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June 16, 2016

Ms. Carolyn Callihan, RPM
Superfund Restoration and Site Evaluation Section
US EPA Region IV Superfund Division
61 Forsyth Street SW, 11th Floor
Atlanta, GA 30303

Approved 6/16/16

Subject: Amended Quality Assurance Project Plan (QAPP)
Hemphill Road TCE
EPA ID# NC0 002 374 445
Gastonia, Gaston County, NC

Dear Ms. Callihan:

During the week of June 20, 2016, NC Superfund Section personnel will be conducting sampling at the Hemphill Road TCE site, Gastonia, Gaston County, NC. The purpose of the sampling is semi-annual sampling of four filter systems maintained by EPA contractors.

The attached Table 2 includes the proposed samples. Methodologies will be identical to the November 2014 Quality Assurance Project Plan (QAPP), also attached. Previous analysis of samples for 1,4-dioxane indicated this contaminant to not be present in drinking water wells in the area; therefore, 1,4-dioxane will not be included in the analytical request during this sampling event.

All samples collected during this sampling event will be submitted to Shealy Laboratories, a state contract laboratory, for analysis. An EPA CLP laboratory will not be used for sample analysis during this sampling event. If you have any questions, please contact me at melanie.bartlett@ncdenr.gov or (919) 707-8373.

Sincerely,

Melanie Bartlett, Environmental Engineer
Division of Waste Management, NC DEQ

Attachments

Hemphill Road TCE
Gastonia, Gaston County, NC
NC0002374445

Table 2

Station ID	Sample ID	Sample Location	Analysis
GIT069	HR-101-PW	Pre-filter groundwater sample from private drinking water well located at 4727 Hemphill Road.	V
GIT069	HR-102-PW	Post-filter groundwater sample from private drinking water well located at 4727 Hemphill Road.	V
4825HEMPHILLRD	HR-103-PW	Pre-filter groundwater sample from private drinking water well located at 4825 Hemphill Road.	V
4825HEMPHILLRD	HR-104-PW	Duplicate of HR-103-PW.	V
4825HEMPHILLRD	HR-105-PW	Post-filter groundwater sample from private drinking water well located at 4825 Hemphill Road.	V
4901HEMPHILLRD	HR-106-PW	Pre-filter groundwater sample from private drinking water well located at 4901 Hemphill Road.	V
4901HEMPHILLRD	HR-107-PW	Post-filter groundwater sample from private drinking water well located at 4901 Hemphill Road.	V
5009HEMPHILLRD	HR-108-PW	Pre-filter groundwater sample from private drinking water well located at 5009 Hemphill Road.	V
5009HEMPHILLRD	HR-109-PW	Post-filter groundwater sample from private drinking water well located at 5009 Hemphill Road.	V
	HR-110-TW	Trip blank; QA/QC.	V

V=volatile organics

Section A: Planning Elements

A1. Title (Project Name):	Hemphill Road TCE Site, Potable Well Monitoring	
EPA ID#:	NC0002374445	
Project Location:	Gastonia, Gaston Co., NC	
Project Requestor and Organization:	Stuart F Parker, NC Superfund Section	
Project Manager's Name, Position, and Organization:	Stuart F Parker, Hydrogeologist II, Federal Remediation Branch, NC Superfund Section, 1646 Mail Service Center, Raleigh, NC, 27699-1646. (919) 707-8377. stuart.parker@ncdncr.gov	
Project Manager's Signature:		Date: 11/14/14
Technical Reviewer's Name and Position:	David Lown, Head, Federal Remediation Branch, NC Superfund Section	
Technical Reviewer's Signature:		Date: 11/14/14
QA Reviewer's Name and Position:	Jim Bateson, Section Chief, NC Superfund Section	
QA Reviewer's Signature:		Date: 11/14/14
DAO's Name, Position, and Organization:	Carolyn Callihan, EPA, SRSEB, SSES	
DAO's Signature:		Date: 11/14/14
A2. Table of Contents	<ul style="list-style-type: none"> • Page i of the NC generic QAPP • Section No. TOC of NC Superfund Section Health and Safety SOP Manual (http://www.wastenotnc.org/SAFETY/WebSite/SFSafety.HTM) • Sampling Plan Table 1, Figures 1, 2 	
A3. Distribution List	Carolyn Callihan, US EPA	
A4. Project Personnel	Organization	Responsibilities
Stuart Parker, Hydrogeologist	NC Superfund	Project Lead/Sampler/GPS 919-218-0014/WT
Harry Zinn, Engineer	NC Superfund	Sampler/Team Lead/GPS Walkie Talkie (WT)
Wade Kirby, Engineer	NC Superfund	Sampler/Team Lead/GPS
Jeanette Stanley, Chemist	NC Superfund	Sampler/Team Lead/GPS/Scribe
Comments: The NC Superfund Section organizational chart and delegation of duties can be found in Section 3.1 and Appendix A of the NC generic QAPP.		
A5. Background:	Hemphill Road TCE site (EPA ID# NC0 002 374 445) is located along Hemphill Road, south of Gastonia, Gaston County, NC. The site consists of a contaminated groundwater plume defined by elevated trichloroethylene (TCE) concentrations in residential wells, community supply wells and in monitoring wells. TCE contamination is likely due to drum dumping and rinsing that took place on one of two parcels currently owned by Gastonia Industrial Truck (GIT), Inc. along Hemphill Road. Geographic coordinates for the site are 35.197933° north latitude	

and -81.189852° west longitude. The site coordinates are assigned to the approximate center of Hemphill Road where it crosses the unnamed tributary.

