to which it was reportedly residential land. The building most recently operated as an automotive and equipment repair facility known as Historic Sites Maintenance Shop - North Carolina Department of Cultural Resources. The Project is serviced by municipal water and sewer services. The facility is not currently in operation and the site is currently unoccupied. The remainder of the property is utilized as a gravel parking area.

EA reviewed chain-of-title information for the Project at the Wayne County Register of Deeds office.

The current owner of record for the Project is:

Richard David Pate
P. O. Box 54
Pikeville, North Carolina 27863

Grantee	Grantor	Date	Book/Page
Richard David Pate	Edith J. Pate (widow), Wilbert L. Pate, Inez B. Pate, Edna P. Knight, John H. Knight, Frances P. Outland, M. Ellis Outland, A. Lee Pate Jr. and Shirley L. Pate	December 17, 1982	1060/340
John C. Williams and wife Louise Thompson Williams	A. L. Pate and wife Edith Pate	September 15, 1953	401/425

2.2 Former Underground Storage Tank Information

The facility previously operated one 280-gallon heating oil UST which was installed in 1946; one 4,000-gallon gasoline UST and one 3,000-gallon gasoline UST which were installed in 1951; and two 3,000-gallon gasoline USTs which were installed in 1974. The location of the former UST area is depicted on the Site Plan, **Figure 2,** and the UST details are presented in the following table.

Former Underground Storage Tank Data

Tank	Gallons	Installation Date	Closure Date	Contents
1	**280**	**1946**	**11-20-1989**	**Oil**
2	**4000**	**1951**	**11-20-1989**	**Gasoline**
3	**3000**	**1951**	**11-20-1989**	**Gasoline**
4	**3000**	**1974**	**11-20-1989**	**Gasoline**
5	**3000**	**1974**	**11-20-1989**	**Gasoline**

Ownership of the former UST system is unknown. However, the current Property owner of record is:

Richard David Pate
P. O. Box 54
Pikeville, North Carolina 27863.

The USTs were operated under the name Pate's Service Station and Garage (Facility ID #0-002653), and all of the USTs were removed in 1989. According to Ms. Rose Ballance with the NCDENR Washington Regional Office - UST Division, the files regarding the former USTs and LUST incident are archived and are not readily available for review. However, Ms. Ballance advised EA that soil and groundwater at the site were most recently tested by NCDENR on January 26, 2005. According to Ms. Ballance, both soil and groundwater contamination were identified to be below state contaminant levels and the incident was issued a "case closed" status on March 3, 2005. No additional information regarding the details of the closure of the USTs was identified.

2.3 Previous Environmental Assessments and Submittals

2.3.1 Transaction Screen

In June 2007, EA performed a Transaction Screen in conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) Designation: E 1528-06 - *Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process* of the referenced property (the "Project"). The Transaction Screen identified the following "potential environmental conditions" (PECs) in connection with the Project:

- The Project is listed as R.D. Pate Service Station on the LUST and IMD databases (Incident # 7658) and Pates Service Station and Garage on the orphan list as a UST site (Facility ID #0-002653). According to information in the UST database, the Site formerly operated four petroleum underground storage tanks (USTs) and one waste oil UST. The USTs were removed on November 20, 1989. According to information provided by Ms. Rose Ballance with the NCDENR Washington Regional Office UST Division, UST closure reports and soil analysis results are not available. However, Ms. Ballance advised that the site was issued a "low rank" status based on groundwater and soil samples which were taken on January 26, 2005. Ms. Ballance advised that the site was issued a "case closed" status on March 3, 2005.

- Two grease traps are currently located at the Project which were reportedly in operation since 1950. The grease traps receive liquid wastes from the floor of the garage area. The presence of grease traps are a potential source of petroleum and solvent contamination to on-site soil and groundwater.

- Two in-ground hydraulic lifts were reportedly installed at the Project in 1950. The lifts utilized underground oil cylinders. The underground oil cylinders are potential sources of contamination to soil and/or groundwater at the Project as a result of potential leaks from the cylinder systems. In addition, the presence of hydraulic lifts is a potential source of polychlorinated biphenyl (PCB) contamination, based on the installation date (1950).

- The abutting property to the north of the Project (Carolina Cars and Trucks Magazine) currently operates a heating oil underground storage tank (UST). This site is located in an upgradient position relative to the Project and estimated groundwater flow is to the southeast, toward the Project. In addition, the UST was observed to be directly adjacent to the Project, within five feet of its exterior wall. Based on the proximity of the heating oil UST to the Project and estimated groundwater flow direction, the potential exists that an undocumented release from this UST has impacted the Project.

- Pikeville Medical Supply is located to the northwest of the Project at 107 Northwest Railroad Street and is listed on the Leaking Underground Storage Tank (LUST) and Facility Index (IMD) databases (Incident #5738). On-site reconnaissance identified this site as approximately 170 feet to the northwest and upgradient of the Project. EA personnel contacted Ms. Rose Ballance with the NCDENR Washington Regional Office UST Division for further information regarding the site. Ms. Ballance advised that the site is a "State Lead" site and referred EA personnel to Mr. Scott Ryals with the NCDENR Raleigh Regional Office UST Division. Mr. Ryals advised that he has limited information regarding the site; however Mr. Ryals advised that the site formerly operated heating oil USTs and is currently ranked as "Low" risk. Mr. Ryals advised that further information regarding the site was not available. However, comments in the EDR report identified the site as potentially high-risk and recommended a Limited Site Assessment should be performed at the site in comments recorded on March 22, 2006. On-site reconnaissance identified the site to be unoccupied. However, signage denoting the site to have formerly operated as Pikeville Medical was still present.

- First American Savings Bank (currently a residence), located adjacent to the south of the Project at 100 Main Street, is listed on the IMD and LUST databases (Incident #11563). On-site reconnaissance identified this site as adjacent to the south of the Project across East Main Street. EA personnel contacted Ms. Rose Ballance with the NCDENR Washington Regional Office UST Division for further information regarding the site. Ms. Ballance advised that the site is a "State Lead" site and referred EA personnel to Mr. Scott Ryals with the NCDENR Raleigh Regional Office UST Division. Mr. Ryals advised that he has limited information regarding the site; however Mr. Ryals advised that the site previously operated one heating oil UST which was removed from the site in 1993. According to Mr. Ryals, results of the UST closure assessment identified hydrocarbon contamination concentrations exceeding soil action levels. Mr. Ryals advised that the site is currently ranked as "Intermediate" risk. Mr. Ryals advised that further information regarding the site was not available. On-site reconnaissance identified the site to be a single family residence and currently occupied.

2.3.2 Phase II Environmental Site Assessment

In July 2007, at the request of BB&T, EA performed a subsurface investigation (Phase II ESA) at the Project. The investigation was conducted to further evaluate soil and groundwater in the location of the site's former petroleum USTs. The subsurface investigation confirmed the presence of petroleum contamination in soil and groundwater. The constituents identified in the soil and groundwater appeared to be a result of releases associated with the former on-site UST system and/or former on-site operations. Groundwater samples WS-1 and WS-2, both of which were collected within the boundaries of the Project's former UST basin, revealed one or more constituents at concentrations which exceeded their respective NCAC 2L Groundwater Standards by a factor of 10 or more. Additionally, EA personnel identified one water supply well located approximately 100 feet to the east of the source area during initial reconnaissance.

Results of the assessment activities were submitted to the R.D. Pate Estate in EA's *Report of a Phase II Environmental Site Assessment*, dated July 25, 2007. Written notice of the release was subsequently provided verbally and by written form to the NCDENR Washington Regional Office by EA. On August 16, 2007, a 24-hour Release Report was submitted by EA to the North Carolina Department of Environment and Natural Resources (NCDENR) on behalf of the R.D. Pate Estate.

2.3.3 Phase II Limited Site Assessment (LSA-II)

On September 5, 2007, EA personnel utilized a track-mounted Geoprobe unit for the installation of four monitoring wells (MW-1 through MW-4) at the site. MW-1 was installed approximately 4 feet from the northwest corner of the subject building along Northeast Railroad Street in an assumed up-gradient location. MW-2 was installed approximately 26 feet from the southwest corner of the subject building at the intersection of Northeast Railroad Street and East Main Street in an assumed cross-gradient location. MW-3 was installed approximately 30 feet east of Northeast Railroad Street and approximately 15 feet south of the southern elevation of the subject building in an assumed down-gradient location. MW-4 was installed approximately 8 feet from the southeast corner of the subject building in an assumed down-gradient location. Groundwater was encountered at approximately 6.5 feet BG at the time of drilling.

EA collected a soil sample from each of the LSA monitoring well locations, as the exact source area was unknown. One soil sample was collected during each well installation (S-1, S-2, S-3 and S-4). All soil samples were collected from a boring depth of 4 feet BG. The soil samples were analyzed for volatile and semi-volatile organic compounds by EPA Methods 8260/8270, as well as volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH) using the Massachusetts Department of Environmental Protection (MADEP) Methods.

Laboratory analysis of soil sample S-2-4, collected from the monitoring well boring location (MW-2) at a depth of 4 feet BG, revealed slightly elevated levels of Benzene at a concentration of 0.473 milligrams per kilogram (mg/kg), exceeding its respective Soil-to-Water MSCC of 0.0056 mg/kg. Several additional common petroleum constituents were also identified at this soil sample location at concentrations which exceeded their respective Soil-to-Water MSCCs. None of the concentrations exceeded the Residential MSCCs. None of the target analytes were detected in soil samples S-1-4, S-3-4 or S-4-4.

The groundwater samples from MW-1 through MW-4 were analyzed for volatile and semi-volatile organic compounds by EPA Methods 8260/8270, as well as volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbons (EPH) using the Massachusetts Department of Environmental Protection (MADEP) Methods. The groundwater samples from each of the monitoring wells revealed levels of target analytes which exceed the state's minimal reporting action limit, the NCAC 2L Groundwater Standards. The compounds included common petroleum and solvent-related contaminants. MW-1 revealed concentrations of 2 chlorinated solvent target analytes, Trichloroethene (TCE) and 1,1,2,2-Tetrachloroethane, which exceed their respective NCAC 2L Groundwater Standards. MW-2 revealed concentrations of TCE and 1,1,2,2-Tetrachloroethane (chlorinated solvent analytes) and Diisopropyl Ether and Benzene (petroleum-related analytes); all of which exceed their respective NCAC 2L Groundwater Standards. MW-3 revealed concentrations of the petroleum-related analytes Diisopropyl Ether; Benzene; and Naphthalene; all of which exceed their respective NCAC 2L Groundwater Standards. MW-4 revealed concentrations of the petroleum-related analytes Total Xylenes and Naphthalene, both of which exceed their respective NCAC 2L Groundwater Standards.

The source of the petroleum-related compounds (Benzene, Xylenes and Naphthalene) appears to be the western side of the former UST basin. The source of the chlorinated solvent-related compounds (TCE and 1,1,2,2-Tetrachlroethane) appears to be the area of the site located between the garage doors and the former UST basin. The lateral extents of the chlorinated solvent contamination plumes in groundwater have not been defined in the down-gradient direction and the extent of impact to off-site properties has not been determined.

Based on water table elevation data collected on September 11, 2007, the groundwater flow direction is calculated to be toward the northwest. The hydraulic gradient in the study area is calculated to be 0.006 ft./ft.

One out-of-use water supply well was identified on the eastern adjacent property (Phil Hardy residence) during the LSA-II field activities. No other water supply wells were identified within 500 feet of the Project. Results of EA's Phase II Limited Site Assessment are summarized in a *Phase II Limited Site Assessment Report*, dated October 8, 2007, and submitted to the NCDENR Washington Regional Office under separate cover.

2.3.4 Well Abandonment and Notice of Residual Petroleum

EA recommended proper abandonment of the water supply located approximately 100 feet to the east of the Project on the adjacent property owned by Phil Hardy. The out-of-use water supply well identified at the Hardy residence was abandoned on December 18, 2007. The well abandonment record and a copy of the filed Notice of Residual Petroleum (on file with the Wayne County Register of Deeds) were submitted to the NCDENR Washington Regional Office on December 20, 2007. This activity allowed re-classification of the incident as "low risk" and closure of the petroleum-related incident pending filing of a deed restriction to address the remaining petroleum contamination in on-site soil and groundwater. Concluding on January 7, 2008, the NCDENR Division of Waste Management (DWM), Washington Regional Office approved the Notice of Residual Petroleum filed with the Wayne County Register of Deeds in Book 1060, Page 340 by EA on behalf of Pamela Watson of Branch Banking & Trust Company (Trustee of R.D. Pate Family Trust). In addition, a *Notice of No Further Action* issued by the DWM on January 7, 2008 concluded that soil contamination exceeds the industrial/commercial MSCCs established in Title 15A NCAC 2L .0411. However, the DWM has determined that no further action is warranted for the petroleum related incident at this time.

2.3.5 Additional Soil and Groundwater Assessment (June 2008)

2.3.5.1 Additional Soil Assessment

As of June 2008, no confirmed source areas (areas of concern) regarding chlorinated solvents had been identified at the Project. The source area of the solvent contamination identified in monitoring wells MW-1 and MW-2 (September 2007) had not been identified. The petroleum constituents identified in LSA-II soil sample S-2-4 was addressed with the previously discussed Notice of Residual Petroleum (**Section 2.3.4**).

On June 3, 2008, 22 additional soil borings were advanced at the site to assess subsurface conditions in areas of concern not previously investigated, and to better define conditions in those areas previously investigated (**Figure 4**). Shallow soil borings were completed using direct push (Geoprobe) equipment. Drilling equipment was cleaned with a high-pressure steam cleaner prior to drilling. Decontamination residues were containerized for proper disposal.

Soil borings were advanced to a target depth of approximately 12 to 16 inches below grade. One soil sample was collected from each boring, with the exception of SB-11-1 due to poor recovery. Soil samples were subdivided for field screening and laboratory analysis, and evaluated and described in the field by qualified personnel. Field screening of soil samples with a photoionization detector (PID) was also completed.

A total of 21 soil samples were submitted for laboratory analysis. The soil samples were submitted to Genapure in Charlotte, North Carolina (a North Carolina-certified laboratory) for analysis of volatile organic

compounds (VOCs) by EPA Method 8260 and Total Hazardous Substance List Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium and zinc).

In summary, soil sample SB-1-1 (automobile service area) revealed a 1,1,2,2-Tetrachloroethane concentration of 0.00327 mg/kg, which exceeds the Soil Remediation Goal for Human Health of 0.0012 mg/kg. As a result, this area has been identified as Area of Potential Concern (AOPC) # 1 – Automobile Service Area (**Section 4.3.1**).

The compound 1,1,2,2-Tetrachloroethane was also identified in soil samples SB-7-1, SB-8-1 and SB-9-1 at concentrations which exceeded the Soil Remediation Goal for Human Health of 0.0012 mg/kg. This compound was not identified in the other soil samples. The compound Trichloroethene (TCE) was also identified in soil samples SB-7-1 and SB-8-1, though their respective concentrations fell below the Soil Remediation Goal for TCE. Soil samples SB-7-1, SB-8-1 and SB-9-1 were collected in the vicinity of a grease trap within the Project's garage area. This area has been identified as AOPC # 2 – Grease Trap Area (**Section 4.3.2**).

Other VOCs identified at the Project to date have been petroleum-related compounds, apparently as a result of the site's historical use a petroleum filling and service station. The petroleum-contaminated soil that remains at the site has been addressed through a Notice of Residual Petroleum (**Section 2.3.4**) and requires no additional assessment or delineation.

2.3.5.1 Additional Groundwater Assessment

On June 3, 2008, EA personnel installed an additional groundwater monitoring well (MW-5) within the garage area, near AOPC # 1. The well was installed to a depth of 14 feet below grade. An off-site well (MW-6) was installed on the southern adjacent residential property across East Main Street (former First American Savings Bank) to help define the lateral extent of the groundwater contaminant plume. MW-6 was also installed to a total depth of 14 feet below grade.

Prior to sampling, EA personnel purged the monitoring wells of at least five well volumes and allowed the monitoring wells to equilibrate. After the wells were fully purged, a groundwater sample was collected from monitoring wells MW-1 through MW-6. The groundwater samples were submitted to Genapure in Charlotte, North Carolina (a North Carolina-certified laboratory) for analysis of volatile organic compounds by EPA Method 8260 and Total Hazardous Substance List Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium and zinc).

In summary, monitoring wells MW-1 and MW-2 were the only wells to reveal concentrations of solvent-related compounds. Monitoring well MW-1 revealed a 1,1,2,2-Tetrachloroethane concentration of 9.78 ug/L, which exceeds its respective Groundwater Remediation Goal of 0.2 ug/L. MW-1 also revealed a Trichloroethene concentration of 2.71 ug/L, which does not exceed the Groundwater Remediation Goal of 3 ug/L. No other solvent-related compounds were identified in MW-1.

Laboratory analysis of MW-2 revealed a minor concentration of cis-1,2 Dichloroethene (21 ug/L), which did not exceed its respective Groundwater Remediation Goal of 70 ug/L. No other solvent-related compounds were identified in MW-2. Levels of Manganese (73.9 ug/L) and Lead (63.6 ug/L) also exceeded the

Groundwater Remediation Goals of 50 ug/L and 15 ug/L, respectively.

MW-3 revealed a slightly elevated level of Lead (18.7 ug/L), which exceeded the Groundwater Remediation Goal of 15 ug/L. All of the other petroleum-related constituents identified in MW-3 have been already addressed with the aforementioned Notice of Residual Petroleum.

MW-4 revealed levels of Manganese (132 ug/L) and Lead (241 ug/L) which exceeded their Groundwater Remediation Goals of 50 ug/L and 15 ug/L, respectively. No other contaminants of concern exceeded the Groundwater Remediation Goals in MW-4.

MW-5 revealed levels of Manganese (54.1 ug/L) and Lead (30.5 ug/L) which exceeded their Groundwater Remediation Goals of 50 ug/L and 15 ug/L, respectively. No other contaminants of concern exceeded the Groundwater Remediation Goals in MW-5.

No contaminants of concern exceeded the Groundwater Remediation Goals in off-site well MW-6.

2.3.5 Inactive Hazardous Sites Branch (IHSB) – REC Program Administrative Agreement

Regarding the chlorinated solvent compounds in groundwater, EA recommended that the chlorinated solvent contamination in groundwater be reported to the state's Inactive Hazardous Sites Branch (IHSB) in order that a determination is made as to any additional requirements for assessment or remediation. The Notice of *No Further Action* issued by the DWM on January 7, 2008 concluded that the groundwater contamination meets the cleanup requirements for a "low-risk" site but exceeds the gross contamination levels established in 15A NCAC 2L .0202. On June 11, 2008, EA entered into an Administrative Agreement with Ms. Pamela Watson, Branch Banking and Trust Company, Executor and Trustee for the R.D. Pate Family Trust to enter into the Registered Environmental Consultant (REC) Program under the direction of the NCDENR IHSB pursuant the Inactive Hazardous Sites Act of 1987 (N.C.G.S. 130A-310 *et seq.*). The scope of work for this phase of remedial action includes the completion of a Remedial Investigation Workplan.

2.4 Regulatory and Hazardous Substance Information

2.4.1 Environmental Permits

No environmental permits have been identified for the Project during the course of this investigation.

2.4.2 Petroleum and Hazardous Substances

EA personnel have identified petroleum products and/or hazardous substances at the Project during on-site reconnaissance, which are summarized in the table below.

Substance	Purpose
Tractor Oil	Automotive/Tractor Repair Operations
Gear Lubricant	Automotive/Tractor Repair Operations
Welding Gases	Automotive/Tractor Repair Operations
Waste Antifreeze (55-gallon drum)	Automotive/Tractor Repair Operations
Antifreeze	Automotive/Tractor Repair Operations
Paint	Automotive/Tractor Repair Operations/Facility Maintenance
Gasoline (Several one-, three- and five-gallon containers)	Automotive/Tractor Repair Operations
Kerosene (five-gallon container)	Unknown

2.5 Physical and Environmental Setting

2.5.1 Site Geology

Based on a review of the geologic map (North Carolina Geological Survey, 1985) of the site vicinity, the Project is located in the Yorktown Formation of the Coastal Plain Physiographic Province of North Carolina. The Yorktown Formation is of Pliocene age and consists primarily of fossiliferous clay with varying amounts of fine grained sand and bluish gray shell material commonly concentrated in lenses. This region of the Coastal Plain is typically underlain by schist, granite or volcanic basement rock varying in thickness from a few feet near bedrock outcrops to over 500 feet in some areas. Based on the soil borings performed at the property, the soils at the site consist of dark brown silty clay to light brown silty sand from the surface to approximately four feet BG.

2.5.2 Groundwater

EA personnel purged monitoring wells (MW-1 through MW-4) of at least 5 well volumes of groundwater and allowed the monitoring wells to equilibrate before gauging water levels on September 11, 2007, using a Heron water level meter. The depth to the groundwater table ranged from 5.70 feet BG (MW-4) to 6.59 feet BG (MW-1). Using a SpectraVision Laser Level, EA personnel surveyed the elevations of the tops of each well casing. Using an assumed benchmark elevation, EA calculated relative well casing elevations. Using the water table depths, EA then calculated the relative water table elevations at each well point. All of the monitoring wells appear to be hydraulically connected as part of the same surficial water table aquifer. Based on water table elevation data collected on September 11, 2007, the groundwater flow direction is calculated to be toward the northwest. The hydraulic gradient in the study area is calculated to be 0.006 ft./ft.

2.5.3 Water Supplies

The majority of properties surrounding the Project site are served by the municipal water supply provided by Wayne County Water District. The municipal water is provided by wells that are located in the southeast portion of the county near the Lenoir and Wayne county line and in the western portion of the county near the Johnston and Wayne county line. None of the public supply wells are located within a 25 mile radius of the town of Pikeville. The distribution lines for the water supply are routed along adjacent road rights-of-way.

The surrounding properties are primarily commercial in nature. East Main Street fronts the Project to the south and Northeast Railroad Street fronts the Project to the west. The Project and the surrounding sites are served by the municipal water and sewer system; however, the property owned by Mr. Phil Hardy adjacent to the east located at 103 East Main Street formerly maintained an "open" water supply well. The out-of-use water supply well identified at the Hardy residence was abandoned on December 18, 2007. No other wells were identified within 1,500 feet of the Project during the LSA-II field activities conducted by EA.

