Geosyntec Consultants of NC, P.C.
NC License No.: C-3500 and C-295

ON AND OFFSITE ASSESSMENT

Chemours Fayetteville Works

34°50'32.32"N, 78°50'8.16"W

Prepared for

The Chemours Company FC, LLC
22828 NC Highway 87
Fayetteville, NC 28306
910-678-1315

Prepared by

Geosyntec Consultants of NC, P.C.
2501 Blue Ridge Road, Suite 430
Raleigh, NC 27607

Geosyntec Project Number TR0795

Version 1: September 30, 2019

Version 2: October 31, 2019

Geosyntec
consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C-3500 and C-295

DIVISION OF WATER RESOURCES

Certification for the Submittal of a Site Assessment

Responsible Party and/or Permittee: The Chemours Company

Contact Person: Kevin P. Garon

Address: 22828 NC Highway 87

City: Fayetteville **State:** NC **Zip Code:** 28306

Site Name: Chemours Fayetteville Works

Address: 22828 NC Highway 87

City: Fayetteville **State:** NC **Zip Code:** 28306

Groundwater Incident Number (applicable): ___________

I, Beau Hodge, P.G., a NC-Licensed Professional Engineer/**Professional Geologist** (circle one) for Geosyntec Consultants of NC, PC _______(firm or company of employment) do hereby certify that the information indicated below is enclosed as part of the required Site Assessment (SA) and that to the best of my knowledge the data, assessments, conclusions, recommendations and other associated materials are correct, complete and accurate.

(Each item must be initialed by the certifying licensed professional)

1. BH — The **sources of known PFAS** contamination have been identified. A list of all potential **historical** sources of the contamination is attached. Mitigation measures for on-going sources are also identified. **The site assessment was completed with focus to understand known Site Associated PFAS compounds at the facility. Sufficient information is being collected and interpreted to prepare a groundwater corrective action plan (CAP) for site groundwater. Data limitations are discussed in Section 1.2 of the report. Additional groundwater monitoring at the site is planned. Additional offsite groundwater sampling will continue. This is an active operating facility and a NPDES permit has been applied for.**

2. BH — Imminent hazards to public health and safety have been **evaluated. Alternate drinking water supplies are being provided to identified residents pursuant to Consent Order requirements. A PFAS Loading Reduction Plan was submitted to NCDEQ on August 26, 2019. Imminent hazards to human health and the environment have been evaluated and additional studies are underway. Ongoing reporting is presented in Section 2.7 of the report.**

3. BH — Potential receptors and significant exposure pathways have been identified (**Qualified, portions are in progress pursuant to Consent Order requirements; see Section 2.7**).

4. BH — Geological and hydrogeological features influencing the movement of groundwater have been identified. The chemical and physical character of the contaminants have been identified. (**Qualified, groundwater flow model will be submitted with December 31, 2019 Corrective Action Plan. An empirical study to obtain additional information on the site Associated PFAS compounds is in progress.**)

5. BH — The CSA sufficiently characterizes the cause, significance and extent of groundwater and soil PFAS contamination such that a Corrective Action Plan can be developed pursuant to Consent Order. **Limitations are outlined in Section 1.2**

If any of the above statements have been altered or items not initialed, provide a detailed explanation. Failure to initial any item or to provide written justification for the lack thereof will result in immediate return of the CSA to the responsible party.

(Affix Seal, Sign, and Date)

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10/31/2019

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ACRONYMS AND ABBREVIATIONS

°C	celsius
°F	fahrenheit
%	percent
C_u	coefficient of uniformity
C_c	coefficient of curvature
CAP	Corrective Action Plan
CFPUA	Cape Fear Public Utility Authority
CFRW	Cape Fear River Watch
CO	Consent Order
CSM	conceptual site model
DFSA	Difluoro-sulfo-acetic acid
DWR	Division of Water Resources
ft	feet
ft bgs	feet below ground surface
ft/day	feet per day
g/g	grams per gram
GPM	gallons per minute
GPS	global positioning system
HFPO-DA	hexafluoropropylene oxide dimer
HPT/EC	Hydraulic Profiling Tool/Electrical Conductivity
KOW	Octanol-Water Partition Coefficient measurements
km	kilometers
MGD	millions of gallons per day
MMF	difluoromalonic acid
mS/m	milliSiemens per meter
MTP	perfluoro-2-methoxypropanoic acid
NCAC	North Carolina Administrative Code
NCDENR	North Carolina Department of Environment and Natural Resources
NCDEQ	North Carolina Department of Environmental Quality
ng/kg	nanograms per kilogram

ACRONYMS AND ABBREVIATIONS (CONTINUED)

ng/L	nanograms per liter
NOAA	National Ocean and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity units
PFAS	per- and polyfluoroalkyl substances
PFESA-BP2	byproduct 2
PFMOAA	perfluoro-2-methoxyaceticacid
PFO2HxA	perfluoro(3,5-dioxahexanoic) acid
PFOA	perfluorooctanoic acid
PMPA	perfluoromethoxypropyl carboxylic acid
PPA	Polymer Processing Acid
ppb	parts per billion
PPF Acid	perfluoropropionic acid
PVF	polyvinyl fluoride
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SA	On and Offsite Assessment Report
SLEA	Offsite Screening Level Exposure Assessment
USCS	Unified Soil Classification System
USGS	United States Geological Survey
WWTP	wastewater treatment plant

EXECUTIVE SUMMARY

This report, the Site Assessment Report (SA), summarizes On and Offsite Assessment activities completed by Geosyntec Consultants and others at the Chemours Fayetteville Works facility (Site) pursuant to Paragraph 18 of the February 25, 2019 Consent Order (CO) among Chemours, the North Carolina Department of Environmental Quality (NCDEQ) and Cape Fear River Watch (CFRW).

Paragraph 18 requires this assessment comply with the requirements of 2L rules for site assessments provided in paragraph (g) of Title 15A of the North Carolina Administrative Code (NCAC), Subchapter 2L (2L). These requirements include characterizing the following:

- The source and cause of contamination;
- Any imminent hazards to public health and safety and any actions taken to mitigate them;
- All receptors and significant exposure pathways;
- The horizontal and vertical extent of soil and groundwater contamination impact and significant factors affecting contaminant transport; and
- Geological and hydrogeological features influencing the movement, chemical, and physical character of the contaminants.

These requirements are addressed in this report. In addition to the requirements above, Paragraph 18 of the CO also requires the identification of groundwater seeps contributing to surface water contamination at the site and areas with significantly contaminated sediment. Observations related to the seeps identified were reported in the *Seeps and Creeks Investigation Report* and are described later in this report. An investigation to characterize sediment PFAS concentrations will be addressed as part of the *Sediment Characterization Plan* required by CO Paragraph 11.2 and submitted to NCDEQ on August 21, 2019. At time of this report's submission, the *Sediment Characterization Plan* is still awaiting comment and approval by NCDEQ. Upon NCDEQ approval, Chemours will implement and then report the findings of the sediment characterization.

ES.1. Source Information

The Site property is 2,177 acres in size. The Site is bounded by NC Highway 87 to the west, the Cape Fear River to the east, and on the north and south by forested areas, farmland and private residences. The Site is an active manufacturing facility, including fluoroproducts, which has had direct releases of per and polyfluoroalkyl substances (PFAS) to air, soil, groundwater and surface water. Until 2015, the Site was owned and operated by DuPont, with a portion leased to and operated by Kuraray. Chemours has been the owner of the Site since July 2015 and has operated the Site since that time except for the portion operated by Kuraray and another portion retained and operated by DuPont.

PFAS are a group of man-made carbon-based chemicals composed of a fully or partially fluorinated chain of carbon atoms (referred to as a "tail") and a nonfluorinated, polar functional group (referred to as a "head") at one end of the carbon chain. Fluorination of the carbon chain renders it hydrophobic and lipophobic, while the polar head group is hydrophilic. The PFAS predominantly present at the Site are Table 3+ PFAS, presently a set of 20 PFAS which at the Site originate from a release from the manufacturing processes. These compounds are analyzed by a newly developed commercial analytical method Table 3+ SOP. The Table 3+ PFAS at Site are expected to be relatively mobile in the subsurface with some PFAS experiencing greater retardation in flow than others due to sorption processes.

Onsite emissions to air and subsequent aerial deposition have resulted in a distributed, non-point secondary source of PFAS in onsite and offsite soils. Infiltrating rainfall has transported these PFAS downward to groundwater. The currently identified extent of this secondary PFAS source is shown in Figures 4-2A, 4-2B, and 9-12. Chemours is presently implementing Paragraph 21 of the CO which requires the extent of PFAS present in offsite private wells to be characterized by August 26, 2020.

Onsite releases of PFAS to soil and groundwater occurred in the manufacturing areas. Known specific release pathways include: (i) leakage from historical process water sewers in the Chemours Monomers IXM Area, (ii) historical leakage from the terracotta pipe transmitting process water to the wastewater treatment plant (WWTP) and (iii) a manufacturing upset which occurred in October 2017. Each of these release pathways has been mitigated as discussed herein.

ES.2. Initial abatement/emergency response information

Chemours has taken actions to reduce emissions of Table 3+ PFAS to air, groundwater and surface water. Chemours has taken and is taking the following actions:

- Diverted Monomers IXM process water discharge from reaching the WWTP and then the Cape Fear River, by sending it for offsite disposal reducing the yearly hexafluoropropylene oxide dimer acid (HFPO-DA) loading to the Cape Fear River by over 95 percent (%);
- Implemented a series of air abatement measures, which to date have reduced HFPO-DA emissions to air by greater than 92% and will achieve substantial further reductions of PFAS emissions to air with the installation and operation of a Thermal Oxidizer, by December 31, 2019, which will destroy 99% of PFAS routed to it.
- Providing replacement drinking water to offsite private well users with well water exceeding CO-defined Attachment C PFAS concentration criteria. Replacement water is first being supplied as bottled water to residents who qualify as an interim provision. Then more permanent replacement water that may be provided to residents based on the qualification criteria include (i) point of use reverse osmosis systems, (ii) whole house filtration systems, or (iii) connection to public water supplies.

Chemours is continuing further actions to reduce PFAS mass loading to surface water. Specifically, in Chemours' *Cape Fear River PFAS Loading Reduction Plan*, Chemours proposed the following actions to reduce such loading:

- Five actions to reduce the PFAS mass loading from present discharges at Outfall 002;
- Capturing and treating the flow of Old Outfall 002; and
- Capturing and treating seeping groundwater expressed above ground surface that reaches the Cape Fear River.