During the 1950s, a former owner allegedly used the southeastern GIT parcel along Hemphill Road to recycle several thousand chemical drums. Local residents and the former owner's son reported that the former owner dumped drum residues of waste materials from textile and other local industries onto the ground surface, then rinsed and burned the drums and sold the scrap metal.

Two individual residences and the Kensington Estates subdivision are located to the southwest, directly across Hemphill Road from GIT. Kensington Estates contains approximately 60 housing units. Several other residences line Hemphill Road and several additional subdivisions, mobile home communities, and individual homes are located within a half-mile radius of the site. All of these residences are served by groundwater-either community or private wells.

During the late 1980s, sampling by Gaston County Environmental Health Services (GCEHS) revealed a high concentration of trichloroethene (TCE) in the Gastonia Industrial Truck facility's production well. TCE was also present in two domestic wells at 4901 and 4825 Hemphill Road, directly across from the site. The TCE concentrations significantly exceeded NC groundwater standards and EPA benchmarks. Upon being notified of the contamination, the homeowners installed carbon filtration units on their respective domestic wells, and the facility stopped using its production well for drinking.

During the late 1980s and early 1990s, well sampling by GCEHS and the NC Division of Environmental Management (NCDEM) detected volatile organic compounds (VOCs) at additional domestic wells near the site. A domestic dug well at 4708 Hemphill Road (700 feet north of Gastonia Industrial Truck (GIT), Inc.) contained TCE and tetrachloroethene (PCE), the latter exceeding the State groundwater standard (0.7 ug/l). A well at 4525 Hemphill Road (0.25 mile north of GIT) contained TCE and 1,1-dichloroethene (DCE). However, this well was also located near the Textron Inc., Homelite Division site, where chlorinated solvent contamination of drinking-water wells was documented in the late 1980s.

In 1989 and 1992, NCDEM performed soil and underground storage tank (UST) sampling at the Gastonia Industrial Truck, Inc., (GIT) forklift repair facility. Chlorinated solvents were detected in samples from a petroleum UST and in soil adjacent to a waste-petroleum aboveground storage tank. After NCDEM issued a Notice of Violation (NOV), GIT completed a soil investigation at these areas and in a the facility's loading dock area. Sampling revealed primarily petroleum contamination, affecting approximately 88 cubic yards of surface soil. Subsurface soil sampling detected no TCE or other VOCs. By 1993, the NCDEM's attention had turned from the forklift repair facility to the alleged 1950s' drum recycling as a potential source for TCE groundwater contamination at the GIT properties.

NCDEM installed monitoring wells on and adjacent to the two GIT properties in

1993 and 1994. Groundwater sampling and elevation data indicated that TCE groundwater contamination was concentrated beneath the southeast parcel, but extended northwest beneath the adjacent forklift repair facility toward Hemphill Road.

The US EPA and NC Superfund Section conducted the 1999 Combined Preliminary Assessment/Site Inspection (cPA/SI) to evaluate the exposure hazard to the Kensington Estates residential subdivision, under construction across Hemphill Road from GIT. The two Kensington Estates community drinking-water wells were operating within 1000 feet west-northwest from GIT.

In May 1999, NC Superfund Section personnel reviewed sample analytical reports on the Kensington Estates community wells, on file at the NC Public Water Supply Section. The results indicated TCE contamination in both of the Kensington Estates community wells, ranging above 10 ug/l and exceeding federal benchmarks and state groundwater standards. Those analytical results had not been reported to Gaston County health officials.

In May 1999, the NC Superfund Section reported the Kensington Estates groundwater contamination to the Gaston County Health Department and to the NC Division of Water Quality (NCDWQ; formerly NCDWM), Mooresville Regional Office (MRO). The County and NCDWQ MRO shut down both Kensington Estates community wells, provided a temporary alternative drinking-water supply to the residents and subsequently connected the subdivision to two existing community wells at the neighboring Amy Acres subdivision.

In July 1999, sampling by NCDWQ detected TCE breakthrough at the domestic well carbon filtration units at 4825 and 4901 Hemphill Road. In response, the property owners replaced the saturated filtration media in each well.