As specified in the REC program rules, a search for private and municipal water supply wells and surface water intakes was conducted as part of the planning for this Remedial Investigation Workplan. EA performed a receptor survey to confirm the presence or absence of: public water supply wells, public water sources and wellhead protection areas located within a half mile of the site through search of municipal, county or water district records; unregistered or unmarked private water supply wells within one-half mile (2,640 feet) of the site including a door to door survey; surface water features within one-half mile (2,640 feet) of the site; subsurface structures such as underground utilities or basements, located onsite or adjacent properties; land use and zoning on site and adjacent properties; areas of public assembly such as schools, parks, and churches within one-half mile (2,640 feet) of the site; and environmentally sensitive areas such as wetlands, designated high quality waters, and areas documented to be endangered or threatened species habitats within one-half mile (2,640 feet) of the site.

During the week of January 11, 2008, EA personnel performed a receptor survey which consisted of attempting to personally contact all property owners and/or occupants within one-half mile (2,640 feet) of the Project. The receptor survey consisted of visual reconnaissance and interviews with property owners/occupants. The visual reconnaissance of properties located within one-half mile (2,640 feet) of the Project indicated that municipal water and sewer services are available to all businesses and residences in the vicinity. All occupied residential properties located within one-half mile (2,640 feet) of the Project are connected to the Town of Pikeville municipal water supply. However, visual reconnaissance of the vicinity and personal interviews with property owners/occupants revealed the presence of residential water supply wells (well houses, vaults, enclosures, etc.) on several properties within one-half mile (2,640 feet) of the Project. To date, twenty-eight (28) water supply wells have been identified within 2,640 feet of the subject site. Six (6) of those water supply wells are reported still in use (have not been abandoned). Seventeen (17) of those identified wells have an unknown well status and five (5) of the identified water supply wells have reportedly been abandoned. None of the 28 water supply wells identified within the one-half mile search radius are utilized for drinking water. Six (6) additional wells were identified just outside the one-half mile search radius (2,620 – 3,000 feet from the Project).

EA recommended proper abandonment of the water supply located approximately 100 feet to the east of the Project on the adjacent property owned by Phil Hardy. The out-of-use water supply well identified at the Hardy residence was abandoned on December 18, 2007. The well abandonment record and a copy of the filed

Notice of Residual Petroleum (on file with the Wayne County Register of Deeds) were submitted to the NCDENR Washington Regional Office on December 20, 2007. This activity allowed re-classification of the petroleum release incident (Incident No. 7568) as "low risk" and closure of the petroleum-related incident pending filing of a deed restriction to address the remaining petroleum contamination in on-site soil and groundwater. Concluding on January 7, 2008, the NCDENR Division of Waste Management (DWM), Washington Regional Office approved the Notice of Residual Petroleum filed with the Wayne County Register of Deeds in Book 1060, Page 340 by EA on behalf of Pamela Watson of Branch Banking & Trust Company (Trustee of R.D. Pate Family Trust). In addition, a *Notice of No Further Action* issued by the DWM on January 7, 2008 concluded that no further action is warranted for the petroleum related incident at this time.

Detailed water supply well information is included in **Table 1** and property owner locations are shown on **Figure 3**. Completed Water Supply Well Information Surveys have been attached as **Appendix D**.

2.5.4 Surface Water

The nearest surface water body is an intermittent drainage feature of The Slough, located approximately 1,500 feet south of the source area of release (**Figure 1**).

2.5.5 Land Use

The Project is located in an area of Pikeville consisting of single family residences, commercial properties and undeveloped land. Residential properties and undeveloped land bound the Project to the east and south, and commercial properties bound the Project to the north and west.

2.5.6 Environmentally Sensitive Areas

The REC program requires a search for the presence of environmentally sensitive areas on or adjacent to the site as part of the remedial investigation planning process. The REC Implementation Guidance provides a list of specific areas to be investigated, as well as applicable government agencies to be contacted. The agencies listed in the REC Guidance were contacted during January and February of 2009, by phone and/or internet inquiry as applicable. The search did not identify any environmentally sensitive areas on or adjacent to the site. Detailed information associated with the search is summarized in **Table 2**.

In addition to the search for environmentally sensitive areas, the REC guidelines require that the following be determined:

1. *Is there evidence of dead domestic animals or wildlife or stressed vegetation in the area of contamination?*

   EA personnel have not identified any dead domestic animals or wildlife, or evidence of stressed vegetation during on-site field activities.

2. *Is there undisturbed land on or contiguous to the site that would likely serve as a natural area attractive to ecological receptors?*

   The adjacent property to the east (103 East Main Street) currently exists as an undeveloped lot; however, the lot is landscaped with grass that is routinely mowed. Because the surrounding properties are commercial in

nature, the adjacent lot is not viewed as significant habitat for terrestrial or aquatic receptors.

3.0 TECHNICAL APPROACH AND DATA QUALITY OBJECTIVES

As previously described, the objective of the investigation includes assessing areas of the site that may pose a potential threat to human health and the environment. Assessment activities include data gathering and analysis to evaluate the nature and general extent of contaminants of concern (COC) at the site. The data must be of sufficient quality and quantity to support subsequent site-related activities (e.g., risk assessment/evaluation, feasibility studies, etc.).

3.1 REC Program Objectives

The overall goals of this remedial investigation as defined under the REC Program are summarized below:

- identify all releases of hazardous substances to the environment;
- identify potential exposure pathways;
- characterize the chemical nature of such releases and collect sufficient sampling data to support a cleanup-level determination;
- delineate the lateral and vertical extent of contamination; and
- characterize site conditions sufficiently to conduct a feasibility study of remedial alternatives and to support a proposed remedy.

3.2 Data Quality Objectives (DQOs)

The following Data Quality Objectives (DQOs) have been established for this Project. A Quality Assurance Project Plan (QAPP) is attached as Appendix B, and further discusses QA/QC issues.

- Sufficient information should be provided to locate and adequately assess sources of contamination, and to ascertain if there is a threat to public health or the environment;
- If contamination is present, the data should allow adequate delineation of the horizontal and vertical limits in a given environmental medium (e.g., soil), and a determination of whether other environmental media have been impacted (e.g., groundwater, surface water, etc.);
- The laboratory data should allow for an adequate assessment of site conditions, so the REC can adequately determine if Preliminary Remediation Goals have been met, or determine what remedial measures will be necessary to attain remediation goals;
- If human health or ecological risk assessment is performed to evaluate the relative risks posed by site conditions, and possibly to determine site-specific remedial goals, the level of uncertainty in the data set will need to be quantified, and that uncertainty must fall within acceptable limits

For the R. D. Pate Estate site, DQOs will be initially based on available knowledge of the site. DQOs will be revised when data is collected and elements are no longer relevant. DQOs will be evaluated with respect to data quality control, implications relative to the determination of the nature and extent of impact, implications relative to potential remedial alternatives, and implications relative to public health and ecology.

3.3 Detection and Notification Requirements

As stated in the REC Program Guidelines, the primary obligation of the Registered Environmental Consultant is to "protect public health, safety, and welfare and the environment in the performance of professional services." The REC Program Guidelines also state that the NCDENR is to be notified within 24 hours following the discovery of the following:

- An imminent hazard at the site;
- Off-site migration of hazardous substances;
- The presence of sensitive environments on the site; or
- The presence of mixed (radioactive and chemical) wastes on the site.

4.0 PROPOSED REMEDIAL INVESTIGATION ACTIVITIES

The activities to be performed during the Remedial Investigation are outlined in this section. Field sample collection techniques and procedures are included in the Field Sampling and Analysis Plan (FSAP, Appendix A). Analytical information and information concerning the QA/QC process are included in the Quality Assurance Project Plan (QAPP, Appendix B). EA proposes investigation activities to thoroughly evaluate the site's status with regards to soil and groundwater contamination. The proposed activities are presented in the following sections. Tentative locations for soil borings and monitoring wells are depicted on **Figure 4**. It should be noted that the planned field activities and sampling locations are approximate, and will be adjusted as necessary based on field observations.

4.1 Pre-Assessment Activities

Prior to mobilizing to the site to implement the Phase I RI Work Plan (Work Plan), the following activities will be completed.

4.1.1 Health and Safety Plan Training

A project-specific Health and Safety Plan (HASP) has been prepared for the implementation of the Work Plan (Appendix C) that includes procedures to eliminate or minimize job hazards to site workers and the surrounding community.

4.1.2 Utility Clearance

At least 72 hours prior to conducting invasive activities, the North Carolina underground utility locating service, NC One Call, will be notified. Most of the sampling locations will be within the Project property boundaries and out of the service area for NC One Call; therefore, a private underground utility locating service will be used to identify underground utilities in areas planned for invasive sampling activities. This subsurface survey work will be completed and verified prior to conducting invasive site work.

4.2 PROCEDURES TO CHARACTERIZE SITE GEOLOGY AND HYDROGEOLOGY

Based on a review of facility operations and the results of previous environmental assessments, the site geology and hydrogeology has been investigated and characterized in detail. The following procedures will be used to review and further characterize the site geology and hydrogeology, and assess soil and/or groundwater at the identified areas of concern (Figure 4). The constituents of concern (COCs) for this Phase I RI include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and hazardous substance list metals.

4.3 CRITERION FOR PLANNED SOIL AND GROUNDWATER SAMPLING

The tasks below are generally listed in order of anticipated completion:

- Background and upgradient locations will generally be investigated first. Background soil samples will be collected to determine background concentrations of metals, and upgradient monitoring wells will be installed to assess for contaminant sources coming onto the Project, and to help with local groundwater flow information.

- In areas of concern not previously investigated, initial soil borings will be completed first, and selected soil samples from that boring will be analyzed for applicable parameters. Laboratory analytical results will determine if the area is a source of contamination, and what contaminants of concern are present. Subsequently, additional soil borings and/or monitoring wells will be installed.

- If surface water and sediment sampling is deemed necessary, sampling will progress from downstream locations to upstream locations, in order to minimize the potential for disturbance of sediment and sample cross-contamination.

4.3.1 AOPC # 1 – Automobile Service Area

Though there has been no evidence of groundwater contamination in this area (vicinity of MW-5), in order to rule out soil contamination caused by automobile repair activities in this area, soils investigation is warranted. One (1) soil sample was collected from this area in June 2008 (SB-1-1) and revealed a 1,1,2,2-Tetrachloroethane concentration of 0.00327 mg/kg, which exceeded its Soil Remediation Goal for Human Health (0.0012 mg/kg). No additional soil samples have been collected from this area.

EA will conduct additional soil samples from this area generally within the upper 12-16 inches of the land surface. Samples will be collected below the organic topsoil (A) horizon. The soil samples will be collected using a decontaminated hand auger. The soil samples will be analyzed for the 13 priority pollutant metals by EPA methods 6010/7471; semi-volatiles organic compounds (SVOCs) by method 8270 and volatile organic compounds (VOCs) by method 8260.

EA will run the library search for the 10 tentatively identified compounds (TICs) on the SVOCs and VOC samples in AOPC #1 and on samples where analysis is done for VOCs and SVOCs.

In AOPC # 1, if soil sample results indicate exceedances of N.C. Inactive Hazardous Waste Sites Branch's (IHSB's) Soil Remediation Goals, then the soils will be delineated in a subsequent phase of soil sampling and analysis.

4.3.2 AOPC # 2 – Grease Trap Area

Three (3) soil samples were collected from this area in June 2008 (SB-7-1 through SB-9-1), all of which revealed 1,1,2,2-Tetrachloroethane concentrations which exceeded the Soil Remediation Goal for Human Health (0.001 mg/kg). No additional soil samples have been collected from this area.

EA will conduct additional soil samples from this area generally within the upper 12-16 inches of the land surface. Samples will be collected below the organic topsoil (A) horizon. The soil samples will be collected using a decontaminated hand auger. The soil samples will be analyzed for the 13 priority pollutant metals by EPA methods 6010/7471; semi-volatiles organic compounds (SVOCs) by method 8270 and volatile organic compounds (VOCs) by method 8260.

EA will run the library search for the 10 tentatively identified compounds (TICs) on the SVOCs and VOC samples in AOPC #1 and on all samples where analysis is done for VOCs and SVOCs.

In AOPC # 2, as with all of the areas, if soil sample results indicate exceedances of IHSB Soil Remediation Goals, then the soils will be delineated in a subsequent phase of soil sampling and analysis.

4.3.3 Other Areas

In order to thoroughly delineate groundwater contamination on-site, EA will conduct groundwater sampling in areas not previously investigated in great detail. A review of the groundwater data indicates that VOCs west of MW-1 and southwest of MW-2 require further delineation. Therefore, EA will collect groundwater samples using newly proposed monitoring wells, installed via direct push technology, from these areas. All groundwater samples will be collected using low flow technologies. These areas are shown on **Figure 4**. The groundwater samples will be analyzed for the 13 priority pollutant metals by EPA methods 6010/7471, semi-volatiles organic compounds (SVOCs) by method 8270 and volatile organic compounds (VOCs) by method 8260. If groundwater sample results indicate exceedances of 15A NCAC 2L groundwater standards, then the groundwater plume will be delineated in a subsequent phase of groundwater sampling and analysis.

4.4 SAMPLING METHODS

The procedures for sample collection, preservation, handling, chain of custody, field-equipment operation, decontamination and preventive maintenance will follow the USEPA, Region IV, Science and Ecosystem Support Division (SESD) *Field Branches Quality System and Technical Procedures* (FBQSTP). The FBQSTP supersedes the *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (EISOPQAM), dated November 2001. The most recent version of the FBQSTP is located at www.epa.gov/region4/sesd/fbqstp. Additionally, the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Waste Management, Superfund Section, Inactive Hazardous Sites Branch (IHSB), Inactive Hazardous Site Program *Guidelines for Assessment and Cleanup*, dated October 2009, will be followed.

4.4.1 Sampling Equipment and Containers

Field personnel responsible for sampling will verify availability of the necessary equipment for obtaining soil, water, and sediment samples at the site. A routine equipment check will be performed that includes the following:

- Meters, calibration standards and other field measurement equipment;
- Appropriate sample containers with labels;
- Applicable trip blanks;
- Sample shippers or coolers;
- Bagged ice;
- Electronic water-level indicator;
- Field sampling equipment
- Field book and indelible ink marker;
- Appropriate field sampling record forms;
- Chain of Custody forms;
- Cleaning and decontamination solutions, analyte-free water, and decontamination equipment.

The laboratory will provide all the necessary sample containers and will prepare the sample containers so that they comply with applicable preparation methods and quality assurance procedures.

4.4.2 Groundwater Sampling

Groundwater samples will be collected from existing permanent monitoring wells and from proposed wells to be installed via direct push methods. The locations and rational for proposed groundwater samples is described above.

4.4.2.1 Monitoring Well Installation

Selected soil borings in or near areas of concern, and in upgradient and downgradient locations across the site, will be completed as monitoring wells. During this Remedial Investigation, approximately 6 additional monitoring wells are planned to assess groundwater conditions in areas of concern not previously investigated, and to better define conditions in those areas previously investigated (**Figure 4**), including upgradient, cross-gradient and downgradient locations. At least one of the proposed monitoring wells will be installed as a deep well in a downgradient location (vicinity of MW-1) to help define the vertical extent of the groundwater contaminant plume. Proposed monitoring well installations will be conducted via direct push technology using a track-mounted Geoprobe unit. The wells will consist of 2-inch PVC casing and screen as well as adequate filter pack, bentonite seal and grouting to the ground surface. A protective steal vault will be installed over the well's riser. The screen will be installed in the lower, highly permeable portion of the surficial unconfined

aquifer. All monitoring wells will be constructed in compliance with applicable guidance and standards. Well construction records will be completed and submitted by the drilling contractor.

4.4.2.2 Low-Flow Purging and Sample Collection

Groundwater samples will be collected by low-flow purging techniques to the extent possible. The procedures described below were developed in accordance with the USEPA guidance document "Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells", dated July 30, 1996.

The following steps outline the purging and sample collection activities for low-flow purging and sampling. A peristaltic pump and dedicated Teflon® tubing will be used and low flow rates will be obtained to minimize sample turbidity. If pumping with a peristaltic pump is not practical, a Teflon® bailer will be used to collect samples. Field parameter measurements will be made using instrumentation and a commercially manufactured flow through cell. Groundwater samples will be collected once field parameters have stabilized. The USEPA guidance will be used for purging and sampling procedures only.

1. Determine target depth for location of tubing. Target depth should be the portion of the screened interval that intersects the zone of highest hydraulic conductivity. If the zone of highest hydraulic conductivity is unknown, or if the screen is placed within homogenous material, then the target depth will be the midpoint of the saturated screen length. Primary flow zones should be identified in wells with screen lengths longer than 10 feet, or in wells with open boreholes in bedrock.

2. Measure and record the depth to water. Care should be taken to minimize disturbance of the water column within the well during pre-sample measurements.

3. Decontaminate tubing prior to use (if pumps and tubing are dedicated then this applies to the initial effort only).

4. Carefully lower the tubing to the predetermined target depth. Start the pump at a purge rate low enough to achieve 0.3 feet of drawdown or less based on historical data. If sampling the well for the first time, start the pump at the lowest possible setting (or approximately 100-milliliter [mL] per minute) and slowly increase the speed until discharge occurs. Check the water level. Adjust pump speed until there is little or no drawdown (less than 0.3 feet if possible). If the drawdown achieved at a pump rate of approximately 100 mL per minute exceeds 0.3 feet, but remains stable, continue purging until indicator field parameters stabilize.

5. Monitor and record pumping rate and water levels every three to five minutes (or as appropriate) during purging. Record adjustments to pumping rates as necessary.

6. During purging, monitor field parameters using a flow through cell (the flow through cell cannot be used for turbidity measurements and the sample for turbidity measurement must be collected prior to entering the flow through cell). Purging is considered complete and sampling may begin when the field parameters have stabilized. Stabilization is considered to

be achieved when three consecutive readings, taken at three to five minute intervals, are within the following limits:

- turbidity (+/- 10% for values >1 NTU)
- dissolved oxygen (+/- 10%)
- specific conductance (+/- 10%)
- temperature (+/- 10%)
- pH (± 0.1 standard unit)
- redox potential (± 10 millivolts)

7. The final purge volume must be greater than the stabilized drawdown volume plus the tubing extraction volume.

8. During purging and sampling the tubing should remain filled with water.

9. Disconnect the tubing from the flow through cell to collect the analytical samples. Water samples for laboratory analyses must not be collected after water has passed through the flow through assembly. Fill sample containers directly from the tubing without alterations to the pumping rate.

10. If a VOC sample is to be collected, that fraction will be collected first. The VOC sample container will be completely filled without air space within the container. The remaining samples will be collected for SVOCs, metals, and any other fraction required for the sample location.

11. For subsequent sampling efforts, duplicate the pump intake depth and final purge rate from the initial sampling event (use final pump dial setting information).

12. If using a non-dedicated pump, remove the pump and perform an external rinse with deionized water on the pump and external tubing. Obtain and record a depth to bottom of well measurement before closing the well.

If the above sampling criteria cannot be met after four hours of purging, the following options are available:

- continue purging until stabilization is achieved;
- collect sample using a bailer; or
- discontinue purging and collect samples.

If the recharge rate of the well is less than the lowest possible extraction rate of the pump (i.e., drawdown does not stabilize at a purge rate of approximately 100 mL per minute or less), the purge rate will be increased and the water will be evacuated down to the pump intake level. This will result in several feet of stagnant water below the pump intake that will not be evacuated. The pump should then remain in place, and the well should

be sampled after the water level has recovered to at or near the initial static water level. Collect the sample from the pump at a pumping rate of approximately 100 mL per minute.

4.4.3 Soil Samples

EA will use a decontaminated soil auger as well as direct push technology to collect soil samples at the R. D. Pate facility. All soil sampling activities will be in compliance to the EPA's FBQSTP. Samples for analysis will be collected into pre-labeled, laboratory-supplied sample containers. Detailed information regarding VOC soil sampling is described in detail in **Section 4.7.4** below.

4.4.4 Surface Water Samples

EA will use a decontaminated, stainless-steel Dipper sampling device that consists of a ladle with spout welded onto the end of a handle to collect any necessary surface water samples. The surface water will be decanted from the sampling device. The surface water samples for metals analysis will be collected first, followed by the samples for volatile and semi-volatile organic compound analysis, respectively.

4.4.5 Sediment Samples

Subsequent to collecting any necessary surface water samples, the same dipper sampling device will be used to collect a sample of the sediment at or proximal to each surface-water sample location. The excess water will be decanted off of the sediment sample back into the creek. The sediment will be transferred from the dipper sampling device into pre-labeled, laboratory-supplied sample containers.

4.5 POST-SAMPLING ACTIVITIES

All soil sampling points will be laid out and marked in the field using a high-resolution GPS system. The final sampling points will be transferred onto scaled maps showing key site features and monitoring wells which have been located previously by a registered land surveyor. The GPS coordinates will be tied into surveyed benchmarks.

4.6 INVESTIGATION-DERIVED WASTES

Investigative derived waste (IDW) consisting of soil cuttings, development and purge water from monitoring wells, decontamination fluids, and personnel protective equipment (PPE) are expected to be generated during the Remedial Investigation. The IDW will be containerized in 55-gallon drums, sealed, labeled and staged in a secured area at the site pending characterization. Once the IDW has been characterized, it will be transported from the site for disposal.

4.7 FIELD AND LABORATORY QA/QC PROCEDURES

Documentation of field activities will be completed using a combination of logbooks, field data records (FDRs), sample tracking systems and sample custody records. Site and field logbooks are completed to provide a general record of activities and events that occur during each field task. FDRs have been designed for each exploration and sample collection task, to provide a complete record of data obtained during the activity.

Deviations from the procedures described in the Phase I Remedial Investigation Work Plan will be documented in the field logbooks and applicable FDRs. Such deviations may be dictated by site-specific conditions encountered during the sampling activity.

4.7.1 Field Logbooks

The field logbooks provide a daily hand written account of all field activities. All entries are made in permanent ink, and corrections are made with a single line with the author initials and date. Each page of the logbook will be dated and signed by the person completing the log. Partially completed pages will have a line drawn through the unused portion at the end of each day. The following information is generally entered into the field logbooks:

- The date and time of each entry. The daily log generally begins with weather conditions;
- A summary of important tasks or subtasks completed during the day;
- A description of field tests completed in association with the daily task;
- A description of samples collected including documentation of any quality control samples that were prepared (rinse blanks, duplicates, matrix spikes, split samples, etc.);
- Documentation of equipment maintenance and calibration activities;
- Documentation of equipment decontamination activities; and
- Descriptions of deviations from the work plan.