The actions Chemours has proposed are estimated to yield a 50%+ reduction of Table 3+ PFAS loading to the Cape Fear River. As requested by NCDEQ, Chemours will present additional actions focused on groundwater in the Supplemental PFAS Loading Reductions Plan, due November 1, 2019. Further details will be presented in the Corrective Action Plan (the CAP) required by Consent Order paragraph 16, due December 31, 2019.

ES.3. Receptor information

According to Cumberland and Bladen County zoning maps, the Site is surrounded by areas that are zoned as residential, agricultural, conservation, industrial or commercial. The following sub-sections describe receptors identified in the proximity of the site. Note that as required in Paragraph 21 of the CO, the full extent of PFAS present in private well receptors is being delineated with the task to be completed by August 26, 2020. Receptors identified within six miles of the Site are shown in this report. Receptors included in this document are public and private supply wells, surface water bodies and intakes, and human and ecological receptors. As of September 2019, the full extent of PFAS in private wells surrounding the Site is not complete and sampling is ongoing to complete the delineation.

ES.3.1. Water Supply Wells

To date, 75 public/community wells and 926 private wells have been identified in the counties surrounding the Site. Community wells are those that serve more than one household. The full extent of offsite contamination is still being assessed, as such the number of identified private wells will increase. There is limited availability of drilling records including logs and installation depths for many private wells.

ES.3.2. Public Water Intakes

The Cape Fear River is a water source for communities downstream of the Site. Raw water intakes are located at Bladen Bluffs and Kings Bluff Intake Canal, located approximately 5 miles and 55 miles downstream from the Site. These intakes serve as Cape Fear River water intakes for the Lower Cape Fear Water and Sewer Authority, which in turn provides water to Cape Fear Public Utility Authority (CFPUA) and other water providers.

ES.3.3. Surface Water Bodies

Surface waters in the region surrounding the Site include the Cape Fear River, swamps and marshes, and several small streams, ponds, and ditches. To the east of the Site is the Cape Fear River. The Cape Fear River and its entire watershed are located in the state of North Carolina. To the north and south of the Site are two tributaries to the Cape Fear River Willis Creek and Georgia

Branch Creek. Additionally, the Site is located on a bluff slope approximately 100 feet (ft) above the Cape Fear River. Along this bluff face are four groundwater seepage pathways where groundwater from the Site is expressed at surface and reaches the Cape Fear River.

ES.3.4. Wellhead Protection Areas

Wellhead protection areas, as defined in the Safe Drinking Water Act: 42 U.S. Code § 300h–7, surrounding the Site are identified in Figure 5-2. According to publicly available data, there is one wellhead protection area and three municipal water supply wells (PWS ID 03-78-030). Daily water extraction from these wells taken together ranges from 0.18 to 0.30 million of gallons per day (MGD). Further details available regarding these wells in the wellhead protection area is provided in Table 5-1.

ES.3.5. Subsurface Structures

A facility map showing subsurface utilities is provided as Figure 5-4. As noted above, direct releases of PFAS to Site soil and groundwater have been documented, some of which occurred through leaking underground piping. Efforts are underway to mitigate continued release of PFAS to groundwater from subsurface structures. Onsite subsurface structures could be pathways for these past point source releases. Offsite, PFAS impacts exist as a diffuse and distributed source and therefore migration through subsurface utilities is not applicable.

ES.3.6. Human and Ecological Receptors

At the Site, human activities are limited to facilities operations and maintenance, office workers, and environmental monitoring activities. In the area surrounding the Site, there is a wide range of human and land use activities, including private residences, farms, commercial businesses, and recreational areas. Current exposures to historically released PFAS for these activities are being evaluated through the Offsite Screening Level Exposure Assessment (SLEA) of Site Associated PFAS - Workplan. The SLEA is evaluating the following receptors: (i) residents, (ii) farmers, (iii) gardeners, (iv) off-site workers, and (v) recreational anglers, swimmers and canoeists. For the receptors identified above, the SLEA is evaluating a range of potential exposure pathways.

An Ecological-SLEA is being performed to assess exposures to PFAS in the Cape Fear River adjacent to and downstream of the Site and the terrestrial habitat surrounding the Site. Environmental samples including samples of river water, river sediments, terrestrial plants, terrestrial invertebrates, surface soils and fish are being collected to evaluate these exposures.

ES.4. Sampling/Investigation Results

Since mid-2017 Chemours has collected stack test samples, water, and soil samples from on and off-site locations to develop a conceptual site model and guide the development of remedial actions that will reduce the PFAS reaching the Cape Fear River.

ES.4.1. Nature and Extent of Contamination

At present, the PFAS contamination is present both on and offsite. There are two primary pathways for PFAS contamination offsite – aerial deposition and discharge of water from existing Outfall 002, Old Outfall 002 and groundwater. Historical air emissions have resulted in off-site well PFAS impacts, in the primary wind direction, over six miles from the site. As specified in the CO paragraph 21, Chemours is to delineate by August 26, 2020 the extent of PFAS in private wells exceeding 10 nanograms per liter (ng/L) of any PFAS listed in Attachment C of the CO. As of September 2019, the full extent of PFAS in private wells surrounding the Site is not complete and sampling is ongoing.

A PFAS Mass Loading Model was developed to assess the contribution of different transport pathways to overall mass loading of PFAS originating from the facility to the Cape Fear River. Ten pathways were identified as contributing to loading to the Cape Fear River. PFAS loading to the Cape Fear River was estimated using a combination of measured and estimated data to develop mass loading estimates by pathway. The model was then calibrated and evaluated against observed downstream river PFAS mass loadings. The mass loading model estimated that the Seeps and Old Outfall 002 (Transport Pathways 6 and 7 respectively) have the highest contribution of Table 3+ PFAS mass loading to the Cape Fear River. These two pathways (Transport Pathways 6 and 7) combined are estimated to contribute greater than 50% of the loading to the Cape Fear River. Onsite groundwater (Pathway 5) is the next highest mass loading pathway to the Cape Fear River with an estimated loading of approximately 20%.

Mass Loading Model Total Table 3+ PFAS including HFPO-DA Contributions per Pathway

Transport Pathway	Total Table 3+ Estimated Loading Percentage per Pathway per Event	
	May 2019 Event	June 2019 Event
[1] Upstream River Water and Groundwater	4%	15%
[2] Willis Creek	10%	4%
[3] Aerial Deposition on the River	< 2%	< 2%
[4] Outfall 002	4%	7%
[5] Onsite Groundwater	22%	17%
[6] Seeps	32%	24%
[7] Old Outfall 002	23%	29%
[8] Offsite Adjacent and Downstream Groundwater	< 2%	< 2%
[9] Georgia Branch Creek	4%	3%

For the Transport Pathways, the loading estimates will vary over time due to a range of potential factors, including but not limited to:

- Detections of PFAS at or near analytical practical quantitation limits have more variability;
- Elevated method reporting limits;
- Uncertainty (often ± 20%) in analytical laboratory results;
- Flow rate estimates in the river, seeps, groundwater and creeks are over- or under-predicted compared to actual flow rates.

Geosyntec will be refining the mass loading model through upcoming quarterly sampling events and a numerical groundwater model to more quantitatively bound groundwater mass loading to the Cape Fear River.

Development of Current Conceptual Site Model

The geology at the Site consists of sands, silty sands and clays. The geology and land use at the Site have influenced the hydrogeology. The current site conceptual model is presented in Figure ES-1. The geology of the Site is depicted in a series of cross sections (See Figures 10-1 to 10-6). The geological features at Site from surface downward are as follows:

1. Perched Zone. The Perched Zone is a relatively thin, spatially limited layer of groundwater present in silty sands to a depth of about 20 ft bgs (Figures 10-2 to 10-6). Groundwater in the Perched Zone is recharged through precipitation onsite, and in the past, has received enhanced infiltration through unlined ditches and sedimentation ponds – these features have since been lined. Groundwater flows radially away from groundwater mound in the Perched Zone. This leads to groundwater discharge to the east at seeps on the edge of the bluff, to the south toward the Old Outfall 002 and to the north and to the west downwards through the geological sequence towards the Surficial and Black Creek Aquifers.
2. Perched Clay Unit. The Perched Clay Unit gives rise to the Perched Zone as it presents a barrier to direct downward groundwater infiltration. The Perched Clay is spatially limited at the Site. To the north it pinches out. To the east and south it outcrops along the bluff face. To the west it terminates and becomes absent (Figure10-6). In cross sections along the Site and in observations of grainsizes and lithologic contact elevations from the boring logs, an erosional feature in the western portion of the geology underlying the manufacturing areas is suggested. This erosional surface, described later in this list, is interpreted to have eroded the Perched Clay Unit enabling downward migration of groundwater off the western edge of the Perched Zone.
3. Surficial Aquifer. The Surficial Aquifer is an unconfined silty sand aquifer lying atop the Black Creek Confining Unit and is present beneath the Perched Clay Unit. Groundwater in the Surficial Aquifer flows towards the bluff faces at the Site – It flows both north, east and west toward surface water bodies (Willis Creek, Seeps, Old Outfall 002) and discharges into them as seeps. The Surficial Aquifer is interpreted to be in contact with the Black Creek Aquifer in places due to an erosional feature. This feature is labeled on the

cross sections and is interpreted to have enabled downward cross formational groundwater flow.

4. Black Creek Confining Unit. The Black Creek Confining Unit is a layer of silty or sandy clay that separates the Surficial Aquifer from the Black Creek Aquifer. The lithologic contact elevation with the overlying Surficial Aquifer is variable, as is the unit thickness – the Black Creek Confining Unit is interpreted to have been eroded under the western portion of the manufacturing areas at Site. In addition to the Black Creek Confining unit being discontinuous, the potential for downward cross formational flow, also exists based on multiple vertical joints (i.e. fractures in the clay) observed in the Black Creek Confining Unit where it outcrops at the Site.

5. Flood Plain Deposits. Surface soils in the flood plain immediately adjacent to the Cape Fear River are comprised of finer grained, likely more recently deposited sediments during river flood stages. These deposits have lower hydraulic conductivity than the Surficial and Black Creek Aquifers. The seeps at the Site cut into Floodplain Deposits as they flow towards the Cape Fear River.