Based on the number of residents affected by groundwater contamination at the site, the 1999 cPA/SI report recommended further remedial action under CERCLA. However, in March 2001, the NC Superfund Section completed a Site Re-Assessment Report (SRR) which reversed this recommendation. The reversal was made because:

No drums, highly-contaminated soil or other remediable source media had been identified on site;

Connection of Kensington Estates to the Amy Acres community wells and maintenance of the carbon units at 4825 and 4901 Hemphill Road had curtailed the existing human exposures identified in the cPA/SI.

In April 2001, the NC Superfund Section sent a letter to NCDWQ MRO and GCEHS with the following recommendations:

- Connect the Amy Acres (and Kensington Estates) subdivision to Gastonia municipal water lines, or, alternatively, conduct quarterly or semi-annual groundwater monitoring of Amy Acres community wells for TCE;
- Connect the residences at 4825 and 4901 Hemphill Road to Amy Acres (via Kensington Estates); and
- Conduct additional evaluation of domestic well contamination and water use at 4708 Hemphill Road.

In 2009, the NC Inactive Hazardous Site Branch (NC IHSB), MRO notified the NC Superfund Section that TCE contamination existed in additional community wells near the site. TCE reportedly existed in the two community wells supplying the Wesley Acres subdivision, located directly across Forbes Road south of Kensington Estates. In 2008, TCE had also appeared in the two community wells supplying the Cedar Grove subdivision, located approximately 1.5 mile southeast of GIT. The NC IHSB MRO reported that TCE concentrations in the affected wells were increasing, approaching the 5.0 ug/l federal Maximum Contaminant Level (MCL).

On July 14, 2009, the NC Superfund Section transmitted a Removal Request to US EPA Region 4, incorporating the above information. The US EPA assigned an On-Scene Coordinator (OSC) who visited the site on July 28, 2009. The OSC sampled the GIT facility production well, two of the on-site monitoring wells, and the domestic wells at 4825, 4901 and 4708 Hemphill Road. Sampling revealed that TCE breakthrough had occurred again in the carbon filters at 4825 and 4901 Hemphill Road. The OSC arranged for replacement of the filtration media in both units. Sample data at GIT and 4708 Hemphill Road were consistent with results from previous investigations.

On January 23, 2012, the NC Superfund Section completed a second Site Re-Assessment Report (SRR) for the site. Based on site conditions as updated in the SRR, the NC Superfund Section recommended the Gastonia Industrial Truck Site for an Expanded Site Inspection (ESI), including:

- 1) Sampling all of the above community wells with a history of chlorinated VOC contamination, and additional community wells considered at risk (e.g., Amy Acres);
- 2) Sampling private domestic wells within an approximately 0.5 mile radius from the site;
- 3) Identification and sampling of potentially contaminated surface springs, to further investigate site hydrogeology;

- 4) Subsurface soil sampling/screening within the Southeast GIT parcel, to identify residual soil contamination; and
- 5) Investigation to determine whether additional candidate sources exist near the site.

In February 2012, the NC Superfund Section conducted a well survey in the areas within approximately ½ mile of the GIT properties. In addition to seven community wells, approximately 150 homes served by private drinking water wells were identified within this ½ mile radius.

In March 2012, NC Superfund Section personnel conducted an ESI sampling event at the Hemphill Road TCE site. During the ESI sampling event, a total of nine monitoring wells, one production well, seven community wells, seventy-six private wells, and five surface water locations were sampled. Samples from the ESI sampling event were analyzed for VOCs.

TCE concentrations exceeded 3 times background in GIT's production well and in five of the nine on-site monitoring wells. Detections in the five monitoring wells ranged from 5.8 ug/l (GT-001-GW) to 210 (GT-005-GW). The above concentrations exceeded the NC groundwater standard (3 ug/l), the federal MCL (MCL, 5.0 ug/l), and the federal Cancer Risk benchmark (1.0ug/l).

Of seven community wells sampled during the March 2012 event, only Wesley Acres #1 (GT-016/216-PW) contained elevated TCE (3.9/3.6 ug/l) and cis-1,2-DCE (0.10/0.10 ug/l). The TCE concentration exceeded the federal Cancer Risk benchmark and the NC groundwater standard.

Elevated TCE, PCE, and/or cis-1,2-DCE concentrations were present in multiple private domestic wells at the site. Samples at 4727 Hemphill Road (GT-069/269-PW) and 4901 Hemphill Road (GT-070-PW pre-filter and GT-170-PW post-filter), contained elevated TCE concentrations (5.1/4.9, 100, and 41 ug/l, respectively). Three results exceeded the MCL, and all 4 results exceeded the federal Cancer Risk benchmark and State groundwater standard.

TCE was also detected in wells at 4847 and 4858 Verde View Drive (GT-099-PW; GT-102-PW), but their distance from the site and the intermediate presence of non-contaminated wells called contaminant attribution to the site into question.