4.7.2 Field Data Records

Sample FDRs contain sample collection and/or exploration details. A FDR is completed each time a field sample is collected. The goal of the FDR is to document exploration and sample collection methods, materials, dates and times, and sample locations and identifiers. Field measurements and observations associated with a given exploration or sample collection task are recorded on the FDR. FDRs are maintained throughout the field program in files that become a permanent record of field program activities.

4.7.3 Sample Containers and Preservation

Sample container and preservation requirements for samples submitted for off-site analysis will be adhered to strictly during the Phase I Remedial Investigation. The analytical laboratory may substitute other containers depending upon laboratory stock at the time of the sampling event: however, bottle type and preservative will not change.

Soil samples for VOC analysis will be collected in accordance with USEPA SW-846 and analyzed by EPA Method 8260. Samples are collected using sampling kit provided by the laboratory that contains a disposable plastic coring device and four pre-weighed 40 milliliter (mL) glass vials with septum-sealed screwed caps. Two of the vials contain stirring bars and five mL of reagent water (e.g., deionized water) and are used for low-level VOC analysis. One vial is unpreserved for screening and dry-weight determination and one vial contains 10mL of methanol for high-level VOC analysis. The plastic coring device produces a sample volume of approximately five grams.

Four separate five-gram sample volumes are collected from the same soil stratum within close proximity to one another. It is very important to minimize the disturbance of the sample and the transfer of the sample be made as quickly as possible to avoid loss of volatile components. One five-gram sample is placed in each sample vial. The samples will be placed on ice in a sample cooler and maintained at 4° Celsius (C) and all samples must be analyzed within 14 days of sample collection.

4.7.4 Sample Custody Requirements

A program of sample custody will be followed during sample handling activities in both field and laboratory operations. This program is designed to assure that each sample is accounted for at all times. The appropriate sampling and laboratory personnel will complete sample FDRs, chain-of-custody records, and laboratory receipt sheets.

The primary objective of sample custody procedures is to obtain an accurate written record that can trace the handling of all samples during the sample collection process, through analysis, until final disposition.

4.7.4.1 Field Sample Custody

Sample custody for samples collected during each sampling event will be maintained by the personnel collecting the samples. Each sampler is responsible for documenting each sample transfer, maintaining sample custody until samples are shipped off-site, and sample shipment. The sample custody protocol followed by the sampling crews involves:

- documenting procedures and amounts of reagents or supplies (e.g., filters) which become an integral part of the sample from sample preparation and preservation;
- recording sampling locations, sample bottle identification, and specific sample acquisition measures on the appropriate forms;
- using sample labels to document all information necessary for effective sample tracking; and

- completing sample FDR forms to establish sample custody in the field before sample shipment.

Prepared labels are normally developed for each sample prior to sample collection. At a minimum, each label will contain:

- sample location and depth (if applicable);
- date and time collected;
- sampler identification; and
- analyses requested and applicable preservative

A manually-prepared chain-of-custody record will be initiated at the time of sample collection. The chain-of-custody record documents:

- sample handling procedures including sample location, sample number and number of containers corresponding to each sample number;
- the requested analysis and applicable preservative;
- the dates and times of sample collection;
- the names of the sampler(s) and the person shipping the samples;
- the date and time that the samples were delivered for shipping;
- shipping tracking information (e.g., FedEx Air Bill); and
- the names of those responsible for receiving the samples at the laboratory.

Chain-of-custody records will be prepared and tracked by sample delivery group (SDG). SDGs will be identified by field personnel during sampling activities and will include associated field quality control samples.

4.7.4.2 Sample Container Packing

Sample containers will be packed in metal or plastic coolers for shipment or pick up by the laboratory. Bottles will be packed tightly so that no motion is possible. Styrofoam, vermiculite, and "bubble pack" are suitable as packing materials for most instances. Ice will be placed in the cooler along with all paperwork in a separate, resealable, air tight, plastic bag. A temperature blank provided by the laboratory will also be placed in each cooler prior to shipment to verify the cooler was maintained at 4° Centigrade (C) [+/- 2°C] during sample shipment. Custody seals will then be placed on the cooler prior to shipment to or pick up by the laboratory. Cooler custody seals will be used to determine whether the coolers may have been tampered with.

4.7.4.3 Sample Shipment

The standard procedure that will be followed for shipping environmental samples to the analytical laboratory is

provided below. In cases where the samples require shipment:

- Shipping of environmental samples will be done through Federal Express or equivalent overnight delivery service, or through the use of laboratory courier services. The air bill number will be used as receiving signature on the chain-of-custody.
- Prior to leaving for the field, the person responsible for sample collection will notify the analytical laboratory of the number, type and approximate collection and shipment dates for the samples.
- If prompt arrival of the samples cannot be guaranteed, the samplers will be responsible for proper storage of the samples until adequate transportation arrangements can be made.

4.7.4.4 Laboratory Receipt and Custody

Once the samples are received at the analytical laboratory, the field chain-of-custody record is completed and signed by the laboratory's sample custodian. The sample custodian will then initiate laboratory chain-of-custody protocols (comparing sample bottle labels against the field chain-of-custody record and noting any discrepancies, checking cooler temperature upon receipt and notifying the laboratory project manager if any issues are identified).

After sample receipt information is checked and recorded, the sample analysis information is entered into the laboratory's information system. The laboratory provides a unique sample identification number to each environmental sample for internal laboratory sample tracking. The signed field chain-of-custody records will be provided with the laboratory deliverables for the project.

4.7.5 Quality Assurance and Quality Control Samples

The following Quality Assurance/Quality Control (QA/QC) samples will be collected during the Phase I Remedial Investigation:

- Matrix Spike/Matrix Spike Duplicate samples (one per 20 primary samples/per medium);
- Equipment rinse blanks (one per day for VOCs and SVOCs);
- Field duplicates (one per 20 primary samples/per medium); and
- Trip blanks (one per cooler of VOC samples per day).

4.7.6 Surveying

Decisions to be made concerning groundwater flow and potential additional sampling needs will require acquisition of horizontal and vertical locations of monitoring wells/sampling points. Surveying activities will be performed by a State of North Carolina licensed surveyor. If no established benchmark is located near the site, a temporary benchmark will be established to obtain survey data.

4.8 DESCRIPTION OF EQUIPMENT- AND PERSONNEL-DECONTAMINATION PROCEDURES

4.8.1 Decontamination Pad

A decontamination pad will be constructed for field cleaning of sampling and drilling equipment. The decontamination pad will meet the following requirements:

- The pad will be constructed in an area believed to be free of surface contamination.
- The pad will be lined with a water impermeable material with no seams within the pad. The material should be easily replaced (disposable) or repairable.
- If possible, the pad will be constructed on a level, paved surface and facilitate the removal of wastewater. This may be accomplished by either constructing the pad with one corner lower than the rest, or by creating a lined sump or pit in one corner or along one site.
- Sawhorses or racks constructed to hold field equipment while being cleaned will be high enough above ground to prevent equipment from being splashed.
- Wastewater will be removed from the decontamination pad frequently.

At the completion of the field activities, the decontamination pad will be removed and any sump or pit will be backfilled with appropriate material

4.8.2 Decontamination of Field Sampling Equipment

Field sampling equipment (except water level meters) will be decontaminated between sample locations as follows:

- Clean with potable water and phosphate-free detergent solution using a brush, if necessary, to remove particulate matter and surface films.
- Rinse thoroughly with tap water.
- Rinse thoroughly with organic-free water and place on a clean foil-wrapped surface to air dry.
- All equipment must be wrapped in foil. If equipment is to be stored overnight before it is wrapped in foil, it will be covered and secured with clean, unused plastic sheeting.

Water level meters will be cleaned as follows:

- Wash with potable water and phosphate-free detergent.
- Rinse with tap water.

- Rinse with de-ionized water.

4.8.3 Decontamination of DPT Equipment

DPT rods and sampling equipment will be decontaminated between boring locations as follows:

- Clean with potable water and phosphate-free detergent solution using a brush, if necessary, to remove particulate matter and surface films.
- Rinse thoroughly with tap water.
- Remove from decontamination pad and cover with clean, unused plastic. If stored overnight, the plastic should be secured to ensure that it stays in place.

4.8.4 Personnel Decontamination Procedures

It is not expected that field activities will result in the need for personnel decontamination. The soils from cuttings that stick on shoes will be scraped from shoes and placed in drums with the soil cuttings.

5.0 REMEDIAL INVESTIGATION REPORT

Field and laboratory data will be compiled and interpreted during the course of this remedial investigation. In any imminent hazards, off-site migration or sensitive environments are identified, the NCDENR will be notified immediately and the appropriate actions will be taken. Routine information, such as interim results, schedule modifications, etc. will be conveyed in the form of quarterly Progress Reports and communications with NCDENR.

Following the first phase if investigative field work, a Phase One Remedial Investigation Report will be prepared and submitted to the NCDENR. The Remedial Investigation (RI) report of assessment activities will include a discussion of investigation methods as well as deviations from the original work plan. Data collected during the assessment will be compiled into tables and figures. The report will also include a surveyed site map illustrating sample locations, soil test boring/monitoring well construction logs, field screening data, field notes, and laboratory analytical data.

Following submittal of the Phase One Remedial Investigation Report, a Phase Two Remedial Investigation Workplan will be prepared and submitted, if required, and this additional phase of investigation will proceed as necessary in order to fully define the extent of contamination, and to collect the information necessary for remedial action planning, including the feasibility study and remedial design, if appropriate.

6.0 SCHEDULE

The following schedule has been developed for the Phase I Remedial Investigation at the R. D. Pate facility:

Completion of Phase I Remedial Investigation Work Plan	07/15/2010
Submission of Phase I Remedial Investigation Work Plan to NCDENR	09/15/2010
Implementation of Phase I Remedial Investigation	11/15/2010
Preparation of Phase I Remedial Investigation Report	02/15/2011

7.0 CERTIFICATIONS

For Remediating Party and REC certifications, please review the following pages.

North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch

REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(b)(2)):

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Branch Banking + Trust Co, Trustee
Cindi M. Lewis, AVP - BB&T - Environmental Risk Officer
(Name of Remediating Party Official)

* C Lewis
(Signature of Remediating Party Official)

* 9/17/2010
Date

North Carolina (Enter State)

Union **COUNTY**

I, Kimberly L. Gray, a Notary Public of said County and State, do hereby certify that Cindi Lewis did personally appear and sign before me this day, produced proper identification in the form of driver license, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 17 day of September, 2010.

Kimberly L. Gray
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: January 27, 2013

North Carolina Department of Environment
and Natural Resources
Division of Waste Management
Superfund Section
Inactive Hazardous Sites Branch

REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1)):

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Gary K. Sawyer
(Name of Registered Site Manager)

* _____ * 09-22-2010
(Signature of Registered Site Manager) Date

North Carolina (Enter State)
Union **COUNTY**

I, Kimberly L. Gray, a Notary Public of said County and State, do hereby certify that Gary K. Sawyer did personally appear and sign before me this day, produced proper identification in the form of driver license, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 22 day of September, 2010.

Kimberly L. Gray
Notary Public (signature)

(OFFICIAL SEAL)

My commission expires: 1/27/2013

Document Certification Form No. DC - II

TABLES

TABLE 1

ADJACENT OWNERS AND WELL LOCATIONS

TABLE 1

ADJACENT PROPERTY OWNER/OCCUPANT AND WATER SUPPLY WELL SURVEY INFORMATION
R.D. PATE ESTATE
SITE ID: NONCD0002795
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC PROJECT NO. 07-7019.5

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
101 East Main Street (Subject Property)	Richard D. Pate P O. Box 54 Pikeville, NC 27863	3603276476	SITE 1	0	NA	NA	NA	NA	NA
100 East Railroad Street	Robin R. Sutherland P.O. Box 10547 Goldsboro, NC 27532	3603276582	Adjacent North 2	0	NA	NA	NA	NA	NA
103 East Main Street	J. Hardy Tile Inc. 139 Graceland Drive Pikeville, NC 27863	3603277551	Adjacent East 3	1	10	Unknown	Water Supply	Abandoned (2007)	Not In Use
101 Southeast Railroad Street	Richard D. Pate P.O. Box 54 Pikeville, NC 27863	3603277363	Adjacent Southeast 4	0	NA	NA	NA	NA	NA
101 Southeast Railroad Street	Richard D. Pate P.O. Box 54 Pikeville, NC 27863	3603276374	Adjacent Southwest 5	0	NA	NA	NA	NA	NA
North Railroad Street	Charlie B. & Lucinda H. Howell P.O. Box 37 Pikeville, NC 27863	3603274421	Adjacent Southwest 6	0	NA	NA	NA	NA	NA
North Railroad Street	Charlie B. Howell et al P.O. Box 37 Pikeville, NC 27863	3603274426	Adjacent West 7	0	NA	NA	NA	NA	NA
North Railroad Street	Charlie B. Howell et al P.O. Box 37 Pikeville, NC 27863	3603274434	Adjacent West 8	0	NA	NA	NA	NA	NA
Railroad Street	William J. & Carol S. Evans 366 Forehand Road Pikeville, NC 27863	3603274428	Adjacent Northwest 9	0	NA	NA	NA	NA	NA

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
West Railroad Street	Robert Joseph Collier P.O. Box 266 Pikeville, NC 27863	3603274513	Adjacent Northwest 10	0	NA	NA	NA	NA	NA
205 Ham Street	W. H. Pate P.O. Box 129 Pikeville, NC 27863	3603261599	Approximately 800' Southwest 11	1	Unknown	Unknown	Water Supply	Unknown	Unknown
302 East Pope Street	James H. Mercer P.O. Box 372 Pikeville, NC 27863	3603377973	Approximately 1,100' Northeast 12	1	Unknown	Unknown	Water Supply	Open	Heat Pump
365 Washington Street NW	Alan Dean Moore P.O. Box 121 Pikeville, NC 27863	3603094021 3603085947	Approximately 2,533' Northwest 13	1	Unknown	Unknown	Water Supply	Unknown Installed in 1960	Not In Use
305 Washington Street NW	Carlton T. Aycock 305 Washington Street Pikeville, NC 27863	3603087527	Approximately 1,750' Northwest 14	1	Unknown	Unknown	Water Supply	Unknown	Unknown
383 Washington Street NW	Kimberly R. Hause 383 Washington Street Pikeville, NC 27863	3603094290	Approximately 2,620' Northwest 15	1	Unknown	Unknown	Water Supply	Unknown	Unknown
380 Washington Street NW	Danny R. Van Devender 538 Washington Street Pikeville, NC 27863	3603190450 3603184909 3603197478 3604007215	Approximately 1,950' Northwest 16	1 Within Radius	700	170	Water Supply	Open Installed in 2000	Irrigation
308 Washington Street NW	Joseph G. Quinn 308 Washington Street Pikeville, NC 27863	3603181940	Approximately 2,000' Northwest 17	1	Unknown	Unknown	Water Supply	Unknown	Not In Use
789 Princeton Road	Willie R. Person 427 Big Daddy's Road Pikeville, NC 27863	3603061752	Approximately 2,550' West-southwest 18	1	Unknown	Unknown	Water Supply	Unknown	Unknown
801 Princeton Road	Lu-Pearl Tucker 110 Woods Mill Road Goldsboro, NC 27534	2693969770	Approximately 2,620' West-southwest 19	1	Unknown	Unknown	Water Supply	Unknown	Unknown
238 Booker Street	Alice Johnson 238 Booker Street Pikeville, NC 27863	3603152201	Approximately 2,600' Southwest 20	1	Unknown	Unknown	Water Supply	Unknown	Unknown

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
Booker Street	Eddie D. Reid Heirs 222 Booker Street Pikeville, NC 27863	3603154253	Approximately 2,400' Southwest 21	1	Unknown	Unknown	Water Supply	Unknown	Unknown
208 Booker Street	Timothy O. & W. Mary Ann Grays 208 Booker Street Pikeville, NC 27863	3603156204	Approximately 2,400' Southwest 22	1	Unknown	Unknown	Water Supply	Unknown	Unknown
Booker Street	Timothy O. & W. Mary Ann Grays 208 Booker Street Pikeville, NC 27863	3603156255	Approximately 2,350' Southwest 23	1	Unknown	Unknown	Water Supply	Unknown	Unknown
192 Booker Street	Lewis Jettye P.O. Box 224 Pikeville, NC 27863	3603158277	Approximately 2,250' Southwest 24	1	Unknown	Unknown	Water Supply	Unknown	Not In Use
182 Booker Street	Jessie J. Tukes P.O. Box 803 Pikeville, NC 27863	3603159258	Approximately 2,200' Southwest 25	1	Unknown	Unknown	Water Supply	Open	Irrigation Vehicle Washing
Booker Street	Jessie J. Tukes & Zola A. Johnson P.O. Box 803 Pikeville, NC 27863	3603159258	Approximately 2,150' Southwest 26	1	Unknown	Unknown	Water Supply	Unknown	Unknown
249 Booker Street	James Perry Jr P.O. Box 729 Pikeville, NC 27863	3603141959	Approximately 2,800' Southwest (Outside of Radius) 27	1	Unknown	Unknown	Water Supply	Unknown	Unknown
241 Booker Street	Weldon M. Meyrs 241 Booker Street Pikeville, NC 27863	3603152021	Approximately 2,750' Southwest (Outside of Radius) 28	1	Unknown	Unknown	Water Supply	Unknown	Unknown
231 Booker Street	Marry L. Hodges & Debbie Dickerson Heirs 231 Booker Street Pikeville, NC 27863	3603153022	Approximately 2,700' Southwest (Outside of Radius) 29	1	Unknown	Unknown	Water Supply	Unknown	Unknown
Booker Street	Cora Ried & Minnie Collins P.O. Box 667 Pikeville, NC 27863	3603159017	Approximately 2,350' Southwest 30	1	Unknown	Unknown	Water Supply	Unknown	Unknown
125 Booker Street	Willie Walker 125 Booker Street Pikeville, NC 27863	3603257054	Approximately 2,350' South 31	1	Unknown	Unknown	Water Supply	Unknown	Unknown

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
Booker Street	Leon & Kay N. Cox 102 Booker Street Pikeville, NC 27863	3603258053	Approximately 2,380' South 32	1	Unknown	Unknown	Water Supply	Unknown	Unknown
107 Booker Street	Joseph T. Core & Carolyn W. Faye P.O. Box 452 Pikeville, NC 27863	3603259063	Approximately 2,400' South 33	1	Unknown	Unknown	Water Supply	Unknown	Not In Use
286 Big Daddy's Road	Kenneth E. Forehand & Wife P.O. Box 283 Pikeville, NC 27863	3603576369	Approximately 2,800' West-southwest (Outside of Radius) 34	1	Unknown	Unknown	Water Supply	Unknown	Unknown
118 Leigh Drive	Norwood A. Gainey Jr. & Wife 1625 Memorial Church Road Freemont, NC 27830	3603576276	Approximately 2,800' West-southwest (Outside of Radius) 35	1	Unknown	Unknown	Water Supply	Unknown	Unknown
144 Leigh Drive	William D. Hobbs 144 Leigh Drive Goldsboro, NC 27530	3603567900	Approximately 2,900' West-southwest (Outside of Radius) 36	1	Unknown	Unknown	Water Supply	Unknown	Unknown
118 Booker Street NW/ N. US HWY 117	Elm Grove Church N. US HWY 117 Pikeville, NC 27863	3603258320	Church Approximately 2,100' South 37	0	NA	NA	NA	NA	NA
119 Goldsboro Street Victory Life Christian Ministries	G. Marc LLC 115 Goldsboro Street Pikeville, NC 27863	3603362378	Church Approximately 1,050' Southeast 38	0	NA	NA	NA	NA	NA
108 Goldsboro Street Kids & Co	Donald N. Price & Constance W. 215 Connie Circle Goldsboro, NC 27530	3603371078 3603372098	Daycare Approximately 550' Southeast 39	0	NA	NA	NA	NA	NA
207 East Main Street	Pikeville Baptist Church 207 East Main Street Pikeville, NC 27863	3603376595	Church Approximately 950' East 40	0	NA	NA	NA	NA	NA

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
403 Main Street	True Vision Ministries Inc. P.O Box 8 Pikeville, NC 27863	3603172024 3603173004 3603162889 3603163709 3603163702	Church Approximately 1,400' East 41	0	NA	NA	NA	NA	NA
107 East Main Street	Pikeville Public Library P.O. Box 9 Pikeville, NC 27863	3603271462	Library Approximately 450' West 42	0	NA	NA	NA	NA	NA
200 Church Street & North Mill Street	St. Joseph Methodist Church 200 Church Street Pikeville, NC 27863	3603189302 3603189404 3603188593 3603281454 3603281331	Church Approximately 900' Northwest 43	0	NA	NA	NA	NA	NA
403 Railroad Street & North Mill Street Pikeville Community Park/ Dee's Memorial Park	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603282735 3603281564 3603283675 3603283788 3603283981 3603293175 3603291250 3603290128 3603198031 3603197127 3603292456	Park Approximately 1,200' North-Northwest 44	0	NA	NA	NA	NA	NA
103 West Smith Street Wages Head Start Pikeville	Pikeville High School School Street Pikeville, NC 27863	3603291144	Daycare Approximately 1,650' Northwest 45	0	NA	NA	NA	NA	NA
P.O. Box 184 Heritage Museum	Northen Wayne Heritage Museum Mill Street Pikeville, NC 27863	3603280996	Museum Approximately 1,550' Northwest 46	0	NA	NA	NA	NA	NA
112 South Railroad Street	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603273057	Water Tower Approximately 350' Southwest 47	1 2 3 4	Unknown 84 Unknown Unknown	Unknown NA Unknown Unknown	Water Supply Water Supply Water Supply Water Supply	Abandoned (1995) Abandoned (2006) Abandoned (1995) Abandoned (1995)	Potable Water Potable Water Potable Water Potable Water
Ham Street	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603264539	Water Tower Approximately 780' Southwest 48	0	NA	NA	NA	NA	NA

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
105 North Parks Drive	Johnny Weaver, Jr. P.O. Box 204 Pikeville, NC 27863	3603079513	Approximately 1,693' Northwest 49	1	Unknown	Unknown	Water Supply	Open	Irrigation
106 North Parks Drive	James Robert Hooks P.O Box 307 Pikeville, NC 27863	3603171619	Approximately 1,507' Northwest 50	1	Unknown	Unknown	Water Supply	Open	Irrigation
5296 Highway 117 North	Susan H. Davis 11697 Gilman Lane Herndon, VA 20170	3603392851 3603394851	Approximately 2,190' North-Northeast 51	1	30	NA	Water Supply	Open	Irrigation Swimming Pool