6. Black Creek Aquifer. The Black Creek Aquifer is comprised of fine to medium grained sands. The Black Creek Aquifer is in contact with the Surficial Aquifer under the western portion of the manufacturing area at the Site and then is separated from the Surficial Aquifer under most of the manufacturing area by the Black Creek confining unit. The Black Creek Aquifer directly adjacent to the Cape Fear River is overlain by Flood Plain Deposits and the Black Creek Confining Unit. The Black Creek Aquifer is interpreted to be the only transmissive groundwater zone at Site in contact with the Cape Fear River. Groundwater in the Black Creek Aquifer flows from west to east towards the Cape Fear River.

7. Upper Cape Fear Confining Unit. The Upper Cape Fear Confining Unit underlies the Black Creek Aquifer. The Upper Cape Fear Confining unit is regionally extensive clay layer which is upwards of 75 ft thick at Site and is likely a barrier to downwards groundwater flow. Groundwater levels in the Upper Cape Fear Aquifer measured at NC DWR wells are 80 ft lower than Black Creek Aquifer groundwater levels immediately above the Upper Cape Fear Aquifer. If the two units were in hydraulic connection, they would have similar groundwater elevations. The dissimilarity in water levels for these co-located NC DWR wells demonstrates how the Upper Cape Fear Confining Unit is a barrier to downward cross formational flow.

8. Erosional Feature. A paleo-era process appears to have eroded the Perched Clay Unit, portions of the Surficial Aquifer and the Black Creek Confining Unit in the geological sequence under the western portion of the manufacturing area. This erosional feature potentially enables cross formational flow of water from the Perched Zone, through the Surficial Aquifer and into the Black Creek Aquifer. This feature is a likely controlling factor of the distribution of PFAS observed in the Surficial and Black Creek Aquifers at Site.

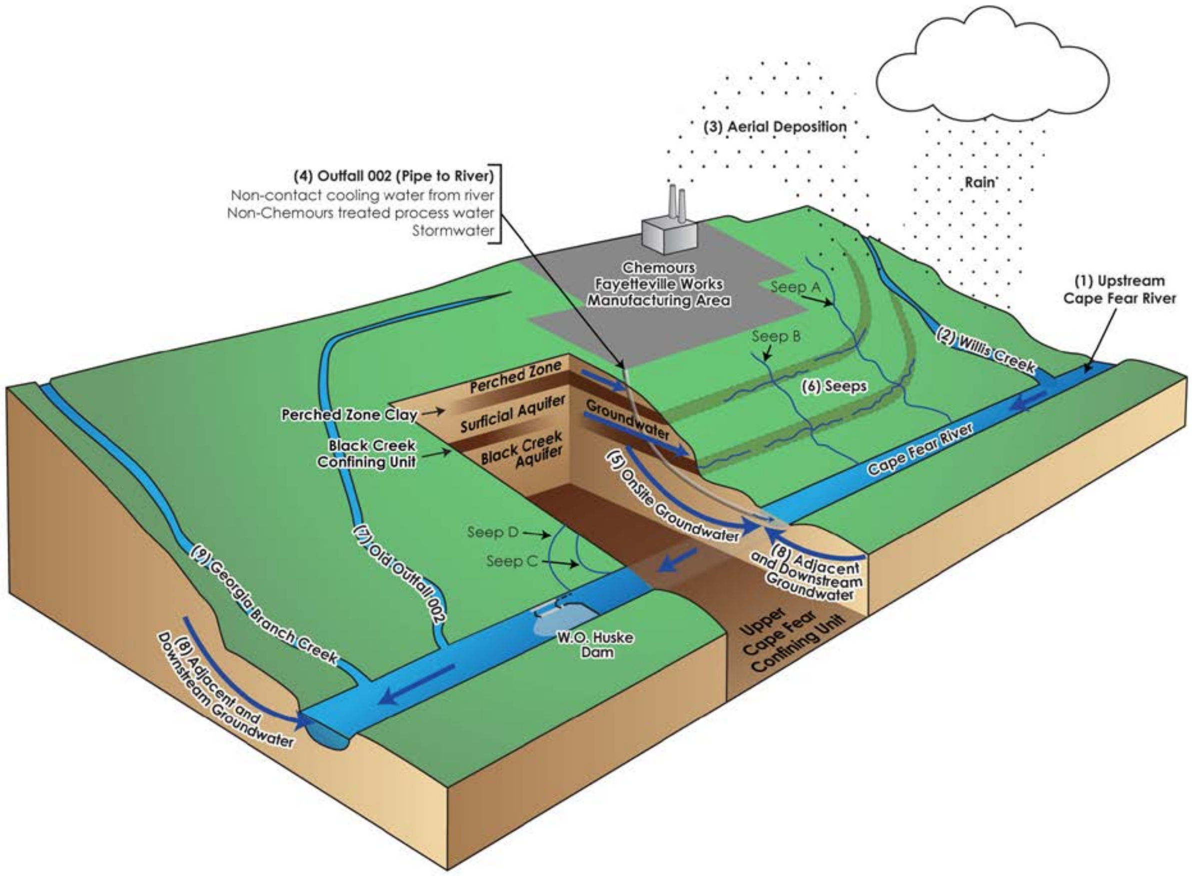

Figure ES1 – Schematic Conceptual Site Model of the Site including geological layers, and PFAS transport pathways

Historically PFAS, the Table 3+ PFAS originating from the Site, have been released at Site to air and from process water. Air sources result in a more distributed, diffuse concentration signature of deposited compounds that decrease in concentration in soil and groundwater gradually and radially away for the source. Meanwhile releases of water result in point sources and plumes of compounds in groundwater where high concentrations can be present in close proximity to low concentrations and where migration and distribution of compounds is controlled by geology and hydrogeology. Total Table3+ PFAS concentrations from the most recent sampling events (June to September 2019) are shown in Figure 9-8 through 9-10 for the Perched, Surficial and Black Creek Aquifer Units. Additional well installation in 2019 have further delineated the PFAS in the subsurface.

Table 3+ PFAS at Site have been released to the environment through different pathways (air, terracotta pipe, leaking process sewers). Each of these release pathways has resulted in a characteristic signature of Table 3+ compounds as follows:

- Aerial deposition PFAS signature characterized by a predominant proportion of PMPA;
- Aerial deposition PFAS signature characterized by a mixture of PFAS compounds;
- Combined process water PFAS signature characterized with a predominant proportion of PFMOAA; and
- Combined process water PFAS signature characterized by a mixture of PFAS compounds.

These signatures are evident in water samples. Seeps A, C, and D, the Old Outfall 002, and Willis Creek have the combined process water signatures. Seep B resembles the aerial PFAS signature with a mixture of PFAS compounds, however; this signature could also be associated with historical process water release. Georgia Branch Creek, offsite groundwater and upgradient groundwater at Site have the aerial deposition signatures. The Cape Fear River have a mix of the aerial and combined process water signatures.

With respect to offsite wells, detection frequencies and concentrations are low in wells for most PFAS compounds. For Table 3+ compounds, seven out of the 20 Table 3+ PFASs were not detected in any samples, while the other 13 were detected in at least one sample. Spatially, the highest concentrations were observed at Bladen-1D (closest to the Site) and the lowest were observed at locations farthest from the Site following the primary and secondary wind directions along the west-southwest to east-northeast and south to north quadrants, respectively.

The geology at Site has influenced hydrogeology and the distribution of PFAS in groundwater. For instance, the erosional feature mentioned earlier is interpreted as having created a pathway for PFAS in groundwater to migrate from the Perched Zone and Surficial Aquifer down into the Black Creek Aquifer. The effect of geology/hydrogeology will be further examined as part of the numerical groundwater model being prepared to evaluate groundwater flow in support of selecting and designing a groundwater remedy at the Site.

Last, a sediment characterization program of the Cape Fear River is planned, pending NCDEQ approval of the submitted work plan.

ES.5. Conclusions

This On and Offsite Assessment Report and the 25+ assessments it relies upon provide sufficient data to inform an interpretation of the nature and extent of PFAS impacts to a level that remedial selection to address groundwater containing PFAS originating from the Site is feasible.

Point source releases of high concentration process water at Site have resulted in groundwater that contains elevated concentration of PFAS migrating through all three geological zones present at Site (i.e., Perched Zone, Surficial Aquifer, and Black Creek Aquifer) and discharging via groundwater seeps, seepage to Old Outfall 002 or direct groundwater discharge to the Cape Fear River.

Chemours is preparing a Corrective Action Plan (CAP) for groundwater due December 31, 2019 as required by Paragraph 16 of CO. This CAP is being supported by:

- Characterization data (reported here);
- Numerical groundwater model (prepared using data presented here); and
- Human health SLEA.

This CAP will describe specific remedial measures and schedules to address PFAS mass loading to the Cape Fear River and other surface water bodies from (a) seeping groundwater and (b) direct discharge of Black Creek Aquifer groundwater to the Cape Fear River.

DOCUMENT VERSION SUMMARY

This section summarizes document versions of the Site Assessment Report for the Chemours Fayetteville Works facility (Site) pursuant to Paragraph 18 of the February 25, 2019 Consent Order (CO) among Chemours, the North Carolina Department of Environmental Quality (NCDEQ) and Cape Fear River Watch (CFRW).

Version	Date of Last Revision	Date Submitted to NCDEQ	Comments	Detailed Comments
1	-	9/30/2019	Version 1 (V1)	-
2	10/30/2019	10/31/2019	Version 2 (V2) Results from 59 samples that were pending when V1 was issued. This includes onsite and offsite groundwater samples and soil samples. A synoptic groundwater measurement event was completed and collected data used to generate potentiometric surface maps for the three hydrogeologic units, vertical gradient calculations and the water levels on cross sections. With a more complete data set an assessment PFAS signatures was completed.	The following text sections were updated: Executive Summary, 1.2, 2.5, 2.7, 6.1.4, 6.3.2, 6.4, 7.4, 9, 10.2, 10.4 and 11. Figures that have been updated include: 4-2A, 4-2B, 7-1, 9-1 through 9-10, 9-11 (new in V2), and 9-12 (new in V2), 10-2 through 10-6 Tables that have been updated include: 7-1 through 7-6, 9-1 through 9-5 Appendices that have been updated: A, G, H, I and J (new in V2)

1. INTRODUCTION

1.1 Purpose of the Site Assessment Report

Geosyntec has prepared this On and Offsite Assessment Report (SA) of the Chemours Fayetteville Works facility (Site) pursuant to Paragraph 18 of the February 25, 2019 Consent Order (CO) among the Chemours Company FC, LLC (Chemours), the North Carolina Department of Environmental Quality (NCDEQ) and Cape Fear River Watch (CFRW). Paragraph 18 requires Chemours to fund a third-party contractor approved by NCDEQ after consultation with CFRW to perform this assessment. DEQ approved Chemours proposal that Geosyntec be the third-party contractor.