During the March 2012 ESI sampling event, surface water sampling was conducted at five locations along the unnamed tributary. Elevated TCE concentrations were present in three downstream surface water samples (GT-021-SW, GT-022-SW, GT-023-SW). Two of these samples also contained elevated cis-1,2-dichloroethene (cis-1,2-DCE), a degradation product of TCE. The highest surface water TCE and cis-1,2-DCE concentrations occurred in GT-023-SW, located adjacent to Hemphill Road, at the northwest corner of the GIT parcels.

	<p>In May 2012, the NC Superfund Section notified US EPA Region 4 ERRB of the preliminary sampling results from the March 2012 ESI sampling event. Based on these results, US EPA Region 4 ERRB replaced existing filter systems at 4825 and 4901 Hemphill Road with new systems. In addition, a new filter system was added to the drinking water well located at 4727 Hemphill Road.</p> <p>The site was renamed Hemphill Road TCE site in August 2012.</p> <p>In August 2012, NC Superfund Section personnel conducted follow-up sampling at the Hemphill Road TCE site. Samples included ground water from six private drinking water wells, including pre- and post-filtration samples from three wells along Hemphill Road. Pre-filtration samples at all three wells (4727, 4825, and 4901 Hemphill Road) contained elevated TCE concentrations (12, 120, and 110 ug/l, respectively) exceeding the 5 ug/l federal Maximum Contaminant Level (MCL). Post-filtration samples were non-detect for TCE, indicating the filters were functioning properly.</p> <p>During the week of November 12, 2012, NC Superfund Section Personnel conducted additional sampling at the site, collecting 17 groundwater samples from 13 drinking water wells, and collecting 10 surface water samples in upgradient and downgradient proximity to the site. Samples were analyzed for VOCs.</p> <p>Proximal targets were lacking within the Surface Water 15-mile Target Distance Limit: no surface water intakes; nearest fishery > 11 miles downstream; nearest HRS-qualifying wetland approximately 5 miles downstream. Therefore, the focus of the surface water pathway investigation was on detecting emergent groundwater contamination at the groundwater/surface water interface, in the intermittent stream north of the GIT facility.</p> <p>November 2012 pre-filtration sampling re-confirmed TCE contamination at 4727, 4825, and 4901 Hemphill Road (2.5, 110 and 81 ug/l, respectively). Concentrations in the latter two wells exceeded the federal MCL. Post-filtration samples were non-detect. PCE was detected below reporting limits in all 3 wells plus one additional well. Cis(1,2)DCE, 1,2-dichlorobenzene, 1,1-dichloroethane (DCA), 1,1-DCE and/or chloroform were detected below reporting limits in two wells. Four downgradient/downstream surface water samples contained TCE, cis(1,2)DCE, 1,1-DCE and/or vinyl chloride, all of which were non-detect in samples farther downstream</p>
<p>A6. Project Description:</p>	<p>This study has two purposes: (1) document any continuing release of site contaminants to local drinking water wells, including both private and community wells, and (2) protection of human health.</p> <p>This project will include collection of 60 samples, including 49 drinking water wells, post-filtration and QA/QC samples. Samples will be analyzed for VOCs by EPA SEDS or an EPA Contract Laboratory. Additional sample portions will be analyzed for 1,4-dioxane at a DWM contract laboratory.</p>

<p>Decision(s) to be made based on data:</p>	<p>Data will be used to characterize the nature and extent of groundwater contamination at the site, in order to determine which, if any, additional drinking water wells need to be replaced with alternative water, and to determine the scope of any needed additional future sampling of drinking water wells in neighborhoods surrounding the site.</p> <p>The primary decision in the DQO process for the site relating to potable well water is: are site-related contaminants found in private drinking water wells within one-half mile of the Hemphill Road TCE site at concentrations exceeding the associated health-based screening criteria?</p> <p>All potable well water samples will be submitted to a CLP laboratory for routine analytical services (RAS) for VOCs in accordance with the CLP Statement of Work (SOW) for Organics Analysis (SOM01.2). Additional sample portions will be analyzed for 1,4-dioxane at a DWM contract laboratory. Analysis for 1,4-Dioxane will be by SW-846 Method 8260. Sample preparation for 1,4-dioxane SIM analyses will be by method 5030B. The SIM method only monitors certain ions (m/z 58 and 88 for 1,4-dioxane) which results in higher sensitivity for 1,4-dioxane and lower reporting limits. The Method Detection Limit will be 1 ug/L and the sample quantitation limit will be 3 ug/L.</p> <p>Analytical results will be compared to the associated federal drinking water Maximum Contaminant Level (MCL), Region 4 Regional Screening Level (RSL), and NC 2L groundwater standards. All data will be reviewed by the NC Project Manager and the NC Industrial Hygienist. Any wells with values exceeding the MCL, RSL, or NC 2L values may be resampled, and based on data values, potentially recommended to the US EPA Region 4 Emergency Response and Removal Branch (ERRB) for further action. EPA Region 4 will be notified of all exceedences of both MCL and RSL values in any of the potable well sample results.</p>
<p>Applicable regulatory information, action levels, etc.</p>	<p>Data will be compared with regulatory benchmarks, including NC Groundwater Standards (15A NCAC 2L, http://portal.ncdenr.org/c/document_library/get_file?uuid=90e20026-1d67-45e0-90cc-a212707e79a3&groupId=38364). The Contract Required Quantitation Limits for Volatile Organics on the Target Compound List using the Trace Water analysis is 0.5 ug/L for most compounds. These quantitation limits will determine if any known or suspected contaminants exceed the Maximum Contaminant Levels (MCLs) for drinking water. The Quantitation Limit for 1,4-dioxane will be 3 ug/L</p> <p>Analytical data results will be compared with the following comparison criteria:</p> <ol style="list-style-type: none"> 1) Non-detects of background concentrations; 2) Three times detectable background concentrations; 3) Sample quantitation limits (SQLs) or minimum reporting limits (MRLs) which are sample specific and correspond to the lowest quantitative point on the calibration curve. 4) NC 2L Groundwater Standards (http://portal.ncdenr.org/web/wq/ps/csu/gwstandards)