TABLE 1

ADJACENT PROPERTY OWNER/OCCUPANT AND WATER SUPPLY WELL SURVEY INFORMATION
R.D. PATE ESTATE
INCIDENT NUMBER: 7568
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC PROJECT NO. 07-7019.5

Property Address	Owner Name and Address	Parcel ID (See Fig 3)	Distance from Source Area	No. of Wells on Property	Well Depth (ft BGS)	Well Casing Depth (ft BGS)	Type of Well	Well Information/Status	Well Use
118 Booker Street NW/ N. US HWY 117	Elm Grove Church N. US HWY 117 Pikeville, NC 27863	3603258320	Church Approximately 2,100' South 37	0	NA	NA	NA	NA	NA
119 Goldsboro Street Victory Life Christian Ministries	G. Marc LLC 115 Goldsboro Street Pikeville, NC 27863	3603362378	Church Approximately 1,050' Southeast 38	0	NA	NA	NA	NA	NA
108 Goldsboro Street Kids & Co.	Donald N. Price & Constance W. 215 Connie Circle Goldsboro, NC 27530	3603371078 3603372098	Daycare Approximately 550' Southeast 39	0	NA	NA	NA	NA	NA
207 East Main Street	Pikeville Baptist Church 207 East Main Street Pikeville, NC 27863	3603376595	Church Approximately 950' East 40	0	NA	NA	NA	NA	NA
403 Main Street	True Vision Ministries Inc. P.O. Box 8 Pikeville, NC 27863	3603172024 3603173004 3603162889 3603163709 3603163702	Church Approximately 1,400' East 41	0	NA	NA	NA	NA	NA
107 East Main Street	Pikeville Public Library P.O. Box 9 Pikeville, NC 27863	3603271462	Library Approximately 450' West 42	0	NA	NA	NA	NA	NA
200 Church Street & North Mill Street	St. Joseph Methodist Church 200 Church Street Pikeville, NC 27863	3603189302 3603189404 3603188593 3603281454 3603281331	Church Approximately 900' Northwest 43	0	NA	NA	NA	NA	NA

403 Railroad Street & North Mill Street Pikeville Community Park/ Dee's Memorial Park	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603282735 3603281564 3603283675 3603283788 3603283981 3603293175 3603291250 3603290128 3603198031 3603197127 3603292456	Park Approximately 1,200' North-Northwest 44	0	NA	NA	NA	NA	NA
103 West Smith Street Wages Head Start Pikeville	Pikeville High School School Street Pikeville, NC 27863	3603291144	Daycare Approximately 1,650' Northwest 45	0	NA	NA	NA	NA	NA
P.O. Box 184 Heritage Museum	Northen Wayne Heritage Museum Mill Street Pikeville, NC 27863	3603280996	Museum Approximately 1,550' Northwest 46	0	NA	NA	NA	NA	NA
112 South Railroad Street	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603273057	Water Tower Approximately 350' Southwest 47	1 2 3 4	Unknown 84 Unknown Unknown	Unknown NA Unknown Unknown	Water Supply Water Supply Water Supply Water Supply	Abandoned (1995) Abandoned (2006) Abandoned (1995) Abandoned (1995)	Potable Water Potable Water Potable Water Potable Water
Ham Street	Town of Pikeville P.O. Box 9 Pikeville, NC 27863	3603264539	Water Tower Approximately 780' Southwest 48	0	NA	NA	NA	NA	NA
105 North Parks Drive	Johnny Weaver, Jr. P.O. Box 204 Pikeville, NC 27863	3603079513	Approximately 1,693' Northwest 49	1	Unknown	Unknown	Water Supply	Open	Irrigation
106 North Parks Drive	James Robert Hooks P.O. Box 307 Pikeville, NC 27863	3603171619	Approximately 1,507' Northwest 50	1	Unknown	Unknown	Water Supply	Open	Irrigation
5296 Highway 117 North	Susan H. Davis 11697 Gilman Lane Herndon, VA 20170	3603392851 3603394851	Approximately 2,190' North-Northeast 51	1	30	NA	Water Supply	Open	Irrigation Swimming Pool

TABLE 2

SEARCH FOR ENVIRONMENTALLY SENSITIVE AREAS

TABLE 2

SUMMARY OF SEARCH FOR ENVIRONMENTALLY SENSITIVE AREAS
R.D. PATE ESTATE
SITE ID: NONCD0002795
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC - PROJECT NO. 07-7019.5

Agency, Contacts, Sources & Dates	Applicable Sensitive Environment	Sensitive Area? (Y/N)
NC Division of Parks and Recreation - Natural Heritage Program (sent email on 1/13/2009; received response 1/15/2009)		
Harry LeGrand	State Parks	No
	Areas Important to Maintenance of Unique Natural Communities	No
	Sensitive Areas Identified Under the National Estuary Program	No
	Designated State Natural Areas	No
	State Seashore, Lakeshore and River Recreational Areas	No
	Rare species (state and federal Threatened and Endangered)	No
NC Planning and Natural Resources (sent email on 1/23/2009; received response 2/13/2009)		
Bryan Strong	Sensitive Aquatic Habitat	No
	State Wild & Scenic Rivers	No
National Park Service - Public Affairs Office		
Anita Barnett	National Seashore, Lakeshore and River Recreational Areas	
	National Parks or Monuments	
	Federal Designated Wild & Scenic Rivers	
US Forest Service (verbal confirmation 1/13/2009)		
Ruth Berner	Designated and Proposed Federal Wilderness and Natural Areas	No
	National Preserves and Forests	No
	Federal Land Designated for the Protection or Maintenance of Aquatic Life	No
NC Division of Water Quality (sent email 1/14/2009; received response 1/14/2009)		
Nora Deamer	State-Designated Areas for Protection or Maintenanc of Aquatic Life	Yes (1)
NC Division of Forest Resources (verbal confirmation 1/13/2009)		
Chris Carlson	State Preserves and Forests	No
US Fish & Wildlife Service		
Leigh Mann	Endangered Species	

Agency, Contacts,	Applicable Sensitive Environment	Sensitive Area? (Y/N)
NOAA		
Michiko Martin	Marine Sanctuaries	No
NC Department of Cultural Resources (mailed letter 1/23/2009; received response 1/27/2009)		
Renee Gledhill-Earley	National and State Historical Sites	No
NC Division of Coastal Management (contacted 1/13/2009)		
Ted Tyndall	Areas Identified Under Coastal Protection Legislation	No (2)
	Coastal Barriers or Units of a Coastal Barrier Resources System	No (2)
NC Wildlife Resources Commission (sent email 1/13/2009; received response 1/16/2009)		
Molly Ellwood	National or State Wildlife Refuges	No
	Migratory Pathways and Feeding Areas Critical for Maintenance of Anadromous Fish Species within River Reaches or Areas in Lakes or Coastal	No
	Spawning Areas Critical for the Maintenance of Fish/Shellfish Species within River, Lake or Coastal Tidal Waters	No
US Army Corps of Engineers (sent email 1/13/2009; received response 1/16/2009)		
Emily Jernigan	Wetlands	No

Notes:

(1) Runoff from this area will flow into the surface waters of the Contentnea Creek and the Neuse River. All waters in the Neuse River basin area classified as nutrient sensitive waters (NSW). Any activity on this property needs to eliminate sediment, nutrients and any other pollutants from running off site. These will have a direct impact to water quality of the Contentnea Creek and Neuse River and the aquatic species that inhabit the area.

(2) Not applicable - project site outside of DCM jurisdiction

TABLE 3

SOIL ANALYTICAL RESULTS
R.D. PATE ESTATE
INCIDENT NUMBER: 7568
101 EAST MAIN STREET
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC PROJECT NO. 07-7019.5

Sample ID	Analytical Method	SB-1-1	SB-2-1	SB-3-1	SB-4-1	SB-5-1	SB-6-1	SB-7-1	SB-8-1	SB-9-1	SB-10-1	Soil Remediation Goal - Groundwater Protection (mg/kg)	Soil Remediation Goal - Human Health (mg/kg)
Sample Depth (ft. bgs)		1	1	1	1	1	1	1	1	1	1		
Collection Date		6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008		
Volatile Organic Compounds by EPA Method 8260B													
Benzene	8260B	**0.00943**	**0.00942**	**0.0101**	**0.00967**	0.00541	0.00400	**0.00973**	0.00485	0.00459	**0.00794**	0.0077	1.1
Toluene	8260B	0.125	0.100	0.122	0.115	0.0907	0.0842	0.169	0.0650	0.101	0.0868	9.8	930
Ethylbenzene	8260B	0.0485	0.0553	0.0698	0.0653	0.0513	0.0844	0.0710	0.0338	0.0998	0.0526	8.2	5.7
M&P Xylenes	8260B	0.150	0.157	0.213	0.192	0.164	0.274	0.211	0.102	0.296	0.158	NS	890
O-Xylene	8260B	0.0490	0.0471	0.0750	0.0645	0.0623	0.120	0.0969	0.0366	0.137	0.0531	NS	300
Total Xylenes	8260B	0.199	0.204	0.288	0.257	0.226	0.394	0.308	0.139	0.433	0.211	7.1	120
1,1,2,2 Tetrachloroethane	8260B	**0.00327**	ND	ND	ND	ND	ND	**0.0107**	**0.0124**	**0.00495**	ND	0.59	0.001
Isopropylbenzene	8260B	ND	ND	ND	ND	ND	0.00844	ND	ND	0.0111	ND	1.5	310
N-Propylbenzene	8260B	0.00716	0.00702	0.0129	0.0112	0.00989	0.0267	0.0142	ND	0.0379	0.00915	1.7	NA
1,3,5-Trimethylbenzene	8260B	0.00948	0.00919	0.0192	0.0146	0.0147	0.0491	0.0219	0.00715	0.0584	0.0132	6.5	9.4
1,2,4-Trimethylbenzene	8260B	0.0316	0.0259	0.0613	0.0477	0.0534	0.155	0.0758	0.0232	0.177	0.0439	6.6	13
N-Butylbenzene	8260B	ND	ND	ND	ND	ND	ND	ND	ND	0.00697	ND	4.3	NA
Tert-Butylbenzene	8260B	ND	ND	ND	ND	ND	ND	0.0100	ND	0.0254	ND	3.4	NA
Trichloroethene	8260B	ND	ND	ND	ND	ND	ND	0.00826	0.00768	ND	ND	0.017	2.8
Acetone	8260B	ND	ND	ND	ND	ND	0.151	ND	ND	ND	ND	2 8	12000
Trichlorofluoromethane	8260B	ND	ND	ND	ND	ND	0.00633	ND	ND	ND	ND	25	160
Naphthalene	8260B	ND	ND	ND	ND	0.00452	0.0771	0.00796	ND	0.00903	ND	0.86	3.9
Total Metals by EPA Method 6010B													
Silver	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	78
Beryllium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	32
Cadmium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	14
Antimony	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	6.2
Selenium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	78
Thallium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	1
Chromium	6010B	1.70	3.14	3.46	2.59	1.55	4.81	2.57	2.79	1.02	4.15	NS	280
Manganese	6010B	3.66	29.70	38.80	45.2	5.37	62.3	22.0	ND	6.26	**276**	65	360
Copper	6010B	ND	4.56	7.98	5.11	ND	ND	3.89	ND	ND	25.40	700	630
Nickel	6010B	ND	1.24	1.84	ND	ND	3.35	1.32	ND	ND	3.42	130	300
Zinc	6010B	ND	11.5	82.3	9.53	ND	ND	15.7	9.82	10.1	69.8	13000	4600
Arsenic	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.33	5.4	4.4
Lead	6010B	28.9	35.1	58.0	40.2	5.6	5.21	21.8	4.82	3.54	122	270	400
Mercury by EPA Method 7471													
Mercury	7471	0.121	0.188	0.19	0.101	0.0547	0.0317	0.115	0.0238	0.0301	0.140	1.1	4.6

Notes:
(1) North Carolina Inactive Hazardous Sites Branch Soil Remediation Goals (October 2009)
All concentrations are reported in milligrams per kilogram (mg/kg).
ft, bgs - feet below ground surface
NS - No Standard
ND - Not Detected
Bold values exceed their respective Soil Remediation Goals.

TABLE 3

SOIL ANALYTICAL RESULTS
R.D. PATE ESTATE
INCIDENT NUMBER: 7568
101 EAST MAIN STREET
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC PROJECT NO. 07-7019.3

Sample ID	Analytical Method	SB-12-1	SB-13-1	SB-14-1	SB-15-1	SB-16-1	SB-17-1	SB-18-1	SB-19-1	SB-20-1	SB-21-1	SB-22-1	Soil Remediation Goal - Groundwater Protection (1) (mg/kg)	Soil Remediation Goal - Human Health (1) (mg/kg)
Sample Depth (ft, bgs)		1	1	1	1	1	1	1	1	1	1	1		
Collection Date		6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008		
Volatile Organic Compounds by EPA Method 8260B with IPE and MTBE														
Benzene	8260B	ND	**0.0278**	**0.0295**	ND	**0.0168**	ND	ND	0.00340	0.00286	ND	ND	0.0073	1.1
Toluene	8260B	ND	0.153	ND	3.13	0.127	**40.3**	0.0219	0.0245	0.0196	0.0204	ND	5.5	820
Ethyl Benzene	8260B	**10.3**	0.360	1.19	**10.6**	0.111	**42.1**	0.0112	0.0112	0.00924	0.0104	ND	8.1	5.4
M&P Xylenes	8260B	**42.8**	0.417	4.14	10.6	0.257	133	0.0289	0.0285	0.0227	0.0274	ND	6	390
O-Xylene	8260B	**16.1**	0.314	0.845	4.65	0.102	68.2	0.00819	0.00833	0.00663	0.00817	ND	6	430
Total Xylenes	8260B	**58.9**	0.731	4.99	**25.3**	0.359	**201**	0.0371	0.0368	0.0293	0.0356	ND	6	130
Isopropylbenzene	8260B	ND	0.0430	0.0629	ND	0.0117	**6.42**	ND	ND	ND	ND	ND	1.5	310
N-Propylbenzene	8260B	**8.97**	0.118	0.167	**4.77**	0.0335	**24.2**	ND	ND	ND	ND	ND	1.5	260
1,3,5-Trimethylbenzene	8260B	**23.6**	0.183	0.688	ND	0.0355	**47.5**	ND	ND	ND	ND	ND	6.7	160
1,2,4-Trimethylbenzene	8260B	**67.5**	1.02	2.96	5.53	0.151	**112**	0.00641	ND	ND	ND	ND	6.7	12
P-Isopropyltoluene	8260B	ND	0.0207	0.0104	19.0	ND	ND	ND	ND	ND	ND	ND	not listed	not listed
Sec-Butylbenzene	8260B	ND	0.0231	0.0133	ND	ND	ND	ND	ND	ND	ND	ND	3.3	NA
N-Butylbenzene	8260B	**4.83**	0.0573	0.0314	ND	0.00660	**9.03**	ND	ND	ND	ND	ND	4.3	NA
Acetone	8260B	ND	0.0983	0.0998	ND	0.0923	ND	ND	ND	ND	ND	ND	24	12000
Naphthalene	8260B	**22.4**	**1.16**	0.143	ND	0.0174	**42.2**	ND	ND	ND	ND	ND	0.21	3.6
Total Metals by EPA Method 6010B														
Silver	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4	78
Beryllium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	31
Cadmium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	0.691	ND	ND	3	14
Antimony	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	6.3
Selenium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.1	78
Thallium	6010B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS
Chromium	6010B	2.89	3.65	2.75	3.65	2.61	9.06	3.27	4.71	0.691	12.8	8.21	23000	360000
Manganese	6010B	14.2	10.6	14.4	20.2	19.2	18.9	7.57	59.9	**110**	30.8	33.3	65	370
Copper	6010B	6.28	4.73	49.2	10.9	3.92	15.1	ND	10.1	14.5	5.73	8.21	700	630
Nickel	6010B	1.15	ND	ND	1.49	1.25	2.22	1.11	1.49	2.18	2.62	1.64	130	300
Zinc	6010B	27.0	16.1	11.5	72.3	30.4	82.5	134	197	381	48.0	73.0	1200	4700
Arsenic	6010B	ND	1.15	ND	ND	ND	1.96	ND	1.31	2.74	**4.91**	2.39	5.8	4.4
Lead	6010B	68.0	21.5	29.90	**274**	62.5	**1210**	10.1	159	**379**	16.3	67.0	270	400
Mercury by EPA Method 7471														
Mercury	7471	0.380	0.0254	0.0817	0.0807	0.0722	0.102	0.0182	0.139	0.201	0.0807	0.0900	1.1	4.6

Notes:
(1) North Carolina Inactive Hazardous Sites Branch Soil Remediation Goals (October 2009)
All concentrations are reported in milligrams per kilogram (mg/kg).
ft, bgs - feet below ground surface
NS - No Standard
ND - Not Detected
Bold values exceed their respective Soil Remediation Goals.

TABLE 4

GROUNDWATER ANALYTICAL RESULTS
R.D. PATE ESTATE
INCIDENT NUMBER: 7568
101 EAST MAIN STREET
PIKEVILLE, WAYNE COUNTY, NORTH CAROLINA
ENVIROASSESSMENTS, PLLC PROJECT NO. 07-7019.5

Sample ID	Analytical	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	Groundwater Remediation Goal (1)
Collection Date	Method	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	6/3/2008	(ug/L)
Volatile Organic Compounds by EPA Method 8260B								
Benzene	8260B	ND	**1850**	**103**	ND	ND	**2.14**	1
Toluene	8260B	ND	**2360**	1.66	ND	ND	ND	1000
Ethyl Benzene	8260B	ND	**982**	281	15.5	ND	2.19	600
M&P Xylenes	8260B	ND	**1800**	ND	45.9	ND	ND	500
O-Xylene	8260B	ND	**982**	ND	15.0	ND	ND	500
Total Xylenes	8260B	ND	**2780**	ND	60.9	ND	ND	500
Styrene	8260B	ND	20.6	ND	ND	ND	ND	70
cis-1,2 Dichloroethene	8260B	ND	21.0	ND	ND	ND	ND	70
Methyl tert-Butyl Ether	8260B	1.14	ND	ND	ND	ND	ND	20
1,1,2,2 Tetrachloroethane	8260B	**9.78**	ND	ND	ND	ND	ND	0.2
Isopropylbenzene	8260B	ND	39.6	15.4	1.28	ND	1.79	70
N-Propylbenzene	8260B	ND	**72.8**	25.1	3.28	ND	ND	70
1,3,5-Trimethylbenzene	8260B	ND	126	30.4	4.33	ND	ND	400
1,2,4-Trimethylbenzene	8260B	ND	**631**	50.6	22.9	ND	ND	400
Sec-Butylbenzene	8260B	ND	ND	1.64	ND	ND	ND	70
N-Butylbenzene	8260B	ND	ND	2.61	ND	ND	ND	70
Tert-Butylbenzene	8260B	ND	ND	ND	ND	ND	ND	70
Acrolein	8260B	ND	ND	ND	ND	ND	ND	NS
P-Isopropyltoluene	8260B	ND	ND	3.66	ND	ND	ND	NS
Trichloroethene	8260B	2.71	ND	ND	ND	ND	ND	3
Acetone	8260B	ND	ND	ND	ND	ND	ND	6000
Naphthalene	8260B	ND	**330**	**178**	**12.1**	1.63	4.47	6
Hazardous Substance Metals by EPA Method 3030C								
Silver	6010B	ND	ND	ND	ND	ND	ND	17.5
Arsenic	6010B	ND	ND	ND	ND	ND	ND	10
Beryllium	6010B	ND	ND	ND	ND	ND	ND	4
Cadmium	6010B	ND	ND	ND	ND	ND	ND	1.75
Antimony	6010B	ND	ND	ND	ND	ND	ND	6
Selenium	6010B	ND	ND	ND	ND	ND	ND	50
Thallium	6010B	ND	ND	ND	ND	ND	ND	2
Manganese	6010B	17.00	**73.9**	28.5	**132.0**	**54.1**	28.1	50
Copper	6010B	ND	16.0	ND	44.7	30.2	ND	1000
Nickel	6010B	ND	ND	ND	ND	11.8000	ND	100
Zinc	6010B	377.00	52.6	29.6	219.0	322.0	61.8	1050
Lead	6010B	7.67	**63.6**	**18.7**	**241.0**	**30.5**	ND	15
Mercury by EPA Method 7471								
Mercury	7471	ND	ND	ND	0.505	ND	ND	1.05

Notes:
(1) Groundwater Remediation Goals are the NCAC 2L Groundwater Standards unless otherwise noted.
All concentrations are reported in micrograms per liter (ug/L).
ft, bgs - feet below ground surface
NS - No Standard
ND - Not Detected
Bold results exceed their respective NCAC 2L Groundwater Standards.