This document focuses on the characterization of per- and polyfluoroalkyl substances (PFAS) in Site media. Assessment of other COCs was conducted as part of the Site Resource Conservation and Recovery Act (RCRA) management process and have been reported in the RCRA Facility Investigation (RFI) (Parsons, 2014). A Corrective Measures Study Work Plan for these COCs was approved by NCDEQ in February 2017 (NCDEQ, 2017). On July 7, 2017 Chemours requested a delay in the completion of the Corrective Measures Study due to additional sampling and characterization Chemours began conducting both voluntarily and in response to state requests regarding identification and detection of PFAS present at the Site. This report prepares an updated assessment of the Site incorporating PFAS data acquired since 2017.

The objective of this SA is to develop the Conceptual Site Model (CSM) that forms the basis for developing the Corrective Action Plan (CAP) pursuant to Paragraph 16 of the CO due on December 31, 2019. Paragraph 18 requires this assessment comply with the requirements of 2L rules for site assessments provided in paragraph (g) of Title 15A of the North Carolina Administrative Code (NCAC), Subchapter 2L (2L), include describing:

- The source and cause of contamination;
- Imminent hazards to public health and safety and any actions taken to mitigate them;
- Receptors and significant exposure pathways;
- The horizontal and vertical extent of soil and groundwater contamination impact and significant factors affecting contaminant transport; and
- Geological and hydrogeological features influencing the movement, chemical, and physical character of the contaminants.

These requirements are addressed in this report. In addition to the requirements above, Paragraph 18 of the CO also requires the identification of groundwater seeps contributing to surface water mass loading contamination at the site and areas with significantly contaminated sediment. Identification of groundwater seeps and observations related to the seeps identified were reported in the *Seeps and Creeks Investigation Report* (Geosyntec, 2019a) and are described later in this report. An investigation to characterize sediment PFAS concentrations will be addressed as part of the *Sediment Characterization Plan* (Geosyntec, 2019b) required by CO Paragraph 11.2 and submitted to NCDEQ on August 21, 2019. At time of this report's submission, the *Sediment Characterization Plan* is still awaiting comment and approval by NCDEQ. Upon NCDEQ approval, Chemours will implement and then report the findings of the sediment characterization.

This report is one of three major inter-related submissions required under the CO listed as follows:

- The Cape Fear River PFAS Loading Reduction Plan (that addresses the imminent hazards to public health and safety and presents proposed mitigation measures), which was required under paragraph 12 of the CO and was submitted to NCDEQ on August 26, 2019. A Supplemental Assessment of Actions Report to the PFAS Loading Plan is being submitted in parallel with this SA report;
- This SA document which is required under paragraph 18 of the consent order; and
- The CAP for groundwater remediation which is required under paragraph 16 of the CO and will describe the remedy.

Together, these three documents form the framework management strategy for overall site assessment and remedy.

1.2 Limitations and Assumptions

This report draws on data available to support the development of the conceptual site model (CSM) and provides a robust assessment of the sources of contaminants, transport pathways and receptors being impacted. Some data, including laboratory results from samples collected from offsite wells, have been delayed due to issues that arose in obtaining offsite access agreements in a timely manner. As additional data and information from continued assessment become available, these data and insights will be incorporated into the approach to managing the Site; these activities are described in Section 2.7. This report presents analytical results of PFAS originating from the Site from over 25 assessment activities where there are over 3,167 environmental samples analyzed for at least HFPO-DA since 2017 with an additional 142 recently collected samples that are being reported here for the first time.

Count of PFAS Samples to Date

Sample Type	Reported Previously	Reported Here	Total
Onsite Soil	147	16	163
Onsite Groundwater	279	96	375
Offsite Soil	--	11	11
Offsite Groundwater	--	19	19
Drinking Water	1,742	--	1,742
Surface Water	857	--	857
Total	**3,025**	**142**	**3,167**

2. SITE HISTORY AND DESCRIPTION

This section provides a brief description of the site location, history of property ownership and use, surrounding land use and adjacent surface water bodies, permitted site activities, assessment and regulatory history.

2.1 Site Location, Acreage, and Ownership

The Site is located within a 2,177-acre property at 22828 NC Highway 87, approximately 20 miles southeast of the city of Fayetteville along the Bladen-Cumberland county line in North Carolina. Figure 2-1 presents an overview of the Site location. Figure 2-2 presents a regional topographic map and Figure 2-3 presents a higher resolution topographic map of the Site.

The Site property was originally purchased by E.I. du Pont de Nemours and Company (DuPont) in 1970 for production of nylon strapping and elastomeric tape. DuPont sold its Butacite® and SentryGlas® manufacturing units to Kuraray America Inc. (Kuraray) in June 2014 and subsequently spun off its specialty chemicals business to Chemours in July 2015. Chemours and its two tenants, Kuraray and DuPont, currently operate manufacturing areas on the Site, described below.

2.2 Site Description

Presently, the manufacturing area of the Site consists of five production areas (Figure 2-1): Chemours Monomers IXM; Chemours Polymer Processing Aid (PPA) Area; Kuraray Trosifol® Leased Area; Kuraray SentryGlas® Leased Area; and DuPont polyvinyl fluoride (PVF) Leased Area. Chemours also operates the wastewater treatment plant (WWTP) and Power Area at the Site; filtered water and demineralized water are produced in the Power Area. The manufacturing area is approximately 312 acres, as shown in Figure 2-1, the remaining areas are grassy areas, forests and wetlands.

2.3 Adjacent Property, Zoning, and Surrounding Land Uses

The Site is bounded by NC Highway 87 to the west, Cape Fear River to the east, and on the north and south by forested areas, farmland and private residences. Cumberland and Bladen County zoning maps indicate that the surrounding areas are zoned as residential, agricultural, conservation, industrial or commercial.

2.4 Adjacent Surface Water Bodies and Classifications

To the east of the Site is the Cape Fear River. The Cape Fear River and its entire watershed are located in the state of North Carolina (Figure 2-4). The Cape Fear River drains 9,164 square miles and empties into the Atlantic Ocean near the City of Wilmington, North Carolina. The Site draws water from the Cape Fear River and returns over 95% of this water via Outfall 002 after being used primarily as non-contact cooling water. Two lock and dam systems with USGS stream gauges are located downstream of the Site: (1) W.O. Huske Lock and Dam, located 0.5 river miles from the Site (USGS 02105500); and (2) Cape Fear Lock and Dam #1, located 55 river miles downstream (USGS 02105769).

The Cape Fear River is a water source for communities downstream of the Site. Raw water intakes are located at Bladen Bluffs and Kings Bluff Intake Canal, located approximately 5 miles and 55 miles downstream from the Site. These intakes serve as Cape Fear River water intakes for the Lower Cape Fear Water and Sewer Authority, which in turn provides water to Cape Fear Public Utility Authority (CFPUA) and other water providers. Drinking water sourced from the Cape Fear River does contains certain chemicals from multiple sources including 1,4-dioxane, trihalomethanes associated with bromide content in raw river water, pharmaceuticals, personal care products, endocrine disrupting chemicals, and PFAS. A brief description of these chemicals and their presence in the Cape Fear River was reported previously (Geosyntec, 2018a).

Two tributaries to the Cape Fear River, located to the north and south of the Site, are described in the Seeps and Creeks Investigation Report (Geosyntec, 2019a). To the north of the property is Willis Creek. During the Seeps and Creeks Investigation, Willis Creek was observed to have flow rates around 2,900 GPM in dry weather and around 6,500 GPM following rainfall. Willis Creek reaches from Highway 87 to the Cape Fear River. To the south of the property is Georgia Branch Creek, which is offsite for its entire course. During the Seeps and Creeks Investigation, Georgia Branch Creek was observed to have flow rates between 2,400 and 2,600 GPM in both wet and dry weather. Georgia Branch Creek runs northwest-southeast beside Highway 87 before turning east towards the Cape Fear River to the south of the Site. These creeks are shown in Figure 2-1.

2.5 Meteorological Setting

The climate at the Site is humid subtropical, characterized by relatively mild winters, hot summers and abundant rainfall. Meteorological records collected at the Fayetteville Regional Airport, located approximately 17 miles north of the Site, for the last four-year period from September 2015 to September 2019 indicate temperatures range from an average monthly high of approximately 94 Fahrenheit (°F) in July to an average monthly low of approximately 34°F in January (North Carolina Climate Office, 2019). Average annual rainfall at the Site is approximately 45.3 inches per year for the period from 1930 to 2018, based on available data recorded at the National Ocean and Atmospheric Administration (NOAA) monitoring station in Fayetteville (Station ID: USC00313017), United States Geological Survey (USGS) monitoring station at Fort Bragg (Station ID: 2102908), and USGS monitoring station for the Cape Fear River at the W.O. Huske Dam (Station ID: 2105500). Extremely high precipitation is often recorded in July and August and sometimes into September and October (e.g., average monthly precipitation of 13 inches in September 2018) due to the tropical storms or hurricanes, which affect North Carolina on an average of 2.27 storms per year (North Carolina Climate Office, 2019).

Wind directions collected at the Site for the period from January 2018 to May 2019 indicate primary and secondary wind directions are along the west-southwest to east-northeast and south to north quadrants, respectively (Figure 2-5). Wind directions vary from these primary and secondary wind directions during rain events, which occurs 5% of the time for the period from January 2018 to May 2019. Primary and secondary wind directions during rain events for the period from January 2018 to May 2019 are along the east to west and east-northeast to west-southeast quadrants, respectively, as shown in Figure 2-4.

2.6 Permitted Activities and Permitted Wastes

The Site received its initial RCRA Permit (NCD047368642) to operate a hazardous waste container storage area and tanks in February 1983, while under DuPont ownership. DuPont submitted an amended Part A application in 1991 to document upgrades to its fluorocarbon waste treatment and tank system. The RCRA Part B permit application submitted in August 1993 identified 71,750 gallons of container storage capacity at the container storage area. Stored waste included characteristic wastes (D001, D002, D003, D007, D009, and D029) and listed wastes (F002, F003, and F005). The Site's RCRA Permit was re-issued in January 1998 and September 2012.