	<p>5) Maximum Contaminant Levels (MCLs); http://water.epa.gov/drink/contaminants/index.cfm#List)</p> <p>6) US EPA Regional Screening Levels (RSLs); http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.html</p>
Field Study Date:	Week of November 17, 2014
Projected Lab Completion Date:	February 1, 2015
Final Report Completion Date:	March 1, 2015
A7. Quality Objectives and Criteria:	<p>Identification of the seven steps of the data quality objectives (DQO) process: DQOs were established for the Hemphill Road TCE site to define the quantity and quality of data to be collected to support the objectives of the sampling event. DQOs were developed using the seven-step process outlines in the following EPA guidance documents: “Guidance on Systematic Planning using the Data Quality Objectives Process,” EPA QA/G-4 (http://www.epa.gov/quality/qs-docs/g4-final.pdf), February 2006; “Guidance for Quality Assurance Project Plans,” EPA QA/G-5 (http://www.epa.gov/quality/qs-docs/g5-final.pdf), December 2002; and “EPA Requirements for Quality Assurance Project Plans,” EPA QA/R-5 (http://www.epa.gov/region8/qa/OAEPAr5-final.pdf), March 2001.</p> <p>Step 1: State the Problem Previous sampling by various parties, including NC Superfund, NC DEM (NC DWQ), GCEHS, US EPA, and community water system owners, has documented the presence of contaminants in groundwater at and near Hemphill Road. Groundwater is the only drinking water source within ½ mile of the site. This includes both private and community drinking water supply wells. Several of the private wells along Hemphill Road have shown TCE contamination, most recently in March and August 2012.</p> <p>Step 2: Identify the Goals of the Study The goal of this study is to monitor drinking water wells to determine if there is a seasonal impact to these pathways and if residents are currently exposed to groundwater contaminants above federal and/or state health-based benchmarks, or could be potentially be exposed to unacceptable levels of such contaminants in the future.</p> <p>Evaluate analytical data for groundwater samples to identify the level of contamination in private and community drinking water wells and determine whether concentrations are present above the comparison criteria (background levels).</p> <p>Previous analysis has not been performed for 1,4-dioxane, a contaminant often associated with chlorinated solvents but not detected at low levels in traditional VOC analyses. This study will also evaluate the potential presence of 1,4-dioxane as a site groundwater contaminant.</p>

Analytical data results will be compared with the following comparison criteria:

- 1) Non-detects of background concentrations;
- 2) Three times detectable background concentrations;
- 3) Sample quantitation limits (SQLs) or minimum reporting limits (MRLs) which are sample specific and correspond to the lowest quantitative point on the calibration curve.
- 4) NC 2L Groundwater Standards
(<http://portal.ncdenr.org/web/wq/ps/csu/gwstandards>)
- 5) Maximum Contaminant Levels (MCLs);
<http://water.epa.gov/drink/contaminants/index.cfm#List>)
- 6) US EPA Regional Screening Levels (RSLs);
http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.html

US EPA Region 4 will be notified of all exceedences of MCL or RSL values in any of the potable well sample results.

Step 3: Identify Information Inputs

The primary inputs needed to support the decision making process are contaminant levels in private drinking water well water samples collected from the groundwater in the vicinity of the site. Analytical results used in the decision-making process will come from laboratory analyses by a CLP laboratory for routine TCL VOC parameters. Trace-level TCL VOC contract required quantitation limits (CRQLs) will be requested for the water samples analyzed by the CLP laboratories. 1,4-dioxane will be analyzed by a NC DWM contract laboratory.

See Section A6. Project Description

See Section A5. Background of this Quality Assurance Project Plan.