FIGURES

FIGURE 1

SITE LOCATION MAP

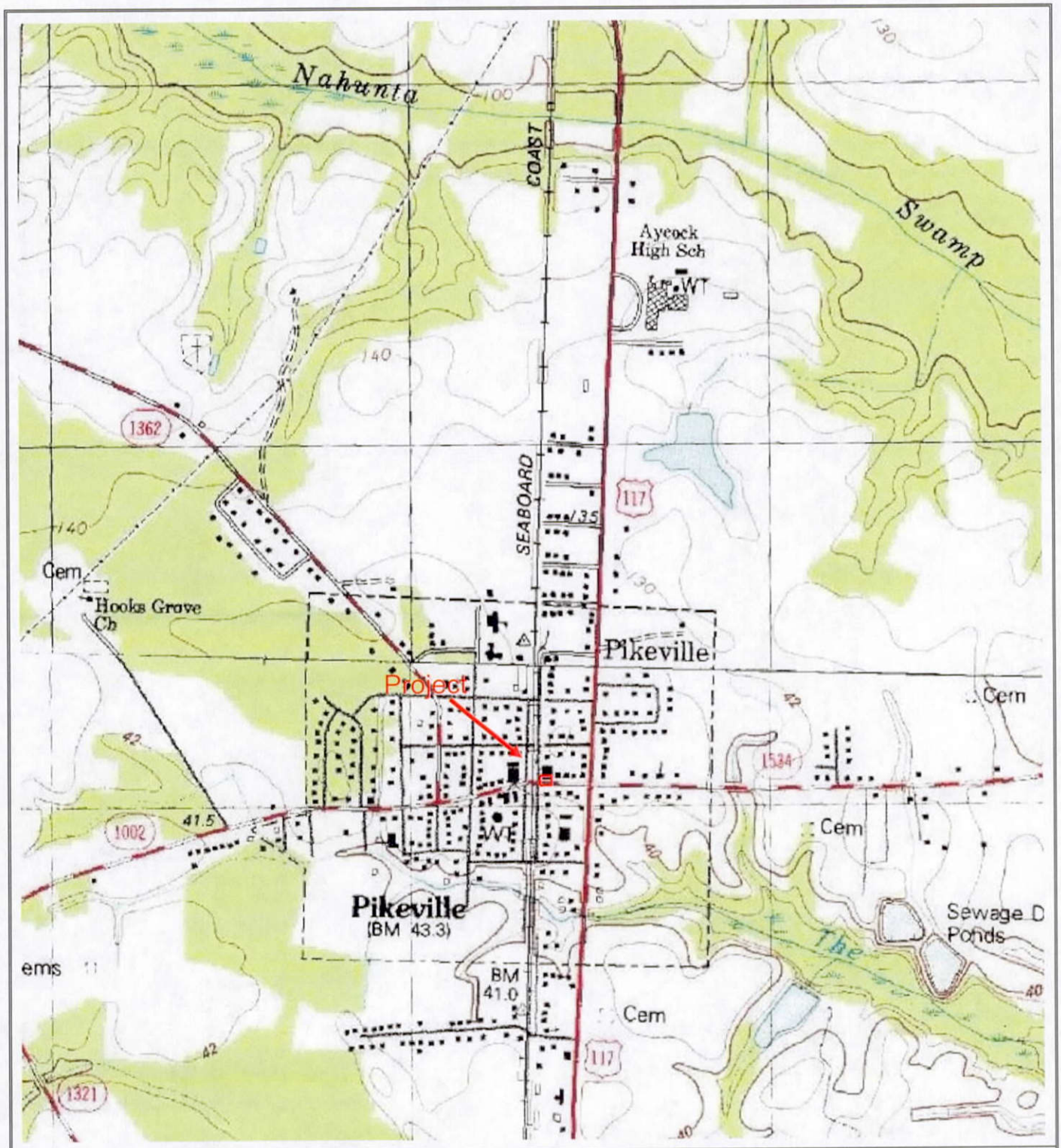

Figure 1 – Site Location Map

Source: USGS 7.5 Minute Topographic Map Pikeville North Carolina Quadrangle 1988

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Charlotte, North Carolina 28270
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N

Site Name: R.D. Pate Estate
101 East Main Street
Pikeville, North Carolina

BB&T Project Number: ESA071433
EA Project Number: 07-7019.1

FIGURE 2

SITE PLAN

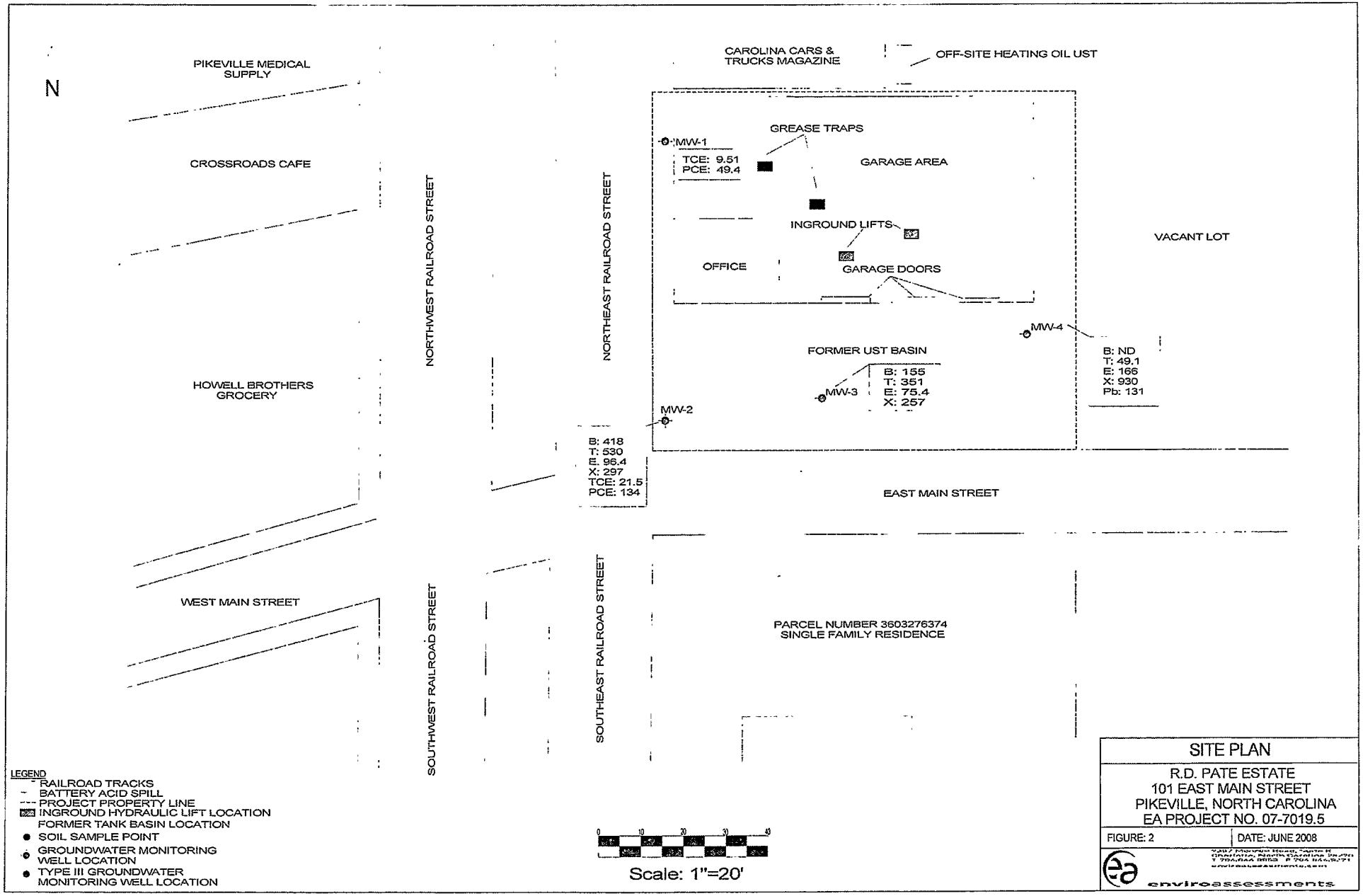
N
PIKEVILLE MEDICAL SUPPLY
CROSSROADS CAFE
HOWELL BROTHERS GROCERY
WEST MAIN STREET
NORTHWEST RAILROAD STREET
SOUTHWEST RAILROAD STREET
NORTHEAST RAILROAD STREET
SOUTHEAST RAILROAD STREET
CAROLINA CARS & TRUCKS MAGAZINE
OFF-SITE HEATING OIL UST
GREASE TRAPS
MW-1
TCE: 9.51
PCE: 49.4
GARAGE AREA
INGROUND LIFTS
OFFICE
GARAGE DOORS
VACANT LOT
MW-4
B: ND
T: 49.1
E: 166
X: 930
Pb: 131
FORMER UST BASIN
MW-3
B: 155
T: 351
E: 75.4
X: 257
MW-2
B: 418
T: 530
E: 96.4
X: 297
TCE: 21.5
PCE: 134
EAST MAIN STREET
PARCEL NUMBER 3603276374
SINGLE FAMILY RESIDENCE
LEGEND
RAILROAD TRACKS
BATTERY ACID SPILL
PROJECT PROPERTY LINE
INGROUND HYDRAULIC LIFT LOCATION
FORMER TANK BASIN LOCATION
SOIL SAMPLE POINT
GROUNDWATER MONITORING WELL LOCATION
TYPE III GROUNDWATER MONITORING WELL LOCATION
0 10 20 30 40
Scale: 1"=20'
SITE PLAN
R.D. PATE ESTATE
101 EAST MAIN STREET
PIKEVILLE, NORTH CAROLINA
EA PROJECT NO. 07-7019.5
FIGURE: 2
DATE: JUNE 2008
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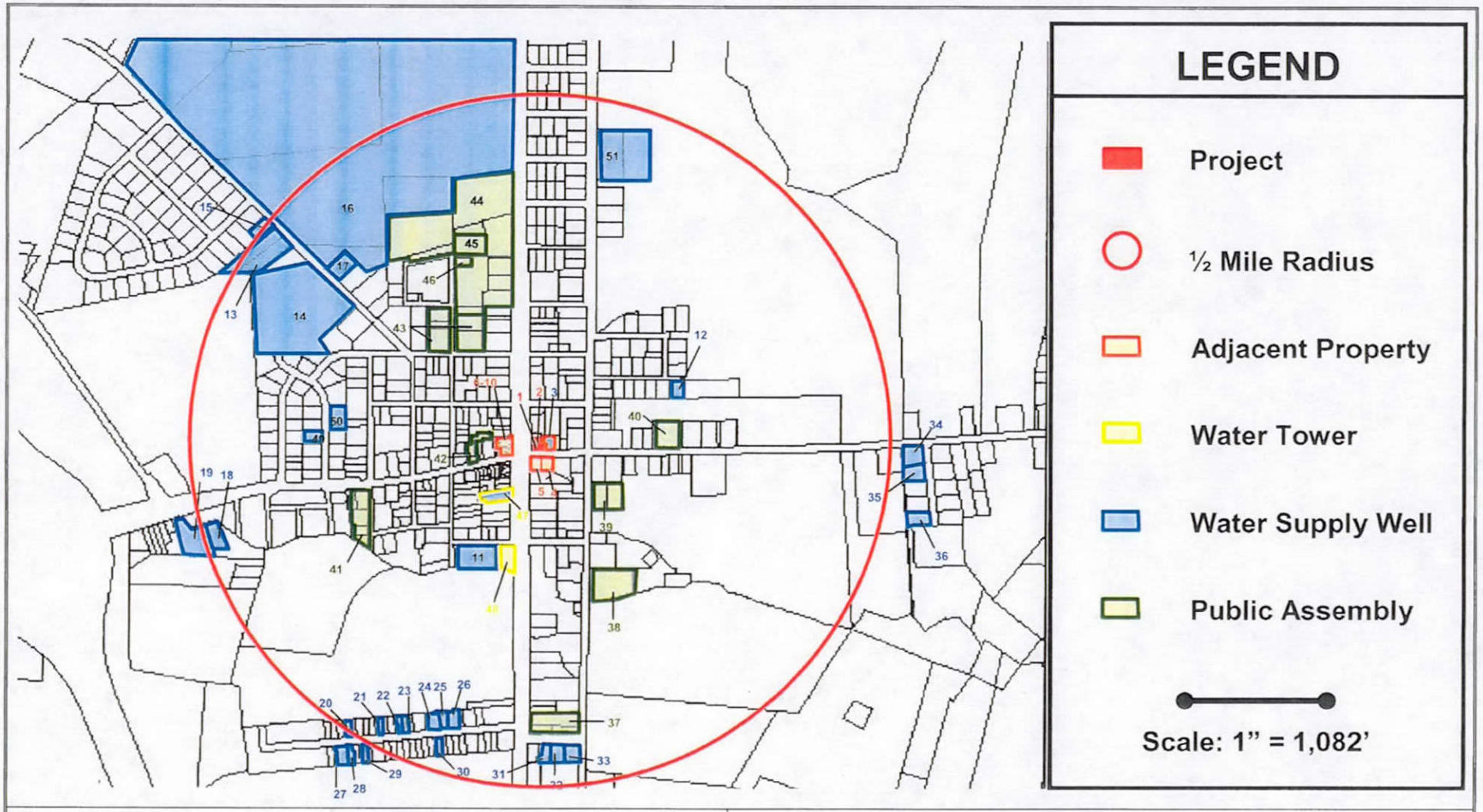
FIGURE 3

SURROUNDING OWNERS, PUBLIC ASSEMBLY AND WELL LOCATIONS MAP



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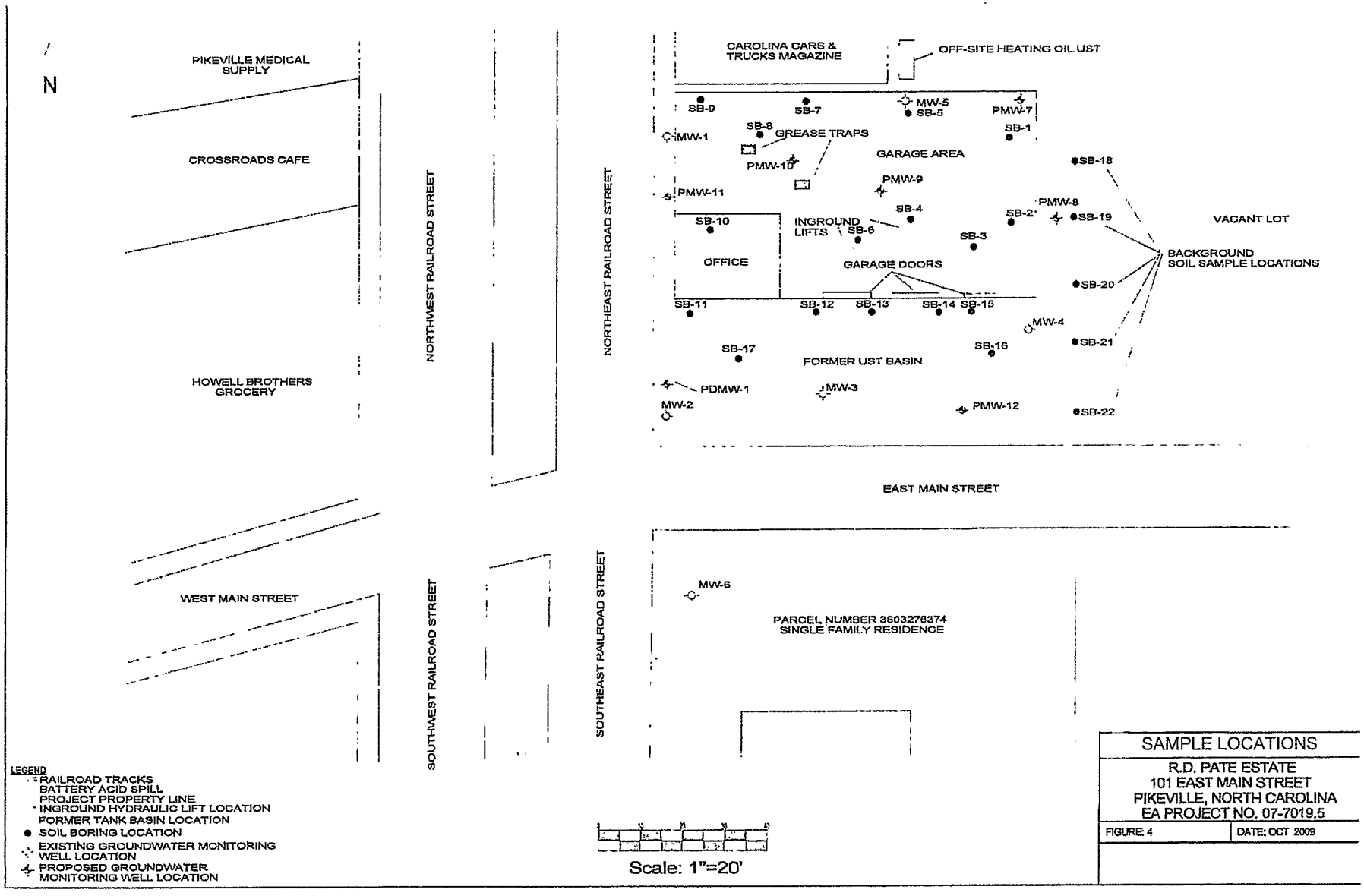
9307 Monroe Road, Ste. K
Charlotte, NC 28270
Office: (704) 846-8853
Fax: (704) 846-3271

Figure #3 – Surrounding Owners & Well & Well Location Map

R.D. Pate Estate
101 East Main Street
Pikeville, Wayne County, North Carolina
Project Number: 07-7019.5

FIGURE 4

SITE PLAN – PROPOSED SAMPLING LOCATIONS



SAMPLE LOCATIONS

R.D. PATE ESTATE
101 EAST MAIN STREET
PIKEVILLE, NORTH CAROLINA
EA PROJECT NO. 07-7019.5

FIGURE 4 | DATE: OCT 2009

APPENDICES

APPENDIX A

FIELD SAMPLING AND ANALYSIS PLAN

9307 Monroe Road, Suite K
Charlotte, North Carolina 28270
T 704.846.8853 F 704.846.3271
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FIELD SAMPLING AND ANALYSIS PLAN

FOR

R.D. PATE ESTATE

101 East Main Street
Pikeville, Wayne County, North Carolina

SITE ID: NONCD0002795

Latitude: 35° 29' 51.46" North Longitude: 77° 58' 59.91" West

February 2010

PREPARED FOR
Ms. Pamela Watson, Vice President
Personal Trust Specialist
Branch Banking & Trust Company
Wealth Management Division
P. O. Box 2907
223 West Nash Street
Wilson, North Carolina 27894-2907
(252) 246-4548

FORMER UST OWNER/OPERATOR AND CURRENT PROPERTY OWNER
Richard David Pate
P.O. Box 54
Pikeville, North Carolina 27863

EA Project No. 07-7019.5

Gary K. Sawyer, L.G., RSM
Principal
NC License No. 1337

NORTH CAROLINA LICENSED SEAL 1337 GEOLOGIST GARY K. SAWYER

1.0 INTRODUCTION

This Field Sampling and Analysis Plan (FSAP) describes the methods to be used while conducting a Remedial Investigation (RI) at the R. D. Pate Estate site located in Pikeville, Wayne County, North Carolina (hereinafter referred to as "the Project," subject site or site). This document will be used in conjunction with the Quality Assurance Project Plan (QAPP) to conduct the assessment.

The R. D. Pate Estate Trust currently owns the site, and has entered into an Administrative Agreement with the North Carolina Department of Environment and Natural Resources (NCDENR) to implement a voluntary remedial action under the Registered Environmental Consultant (REC) Program. A copy of the Administrative Agreement is attached. EnviroAssessments (EA) is the REC assigned to this project, and Gary K. Sawyer, P.G. (NC #1337) is the designated Registered Site Manager (RSM) for the remedial action.

The purpose of the FSAP is to establish data collection activities, which are compatible with the DQOs identified in the Work Plan and to provide a mechanism for planning and approving field activities. The scope of work is intended to initially document the presence, nature, and extent of affected media. The FSAP provides guidance for the field work by defining the sampling and data-gathering methods to be used. The types of samples to be collected are initially soil and groundwater. Duplicate samples, field blanks, and trip blanks will be utilized as Quality Assurance (QA) and are discussed in the QAPP. Sampling methods, chain-of-custody, preservation and equipment procedures used to perform the work activities described in the Work Plan will comply with the US EPA Region IV *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (US EPA, November 2001).

1.1 Site Description

The subject site is owned by Richard David Pate and consists of approximately 0.12 acres. The Project is located in an urban area at 101 East Main Street in Pikeville, Wayne County, North Carolina. The property contains one approximately 3,397 square foot one-story building constructed in phases throughout the 1940s and 1950s. Historically, the Project operated as an automotive repair facility and service station from the late 1940s to 1992; prior to which it was reportedly residential land. The building most recently operated as an automotive and equipment repair facility known as Historic Sites Maintenance Shop - North Carolina Department of Cultural Resources. The Project is serviced by municipal water and sewer services. The facility is not currently in operation and the site is currently unoccupied. The remainder of the property is utilized as a gravel parking area. The Project is located in an area of Pikeville consisting of single family residences, commercial properties and undeveloped land. Residential properties and undeveloped land bound the Project to the east and south, and commercial properties bound the Project to the north and west.

1.2 Project Scope of Work

The Remedial Investigation will be conducted in order to evaluate the presence or absence of contamination in potential areas of concern (where no previous investigation has been completed), and to more fully evaluate the nature, extent and magnitude of contamination identified in prior assessments. A brief summary of the scope of work is presented below:

- Completion of soil borings using direct-push (Geoprobe) methods, to assess subsurface conditions and collect soil samples for laboratory analysis in areas of known or potential concern, and to determine background soil concentrations for selected analytes
- Installation of groundwater monitoring wells
- Collection of groundwater samples for laboratory analysis
- Site mapping and surveying

2.0 FIELD SAMPLING AND DATA COLLECTION PROCEDURES

As stated in **Section 1.0**, sampling methods, chain-of-custody, preservation and equipment procedures used to perform the work activities described in the Work Plan will comply with the US EPA Region IV *Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (US EPA, November 2001). In addition, the following procedures outlined in the REC Program Implementation Guidance Manual (November 2009) will be observed:

- At least one duplicate sample, per medium, per container type, per field day will be collected. In addition, equipment rinsate blanks and VOA trip blanks will also be included
- All types of samples selected for VOC analysis will be collected into separate containers without mixing
- All boring and sampling locations will be staked and flagged during the entirety of the remedial investigation
- A North Carolina registered land surveyor will survey all monitoring well locations
- If turbidity complicates groundwater sampling activities, samples will be collected using a low-flow purging and sampling technique
- Drill cuttings and well development purge and decontamination water will be containerized pending laboratory analysis of the material. If the material is found to exceed remediation goals, it will not be replaced on-site.

2.1 Drilling and Soil Sampling

Prior to any drilling or soil sampling activities, the locations of underground utilities will be confirmed by the contacting the underground utility locating service, and by reviewing site drawings. The utilities will be properly marked. A qualified engineer/geologist will be present at all drilling locations to log samples, supervise drilling operations and record soil conditions.

Soil samples within the building will be collected using direct-push technology (DPT). The direct push borings will be performed with a truck-mounted rig which hydraulically advances (pushes) a tube sampler into the soil. The tube sampler houses a four-foot long clear polyethylene tube, into which the soil enters during advancement. Upon removal from the boring, the clear tube is removed from the sampler, providing a representation of the soil profile.

A new clear tube is then inserted into the sampler, and the next four-foot interval of soil is sampled. Soil samples will be collected in each boring to the depth at which groundwater is encountered or refusal to DPT equipment. The texture of the soil samples will be described in the field by an on site geologist.