On April 27, 2016, The Chemours Company – Fayetteville Works requested a renewal of the National Pollutant Discharge Elimination System (NPDES) permit for the Site (NC0003573). The application that preceded the permit also described the operations of two separate companies at the Site, Kuraray America Inc. and the DuPont Company. The discharge permit included permit limits for internal Outfall 001, after biological wastewater treatment, for the Chemours, Kuraray, and DuPont manufacturing processes, demineralized water neutralized regenerate, sanitary wastewater, and process area stormwater. Effluent limits for Outfall 002, the Site's discharge to the Cape Fear River, included the treated flow from Outfall 001, non-contact cooling water, stormwater, and boiler condensate blowdown.

In June 2017, Chemours began capturing certain process water from the Monomers IXM area for offsite disposal, and since November 2017, as directed by NCDEQ, all process waters from Chemours's operation have been captured for offsite disposal.

Chemours recently submitted a new NPDES permit application for the Site, which contemplates continued shipping of Chemours process wastewater from the Monomers IXM and PPA areas offsite and the intent to build a treatment facility to treat captured baseflow originating from Old Outfall 002, and a thermal oxidizer with water discharges where no additional PFAS outside of those PFAS present in the river water intake are expected to be present. The recent permit application includes descriptions of recent extensive sampling at the Site for HPFO-DA and PFMOAA, as well as a number of other PFAS.

On March 14, 2019, Chemours received a Title V Air Quality Permit No. 03735T44 from NCDEQ to construct and operate the emissions sources and associated air pollution control devices(s). This permit authorized Chemours to continue manufacturing operations and install a thermal oxidizer to reduce by 99% site-wide PFAS emissions to air.

2.7 Assessment and Regulatory History

Since 1996, several stages of RCRA Facility Assessments and Investigations have been conducted and are detailed in the RCRA Facility Investigation (Parsons, 2014). The RFI process was performed for Site COCs identified in the 2014 RFI including multiple VOCs, metals, other inorganic compounds and perfluorooctanoic acid (PFOA). The RFI process did not include the Site Associated PFAS that are now analyzed by the Table 3+ SOP method; these compounds are listed in Table 2-1. The outcome of the RFI process was the *Corrective Measures Study Work Plan* submitted to NCDEQ on December 2, 2016 (Parsons, 2016). On February 8, 2017, NCDEQ approved Chemours Work Plan for preparing the Final Corrective Measures Study. On July 7, 2017, Chemours requested a delay in the completion of the Corrective Measures Study due to additional sampling and characterization Chemours began conducting both voluntarily and in response to state requests regarding identification and detection of additional PFAS present at the Site.

Since identifying the presence of the PFAS associated with the Site, Chemours has performed multiple investigations and assessments and is continuing to perform assessments that support moving toward corrective action for PFAS at the Site. The table below list assessments conducted and the second table lists assessments in-progress and planned.

PFAS Focused Assessment Activities to Date

Assessment	**Reference**
2018 Cape Fear River Sampling	Geosyntec, 2018a
2018 Stormwater Characterization	Geosyntec, 2018b
2019 Seeps and Creeks Investigation	Geosyntec, 2019a
2019 Fate and Transport Study	Geosyntec, 2019c
2019 Mass Loading Reductions Plan	Geosyntec, 2019d
2019 Terracotta Pipe Section Grouting	Geosyntec, 2019e
2019 Mass Loading Model	Geosyntec, 2019f
2018 Post Florence Characterization	Geosyntec, 2019i
2019 Conveyance Network Sampling	Geosyntec, 2019j
2019 Outfall 002 Assessment	Geosyntec, 2019k
2017 Groundwater Investigation	Parsons, 2017a
2017 Soil Investigation	Parsons, 2017b
2017 Surface Water Investigation	Parsons, 2017c
2018 Terracotta Pipe Investigation	Parsons, 2018a
2018 Additional Investigation	Parsons, 2018b
2018 VE South Sampling	Parsons, 2018c
2018 Old Outfall 002 Sampling	Parsons, 2018d
2018 Exclusion Zone Investigation	Parsons, 2018e
2018 Southeast Perched Zone Investigation	Parsons, 2018f

Assessment	Reference
2018 - 2019 Private Well GAC Pilot	Parsons, 2018g
On-going Private Well Sampling	Parsons, 2019a
2019 PlumeStop™ Pilot Study	Parsons, 2019b
2019 Old Outfall 002 GAC Pilot Study	Parsons, 2019c
2019 Old Outfall Sampling Results	Parsons, 2019d
2019 On and Offsite Assessment	This Report

Ongoing PFAS Assessment and Planned Activities

Activity	Description and Status
Offsite Wells	Continued assessment of offsite soil and groundwater in addition to private well data; 20 wells installed. Wells are being redeveloped and sampled.
Consent Order Required Private Well Delineation	By August 26, 2020 Chemours is required by CO Paragraph 21 to delineate the extent of private wells offsite with any PFAS on Attachment C of the CO present above 10 nanograms per liter (ng/L) within a quarter mile of other wells with similar detections.
Human Health Screening Level Exposure Assessment	Assessment of human receptor exposures to historically deposited PFAS from the Site. All samples collected, data and interpretations to be reported by December 31, 2019
Ecological Screening Level Exposure Assessment	Assessment of ecological exposures to PFAS originating from the Site. Sampling was performed in part with the Human Heath SLEA sampling and will be completed with the Sediment Characterization sampling.
Empirical Laboratory Study	Assessment of Table 3+ PFAS empirical fate and transport characteristics. Portions of the study have begun. Components of assessment will be reported by December 31, 2019 where data are available. The full set of data will be reported in early 2020.
Onsite Characterization	Assessment of onsite groundwater levels and concentrations; in 2019, 42 wells installed. Full set of data collected from new wells are reported herein.

Activity	**Description and Status**
Consent Order Required Sediment Characterization	Chemours submitted the Sediment Characterization plan to NCDEQ on August 21, 2019 is awaiting comments and approval before conducting sampling.
Quarterly Mass Loading Sampling	Assessment to evaluate mass loading to the Cape Fear River. Sampling and flow gauging performed quarterly in seeps, creeks, the Old Outfall 002, Outfall 002 and groundwater adjacent to surface water.
Numerical Groundwater Model	Quantitative assessment of groundwater at the Site to assess flow to surface water features and assess performance of potential remedies. Results to be reported by December 31, 2019.
Consent Order Required Bimonthly Paragraph 11 PFAS Characterization Sampling	Bimonthly assessment of PFAS concentrations in the Site conveyance network. Data and interpretations are reported quarterly.
Consent Order Required Corrective Action Plan	Corrective Action Plan for PFAS in groundwater. Due December 31, 2019.

3. REGIONAL GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

The Site is located on the Coastal Plain. In North Carolina, the Coastal Plain Physiographic Province extends from the present Atlantic Ocean inland to the Fall Line, an erosional contact boundary with the Piedmont Province (Figure 3-1). The Coastal Plain is comprised of a wedge of unconsolidated to semi-consolidated, both marine and terrestrial lithologic units that typically strike northeast-southwest and dip gently to the east-southeast (Trapp and Meisler,1992). This wedge of Coastal Plain sediments thickens east southeastward toward the Atlantic Ocean.

Sediments of the Coastal Plain range in age from Cretaceous to Holocene and overlie older Paleozoic metamorphic, igneous, and sedimentary rocks of the Piedmont Province. Early Cretaceous deposition of Coastal Plain sediments were initially terrestrial in nature and were derived from adjacent upland areas, transported by streams, and deposited as alluvial and deltaic sediments. By Late Cretaceous time, a widespread marine transgression event caused sea level rise of the ocean and deposited marine sediments on older terrestrial sediments of the Coastal Plain (Trapp and Meisler, 1992). Several small-scale alternating transgressive and regressive events occurred as a result of eustatic sea-level change.

Generally, the bottom one third of the Coastal Plain section is composed of terrestrial sand and clay sequences that are discontinuous and heterogeneous, while the upper sequences are primarily marine in origin and include nearshore and estuarine deposits, lagoonal sediments, and deep-water deposits (Winner and Coble, 1996). Specifically, the Cretaceous-aged Black Creek Formation is presently thought to be an assembly of estuarine and lagoon deposits. The estuarine deposits include rhythmically interstratified dark clays, sands, and gravelly intervals with wood, shell, bone, and clay pebble megaclasts (Farrell et al., 2001). The lagoon deposits consist of thinly bedded clay and alternating crossbedded sands, mottled sand, and contorted sand with clay laminae (Farrell et al., 2001). In comparison, the Cretaceous-aged Cape Fear Formation is interpreted to be both marine and fluvial in origin (Heron et al., 1968). The Cape Fear Formation consists of "a stack of feldspathic, bioturbated, upward-fining facies sequences" (Farrell et al., 2001). The Black Creek Formation can be observed unconformably overlying the Cape Fear Formation just north of the Site, near the Fall Line (NCGS, 1985; Farrell et al., 2001).

3.2 Regional Hydrogeology

Successive deposition of permeable and impermeable sediments in this region has resulted in aquifers separated by confining units. Sediments that comprise the North Carolina Coastal Plain aquifer system lie on crystalline basement rock and are approximately 10,000 ft thick near the present Atlantic Ocean (Winner and Coble, 1996). The hydrogeologic framework of the North Carolina Coastal Plain aquifer system consists of 10 aquifers separated by 9 confining units (Winner and Coble, 1996). Stratigraphically, from top to bottom, the aquifers include: surficial aquifer (water-table aquifer), Yorktown Aquifer, Pungo River Aquifer, Castle Hayne Aquifer, Beaufort Aquifer, Peedee Aquifer, Black Creek Aquifer, Upper Cape Fear Aquifer, Lower Cape Fear Aquifer, and Lower Cretaceous Aquifer.

Exposed aquifers that appear to be present in the vicinity of the Site include, from stratigraphically top to bottom, a Surficial Aquifer, Black Creek Aquifer, and Upper Cape Fear Aquifer. The Surficial Aquifer is the uppermost unconfined hydrostratigraphic unit in the vicinity of the Site and constitutes the surface water table and follows the surface topography. The surficial aquifer in the vicinity of the Site is not restricted to a specific geologic unit in terms of age or lithology. The only interpretation that is made in regard to age is that the surficial aquifer is post-Cretaceous due to the unconformable contact above the Black Creek Formation. Surficial sediments in the vicinity tend to be variable and well graded sandy to silty soils that contain some significant amounts of clay. Regionally, surficial soils have reported saturated permeabilities of 4 to 40 feet per day (ft/day) (Winner and Coble, 1996).