Step 4: Define the Boundaries of the Study

The primary media of interest is groundwater from residential drinking water wells located along and near Hemphill Road. The study boundaries include the study area, well depths, temporal boundaries such as field investigation dates and turnaround times on analytical results, and physical boundaries.

The site has documented groundwater contamination as described in Section A5 of this Quality Assurance Project Plan. The approximate study area is shown on Figures 1 and 2 of this QAPP.

All individuals within ½ mile of Hemphill Road are supplied drinking water via groundwater wells—either community wells or privately-owned wells. Potable wells, including both community and individually owned, will be sampled at the wellhead when possible. If a wellhead is not accessible or no sample tap is available at the wellhead, the sample will be collected from an unfiltered tap

closest to the wellhead. The collection point of each sample will be notated in the field logs (i.e. spigot on wellhead, spigot on front of house, etc.). Each potable well will be purged for at least 15 minutes prior to sample collection. Temperature, pH, conductivity, and turbidity readings will be collected a minimum of three times, at five-minute intervals, prior to sample collections.

This study includes private drinking water well samples. Drinking water wells included in this study have shown TCE and/or PCE contamination during prior sampling events or are adjacent to wells that have shown prior contamination.

Gaston County is located within North Carolina's Piedmont Physiographic Province and is geologically mapped within the Proterozoic Kings Mountain lithotectonic belt. Groundwater beneath the site exists primarily within bedrock fractures. Well depths in the area range from 30 to 450 feet in depth.

Sampling is scheduled for the week of November 17, 2014. Field investigation activities are expected to take three days. A turnaround time of 21 days from sample submittal to a CLP laboratory will be requested. An additional turnaround time of approximately 30 days from receipt of laboratory results by SESD is expected for data validation.

Step 5: Develop the Analytic Approach

Matrix	Sample Type	Container Type	Bottle Count	Minimum Volume	Important Notes	Preservative	Holding Time
Water	Sample	40mL glass vial, 24 mm neck finish	6	Fill to capacity	Vials must be filled to capacity with no headspace or air bubbles.	Preserve to a pH of 2 with HCL and cool to 4°C (+/- 2°C) immediately after collection.	14 days
	Sample with MS/MSD		12				

<http://www.epa.gov/superfund/programs/clp/download/sampler/CLPSamp-10-2014.pdf>

Laboratory analysis will include: Target Compound List (TCL) volatile organic compounds (VOCs) using the EPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Trace Water, "Multi-Media, Multi-Concentration Organics Analysis" (SOM01.2), June 2007 (<http://www.epa.gov/superfund/programs/clp/som1.htm>) or comparable methods performed by the US EPA Region 4 Laboratory in Athens, GA. Due to known levels of halogenated VOC contamination in drinking water wells, Select Ion Monitoring (SIM analysis) will be performed only for 1,4-dioxane [(CH₂)₄O₂].

Analysis for 1,4-Dioxane will be performed by a DWM contract laboratory via SW-846 Method 8260, SIM modified to include 1,4-Dioxane. Sample preparation for 1,4-dioxane SIM analyses will be by method 5030B, which includes a 40°C

	<p>purge. The SIM method only monitors certain ions (m/z 58 and 88 for 1,4-dioxane) which results in higher sensitivity for 1,4-dioxane and lower reporting limits. The Method Detection Limit (MDL) will be 1 ug/L and the Sample Quantitation Limit (SQL) will be 3 ug/L.</p> <p>Laboratory assignment has not yet been received. In addition, groundwater parameters of temperature, pH, turbidity, and conductivity will be collected for all groundwater samples.</p> <p>See Section A6 Project Description: Step 2: Identify the Goals of the Study.</p> <p>Step 6: Specify Performance or Acceptance Criteria Analytical results for initial acceptance will be assessed during validation performed by US EPA Region 4 Science and Ecosystem Support Division (SESD) that evaluates the usability of the data defined. Any rejected data and the reasons for rejection will be summarized in the data validation report.</p> <p>Step 7: Develop the Plan for Obtaining Data Proposed sampling includes 60 groundwater samples (including post-filtration, background and QA/QC samples) from 49 domestic and community wells. Access permission has been previously granted for the wells (including community and private) and surface water via mail, email, fax, phone calls, and in person.</p>
A8. Special Training/Certifications:	<ul style="list-style-type: none"> • Section 3.3 of the NC generic QAPP. • Section 2.1 and Appendix A of NC Superfund Section Health and Safety SOP Manual (http://www.wastenotnc.org/SAFETY/WebSite/SFSafety.HTM)
A9. Documents and Records:	Section 3.4 of the NC generic QAPP.