Selected soil samples from each soil boring (lithologic zones, field screening, visual indicators, etc.) will be split into two portions. The first half of the sample will be placed in a sealed glass container, and placed in a cooler on ice to maintain a temperature of approximately 4 degrees Celsius until it is received by the laboratory. The other half of the sample will be placed in a Ziploc bag, labeled, and allowed to reach ambient temperature. These samples will be screened with a photoionization detector (PID). PID readings will be used to help determine which soil samples are sent to the laboratory, and to determine if additional soil borings are necessary to define a given area of concern.

After each soil boring has been advanced to an adequate depth, it will either be completed as a groundwater monitoring well or filled with a grout seal to the surface.

2.2 Monitoring Well Construction

The monitoring wells installed at the Project will consist of 2-inch diameter schedule 40 PVC with a threaded bottom cap. For the shallow wells, the bottom 10 feet will consist of 0.010 inch machine-slotted screen. For the deep wells, the bottom 5 feet will consist of 0.010 inch machine-slotted screen. The filter pack will consist of coarse, pre-washed and bagged silica sand, which will be placed around the screen from the bottom of the borehole to approximately two feet above the screen. A bentonite seal will be placed to approximately two feet above the filter pack. Clean potable water will be added to ensure hydration of the seal. A bentonite grout mixture will be then be added if necessary to within two feet of the ground surface. Monitoring wells will have flush-mounted protective covers and concrete pads.

2.3 Monitoring Well Development

The monitoring wells will be developed upon completion using either a submersible pump or PVC bailers. Development will remove silt and sediments within the well and sand-pack to insure proper groundwater flow into the well. Prior to sample collection, the water level will be measured in each monitoring well. The monitoring wells will then be purged. Sample collection will commence when three well volumes of water have been purged or the well is purged to near dryness and allowed to recharge. Any non-disposable equipment that may contact groundwater in the wells will be decontaminated prior to use at each well. Sample collection will be conducted using bailers suspended from clean nylon cord. The ensuing groundwater samples will be decanted directly into laboratory supplied sample containers and immediately chilled.

2.4 Groundwater Sampling

Prior to collecting a groundwater sample, field personnel will measure the static water level to the nearest 0.01 foot with an electric water level indicator, recorded from grade level. Field personnel will then remove minimum of three to five times the volume of standing water in the well. After the well has been adequately purged, a groundwater sample will then be collected for laboratory analysis. Samples will be collected into laboratory-supplied containers and placed in ice-filled coolers for delivery to the laboratory.

2.5 Sample Handling

All environmental samples will be placed in pre-cleaned bottles provided by the laboratory. Sample preservation will be completed as per USEPA SW846 requirements immediately in the field. Sample bottles will then be placed into insulated shipping coolers with plastic bags of ice to keep samples cool prior to laboratory pickup. Chain-of-custody records identifying sample collection times and dates along with analytical methods will be signed and will accompany samples to the laboratory. Detailed sample handling, preservation and custody procedures are described in the Quality Assurance Project Plan (QAPP, Appendix B).

2.6 Laboratory Analysis

All soil, water or other environmental samples collected during this remedial investigation will be immediately placed in an iced cooler and delivered under strict chain-of-custody protocol. Samples will be analyzed for REC Program-specified parameters using USEPA SW846 Methods, including volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and Total Hazardous Substance List metals. Samples will be analyzed for other parameters such as PCBs and hexavalent chromium when their presence is suspected.

2.7 Site Survey

All monitoring wells will be surveyed by a North Carolina registered land surveyor to define their horizontal locations and elevations with respect to a local benchmark. Monitoring wells will be located to within 3.0 feet horizontally, and approximately 0.01 feet vertically. These data will be plotted on the site survey.

2.8 Equipment Calibration

Equipment used to measure parameters such as pH, conductivity, total organic vapors, etc. will be calibrated according to methods and frequencies recommended by the manufacturer. Calibration kits for each instrument will accompany the instrument to the field.

3.0 DECONTAMINATION PROCEDURES

Decontamination procedures are intended for use by field personnel for cleaning sampling and other equipment in the field. Sampling and field equipment cleaned in accordance with these procedures will meet the minimum requirements for DQO data collection as specified in the QAPP.

Proper decontamination of sampling equipment is essential to prevent cross contamination of samples with the sampling device. All sampling equipment will be decontaminated before sampling and between each sample unless samples are to be composited. Sampling equipment will be decontaminated with materials and procedures specified in the QAPP and according to the following procedures:

- Clean with tap water and laboratory detergent using a brush if necessary to remove particulate matter and surface films.

- Rinse thoroughly with tap water.
- Rinse thoroughly with deionized water.
- Rinse once with propanol if organic compounds are the constituents of concern. Rinse once with 0.1N HCI if inorganic compounds are the constituents of concern. If both organic and inorganic compounds are of concern, the propanol rinse will take precedence.
- Rinse thoroughly with organic-free water and allow to air dry.
- Wrap with plastic or aluminum foil to prevent contamination if equipment is going to be stored or transported.

During the field investigation, large equipment such as drill augers, bits, and/or backhoe equipment will be steam cleaned (soap and high pressure hot water). Sampling equipment such as split barrel samplers will be decontaminated according to the procedure describe above.

Tap water (potable) will be used for steam cleaning and will be obtained from the local public water supply. The public water supply will be sampled during the field investigation and analyzed for the volatile organic compounds (VOCs).

Soil cuttings generated during drilling of soil test borings will be contained in a steel roll-off box lined with polyethylene sheeting. Monitoring well development/purge water and equipment decontamination water generated during assessment activities will be contained in 55-gallon steel drums. The drums will be labeled according to content, sampling media, location and date generated. A composite sample will be collected of the soil cuttings within the roll-off box and a composite sample will be collected of the development/purge/decon water. These samples will be submitted to the laboratory for analysis by the toxicity characteristic leaching procedure (TCLP). Disposal of soil and water will be based on the results of the sample analyses.

4.0 SAMPLE CONTROL, FIELD RECORDS AND DOCUMENT CONTROL

This section presents procedures for sample control, field records, and document control. Sample control includes sample identification and chain-of-custody procedures. A sample is defined as physical evidence collected from a facility, site, or from the environment.

4.1 Sample Designation

Samples collected for specific field analyses or measurement data are recorded directly in bound logbooks (field books). Standard sample labels, which are attached to the sample containers, will be used to identify samples collected for laboratory analysis. Each sample will be assigned a unique alphanumeric sample descriptor that identifies the sample type, sample site number, and sample interval, (if applicable).

4.2 Chain-of-Custody Procedures

Chain-of-custody procedures are established to maintain sample custody and documentation of samples for evidence. The possession of samples must be traceable from the time of collection to its introduction into evidence. Chain-of-custody procedures shall follow procedures as outlined in **Section 3.0** of the QAPP. The unique sample identification numbers discussed above will be included on the chain-of-custody form used to

track the sample containers. Duplicate samples will be given unique sample identification numbers and will be noted in the field book.

Chain-of-custody forms must accompany all sample containers to document the transfer of the containers and samples from the originating laboratory, through the field collection, and to the laboratory receiving the samples for analyses. Each set of sample containers will be shipped with a chain-of-custody form, which travels with the sample containers. A copy of the chain-of-custody form with its unique sample numbers it tracks will be kept in the laboratory to help identify lost or missing samples. If a sample chain-of-custody is lost in shipment, the field investigator will prepare a written statement detailing the pertinent information including the following:

- Where and how the sample was collected,
- Field book entries regarding the sample, and
- How and when the sample was shipped.

4.3 Field Records

Documentation of an investigative team's field activities provides the basis for technical site evaluations and related written reports. Additionally, all records and notes generated in the field may be considered as evidence and may potentially be subject to scrutiny in litigation. It is essential that all field documentation provide a clear, unbiased picture of field activities. All aspects of sample collection and handling, as well as visual observations, shall be documented in the field books.

Bound field books will be used on work assignments requiring field activities. Entries into field books will be legibly written in indelible ink and provide a clear record of all field activities. The following information will be provided on the inside front cover or first page of the field book:

- Project Name and Project Manager,
- Site Location,
- Job Number,
- Date.

Instructions and procedures relating to the format and technique in which notebook entries are made area as follows:

- If photographs are taken as part of the field investigation, a photo description will be made in the notes at the time the photo is taken. Photo descriptions will be numbered sequentially in the notes.
- Entries will be made in waterproof ink.
- Entries will be made in language that is objective, factual, and free of personal feelings or other terminology which might appear unclear or inappropriate.
- Entries will be printed as neatly as possible.
- Entries will be logged according to military time.
- Errors in the field notes will be indicated by drawing a single line through the text, ensuring the text is still legible, and initialing and dating the errors.

- A new page will be started at the beginning of each day's field activities and the remaining clear page at day's end will be marked out with a single initialed line at the day's end.
- The person taking notes shall sign, number and date each page.
- Later additions, clarifications, or corrections must be dated and signed.

Instructions and procedures providing guidance on the information to be recorded on field activities are provided below:

- A new page will be used at the start of each day's activities. The date, time, on-site personnel, and observed weather conditions will be noted. Changes in weather conditions will be noted as they occur.
- Sketches or maps to identify photo and/or sample locations will be included in the field book. Landmarks and direction of north will be included.
- Photograph locations will be referenced to a site sketch or map. Photograph information will include date, time location, photographer, sample number, roll number, frame number, and a complete description or identification of the subject in the photograph.
- On-site health and safety equipment used will be documented.
- As part of the chain-of-custody procedure, in-situ sampling information will include sample number, date, time, sampling personnel, sample type, designation of sample as a grab or composite, and any preservative used. Sample locations will be referenced to sample numbers on a site sketch or map.
- Information for in-situ measurements will include a sample number, date, time, and personnel taking measurements. If in-field calculations are necessary, they will be checked in the field and signed by a second team member, whenever possible.
- If on-site interviews occur, relevant information obtained will be recorded. Names of persons interviewed, the interest group represented (if applicable), address, and phone number will be recorded.
- Any other relevant information, which would be difficult to acquire at a later date, will be recorded.

All project field books are the property of EA and will remain in its possession when the project has been concluded. None of the documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies.

4.4 Photographs

As discussed in the previous section, photographs taken in the field will be documented in the field book. Photographs will be taken using an electronic (digital) camera. The locations of photographs will be referenced to a site map or sketch. Information in the field book will include the date, time, location, photographer, sample number (if appropriate), frame number, and a complete description or identification of the subject in the photograph.

After the photographs are downloaded onto computer, they will be labeled with, at a minimum, the following information:

- Job identification number
- Date

- Location
- Frame number
- Sample number (if appropriate)

APPENDIX B

QUALITY ASSURANCE PROJECT PLAN

9307 Monroe Road, Suite K
Charlotte, North Carolina 28270
T 704.846.8853 F 704.846.3271
enviroassessments.com

enviroassessments

QUALITY ASSURANCE PROJECT PLAN

FOR

R.D. PATE ESTATE

101 East Main Street
Pikeville, Wayne County, North Carolina

SITE ID: NONCD0002795

Latitude: 35° 29' 51.46" North Longitude: 77° 58' 59.91" West

February 2010

PREPARED FOR
Ms. Pamela Watson, Vice President
Personal Trust Specialist
Branch Banking & Trust Company
Wealth Management Division
P. O. Box 2907
223 West Nash Street
Wilson, North Carolina 27894-2907
(252) 246-4548

FORMER UST OWNER/OPERATOR AND CURRENT PROPERTY OWNER
Richard David Pate
P.O. Box 54
Pikeville, North Carolina 27863

EA Project No. 07-7019.5

Gary K. Sawyer, L.G., RSM
Principal
NC License No. 1337

NORTH CAROLINA LICENSED SEAL 1337 GEOLOGIST GARY K. SAWYER

1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) has been prepared by EnviroAssessments (EA) for the R. D. Pate Estate site in Pikeville, North Carolina. The QAPP describes the quality assurance procedures, quality control specifications, and other technical activities that must be implemented to ensure that the results of the project or tasks to be performed will meet project specifications while conducting a Remedial Investigation (RI) at the site. This document will be used in conjunction with the Field Sampling and Analysis Plan (FSAP) to conduct the assessment.

2.0 PROJECT MANAGEMENT

2.1 Distribution List

This QAPP will be distributed along with the Work Plan and FSAP.

2.2 Project Organization and Roles

The investigation will be managed according to the line of authority described in this section. The project position and associated responsibilities are described in the following paragraphs. Gary K. Sawyer, P.G., RSM will serve as the Registered Site Manager (RSM). All work performed will be conducted under the supervisions of the RSM. Don Warren will serve as the Field Project Manager of the field assessment activities. In this role, he will coordinate the field activities, data review and evaluation, and will coordinate submittals to the appropriate parties. Mr. Warren will both participate in and supervise the data gathering efforts and will be on site for the majority of the field activities. He will be one of the principal contacts with the analytical laboratory, and he will be the primary writer of the RI report.

Mr. Jeff Hvozdik will serve as the Project Health and Safety Officer. During assessment activities, the onsite geologist/engineer will serve as the Site Health and Safety Officer. This person will conduct health and safety meetings and insure the implementation of the health and safety plan. Health and safety meetings will be conducted each morning before initiating assessment activities; and at any other time site conditions warrant. Amanda Petoskey, Mike McDermott and Jeff Hvozdik will serve as Sampling Technicians during soil, sediment, surface water, and groundwater sampling. They will also develop and purge groundwater monitoring wells.

Investigative derived waste (i.e., soil and groundwater) generated during assessment activities and requiring offsite disposal will be transported and disposed of by an approved company.

2.3 Problem Definition

The objective of this assessment is to assess areas of the property that may pose the greatest immediate potential threat to human health and the environment. Assessment activities include data gathering and analysis to evaluate the nature and general extent of residual contaminants-of-concern. The data must be of

sufficient quality and quantity to support subsequent site-related activities (e.g., risk assessment/evaluation, feasibility studies, etc.).

2.4 Project Schedule

Upon review and approval of the Work Plan, field assessment activities will be scheduled. It is estimated that field assessment activities will begin approximately three weeks after Work Plan approval. Monitoring well drilling and installation will require approximately ten days. Well development, soil sampling, sediment/surface water sampling, and groundwater sampling will require approximately four days. A total of approximately three weeks will be required for field assessment activities. The laboratory data should be received approximately three weeks after sample collection. Data review/validation and final report preparation will require approximately four weeks from receipt of laboratory data.

2.5 Quality Objectives and Criteria for Measurement Data

Section 3.0 of the Remedial Investigation Work Plan discusses the development of DQOs according to the US EPA's recent guidance (US EPA, 2000). The DQO development process involves the following steps:

1. State the Problem
2. Identify the Decision
3. Identify Inputs to the Decision
4. Define the Study Boundaries
5. Develop a Decision Rule
6. Specify Limits on Decision Errors
7. Optimize the Design for Obtaining Data

2.6 Documentation and Records

In summary, data will be collected in the field or in the laboratory and will be transferred to an appropriate summary form. The appropriate team member as designated by the project manager will validate (i.e., check the completeness and accuracy) of all data generated. The validated data will be compiled and reported according to the project schedule.

2.6.1 Field Data

Field data will be recorded on data collection sheets or directly in a field log book. Data to be recorded includes visual observations, chemical analysis (e.g., pH, conductivity, temperature, etc.), and physical measurements (e.g., sample depth, sample location etc.). Field personnel will evaluate this information at the time of collection for accuracy based on instrument response, calibration results, and related measurements where applicable. Data that appears to be an outlier will be confirmed by a second measurement or by recalibration of the instrument where possible. In the event of an instrument malfunction, a replacement instrument will be utilized where possible. Any questionable results identified by the sampling personnel will be noted as such and evaluated further by the QA/QC team. An additional review of the field data will be performed by the project manager after the data have been finalized and submitted by the field personnel. This validation review will include confirmation of appropriate frequency and procedures for calibration,

completeness of the data, and appropriate documentation of the measurements. Any datum that is identified as not meeting the QC criteria will flagged appropriately based on the severity of the deviation from the criteria. If necessary, the datum will be declared invalid and will not be used for any subsequent calculations or decision-making processes. If invalidated data are considered critical, the project manager may require remeasurement.

Analytical results for field measurements will be available immediately. Records associated with the field measurements (e.g., field log books, field data collection sheets, etc.) will be retained by EA for a minimum of 10 years.

2.6.2 Laboratory Data

Laboratory data will be recorded according to the analytical laboratory's standard procedures. The laboratory's QA/QC program addresses the procedures for evaluating the validity of the data being generated, and the response to be taken in the event the QC criteria are not met. The laboratory will assign flags to data that do not meet all QA parameters to indicate possible reduction in data quality. These flags, along with an explanation of their meaning, will appear with the data in any summary tables or other reports that include the data. An additional review of the laboratory data will be performed after the data have been received. This validation review will include an assessment of data quality indicators to determine the data usability. The five common data quality indicators that will be evaluated are precision, accuracy, representativeness, completeness, and comparability (PARCC). These indicators are assessed through field and laboratory QC samples and other procedures. Each is discussed in the following paragraphs.

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is the quantitative measure of the variability of a group of measurements compared to the average value. The overall precision of measurement data is a mixture of sampling and analytical factors. Analytical precision is much easier to control and quantify than sampling precision. Sampling precision may be determined by collecting and analyzing replicate field samples. The analytical results from laboratory replicates provide data on analytical precision. Subtracting the analytical precision from the measurement precision defines the sampling precision.

Accuracy measures the bias in a measurement system. Accuracy is difficult to measure for the entire data collection activity. Sources of error are the sampling process, cross contamination, preservation, sample handling, sample matrix, sample preparation, and analysis techniques. Analytical accuracy is assessed through use of known and unknown QC samples and spike samples. Accuracy determinations by known samples include single control and duplicate control samples, commonly referred to as laboratory control samples. These are samples made up of reagent grade water that is spiked with known amounts of target compounds. Percent recovery and percent difference parameters are determined from these samples. Analytical accuracy determinations by unknown samples include the evaluation of matrix interferences in the environmental samples. These samples also provide percent recovery and percent difference parameters through the use of surrogate and matrix spikes in the environmental samples.

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter that is most concerned with the proper design of the sampling

program. Making certain that sampling locations are selected properly and a sufficient number of samples are collected best satisfies the representativeness criterion.

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is essentially the same for all data uses: that a sufficient amount of valid data is generated. It is important that critical samples are collected and valid data achieved for them.

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurement data for similar samples and sample conditions. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units.

Comparability is limited to the other PARCC parameters because comparisons between data sets require known precision and accuracy. The laboratory data will be evaluated using the PARCC parameters to the extent possible based on available information. Any datum identified as not meeting the QC criteria will be flagged appropriately based on the severity of the deviation from the criteria. If necessary, the datum will be declared invalid and will not be used for any subsequent calculations or decision making processes. If invalidated data are considered critical, the project manager may require reanalysis if there is sufficient sample remaining within the required holding time or recollection and analysis.

Analytical results for the laboratory analysis are expected to be available within 21 days of sample collection. The analytical reports and data packages will be retained by EA for a minimum of 10 years.

3.0 MEASUREMENT AND DATA ACQUISITION

This section presents information related to measurement and data acquisition that is not contained in other related documents. Where the required information is contained in another document, the appropriate reference is provided.

3.1 Sampling Method Requirements

Sample quality will be ensured through the use of appropriate sampling techniques, containers, and handling procedures. The FSAP was prepared according to the *US EPA Region IV Environmental Investigations Standard Operating Procedures and Quality Assurance Manual* (US EPA 1997). Descriptions of sampling methods for each media to be sampled are included in the following sections of the FSAP:

- Soil (**Section 2.1**)
- Groundwater (**Section 2.4**)

Samples will be collected from locations that are intended to provide information about background and on-site levels of analytes. The sample locations chosen and the numbers of samples from each medium are presented in the Work Plan.

Soil samples collected for VOC analysis will be collected in 2 40-ml glass vials preserved with sodium bisulfate, 1 40-ml glass vial preserved with methanol, and 1 4-oz unpreserved glass jar. Soil samples will

have a holding time of 14 days. Groundwater samples collected for VOC analysis will be collected in 3 40-ml glass vials preserved with hydrochloric acid. Groundwater samples will have a holding time of 14 days. Precleaned sample containers will be obtained from the analytical laboratory along with the appropriate preservatives. Sample containers will be secured from the time of receipt from the laboratory, through collection, and until the time of delivery to the laboratory or courier.

Sample custody is presented in **Section 3.3** of this document. Procedures for sample and photographic documentation are discussed in **Section 4.0** of the FSAP. The discussion includes information concerning sample identification, chain-of-custody, and field records.

3.3 Sample Handling and Custody Requirements

Appropriate sample handling and custody helps to ensure the quality and accuracy of the analytical results. Sampling personnel will be responsible for recording the appropriate information on the sample containers, in field logbooks, and on the corresponding chain-of-custody forms. The following subsections of this QAPP describe the sample handling and custody procedures.

3.3.1 Sample Handling

The appropriate sample containers and preservatives will be assembled for the sample to be collected. Prior to sampling, a self-adhesive label will be affixed to each sample bottle. The label will be completed immediately prior to sample collection and will contain the following information:

- Client - Job Name/Project Number,
- Sample identification,
- Date and time collected,
- Sampler's signature or initials
- Preservatives added, and
- Analysis to be performed.

The following information will also be recorded in a bound field log book:

- sample identification,
- date and time of collection,
- personnel present,
- type of sample,
- analysis required,
- sample location and depth (if applicable),
- containers filled, and
- preservatives used.

3.3.2 Sample Custody

Chain-of-custody forms will accompany samples containers to document the transfer of possession of the originating laboratory, through field collection, and to the laboratory receiving the samples for analysis. A sample container is considered to be in the possession of field personnel when:

- it is in the persons actual possession;
- it is in the persons view, after being in their possession; or,
- it was secured by the person in such a way as to prevent unauthorized access.

Each time possession of samples change, the appropriate section of the chain-of-custody form will be completed. The person relinquishing custody will sign and record the date and time custody was relinquished. The person receiving custody will also sign and record the date and time custody was received.

Sampling personnel will complete and verify the chain-of-custody forms. A copy of the chain-of-custody form will be retained and placed in the project file. The original form will accompany the samples to the laboratory. Prior to shipping, the shipping container will be secured with the competed chain-of-custody form inside. The shipping container will be closed and secured with appropriate shipping tape. A custody seal will be affixed across the opening of the container. The seal will be labeled with the date and signature of the sampler.