The Black Creek aquifer is separated from the surficial aquifer by the Black Creek confining unit, which consists of dark gray to black organic-rich clay. The Black Creek aquifer is associated with the Black Creek Formation, which is Cretaceous in age. Soils of the Black Creek aquifer are typically medium-grained, poorly graded, "salt and pepper" colored sands. The hydraulic conductivity of the Black Creek aquifer is estimated to range from 15 to 50 ft/day with the average value being approximately 28 ft/day (Winner and Coble, 1996). The Upper Cape Fear aquifer is separated from the Black Creek aquifer by the Upper Cape Fear confining unit, which consists of nearly continuous clay, silty clay, and sandy clay beds (Winner and Coble, 1996). The Upper Cape Fear aquifer is associated with the Cape Fear Formation, which is Cretaceous in age. Sediments of the Upper Cape Fear aquifer are typically alternating beds of well-graded, fine- to coarse-grained sand and clay that often show vertical gradation. The hydraulic conductivity of the Upper Cape Fear aquifer is estimated to range from 10 to 70 ft/day with the average value being approximately 30 ft/day (Winner and Coble, 1996).

4. PFAS PROPERTIES AND SOURCES

This section provides a description of the physical and chemical properties of the Site associated PFAS (Section 4.1), laboratory studies being conducted to better understand selected physical and chemical properties, and sources of PFAS at the Site.

4.1 Table 3+ PFAS Characteristics

Pursuant to Consent Order Paragraph 27, Chemours funded a study analyzing the fate and transport of identified PFAS originating from the Site in air, surface water, and groundwater (Geosyntec, 2019c). The findings of the study are summarized below.

PFAS are a group of man-made carbon-based chemicals composed of a fully or partially fluorinated chain of carbon atoms (referred to as a “tail”) and a nonfluorinated, polar functional group (referred to as a “head”) at one end of the carbon chain. Fluorination of the carbon chain renders it hydrophobic and lipophobic, while the polar head group is hydrophilic (Mueller and Yingling, 2018). Generally, PFAS vapor pressures are low and water solubilities are high. Most PFAS have one or more negatively charged head groups, so they are likely to be relatively mobile in the subsurface due to the affinity of the head group for water molecules (Mueller and Yingling, 2018).

Most Site associated PFAS, i.e. Table 3+ PFAS, are fluoroethers: their structure includes two carbons connected by an oxygen atom – an ether bond. PFAS with ether bonds are expected to be less volatile and more soluble than non-ether PFAS of equivalent chain length due to the polar oxygen atoms included in their structures. Table 3+ PFAS contain at least one polar head group and many also contain additional polar head groups. The structural information for the Table 3+ PFAS is provided in Table 4-1.

Generally, Table 3+ PFAS are expected to be mobile in the environment given the presence of charged head groups and ether bonds, but they will experience some retardation. For some Table 3+ PFAS, mobility may be enhanced relative to straight-chain, non-ether PFAS by their branched structure and the presence of two charged head groups. The mobility of the Table 3+ PFAS will be retarded by various chemical processes but will likely have lower retardation than long-chain PFAS without ether bonds. Chemical processes expected to have the most impact on mobility are sorption to organic carbon and, in the unsaturated soil zone, preferential partitioning to the air water interface.

The tails of PFAS are made primarily of carbon atoms. They tend to be nonpolar, and so they tend to sorb to organic carbon species in soil and sediment (Higgins and Luthy 2006, Guelfo and Higgins, 2013). Because PFAS tails are also lipophobic, sorption to organic carbon tends to be weaker than that of alkanes. The sorption and retardation of PFAS will increase with increasing fluorinated tail length. For a given soil, sediment, or organic carbon type, the structure of the PFAS tail affects its interactions with organic carbon molecules. Branched isomers tend to have lower sorption affinity than linear isomers of equal chain length (Kärrman et al., 2011). Sorption of PFAS to charged particle surfaces in common soils and sediments is expected to be negligible relative to sorption to particulate organic carbon (Higgins and Luthy, 2006).

Current literature indicates that transformation of most PFAS in the environment is negligible. An important observed environmental transformation of PFAS has been the hydrolysis of some polyfluorinated precursors to form perfluorinated compounds (Mueller and Yingling, 2018) and the biotic degradation of trifluoroacetate (e.g., Visscher et al., 1994). Recently, researchers identified an *Acidimicrobium* microbial species that appears capable of defluorinating select PFOA and PFOS (Huang and Jaffe, 2019). Components of the Table 3+ PFAS that may be amenable to transformation reactions that degrade the tails of these compounds are ether bonds present in 21 of 24 Site associated PFAS, and carbon-hydrogen bonds present in 5 of 24 Site associated PFAS. (e.g., Weber et al., 2017).

4.1.1 Empirical Parameters Testing

Empirical laboratory studies are being performed to better understand selected physical and chemical properties of the Table 3+ PFAS so that more information is available on the potential fate and transport of these compounds. These studies are in progress and their results, where available, will be incorporated into the CAP. Empirical studies being conducted include:

1. Relative Sorptive Capacity: The relative capacity of soil / groundwater and of sediment / river water for the Table 3+ compounds is being evaluated to establish the contact times for the solids and water to achieve equilibrium and to determine solid to water ratios for subsequent isotherm and desorption tests;
2. Isotherm Testing: Isotherm tests will be conducted to develop isotherm adsorption curves and to develop Site-specific distribution coefficients (Kd) for the Table 3+ compounds;
3. Desorption Testing: Desorption tests will be conducted to assess desorption of Table 3+ compounds from sediment to PFAS-free simulated river water;
4. Column Testing: Column tests will be conducted to evaluate the retention and leachability of the Table 3+ compounds in unsaturated and saturated soils collected from the Site;
5. Octanol-Water Partition Coefficient (KOW) Measurements: Liquid chromatography elution time runs will be performed with compounds with known Kow values to calculate Kow values for Table 3+ PFAS per the HPLC method (OECD, 2004); and
6. Surface Tension Measurements: Surface tension measurements will be performed to help estimate the degree of retardation Table 3+ PFAS will experience in unsaturated zone soils due to air-water interfacial partitioning.

4.1.2 Laboratory Analytical Methods

EPA method 537 is a commercial analytical method to analyze for PFAS compounds, including PFOA and PFOS. EPA method 8321A is a commercial analytical method for HFPO-DA. Through non-targeted mass spectrometry analyses of water and soil samples collected at Site, Chemours has identified 24 PFAS not currently quantified by EPA Method 537 or 8321A. In 2019, a commercial analytical method, referred to as the Table 3+ SOP method, was developed (Table 2-

1). An analytical method for four of these PFAS is still under development. These PFAS are Difluoro-sulfo-acetic acid (DFSA), Difluoromalonic acid (MMF), Perfluoro-2-methoxypropanoic acid (MTP) and Perfluoropropionic acid (PPF Acid).

4.2 PFAS Source Characteristics

Historical fluoroproduct manufacturing at the Site resulted in releases of PFAS to environmental media. These releases have resulted in PFAS being now present as both diffuse and more concentrated secondary sources in environmental media on and off site. The remainder of this section provides an overview of the primary sources of Table 3+ PFAS in environmental media, including air (Section 4.2), soil and groundwater (Section 4.3), and surface water (Section 4.4) with secondary sources described in Section 4.5.

4.2.1 Emissions to Air

The facility operates multiple stacks, blowers and vents as part of manufacturing activities. As part of CO compliance, the facility is capturing and treating these emissions to air to reduce PFAS emissions to air by 99% from facility wide operations compared to 2017 baseline. This reduction is required to be complete by December 31, 2019 with the installation and operation of the thermal oxidizer. The Thermal Oxidizer is also required to control PFAS in the streams routed to it with an efficiency of 99.99%. Prior to these in-progress reductions, and other interim reduction achieved over the past two years, PFAS compounds had been emitted to air and subsequently deposited both onsite and in the area surrounding the Site. The locations of emissions to air and locations of past loading are presented in *Modeling Report: HFPO-DA Atmospheric Deposition and Screening Groundwater Effects* (ERM, 2018) and in Figure 4-1. Estimates of past loadings to air and surface water and reductions in loadings achieved are presented in the PFAS Loading Reductions Plan (Geosyntec, 2019d).

Generally, the four compounds reported with highest concentrations in offsite groundwater are PMPA, PEPA, perfluoro(3,5-dioxahexanoic) acid (PFO2HxA) and HFPO-DA as described in greater detail in Section 9.3 and Section 10.2. These four compounds have been found in certain private offsite wells and in Chemours installed offsite wells. Offsite wells are typically hydraulically upstream or isolated from groundwater near facility operations and are therefore Table 3+ PFAS detected in these wells are interpreted to have originated from aerial deposition only. Based on these offsite detections, these four compounds are interpreted to be the predominant PFAS emitted to air from the facility that subsequently deposit on the land surface. These historically airborne deposited PFAS compounds are also present on surface soils and can be mobilized during rainfall events.

4.2.2 Releases of Process Water to Soil and Groundwater

On Site releases of PFAS to soil and groundwater occurred in the manufacturing areas. Known specific release pathways included (i) leakage from historical process water discharge lines, (ii) leakage of combined process water from the terracotta pipe and (iii) a manufacturing upset which occurred in October 2017. Each of these pathways is described below.

Historical process sewer system in Monomers IXM

In 2000, the facility replaced underground piping in the Monomers IXM area that conveyed process waters and wastewaters with above ground piping (DuPont, 2006). At the time of writing, the facility identified one remaining underground pipe connecting the sump at vinyl ethers south to the vinyl ethers south retention basin. The basin ensures that the vinyl ethers south sump does not overflow during heavy rainstorm events. The replacement of the piping in 2000 was initiated based on observations of potential losses of process water to soils via leakage from these underground pipes. Replacement with above ground piping enabled routine inspections and the ability to perform more rapid leak detection and repair.