Section B: Data Generation and Acquisition	
B1. Sampling Design	<p>An authoritative sampling design was chosen based on the data quality objectives of the study. Sample IDs, media, analysis, location and rationale can be found in Table 1 of the sampling plan. Sample locations can also be found on Figures 1-4 of this sampling plan.</p> <p>Volume, Holding time, and Preservation requirements are in accordance with: <i>SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual, Figure 3-1</i> (http://www.epa.gov/region4/sesd/asbsop/asb-loqam.pdf)</p>
B2. Sampling Methods, General Procedures:	<p><i>SESD Field Branches Quality System and Technical Procedures</i> (http://www.epa.gov/region4/sesd/fbqstp/index.html)</p> <ul style="list-style-type: none"> • Field pH Measurement, January 29, 2013

	<ul style="list-style-type: none"> • Field Specific Conductance Measurement, August 30, 2012 • Field Temperature Measurement, October 23, 2014 • Field Turbidity Measurement, January 29, 2013 • Global Positioning System, April 20, 2011 • Field Equipment Cleaning and Decontamination, December 20, 2011 • Groundwater Sampling, March 6, 2013, (PDF, 32pp, 534K) • Packing, Marking, Labeling and Shipping of Environmental and Waste Samples, April 20, 2011, (PDF, 10pp, 351K) • Potable Water Supply Sampling, May 30, 2013 • Field Sampling and Measurement Procedure Validation, August 30, 2012, (PDF, 9pp, 586K) • Logbooks, May 30, 2013 • Sample and Evidence Management, January 29, 2013
B3. Sampling Handling and Custody:	All samples will be handled and custody maintained in accordance with <i>SESD Operating Procedures for Sample Evidence Management</i> , SESDPROC-005-R2. (http://www.epa.gov/region4/sesd/fbqstp/Sample-and-Evidence-Management.pdf)
B4. Analytical Methods:	As of this time, laboratory assignment has not been received; therefore, information for both CLP labs and the SESD lab is included.
CLP:	Analytical methods for organic samples are in accordance with: <i>CLP Multi-Media, Multi-Concentration Organics Analysis, SOM01.2</i> (http://www.epa.gov/superfund/programs/clp/som1.htm)
SESD:	Analytical methods for organic samples are in accordance with: <i>SESD Analytical Support Branch Laboratory Operations and Quality Assurance Manual, Chapter 8</i> (http://www.epa.gov/region4/sesd/asbsop/asb-loqam.pdf)
B5. Quality Control:	
Field:	<ul style="list-style-type: none"> • Rinsate blanks are collected on a quarterly basis on equipment used for sampling during that calendar quarter. • Rinsate blanks are collected on a quarterly basis on gloves utilized for sampling during that calendar quarter. • Rinsate blanks are collected on a quarterly basis on the DI water system maintained and utilized by the NC Division of Waste Management for decontamination of sampling equipment. • Organic-free water is obtained from the NC Public Health lab for VOC water trip blanks. • A minimum of one duplicate per twenty samples per media will be collected. • A minimum of one trip blank per shipping container will be collected for VOC water samples. • Section 3.5 of the NC generic QAPP
Laboratory:	<ul style="list-style-type: none"> • A minimum of one MS/MSD sample per twenty samples per media will be collected. • Section 3.5 of the NC generic QAPP

B6. Instrument/Equipment Testing, Inspection and Maintenance:	<ul style="list-style-type: none"> • Section 3.4 and Appendix B of the NC generic QAPP • Section 6 of NC Superfund Section Health and Safety SOP Manual (http://www.wastenotnc.org/SAFETY/WebSite/SFSafety.HTM)
B7. Instrument/Equipment Calibration and Frequency:	<p>All monitoring equipment and instruments are calibrated a minimum of once daily, at the start of the day, when field activities requiring use of the equipment occur. Serial numbers and calibration records are maintained in the field logbook for the project. Any inconsistencies and errors during calibration are also to be noted in the field logbook. In the event that anomalous-appearing field readings are encountered, calibration will be re-checked for comparison, and results recorded in the field logbook.</p> <p>Equipment to be used for this project and requiring calibration includes:</p> <ul style="list-style-type: none"> • pH/Conductivity/Temperature Meter(s): pH is calibrated to three standards (pH 7, pH4, pH10); Conductivity is calibrated to one standard (1413 uS) • Turbidity Meter(s): Turbidity is calibrated to three standards (Low, Medium, and High ntu) • GPS Trimble XT/XM Units: Used for geolocating sampling locations. GPS Units do not require calibration.
B8. Inspection/Acceptance for Supplies and Consumables:	<p>All critical supplies and consumables for this field investigation are inspected and maintained by the QAO and designated staff, as discussed in Section 3.2 of the NC generic QAPP. A list of these supplies is included in Appendix B of the NC generic QAPP.</p>
B9. Non-direct Measurements:	<p>Not applicable.</p>
B10. Data Management:	<p>The project manager will be responsible for ensuring that all requirements for data management are met. All data generated for this field investigation, whether hand-recorded or obtained using an electronic data logger, will be recorded, stored, and managed according to the following procedures:</p> <p><i>SESD Operating Procedure for Control of Records</i>, SESDPROC-002-R6. (http://www.epa.gov/region4/sesd/fbqstp/Control-of-Records.pdf)</p> <p><i>SESD Operating Procedures for Logbooks</i>, SESDPROC-010-R5. (http://www.epa.gov/region4/sesd/fbqstp/Logbooks.pdf)</p>