When received by the laboratory, the samples will be managed according the laboratory's QA procedures. Typically, the receiving laboratory will perform the following:

- Inspect the shipping containers and note the physical condition and confirm that custody seals are intact.
- Inspect each sample container for damage or leaks and inspect the label.
- Note the presence or absence of sample container custody seals.
- Reconcile the samples received against the chain-of-custody record including the sample identification, type of sample, volume, preservative, date collected, time collected, and analysis required.
- Log the samples in the laboratory logbook, prepare a sample receipt report, assign a laboratory identification number, and store the sample in a secure sample storage area.
- Notify the sampler of any problems with the samples received (e.g., broken bottles, missing seals, conflicts between chain of custody information and sample label information).

Conflicts between the sample label and the chain of custody will be resolved before the sample is assigned for analysis. The sampler will be informed of any such discrepancies and their resolution. The conflict and its resolution will also be documented in the laboratory report.

3.4 Analytical Methods Requirements

Samples collected during the RI will be analyzed according to Level III as recognized by the Superfund Program (US EPA, 1987). Level III pertains to Non-Contract Laboratory Program (CLP) analysis of sample

collected. An example of Level III analysis is SW-846 Method 8260B. Samples collected during this investigation will be analyzed for volatile organic compounds (VOCs) by SW-846 Method 8260B, semi-volatile organic compounds by 8270C and Total Hazardous Substance List Metals. Samples will be analyzed for PCBs and/or hexavalent chromium if the presence of those substances is suspected.

3.5 Quality Control Requirements

Quality control activities will be performed by collecting QC samples and by various laboratory QC activities. Samples that will be used for QC purposes include trip blanks, field blanks, and duplicate samples. Each of these sample types is discussed in the following paragraphs. A trip blank is a sample that is prepared prior to the sampling event in the actual container and is stored with the investigative samples throughout the sampling event. The trip blank is prepared by filling a sample container with organic-free water and any required preservative. Trip blanks are routinely used for volatile organics analyses.

An equipment blank (or rinsate blank) is collected at the same time other samples are being collected. Organic-free water is poured over or through any sampling equipment that is used to collect samples after decontamination. The water is collected directly into sample containers. Equipment blanks measure the effectiveness of decontamination procedures and measure the quantity of analytes introduced through the sampling procedures. Equipment blanks are used for both organic and inorganic analysis.

Field duplicate samples are used to measure the precision of the sampling and analysis. The sample is collected by dividing a thoroughly mixed sample (except in the case of volatile organic analysis) into two parts. The two parts are then submitted as separate samples to the laboratory for analysis. The relative percent difference between the two sample results can be calculated.

During the data validation process described in **Section 2.6**, the results of the QC samples will be used to evaluate the PARCC parameters. Appropriate actions will be taken during the validation process according to the following methods:

- *US EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (US EPA, 1999b),*
- *US EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (US EPA, 1994b),*
- *Data Validation Standard Operating Procedures for Contract Laboratory Program Routine Analytical Services (US EPA, 1999c).*

3.6 Instrument Equipment Testing, Inspection, and Maintenance Requirements

Instruments and equipment used in the field during the investigation will be frequently tested and inspected to confirm proper operation. Spare parts will be maintained to prevent delays in equipment repair. Backup instruments will be accessible should primary equipment fail. The off-site laboratory will be responsible for testing, inspecting, and maintaining their equipment.

Field equipment will be maintained and calibrated according to the frequency and procedures contained in the manufacturer's requirements. Field calibration and maintenance will be documented in the field logbook.

3.7 Instrument Calibration and Frequency

Instrument calibration is an important part of an effective QA program. All instruments related to data collection that are capable of adjustment will be properly calibrated at the appropriate frequency. Calibration records will also be maintained as evidence of properly operating instruments. Laboratory equipment will be calibrated according to the laboratory's QA plan.

3.8 Inspection/Acceptance Requirements for Supplies and Consumables

The assessment project manager is responsible for inspecting the supplies and consumables to be used on this project. The supplies and consumables include the following:

- Sampling equipment - sample containers, bailers/rope, shipping containers, and organic-free water.
- Decontamination fluids - detergent, potable water, deionized water, isopropyl alcohol.
- Personal protective equipment - gloves and coveralls.

Shipping containers received from the laboratory will be inspected and inventoried to confirm that all requested items have been received and are in good condition. The shipping container will be inspected for signs of tampering or mishandling. Replacements will be requested from the laboratory as necessary.

Detergent for decontamination will be purchased for the project. When received, it will be inspected to confirm it is appropriate for the intended use. The potable water supply will be confirmed to be secure and easily accessible. Deionized water and laboratory pure water will be obtained from an analytical laboratory. The laboratory will supply the water in sealed containers with documentation of the quality of the water (i.e., deionized or organic-free). The water will not be used unless it is received with the seals intact and the appropriate documentation.

The pesticide-free isopropanol for decontamination will be purchased for the project. The containers will be inspected for damage and for intact seals. It the containers are damaged or the seals not intact, the isopropanol will be rejected.

New personal protective equipment will be used for the project. Each item will be visually inspected prior to use to ensure that it is undamaged and not contaminated. If any equipment is damaged or contaminated, it will be rejected.

4.0 ASSESSMENT AND OVERSIGHT

4.1 Assessment and Response Actions

Assessments will be performed throughout the project to ensure the quality of the data collected and the reports generated. Corrective action will be taken to prevent recurrence of any non-conformances.

The off-site laboratory will be responsible for performing internal audits and assessments to ensure their data quality. Any deficiencies identified by the assessments will be addressed by the laboratory's corrective action program.

Field personnel are responsible for assessing the operation of the equipment they are using through calibration and observation of performance. Corrective actions will be instituted whenever conditions are identified that may negatively affect the quality of the information being acquired. All staff members are responsible for reporting any project activity or product discovered in non-conformance with established plans and procedures and to initiate the corrective action process.

The procedure for reporting non-conformance includes the following three steps:

- The discoverer of the non-conformance will immediately notify the Field Project Manager who will in turn notify the Project Manager.
- The Project Manager will then investigate the extent of the problem and recommend corrective action.
- Any data that has been adversely affected by the non-conformance will be identified and documented in the project file. If necessary, the data will be rejected.

System audits will be performed throughout the project. The Field Project Manager is responsible for supervising and checking that each batch of samples is collected. The samples should be handled in accordance with the approved methods describe in the project documents.

Audits will be performed on the following activities:

- Field Performance audits - At least once during assessment activities, the Field Project Manager will personally observe field personnel collecting samples, packing samples for shipment, decontaminating equipment, etc. The Field Project Manager will personally oversee subcontractors.

- System audits - The Project Manager will personally review all project documentation at least weekly. Before a report or technical memo is issued, the Project Manager will review the item.

- QA Program audits - The Project Manager will regularly review the QA program to ensure that the quality assurance program is being implemented.

Corrective actions will be taken based on deficiencies identified during an audit or at any other time. The specific corrective actions will differ based on the nature of the deficiency. However, the general corrective action program will be implemented as follows: the recommended corrective action will be documented in a memorandum along with the time for implementation. The QA Officer will follow up to ensure that the recommended corrective action has been implemented. The results of the follow-up assessment will be documented in a memorandum.

4.2 Reports to Management

The Field Project Manager will review field notes, sampling records, and chain-of-custody forms and will provide a summary of any significant QA problems and recommended solutions.

Laboratory data will be checked according to the laboratory's QA/QC program. The data will also be reviewed by the Field Project Manager. A Quality Control Summary Report (QCSR) will be prepared by the Field Project Manager for the data. The report will include:

- A copy of the laboratory report.
- A summary of the data quality.
- An assessment of the PARCC parameters.
- A discussion of any quality control problems and corrective actions undertaken to resolve problems.

A copy of the QCSR will be provided to the Project Manager for review.

5.0 DATA VALIDATION AND USABILITY

5.1 Data Review, Validation, and Verification Requirements

Field and laboratory data will be reviewed by the QA/QC Reviewer to evaluate the PARCC parameters. The criteria for accepting or rejecting data are those described in **Section 3.5** of this QAPP. The general review process is listed in **Section 2.6** of this QAPP.

5.2 Reconciliation with User Requirements

A QCSR will be prepared for the data generated during the investigation in accordance with **Section 4.2**. The Project Manager will review the QCSR to identify any data that does not achieve the DQO and assess the impact of any qualified data on the overall data usability for the project.

APPENDIX C

SITE HEALTH AND SAFETY PLAN

9307 Monroe Road, Suite K
Charlotte, North Carolina 28270
T 704.846.8853 F 704.846.3271
enviroassessments.com

enviroassessments

HEALTH AND SAFETY PLAN

FOR

R.D. PATE ESTATE

101 East Main Street
Pikeville, Wayne County, North Carolina

SITE ID: NONCD0002795

Latitude: 35° 29' 51.46" North Longitude: 77° 58' 59.91" West

February 2010

PREPARED FOR
Ms. Pamela Watson, Vice President
Personal Trust Specialist
Branch Banking & Trust Company
Wealth Management Division
P. O. Box 2907
223 West Nash Street
Wilson, North Carolina 27894-2907
(252) 246-4548

FORMER UST OWNER/OPERATOR AND CURRENT PROPERTY OWNER
Richard David Pate
P. O. Box 54
Pikeville, North Carolina 27863

EA Project No. 07-7019.5

Gary K. Sawyer, L.G., RSM
Principal
NC License No. 1337

NORTH CAROLINA LICENSED SEAL 1337 GEOLOGIST GARY K. SAWYER

SITE HEALTH AND SAFETY PLAN
ABSTRACT

Site Address

101 East Main Street
Pikeville, North Carolina 27863

Project Manager/Site Safety and Health Officer

Gary K. Sawyer, P.G., RSM
EnviroAssessments
9307 Monroe Road, Suite K
Charlotte, North Carolina 28270
(704) 846-8853 (office)
(704) 980-3201 (cellular)

Emergency Contacts

EMS & Fire:	**Dial 911**
Fire Station:	Pikeville – Pleasant Grove Fire Department 105 SW Railroad Street Pikeville, North Carolina 27863 (919) 242-6780

Local Hospital

Wayne Memorial Hospital
2700 Wayne Memorial
Goldsboro, North Carolina 27534 (See Figure 3 for map and directions)
(919) 736-1110

Total Distance: 8.3 miles
Total Estimated Time: 12 minutes

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Figures

Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: Map and Directions to nearest Hospital

1.0 INTRODUCTION

This Site Specific Health and Safety Plan (HASP) has been developed to guide the health and safety practices of EnviroAssessments (EA) personnel conducting Remedial Investigation (RI) field activities at the R.D. Pate Estate site, or "Project", located at 101 East Main Street in Pikeville, Wayne County, North Carolina. A Site Location Map is attached as **Figure 1**. This HASP has been prepared in accordance with Occupational Safety and Emergency Response (OSHA) Regulations, 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response, or HAZWOPER).

The RI is part of a voluntary remedial action being implemented at the site by the R.D. Pate Estate, the current site owner, under the North Carolina Department of Environment and Natural Resources (NCDENR) Registered Environmental Consultant (REC) Program. The RI is designed to identify and delineate areas of contamination at the Project. A Work Plan has been prepared for the RI, and provides detailed information on the site history, previous environmental assessments, Project objectives and work scope.

This HASP identifies potential hazards associated with the planned work, and describes procedures and precautions to be followed in order to protect EA personnel, subcontractors, site visitors, the surrounding public and the environment. The HASP will be updated as necessary during the progression of the remedial action, as additional information becomes available.

1.1 Site Description

The subject site ("the Project") consists of one approximately 0.12 acre rectangular-shaped parcel of land identified as parcel number 3603276476 by the Wayne County Tax Assessor and located in an urban area at 101 East Main Street in Pikeville, Wayne County, North Carolina. The property contains one approximately 3,397 square foot one-story building constructed in phases throughout the 1940s and 1950s. Historically, the Project operated as an automotive repair facility and service station from the late 1940s to 1992, and an automotive repair facility until 2007. The remainder of the property is utilized as a gravel parking area. Prior to the current improvements, the Project was reportedly residential land. A detailed sketch of the Project is attached as **Figure 2**.

1.2 Site History

Prior to the current improvements, the Project was reportedly residential land. The current improvements were constructed in phases throughout the 1940s and 1950s. Historically, the Project operated as an automotive repair facility and service station from the late 1940s to 1992, and an automotive repair facility until 2007.

EA's Transaction Screen (TS), Phase II Environmental Site Assessment (ESA), and a Phase II Limited Site Assessment (LSA-II) identified several areas of concern, and detected soil and groundwater contamination in those locations. Petroleum-related (Benzene and Diisopropyl Ether) and chlorinated solvent compounds (Trichloroethene (TCE) and 1,1,2,2-Tetrachloroethene) were detected in the soil and groundwater at the Project and appear to be a result of a combination of releases (leaks and spills) from the former on-site UST

systems and from the on-site automotive and equipment repair operations. Each of the two (2) release incidents is addressed by a separate division within the NCDENR.

Regarding the petroleum related constituents, the NCDENR Division of Waste Management (DWM), Washington Regional Office approved the Notice of Residual Petroleum prepared by EA and filed with the Wayne County Register of Deeds in Book 1060, Page 340 on behalf of Pamela Watson of Branch Banking & Trust Company (Trustee of R.D. Pate Family Trust). In addition, a Notice of No Further Action issued by the DWM on January 7, 2008 concluded that soil contamination exceeds the industrial/commercial MSCCs established in Title 15A NCAC 2L .0411; however, the DWM has determined that no further action is warranted for the petroleum related incident.

Subsequently, the chlorinated solvent contamination in groundwater was reported to the state's Inactive Hazardous Sites Branch (IHSB). On May 15, 2008, EA entered into an Administrative Agreement with Ms. Pamela Watson, Branch Banking and Trust Company, Executor and Trustee for the R.D. Pate Family Trust to enter into the Registered Environmental Consultant (REC) Program under the direction of the NCDENR IHSB pursuant the Inactive Hazardous Sites Act of 1987 (N.C.G.S. 130A-310 *et seq.*).

1.3 Applicability of the HASP

The purpose of this HASP is to define the requirements and designate protocols to be followed at the Site during investigation activities. Applicability extends to all S&ME employees, contractors, subcontractors, and visitors. All personnel on the Site, contractors and subcontractors included, shall be informed of the Site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering the exclusion zone or the contamination reduction zone. During development of this plan, consideration was given to current safety standards as defined by the Occupational Safety and Health Administration (OSHA) and other applicable agencies. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 (Requirements for Hazardous Waste Site and Emergency Response Workers)
- NIOSH/OSHA/USCG/EPA Occupational Health and Safety Guidelines for Hazardous Waste Sites
- American Conference of Governmental Hygienists (ACGIH) Threshold Limit Values (TLVs)

1.4 Project Scope of Work

As detailed in the Work Plan, an investigation will be conducted at the Project in order to evaluate potential areas of concern for which no previous investigation has been completed, and to more fully evaluate the nature, extent and magnitude of contamination where indicated by the previous investigation(s). A Remedial Action Plan Report will present the findings and evaluate remedial alternatives. Remedial alternatives will be presented in a feasibility study, along with justification for the selected remedy. A summary of the work is as follows:

- Completion of soil borings using direct-push (Geoprobe) methods, to assess subsurface conditions and collect soil samples for laboratory analysis in areas of known or potential concern, and to determine background soil concentrations for selected analytes

- Installation of additional groundwater monitoring wells
- Collection of groundwater samples for laboratory analysis
- Collection of surface water and sediment samples for laboratory analysis
- Site mapping and surveying

2.0 ORGANIZATIONAL STRUCTURE

2.1 Roles and Responsibilities

All personnel and visitors on the Project grounds must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs. A summary of current organizational assignments is shown below.

Site Organizational Structure

Assignment	Name
Project Manger(s); Site Safety & Health Officer(s)	Gary K. Sawyer, P.G./Principal Donald Warren, Field Operations Manager Jeff Hvozdik, Project Health and Safety Officer
Field Sampling Personnel	Amanda L. Petoskey, Staff Geologist Michael P. McDermott, Environmental Scientist Jeffrey T. Hvozdik, Environmental Scientist / NC Certified Driller
Outside Contractor(s)	Surveyor Drilling Contractor Excavation Contractor Utility Locator
Other Site Personnel & Visitor(s)	EnviroAssessments representatives; NCDENR representatives; others (to be determined)

Project Manager (PM)

The PM has the responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Safety and Health Officer (SSHO), has the authority to oversee and monitor the performance of the SSHO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are: preparing and coordinating the site work plan; providing site personnel with work assignments and overseeing their performance; coordinating safety and health efforts with the SSHO; ensuring effective emergency response actions (if applicable); serving as primary site liaison with public agencies and officials and site contractors.

Site Safety and Health Officer (SSHO)

The SSHO has full responsibility and authority to develop and implement this HASP and to verify compliance. The SSHO reports to the Project Manager. The SSHO is on-site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are: managing the safety and health functions on this site; serving as the Project's point of contact for safety and health matters; ensuring site monitoring, work training, medical surveillance, and effective selection and use of PPE; assessing site conditions for unsafe acts and conditions and providing corrective action; assisting the preparation and review of this HASP; maintaining effective safety and health records as described in this HASP; directing and controlling emergency response activities and personnel.

Other Site Personnel, Outside Contractors & Visitors

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the lines of authority established for the Project.

3.0 SITE CHARACTERIZATION AND JOB HAZARD ANALYSIS

3.1 Site Characterization

Environmental assessments have been completed for the site, as detailed in the Work Plan. These studies have provided information relative to environmental conditions and potential hazards. Petroleum and hazardous substances identified as having been used at the site are listed below.

Substance	Purpose
Tractor Oil	Automotive/Tractor Repair Operations
Gear Lubricant	Automotive/Tractor Repair Operations
Welding Gases	Automotive/Tractor Repair Operations
Waste Antifreeze (55-gallon drum)	Automotive/Tractor Repair Operations
Antifreeze	Automotive/Tractor Repair Operations
Paint	Automotive/Tractor Repair Operations/Facility Maintenance
Gasoline (Several one-, three- and five-gallon containers)	Automotive/Tractor Repair Operations
Kerosene (five-gallon container)	Unknown

Information from EA's Transaction Screen, Phase II ESA, and Phase II LSA indicates the following:

- The facility previously operated one 280-gallon heating oil UST which was installed in 1946; one 4,000-gallon gasoline UST and one 3,000-gallon gasoline UST which were installed in 1951; and two 3,000-gallon gasoline USTs which were installed in 1974.

- The subsurface investigation confirmed the presence of petroleum contamination in soil and groundwater. The constituents identified in the soil and groundwater appeared to be a result of releases associated with the former on-site UST system. Groundwater samples WS-1 and WS-2, both of which were collected within the boundaries of the Project's former UST basin, revealed one or more constituents at concentrations which exceeded their respective NCAC 2L Groundwater Standards by a factor of 10 or more.

- EA collected a soil sample from each of the four LSA monitoring well locations, as the exact source area was unknown. One soil sample was collected during each well installation (S-1, S-2, S-3 and S-4). Laboratory analysis of soil sample S-2-4, collected from the monitoring well boring location (MW-2) at a depth of 4 feet BG, revealed slightly elevated levels of Benzene at a concentration of 0.473 milligrams per kilogram (mg/kg), exceeding its respective Soil-to-Water MSCC of 0.0056 mg/kg. Several additional common petroleum constituents were also identified at this soil sample location at concentrations which exceeded their respective Soil-to-Water MSCCs. None of the concentrations exceeded the Residential MSCCs. None of the target analytes were detected in soil samples S-1-4, S-3-4 or S-4-4.

- The groundwater samples from each of the monitoring wells revealed levels of target analytes which exceed the state's minimal reporting action limit, the NCAC 2L Groundwater Standards. The compounds included common petroleum and solvent-related contaminants. MW-1 revealed concentrations of 2 chlorinated solvent target analytes, Trichloroethene (TCE) and 1,1,2,2-Tetrachloroethane, which exceed their respective NCAC 2L Groundwater Standards. MW-2 revealed concentrations of TCE and 1,1,2,2-Tetrachloroethane (chlorinated solvent analytes) and Diisopropyl Ether and Benzene (petroleum-related analytes); all of which exceed their respective NCAC 2L Groundwater Standards. MW-3 revealed concentrations of the petroleum-related analytes Diisopropyl Ether; Benzene; and Naphthalene; all of which exceed their respective NCAC 2L Groundwater Standards. MW-4 revealed concentrations of the petroleum-related analytes Total Xylenes and Naphthalene, both of which exceed their respective NCAC 2L Groundwater Standards.

- The source of the petroleum-related compounds (Benzene, Xylenes and Naphthalene) appears to be the western side of the former UST basin. The source of the chlorinated solvent-related compounds (TCE and 1,1,2,2-Tetrachlroethane) appears to be the area of the site located between the garage doors and the former UST basin. The lateral extents of the chlorinated solvent contamination plumes in groundwater have not been defined in the down-gradient direction and the extent of impact to off-site properties has not been determined.

3.2 Job Hazard Analysis

Potential health and safety hazards of these certain job tasks are listed below. The potential for encountering these hazards is ranked high, medium, or low based on the work to be performed and the hazard control measure to be used.