Terracotta Pipe Leakage

The terracotta pipe was designed to convey wastewater from the various manufacturing areas to the WWTP (Figure 4-1). Prior to June 21, 2017 Chemours transmitted PFAS containing process wastewater containing Table 3+ PFAS to the WWTP from the Monomers IXM Area via the terracotta pipe. Leaking of this process water from the terracotta pipe to groundwater is probable and these releases are likely the source of elevated PFAS detections at location PZ-18 and its replacement well, MW-24 (Parsons, 2018a). Chemours no longer transmits process water from the Monomers IXM Area to the WWTP. These wastes are sent to offsite disposal. In 2018, Chemours grouted a portion of the terracotta pipe, and by 2021 Chemours and Kuraray plan to fully decommission and replace the terracotta pipe with above-ground piping (Geosyntec, 2019e, f).

October 2017 Scrubber Upset

In October 2017, a scrubber upset occurred in the Vinyl-Ethers South area of the Monomers IXM Area (Arnold and Porter, 2017). This release resulted in process water containing PFAS contacting site soils and infrastructure in the Monomers IXM area. Subsequent to this release, Chemours removed soils from this area, replaced some roofing materials and re-lined the cooling water channel with new materials. The scrubber upset resulted in increased HFPO-DA concentrations in the Outfall 002 after rainfall events for a period of time. As materials were replaced, soils were removed and the area flushed, and observed HFPO-DA concentrations diminished at Outfall 002.

4.2.3 Releases of Process Water to Surface Water

Prior to June 21, 2017, Chemours transmitted PFAS containing process wastewater to the WWTP from the Monomers IXM Area via the terracotta pipe. This process water was then transmitted via the WWTP to Outfall 002 where this water and the PFAS it contained reached the Cape Fear River. As of November 29, 2017, Chemours has diverted Chemours Monomers IXM Area process wastewater flows away from the WWTP and currently sends this wastewater offsite for disposal. PPA process water also contains PFAS, but this waste stream has always been collected and sent for offsite disposal since commissioning of the PPA Area.

4.2.4 Secondary Sources

Chemours has taken measures to mitigate releases of PFAS to groundwater, soil, and surface water, and will have reduced annual emissions of PFAS compounds to air by 99%, once the thermal oxidizer, which will control PFAS routed to it with an efficiency of greater than 99%, is operational by December 31, 2019 as required by the CO. Historical releases have resulted in the following secondary sources of PFAS being present in the environment:

- PFAS in soils and groundwater from aerial deposition. Aerial deposition has resulted in a distributed, non-point source secondary source of PFAS in onsite and offsite soils. Infiltrating rainfall has transported these PFAS downward to groundwater. The currently identified extent of this secondary PFAS source is shown in Figures 4-2A and 4-2B.
- PFAS in soils and groundwater from Site process water releases. Process water leaks in the manufacturing areas resulted in PFAS in Site soil and groundwater. Based on the hydrogeology of the Site, these PFAS are detected the Perched Zone, Surficial Aquifer, or Black Creek Aquifer and then migrate towards primarily the Cape Fear River and Old Outfall 002 with some component reaching Willis Creek.

5. RECEPTOR INFORMATION

This section summarizes currently known receptors in the area surrounding the Site. Presently, as required in Paragraph 21 of the CO, the full extent of PFAS present in private well receptors is being delineated with the task to be completed by August 26, 2020 (Parsons, 2019a). Receptors identified within six miles of the Site are shown in this report. Receptors included in this document are public and private supply wells, surface water bodies and intakes, and human and ecological receptors. As of September 2019, the full extent of PFAS in private wells surrounding the Site is not complete and sampling is ongoing to delineate the extent.

5.1 Summary of Receptor Survey Activities

Information surveys, described in more detail below, were completed to identify potential receptors including public and private water supply wells, wellhead protection areas, surface water features, and human and ecological receptors. Information was also gathered on subsurface structures onsite that could be a preferential pathway. Receptors were identified as listed below:

1. Public water supply wells were identified using publicly available well data from NC OneMap GeoSpatial Portal.
2. Private water supply wells were identified through a door to door residential survey conducted by Chemours' contractor Parsons. GIS parcel data was reviewed for properties with structures, and residents of those properties were approached to determine whether they owned a private well. Structures in areas with no public water supply were assumed to be on a private well, and this was confirmed through communication with the residents where possible. There was no private well registration system available for the area around the Site.
3. Wellhead protection areas were identified using publicly available data on North Carolina wellhead protection areas from NCDEQ and using publicly available data on usage of public water supplies.
4. Surface water bodies were identified using publicly available surface water data from the USGS National Hydrography Dataset. The surface water intakes have been previously described.
5. Human receptors are being identified and will be assessed through an *Offsite Screening Level Exposure Assessment (SLEA) of Site Associated PFAS* (Geosyntec, 2019g) in progress.
6. Ecological receptors are being identified and will be assessed through an Ecological-SLEA. The workplan for the Ecological-SLEA is in preparation.
7. Onsite subsurface structures that could be preferential pathways were identified using Site data and as-built information that is kept up to date by Chemours' contractor KBR Inc.

5.2 Summary of Receptor Survey Findings

5.2.1 Wells and Wellhead Protection Areas

To date, 75 public/community wells and 926 private wells have been identified in the counties surrounding the Site (see Figure 5-1). Community wells are those that serve more than one household. The full extent of offsite contamination is still being assessed, as such the number of identified private wells will increase. There is limited availability of drilling records including logs and installation depths for many private wells. The geological and hydrogeological settings where these well receptors are present are described, to the extent possible, in Section 3.1. The offsite wells installed in August and September 2019 are described in Section 6.4. Public/community wells identified are listed in Table 5-1, along with their locations, depths, usage, and distance from the Site. Private wells shown on Figure 5-1 are not included in Table 5-1 in order to protect the privacy of well owners. Surrounding property owners are similarly not identified for privacy reasons.

Wellhead protection areas, as defined in the Safe Drinking Water Act: 42 U.S. Code § 300h–7, surrounding the Site are identified in Figure 5-2. According to publicly available data, there is one wellhead protection area in the extent of Figure 5-2, including three municipal water supply wells (PWS ID 03-78-030). Daily water extraction from these wells taken together ranges from 0.18 to 0.30 million of gallons per day (MGD). Further details available regarding these wells in the wellhead protection area is provided in Table 5-1.

5.2.2 Surface Water Receptors

Surface waters in the region surrounding the Site include the Cape Fear River, tributaries, ponds, swamps and marshes, and several small streams and ditches. Figure 5-3 identifies named surface water bodies from the USGS National Hydrography Dataset surrounding the Site. Sampling of the Cape Fear River and tributaries to the Cape Fear River has been performed as part of multiple site investigation activities. Sampling of ponds and tissues of fish from the ponds has been performed for the Human Health and Ecological-SLEA. These SLEAs are described in the following sub-sections.

5.2.3 Human Receptors and Human Health SLEA

At the Site, human activities are limited to facilities operations and maintenance, office workers, and environmental monitoring activities. In the area surrounding the Site, there is a wide range of human and land use activities, including private residences, farms, commercial businesses, and recreational areas. Current exposures to historically released PFAS for these activities are being evaluated through the *Offsite Screening Level Exposure Assessment (SLEA) of Site Associated PFAS - Workplan* (Geosyntec, 2019h). Chemours is performing this SLEA to support the CAP due on December 31, 2019. The results of the SLEA will be reported by December 31, 2019. The SLEA is evaluating the following receptor types:

1. Residents. The nearest residence is approximately ½ mile north of Site manufacturing areas. North and northwest of the Site, several residential neighborhoods exist within 6 miles of the Site.
2. Farmers. Farmers were identified as potential receptors based on the predominance of agricultural land use to the east, south, and west of the Site.
3. Gardeners. Residents and farmers may garden on their properties.
4. Offsite workers. Although residential and agricultural land uses predominate the areas surrounding the Site, some commercial businesses are also present.
5. Recreational Canoeists/Swimmers. The Cape Fear River may be used for recreational purposes, including canoeing and swimming.
6. Recreational Anglers. The Cape Fear River and surrounding ponds may be used for recreational purposes, including fishing.

For the receptors identified above, the SLEA is evaluating the following potential exposure pathways listed below:

1. Residents (Adult and Child): Surface soil via incidental ingestion and groundwater and surface water as tapwater via ingestion.
2. Farmers (Adult and Child): Surface soil via incidental ingestion; groundwater as tapwater via ingestion; and, aboveground leafy vegetables (e.g., lettuce), aboveground fruits (e.g., tomatoes), and belowground vegetables (e.g., carrots) via ingestion.
3. Gardeners (Adult and Child): Surface soil via incidental ingestion; groundwater as tap water via ingestion; and, aboveground leafy vegetables (e.g., lettuce), aboveground fruits (e.g., tomatoes), and belowground vegetables (e.g., carrots) via ingestion.
4. Recreational Canoeists/Swimmers (Adult and Child): Surface water via incidental ingestion.
5. Recreational Anglers (Adult and Child): Fish tissue fillets via ingestion.

5.3 Ecological-SLEA

An Ecological-SLEA is being performed to assess exposures to PFAS in the Cape Fear River adjacent to and downstream of the Site and the terrestrial habitat surrounding the Site. Chemours is performing this Ecological-SLEA to help inform management of PFAS in the environment. Environmental samples including samples of river water, river sediments, terrestrial plants, terrestrial invertebrates, surface soils and fish are being collected to evaluate these exposures.

5.4 Summary of Site Subsurface Structures

As discussed in Section 4.2, direct releases of PFAS to Site soil and groundwater have been documented, some of which occurred through leaking sewers used historically for PFAS process water conveyance. Figure 5-4 shows a site map and known subsurface structures including underground piping. Offsite underground structures are not included in Figure 5-4 since the offsite impacts are widely distributed and there are no indication of sources emanating from such structures to other media These PFAS were deposited aerially and distributed across the land surface due to the non-point source nature of aerial deposition.

5.5 Mitigation Measures/Point of Use Treatment

Pursuant to CO Paragraphs 19 to 25 (Compliance Measures), Chemours is implementing a Drinking Water Compliance Plan (Parsons, 2019a). Through this plan, Chemours is providing replacement drinking water to private residents whose drinking water wells are impacted by PFAS listed on Attachment C of the CO. Replacement drinking water is being provided through a range of options depending on the levels of PFAS found. First residents are supplied bottled water as an interim measure. Then residents, should they accept, will receive either: (i) point of use reverse osmosis systems, (ii) whole house filtration systems, or (iii) connection to public water supplies to private residents whose drinking water wells are impacted by Site associated PFAS. Pursuant to CO Paragraph 19, Chemours is working with NCDEQ to identify locations where public water is available and can be provided to private residents for less than $75,000 per affected party. Beyond this threshold, permanent water supplies will be provided through whole house filtration systems or reverse osmosis systems. Chemours is providing quarterly updates on implementation of the Drinking Water Compliance Plan to NCDEQ.