Section C: Assessment/Oversight	
C1. Assessments and Response Actions:	<p>Assessments will be conducted during the field investigation according to <i>SESD Operating Procedure for Project Planning</i>, SESDPROC-016-R3 (http://www.epa.gov/region4/sesd/fbqstp/Project-Planning.pdf) to ensure the QAPP is being implemented as approved. The Project Manager is responsible for all corrective actions while in the field.</p> <p>Section 3.2.4 of the NC generic QAPP.</p>
C2. Reports to Management:	<p>The Project Manager will report to their immediate supervisor if any circumstances arise during the field investigation that may adversely impact the quality of the data collected. The Project Manager and/or their</p>

	<p>immediate supervisor will also be responsible for notifying the EPA Project Manager if any circumstances arise during the field investigation that may adversely impact the quality of the data collected.</p> <p>Section 3.2.4 of the NC generic QAPP</p>
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Section D: Data Validation and Usability	
D1. Data Review, Verification, and Validation:	Section 3.2.4 of the NC generic QAPP.
D2. Verification and Validation Methods:	Section 3.2.4 of the NC generic QAPP.
D3. Reconciliation with User Requirements:	<p>Review of blanks is evaluated by the Project Manager using the following guidelines:</p> <ul style="list-style-type: none"> • <i>USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA-540-R-08-01, June 2008</i> (http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf) <p>Review of data is evaluated by the Project Manager using the following guidelines:</p> <ul style="list-style-type: none"> • <i>USEPA Using Qualified Data to Document an Observed Release and Observed Contamination, EPA 540-F-94-028, Exhibit 3 and Tables 1-4</i> (http://www.epa.gov/superfund/sites/npl/hrsres/fact/docoroc.pdf) <p>Section 3.2 of the NC generic QAPP</p>

Table 1
Hemphill Road TCE Site
November 17-19, 2014
Water-Supply Well Sample Locations

Address	November 2014 Sample ID	Notes	Address	November 2014 Sample ID	Notes
Amy Acres East Well #1	HH013PW	MS/MSD	4804 Hemphill Rd	HH116PW	
Amy Acres West Well #2	HH014PW	MS/MSD	4825 Hemphill Rd	HH107PW	Pre-filtration
Beverly Acres	HH015PW	MS/MSD		HH9107PW	Duplicate Sample
Wesly Acres N Well #1	HH016PW			HH107PWF	Post-filtration
Wesly Acres S Well #2	HH017PW		4901 Hemphill Rd	HH070PW	Pre-filtration
Covington Estates N Well #1	HH018PW			HH9070PW	Duplicate Sample
Covington Estates S Well #2	HH019PW			HH070PWF	Post-filtration
2630 Forbes Rd	HH031PW		5009 Hemphill Rd	HH117PW	Pre-filtration
2647 Forbes Rd	HH033PW			HH117PWF	Post-filtration
2703 Forbes Rd	HH038PW		4712 Little Mountain Rd	HH071PW	
2707 Forbes Rd	HH039PW		5100 Little Mountain Rd	HH078PW	
2903 Forbes Rd	HH042PW		5106 Little Mountain Rd	HH080PW	
2916 Forbes Rd	HH122PW		5205 Little Mountain Rd	HH085PW	
2921 Forbes Rd	HH109PW		153 McCarver Rd	HH088PW	
2935 Forbes Rd	HH112PW		4823 Verde View Dr	HH083PW	
2943 Forbes Rd	HH043PW		4829 Verde View Dr	HH094PW	
2961 Forbes Rd	HH045PW		4833 Verde View Dr	HH095PW	
3026 Forbes Rd	HH051PW		4837 Verde View Dr	HH096PW	
1537 Greenpack Pkwy	HH136PW		4841 Verde View Dr	HH137PW	
4525 Hemphill Rd	HH064PW		4842 Verde View Dr	HH097PW	
4705 Hemphill Rd	HH065PW		4854 Verde View Dr	HH100PW	
4708 Hemphill Rd	HH066PW		4858 Verde View Dr	HH102PW	
4712 Hemphill Rd	HH134PW		4859 Verde View Dr	HH103PW	
4715 Hemphill Rd	HH067PW		5014 Benton Ave	HH108PW	
4716 Hemphill Rd	HH068PW		5015 Benton Ave	HH127PW	
4727 Hemphill Rd	HH069PW	Pre-filtration	4615 Benfield Rd	HH125PW	
	HH069PW	Duplicate Sample	4656 Benfield Rd	HH10PW	
	HH069PWF	Post-filtration	4665 Benfield Rd	HH111PW	