Field Activity	Summary	Description of potential hazards	Hazard Control Method	Hazard Potential
Non-Intrusive Work (Project reconnaissance; surveying; site preparation for intrusive activities)	Safety	Slips, trips or falls due to uneven walking surface or wet/snowy/icy conditions	Watch where stepping. Avoid areas of debris or thick vegetation. Use caution when walking on slopes. Where personal protective equipment when required or deemed necessary.	Medium
	Physical	High or low ambient temperatures; noise; radiological; atmospheric	Appropriate dress and relief for forecasted conditions in addition to the required personal protective equipment	Medium
	Biological	Plants, animals, insects, spiders, infectious waste	Team member should alert SSHO of any allergens prior to any field activity. Apply repellants, antihistamines, etc. as needed	Low
	Utilities	Buried, overhead, or in general work area	Utility locates will be conducted prior to any intrusive subsurface investigation.	Medium
Sampling and Related Tasks (well development; groundwater sampling; surface water and/or sediment sampling; surface hand augering and grab sampling)	Safety	Slips, trips or falls due to uneven walking surface or wet/snowy/icy conditions	Watch where stepping. Avoid areas of debris or thick vegetation. Use caution when walking on slopes. Wear the appropriate level of personal protective equipment when required or deemed necessary.	Medium
	Chemical	Dermal contact and inhalation of hazardous substances	Work in well ventilated areas. Monitor breathing zone of work area for volatile organic compounds using a photoionization detector (PID). Wear the appropriate level of personal protective equipment when required or deemed necessary. Modify as necessary.	Low

	Biological	Plants, animals, insects, spiders, infectious waste	Team member should alert SSHO of any allergens prior to any field activity. Apply repellants, antihistamines, etc. as needed	Low
	Physical	Materials handling	Observe proper lifting techniques. Obey sensible lifting limits. Use mechanical lifting equipment when handling large awkward loads.	Low
	Physical	High or low ambient temperatures; noise; radiological; atmospheric	Appropriate dress and relief for forecasted conditions in addition to the required personal protective equipment	Medium
	Utilities	Buried, overhead, or in general work area	Utility locates will be conducted prior to any intrusive subsurface investigation (i.e. coring and/or hand augering).	Medium
Intrusive Work (drilling operations; heavy equipment operations/ excavating)	Safety	Slips, trips or falls due to uneven walking surface or wet/snowy/icy conditions	Watch where stepping. Avoid areas of debris or thick vegetation. Use caution when walking on slopes. Stand back away from heavy equipment while in use to avoid turning radius and to remain visible to the operator; and stand back away from edges of any excavated areas. Wear the appropriate level of personal protective equipment when required or deemed necessary.	Medium
	Chemical	Dermal contact and inhalation of hazardous substances	Work in well ventilated areas. Monitor breathing zone of work area for volatile organic compounds using a photoionization detector (PID). Wear the appropriate level of personal protective equipment when required or deemed necessary. Modify as necessary.	Low
	Physical	Materials handling	Observe proper lifting techniques. Obey sensible lifting limits. Use mechanical lifting equipment when handling large awkward loads.	Low
	Physical	High or low ambient temperatures; noise; radiological;	Appropriate dress and relief for forecasted conditions in addition to the required personal protective equipment	Medium

		atmospheric		
	Biological	Plants, animals, insects, spiders, infectious waste	Team member should alert SSHO of any allergens prior to any field activity. Apply repellants, antihistamines, etc. as needed	Low
	Site Instability	Seismic zone, karst topography, etc.	Not applicable	Low
	Utilities	Buried, overhead, or in general work area	Utility locates will be conducted prior to any intrusive subsurface investigation (i.e. drilling and/or excavating operations).	High

These tables will be modified as necessary during the Project; for example, if the scope of work is changed by adding, eliminating, or modifying tasks; new chemical, physical or other hazards are identified; or monitoring data indicate changes in the concentration and/or likelihood of exposure.

Direct Reading Exposure Monitoring (to monitor potential worker exposure)			
Activity	**Instrument**	**Actions**	**Frequency**
Scanning each soil sample prior to sample collection	Mini RAE 2000 Portable VOC Monitor	Record meter response in parts per million (ppm) to compare with laboratory analytical results	Each individual sample
Screening groundwater monitoring wells for free product prior to sample collection	Solinst Interface Probe	Record and report thickness of free product in inches	Suspected source area

3.3 Employee Notification of Hazards and Overall Site Information Program

This information is made available to all affected employees prior to the beginning of intrusive work activities. Modifications are communicated through routine briefings.

4.0 SITE CONTROL MEASURES

The site control program is designed to reduce the spread of hazardous substances from contaminated areas to clean areas, to identify and isolate contaminated areas of the Project, to facilitate emergency evacuation and medical care, to prevent unauthorized entry to the site, and deter vandalism and theft.

The site control program includes elements specified in 29 CFR 1910.120(d) and provides the following specific information:

- a site map, indicating site perimeter and work zones
- site access procedures
- site security
- site work zones including standard operating procedures
- use of the buddy system, when appropriate
- both internal (on-site) and external communications

The Site Safety and Health Officer (SSHO) is responsible for evaluating site conditions and for verifying that the site control program functions effectively. The site control program is updated regularly to reflect current site conditions, work operations, and procedures.

4.1 Site Map

A map of the Project showing property boundaries, ingress/egress points, and planned work areas is attached as **Figure 2**.

4.2 Site Access and Security

Access to designated work zones is restricted to reduce the potential for exposure to its safety and health hazards. Entry and exit to designated work zones is monitored by the SSHO.

When the site is not operating, access is controlled by locking all doors and gates (if applicable), and/or barricading ingress/egress points.

Visitors to the site register with the SSHO, and are escorted at all times when entering controlled work areas. Visitors are expected to comply with the requirements of this HASP. Visitors who wish to enter contaminated areas of the site must provide documentation that they have the required training and medical evaluation and must receive a site-specific briefing about protecting themselves from site hazards, recognizing site zones demarcations, and following emergency evacuation procedures prior to entry.

4.3 Site Work Zones

The site is divided into three zones, as follows:

- Exclusion Zone: areas known to be contaminated, or having the potential for contaminant exposure during the work activity.
- Contamination Reduction Zone: the area between the Exclusion Zone and the Support Zone, where personnel and equipment will be decontaminated.
- The Support Zone: the site areas which are not contaminated, or not subject to contaminant exposure during the work activity.

Exclusion Zone

During the RI, an Exclusion Zone will be formally defined only for activities and work areas where there is a significant chance for exposure to hazards (e.g., drilling and excavating operations). In those instances, the perimeter of the Exclusion Zone will extend approximately 25-feet from the location of the work activity, adjusted as necessary to guard surrounding personnel and/or accommodate site constraints. Where the work area is confined to a particular location for an extended period of time, the perimeter of the Exclusion Zone will be marked with hazard tape, cones, or similar markers. All personnel entering these areas must wear the prescribed level of PPE.

For relatively non-intrusive RI activities, such as sampling of groundwater, surface water, surficial soil and sediment, a formal Exclusion Zone will not be delineated, due to the limited likelihood of exposure to personnel other than those actually doing the work.

Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) is located between the Exclusion Zone and the Support Zone, for decontamination of workers and equipment. The CRZ also serves as a buffer between the Exclusion Zone and the Support Zone, to limit the potential for spread of contamination.

The CRZ can only be established for operations where a significant chance for exposure to hazards (e.g., drilling and excavating operations) has been delineated by demarcating the Exclusion Zone. When establishing the CRZ for those instances, consider factors such as air flow from the Exclusion Zone toward the Support Zone, work site configurations, traffic patterns, and other activities or processes that could result in the transfer of contaminants. The CRZ boundaries should be clearly marked (e.g., lines, placards, hazard tape and/or signs) and/or enclosed by physical barriers, such as chains, barricades or ropes.

General Work Area(s)/Support Zone

Individual time in the general work area will be documented in log books or a sign-in log. Traffic cones and barricade tape will be used as temporary fencing to establish site control. A tailgate meeting will be completed for activities conducted at the site prior to commencement on a daily basis.

During instances where the establishment of an Exclusion Zone and Contamination Reduction Zone were deemed necessary, the Support Zone would encompass all clean or unaffected areas beyond the outer boundary of the Exclusion Zone and Contamination Reduction Zone. There should be no contamination in this zone. Administrative, clerical, and other support functions are based in the Support Zone.

4.4 Site Communications

A primary and back-up means of communications for field crews have been established as described below.

Type of Communication	Primary Means	Back-up Means
Communication with home base	Cell phones EnviroAssessments office: 704-846-883	Land line, if available
Communications among field crew members	Hand signals or voice communications	Not applicable
Communications with Client and/or Client representatives	Cell phones for off-site Clientele and/or voice communication for on-site Clientele	Land line, if available

5.0 MEDICAL MONITORING AND TRAINING REQUIREMENTS

5.1 Medical Monitoring

All personnel performing intrusive activities on this site must be active participants in a Medical Monitoring Program which complies with 29 CFR 1910.120. The use of respirators is not anticipated during performance of the RI. However, should respirator use be required, affected workers are required to receive medical examinations in accordance with 29 CFR 1910.134(e) to ensure they are physically capable of performing the work and using the equipment.

5.2 Training

All personnel covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response [HAZWOPER] Training). The following training, at a minimum, is required for all on-site personnel working in the field.

Each individual must have completed the initial 40-hour HAZWOPER training course (or annual 8-hour HAZWOPER Refresher course) within the past year prior to performing work on this site covered by this HASP. Each individual must also have completed a course certifying them in standard first aid and CPR. Additionally, on-site managers and supervisors directly responsible for supervising individual engaged in hazardous waste operations must have completed the specified 8-hour supervisory training course.

6.0 AIR MONITORING PROGRAM

Air monitoring will be used to identify and quantify airborne levels of hazardous substances in order to determine the appropriate level of employee protection needed on-site.

6.1 General Requirements

Air monitoring shall be performed during intrusive RI site activities such as soil borings and excavation. At the beginning of each day prior to conducting these activities, air monitoring shall be conducted at the upwind

boundary of the site to establish a background reading. During the course of the day similar background readings may be taken as appropriate. The frequency of monitoring shall be sufficient to characterize employee exposure. All air monitoring data will be recorded onto appropriate field logs by the Site Safety and Health Officer or other designee. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

6.2 Site Specific Requirements

Task-specific monitoring requirements are identified below.

PID Reading (In Breathing Zone, above background, in ppm)	Action
0-5	Continue work in Level D.
5-25	Discontinue work, monitor breathing zone to assess whether VOC concentrations stabilize below 5 ppm within 15 minutes. If so, resume field activity in Level D and continue to monitor. If not, withdraw from area and contact Site Safety and Heath Officer.
$\geq$ 25	Discontinue work, monitor breathing zone to assess whether VOC concentrations stabilize below 25 ppm within 15 minutes. If so, resume field activity in appropriate level of personal protection and continue to monitor. If not, withdraw from area and contact Project Manager/Site Safety and Heath Officer.

Air borne dust levels will be monitored visually. If a significant amount of potentially contaminated airborne dust is present in the breathing zone, measures will be taken to reduce dust generation and exposure, such as wetting down the work area.

Oxygen deficiency is not considered to be a significant issue given the site characterization activities will be generally conducted outside and not in confined spaces. Air monitoring for radiation is not warranted because the identified contaminants of concern do not include radioactive materials and the radiation level in the work areas is not anticipated to deviate from background values for the Project area.

7.0 PERSONNEL PROTECTIVE EQUIPMENT

This section describes the selection and use of personal protective equipment (PPE) which may be required to protect workers from exposure to hazardous substances and hazardous conditions on the site.

7.1 Levels of PPE and Selection Criteria

Site safety and health hazards are eliminated or reduce to the greatest extent possible through the use of engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices, and PPE are used to protect employees. An initial level of PPE (i.e., Levels A through D), is assigned to each task, based on the anticipated concentrations and exposure routes of chemical hazards associated with the task. Modifications to the initial PPE (upgrades, downgrades) are made, as

necessary, based on chemical data, air monitoring results and other information gathered during the Project.

This section describes the personal protective equipment (PPE) that will be used during the activities at the site, when engineering controls and work practices are not feasible to reduce employee exposure. Based on available analytical data and activities planned for the RI, it is not anticipated that PPE requirements will exceed Level D or Modified Level D PPE.

Level D

- Safety glasses (goggles or face shield if splash hazard is present)
- Chemical resistant boots/shoes (steel-toed and steel shank if heavy objects & equipment are present)
- Hard hat (for work involving heavy equipment, overhead lifting, potentially falling objects or head-bumping hazards, and/or at discretion of SSHO)
- Hearing protection must be worn if noise levels prevent normal conversation at three feet.
- Latex or nitrile surgical gloves (for sampling activities, and at the discretion of SSHO)
- Rubber overboots or disposable "booties" (at discretion of SSHO)
- Cotton long sleeve shirt and pants (or coveralls, at discretion of SSHO)

Criteria for Use

- No indication of airborne health hazards present
- Total vapor levels less than 1 ppm above background with photoionization detector
- No indication of dermal contact hazards present

Modified Level D

- Safety glasses (goggles or face shield if splash hazard is present)
- Chemical resistant boots/shoes (steel-toed and steel shank if heavy objects & equipment are present)
- Hard hat (for work involving heavy equipment, overhead lifting, potentially falling objects or head-bumping hazards, and/or at discretion of SSHO)
- Hearing protection must be worn if noise levels prevent normal conversation at three feet.
- Gloves – outer, chemical resistant
- Gloves – inner, chemical resistant
- Rubber overboots or disposable "booties" (at discretion of SSHO)
- Uncoated or polyethylene-coated coverall (use and type at discretion of SSHO)

Criteria for Use

- No indication of airborne health hazards present
- Total vapor levels less than 5 ppm above background with photoionization detector
- A higher level of skin protection than standard work clothes is required

The following competent person(s) certifies that a hazard assessment for the identified activities has been performed and the selection of PPE is based on the best available information.

In addition to the established level of PPE, the following shall apply:

- No eating or drinking is allowed in the exclusion or contamination reduction zones. No smoking anywhere on site.

- No EnviroAssessments personnel shall conduct a confined space entry. In addition, no personnel shall approach any excavation area where there is danger of a wall collapse.
- Respiratory protection is dependent on conditions.

7.2 Training

Employees receive general training regarding proper selection, use and inspection of PPE during initial HAZWOPER training (or equivalent) and subsequent refresher training. Site-specific PPE requirements, including task-specific PPE, ensemble components, cartridge/canister service times, and inspection procedures are communicated by the SSHO as necessary.

7.3 Respiratory Protection

Respiratory protective equipment, if deemed necessary, shall be National Institute for Occupational Safety and Health (NIOSH) approved and use shall conform to OSHA 29 CFR Part 1910.134 Requirements. Each employer shall maintain a written respirator program detailing selection, use, cleaning, maintenance, and storage of respiratory protective equipment.

7.4 Hearing Protection

Hearing protection is made available when noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 dBA. Hearing protection is required when the 8-hour time weighted average sound level $\geq$ 90 dBA. Where noise exposure meets or exceeds this level, noise is listed as a physical hazard in the job hazard analysis for the tasks/operation, and hearing protection is included as one of the control measures (PPE).

8.0 DECONTAMINATION PLAN

This section describes how personnel and equipment are decontaminated when they leave the Exclusion Zone, and how residues from decontamination processes are managed. Decontamination procedures are designed to achieve an orderly, controlled removal or neutralization of contaminants that may accumulate on personnel or equipment. These procedures minimize worker contact with contaminants and protect against the transfer of contaminants outside designated work zones.

Decontamination is not anticipated to be a significant issue for personnel involved with RI field activities, due to an anticipated lack of direct exposure to gross levels of contamination. Decontamination of equipment is not considered to be a substantial health and safety issue, and will mainly be conducted to eliminate the chance of cross-contamination of samples collected for laboratory analysis.

8.1 Decontamination Facilities

Decontamination is conducted in the Contamination Reduction Zone (CRZ). The CRZ acts as a buffer between the Exclusion Zone and the Support Zone. The location and design of decontamination stations minimize the spread of contamination beyond these stations. Separate facilities are used for personnel and for equipment.

8.2 Decontamination Procedures

The following table describes the required decontamination procedures:

Type of Contamination	**Activities requiring decontamination, and decontamination steps, location, required equipment, and collection and disposal of potentially contaminated solids and liquids**
Personnel decontamination	**Level D** Proper doffing and disposal of gloves as sanitary waste. **Modified Level D** 1. Outer Boot and Glove Removal – Remove outer boots and gloves. If outer boots are disposable, deposit them in a plastic-lined container. If non-disposable, store them in a clean dry place. 2. Outer Garment Removal – remove chemical resistant outer garments and dispose of them in a plastic-lined container. 3. Facial Protection – Remove hard hat, face piece and ear protection. Wash and rinse hard hat, face piece and ear protection at least daily. Dry/wipe off and store in a clean, dry location. 4. Inner Glove Removal – Remove inner gloves and dispose of them in a plastic-lined container. 5. Field Wash – Thoroughly wash hands and face with soap and water. If significant dermal exposure is indicated or suspected, the affected area will be thoroughly washed with soap and water at the closest wash area. If lingering effects of exposure are indicated or suspected, the affected personnel will seek prompt medical attention.
Equipment decontamination	Dedicated or disposable equipment will be used when practicable. Dry decontamination will be performed until samples are clean and sampling utensils have been bagged for disposal. Smaller pieces of re-usable equipment (e.g., hand auger) will be decontaminated with a scrub brush and non-phosphate soap solution, followed by clean (distilled) water rinse prior to re-use. Equipment and samples will be scanned before packaging, and then before placing in the vehicles.

	Larger pieces of equipment (e.g. backhoe/excavator, drill rig) will be power washed/steam cleaned when warranted based on visual observations, and prior to leaving the site.

9.0 EMERGENCY RESPONSE PLAN

Site personnel must be prepared for emergencies such as: illness or injuries, chemical exposure, fire, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. The following sections outline the general procedures for emergencies. Emergency information, such as telephone numbers of emergency contacts, should be posted as appropriate.

9.1 Emergency Information

In the event of an emergency, the field team will immediately contact the appropriate emergency services. Local emergency contact information is detailed below.

Name	Address	County	Zip Code	Phone Number
Pikeville Police Department	112 SW Railroad Street, Pikeville, NC	Wayne	27863	919-242-5330
Pikeville-Pleasant Grove Volunteer Fire Department	105 SW Railroad Street, Pikeville, NC	Wayne	27863	919-242-6780
Wayne Memorial Hospital	2700 Wayne Memorial Drive, Goldsboro, NC	Wayne	27534	919-736-1110

Wayne Memorial Hospital is located at 2700 Wayne Memorial in Goldsboro, North Carolina. A map with directions to the hospital is attached as **Figure 3**.

State, regional, and national emergency contact information is detailed below.

9.2 General Procedures

A first aid kit (including an EpiPen), 15-minute emergency eye wash, and fire extinguisher rated for class A, B and C fires will be present adjacent to the Exclusion Zone during all subsurface explorations. It shall be the responsibility of the SSHO to make a determination as to the proper response to a particular emergency.

In case of the need for evacuation from the Project, an alarm in the form of verbal instructions will be given by the SSHO. The evacuation route will be along the most direct open path to the site entrance. If personal safety permits, prior to evacuation, equipment and other site conditions will be left in a condition so as to limit the potential for accidental injury to others. Subsequent to evacuation from the area of danger, as soon as it is possible, the SSHO will make an accounting of all on-site Project personnel, and the incident will be reported to the appropriate authorities.

9.3 Emergency Procedures – Specific Incidents

Chemical Exposures

A. If site personnel experience symptoms suggesting overexposure to toxic chemicals (lightheadedness, dizziness, headache, nausea, shortness of breath, burning sensation in the mouth, throat or lungs), the person should be escorted from the contaminated environment to fresh air immediately. The SSHO will be responsible for monitoring personnel.

B. If unconscious, the victim should be removed from the contaminated area immediately and brought to the nearest hospital. Rescuers shall wear personal protective equipment equivalent to one level of protection above that of the victim.

C. If the victim is no longer breathing, he/she shall be moved away from the contaminated area. Mouth-to-mouth resuscitation or some alternate form of effective artificial respiration shall begin immediately. Should any of the above scenarios be encountered, emergency medical attention/advice must be obtained immediately by contacting the Fire Department and/or transporting the victim to the hospital.

Skin Exposure

If there is skin contact with toxic or potentially toxic chemicals, the skin should be washed with copious amounts of soap and water. If clothing is contaminated, it should be removed immediately and the skin washed thoroughly with running water. All contaminated parts of the body, including the hair, should be thoroughly washed. It may be necessary to wash repeatedly.

Ingestion

If site personnel should ingest toxic or possibly toxic chemicals, obtain medical attention immediately.

Eyes

If a toxicant should get into the eyes, they should be washed with generous amounts of water. The eye should be flooded with water so that all surfaces are washed thoroughly. Washing should be continued for at least fifteen minutes. Medical attention should be obtained immediately.

Personnel Injury

The SSHO will maintain a current certification in Standard First Aid. A first aid kit will be available on-sit at all times. In event of personnel injury, the SSHO, or the designated alternate, will administer appropriate first aid and arrange transportation for injured personnel to the designated medical facility (if necessary). If the personnel injury is a work related injury/illness (e.g., hit by a falling piece of drill equipment of backhoe/excavator), rather than a non-work related injury/illness (e.g., heart attack), the SSHO will evaluate the site conditions to determine if the hazard still exists. Site personnel shall not re-enter the work zone until the cause of the injury/illness is determined, and the work zone is designated safe to re-enter by the SSHO.

Fire/Explosion

In the event of fire or explosion, the Fire Department shall be alerted and all personnel shall move to a safe distance from the involved area. Fires shall not be fought by site personnel if an explosion hazard is present. Personnel should not attempt to fight large fires at the Project.

This Site-Specific Health and Safety Plan are based on the information available during preparation. Any changes in activities or conditions which arose that affected the status of hazardous conditions will require amendments to the original plan.

Changes in Field Activities or Hazards:

_____

_____

_____

_____

_____

Prepared By: _____ Date: _____

Approved By: _____ Date: _____

EnviroAssessments Employee
Site Health and Safety Plan Review Record

I acknowledge that I have read and understood the contents of this Site Health and Safety Plan and I agree to abide by all provisions as set forth. I have also checked in with the site client contact to alert them of our presence and for any daily safety issues. Please note: "no implements are to be brought on an EnviroAssessments site, or while performing EnviroAssessments business that are, or intended to be used, as weapons (such as: guns, knives, etc.)". Firearms are expressly prohibited. By signing below you are certifying that this policy is upheld. EnviroAssessments retains the option to audit your personnel and equipment to assure your compliance.

Name (Print)	**Name** (Signature)	**Affiliation**	**Date**

Subcontractor & Visitor
Site Health and Safety Plan Review Record

I have read the Site Health and Safety for this site and have been briefed on the nature of the contaminants and the level and degree of exposure likely as a result of participation in this Project. I agree to conform to all the requirements of this plan. This HASP does not replace the requirement or liability for your company to have its own safety program and site-specific HASP. I also acknowledge that this plan is specific for this EnviroAssessments site and may not address unforeseen hazards not included in the Site Health and Safety Plan on your specific contracted task.

Please note: "no implements are to be brought on an EnviroAssessments site, or while performing EnviroAssessments business that are, or intended to be used, as weapons (such as: guns, knives, etc.)". Firearms are expressly prohibited. By signing below you are certifying that this policy is upheld. EnviroAssessments retains the option to audit your personnel and equipment to assure your compliance.

Name (Print)	**Name** (Signature)	**Affiliation**	**Date**