6. ADDITIONAL CHARACTERIZATION

Following review of the existing CSM (Parsons, 2018b), additional data requirements were identified, and several field programs completed to enhance the CSM and inform the development of a CAP. These additional characterization efforts included:

1. Assessment of the seeps and creeks near the facility (Geosyntec, 2019a): the objective of this program was to identify the locations of seeping groundwater at the facility and assess the mass loading from the various transport pathways of PFAS originating from the facility to the Cape Fear River.
2. Onsite Black Creek Aquifer Characterization: the objective of this program was to understand the hydrogeology and groundwater discharge characteristics from the Site to the Cape Fear River along the river bank. An overview of the assessment and the results are presented below in Section 6.1 and a description of field methods implemented is provided in Appendix A.
3. River Temperature Assessment: the objective of this program was to assess areas of groundwater upwelling along the Cape Fear River shoreline adjacent to the Site. An overview of the assessment and the results are presented below in Section 6.2.
4. Additional Onsite Investigation: the objective of this program was to refine the understanding of the site lithology and the extent and magnitude of PFAS in different stratigraphic layers to support groundwater flow modeling. Several wells were installed to assess conditions adjacent to nearby surface water bodies and serve as dual purpose performance monitoring wells for the CAP. An overview of the assessment and the results are presented below in Section 6.3 and a description of field methods implemented is provided in Appendix A.
5. Offsite Characterization: the objectives of this program were to assess the horizontal and vertical extent of PFAS in soil and groundwater and to facilitate comparison with results obtained from private wells being sampled as part of Paragraph 21. An overview of the assessment and the results are presented below in Section 6.4 and a description of field methods implemented is provided in Appendix A.

6.1 Onsite Black Creek Aquifer Characterization

6.1.1 Objectives

The objectives of the onsite Black Creek Aquifer characterization study were to:

Refine understanding of geology, hydrogeology and groundwater discharge at the Site to surface water and Cape Fear River.

i. Assess groundwater flow to the Cape Fear River, i.e., regions of higher vs. lower groundwater flow;

ii. Assess the spatial and vertical distribution of hydraulic conductivity of soils along the Cape Fear River bank;

iii. Evaluate groundwater gradients across the Cape Fear River bank;

iv. Assess PFAS concentrations in groundwater to facilitate a more refined estimate of PFAS mass loading to the Cape Fear River; and

The following scopes of work were completed:

i. Geologic mapping of the Black Creek Confining unit and other lithologic features of interest;

ii. High-resolution hydraulic conductivity and electrical conductivity profiling along the Cape Fear River bank using the Hydraulic Profiling Tool/Electrical Conductivity (HPT/EC);

iii. Installation of 15 paired monitoring wells to assess hydraulic gradients;

iv. Collecting soil samples for lithologic classification and groundwater samples to assess soil physical parameters and PFAS concentrations; and

v. Slug testing the five LTW wells and select wells adjacent to the Cape Fear River to assess hydraulic conductivity.

Methods and results for each scope of work is summarized below, groundwater sampling results are discussed in Section 9. Details on investigation methods are provided in Appendix A.

6.1.2 Geologic Mapping

The objective of the geologic mapping effort was to locate and collect outcrop measurements to inform the Site lithologic conceptual model. The following litho-stratigraphic units were included in this mapping effort, listed from stratigraphically lower sections to stratigraphically higher sections: (1) Black Creek Confining Unit; (2) Surficial Aquifer Unit; (3) Perched Clay Unit; and, (4) Perched Zone Unit.

Prior to mapping, field teams reviewed onsite lithostratigraphy and a type section (i.e., reference exposure) of the Black Creek Confining Unit located at the USGS W.O. Huske Lock and Dam. This type section is a 2-meter outcrop section of the Campanian-aged Tar Heel Formation, a subgroup of the Black Creek Group, described in literature as lenticularly bedded, black carbonaceous clay with thin partings of light-colored micaceous, fine sand (Farrell et al., 2001, Owens and Sohl, 1989).

Stratigraphic units were mapped in areas where exposed outcrops are visible, safely accessible, and topographic information was available. Exposed outcrops were primarily located along stream cuts at Seep A, Seep B, Seep D, Old Outfall 002 and portions of Willis Creek. Stream cuts along Seep C were heavily vegetated and outcrops were less visible at the time of mapping. Exposures along Old Outfall 002 provided the most continuous outcrops and spanned approximately 4,500ft. At each accessible outcrop location, the station number, location, approximate elevation, outcrop type and size, major and minor lithologic description, structural features, strike, and dip were recorded. Structural features were measured using a Brunton compass.

Figure 6-1 shows 41 locations where outcrops were observed, primarily within stream cuts, along Seep A, Seep B, Seep D, Old Outfall 002 and portions of Willis Creek. Table 6-1 summarizes information collected at each outcrop location. Observations for each lithostratigraphic unit is described below from stratigraphically lower sections to stratigraphically higher sections.

Black Creek Confining Layer

The Black Creek Confining Unit was the most frequently exposed outcropping unit at the Site, observed at 28 locations. Exposures ranged from 1 to 24 ft in thickness and were primarily observed in cut banks, waterfalls, creek beds, and ledges at elevations between 53 and 83 ft above mean sea level along Seep A, Seep B, Seep D, Old Outfall 002, respectively. Larger outcrop exposures (greater than 10 ft thick) were primarily observed along the Old Outfall 002. Lithostratigraphic description of this unit at outcrops were recorded as light and dark gray to black, massive to thinly laminated, fat to lean, moderately plastic, soft to firm clay with trace mica and sulfide mineralization. Locally, clay was observed with millimeter to meter scale interlayers of dark gray to light gray, fine- to medium-grained, poorly- to well-graded, angular, quartz-rich sand and silty sand. Local lignitic layers and individual sections of petrified wood (not connected to the outcrop) were also observed throughout the Black Creek Confining Unit. The presence of interstratified dark clays and cross-stratified sands with lignite and wood are a common, recurring facies in the Black Creek Formation along the Cape Fear River, as described in literature (Farrell et al., 2001, Owens and Sohl, 1989).

Structural features observed and measured in the Black Creek Confining Unit include bedding, cross-bedding, and joints. Locally, this unit displayed northeast-southwest strikes with primarily horizontal bedding and gentle dips ranging from 4 degrees to less than approximately 10 degrees. Higher dip measurements recorded at certain locations (e.g., 23 degrees at location 28; Table 6-1, Figure 6-1) may likely be attributed to slumping or cross-bedding. A northeast-southwest strike with primarily horizontal bedding and gentle dips is consistent with generally observed trends for Cretaceous-aged, Coastal Plain deposits of North Carolina in this area (Section 3). Joints were observed within the Black Creek Confining Unit at six locations (Table 6-1). Trends of joints observed revealed no preferred orientation but displayed primarily steep dips ranging from 46 degrees to 89 degrees.

Surficial Aquifer

The Surficial Aquifer Unit was observed overlying the Black Creek Confining Unit at three locations along Old Outfall 002 and two locations along Seep A (Figure 6-1). Limited exposures ranged from 1 to 5 ft in thickness and were primarily observed in cut banks and ledges at elevations between 77 and 103 ft above mean sea level along the Old Outfall 002 and Seep A, respectively. Lithostratigraphic description of this unit at outcrops were recorded as red-brown to tan-white, thinly bedded, fine- to coarse-grained, angular, poorly to well-graded, weakly compacted, quartz-rich sand with highly oxidized laminations. Locally, sand was observed with centimeter to tens of centimeter-scale light and dark gray, thinly laminated, lean, weakly plastic, soft, mica-rich clay.

Perched Zone

The Perched Zone was observed overlying the Surficial Aquifer in Old Outfall 002 and Seep A at elevations between 89 and 136 ft above mean sea level. Exposures ranged from 0.5 to 4 ft in thickness and were primarily observed in cut banks and waterfalls. Lithostratigraphic descriptions of this unit at outcrops were recorded as light gray and reddish orange to dark gray, thinly laminated, fat to lean, moderately plastic, soft, mica-rich clay. Upper portions of this unit were highly oxidized and contained local centimeter to tens of centimeter scale interbedded reddish orange, medium- to coarse-grained, poorly graded, angular to sub-rounded, hematite-rich sandstone. Only two exposures of the Perched Zone were observed during this mapping event at elevations between 120 and 147 ft above mean sea level along the Old Outfall 002 and Seep A, respectively. The two exposures were very limited and revealed approximately 1 ft of red-brown to tan, fine- to coarse-grained, angular, well-graded, weakly compacted to unconsolidated, highly oxidized sand.

6.1.3 Permeability and Electrical Conductivity Profiling

The primary objective of the permeability and electrical conductivity profiling was to assess the lithologic and hydrogeologic characteristics of the Black Creek Aquifer that may be in direct connection with the Cape Fear River. This assessment included investigating the spatial and vertical distribution of electrical conductivity, permeability and estimated hydraulic conductivity along the Cape Fear River bank using the combined HPT/EC.

Hydrogeologic characteristics of the Black Creek Aquifer along the Cape Fear River bank were assessed by a direct push rig equipped with the HPT/EC probe. During hydraulic profiling, clean water was injected into the subsurface at a controlled rate. Total pressure required to inject the water (referred to as HPT pressure) served as a proxy for the permeability of the formation and, along with the rate of injection, is was used to estimate the hydraulic conductivity. Simultaneous electrical conductivity measurements provided additional information on the lithology (e.g., due to grain size and mineralogy, EC is typically higher in clays than in sands) and showed relative changes in lithology with depth.

This assessment was completed at 31 locations shown on Figure 6-2. HPT/EC tooling was advanced until refusal was encountered, and total boring depths varied between 32 to 61 ft bgs. Table 6-2 provides a list of HPT/EC borings completed along with the total depth advanced.

To allow for correlation of site-specific HPT/EC responses with lithologic descriptions of the LTW wells, five of the 31 HPT/EC locations were selected to be co-located with existing wells. Ten additional soil borings were advanced at locations where HPT/EC profiling was completed. Continuous soil cores were collected from the bottom of hand auger clearance (about 5 ft bgs) to approximate depths of HPT/EC borings with a dual tube or macro core sampler, visually logged, and sampled for physical parameters, as discussed in Section 7.

Locations of HPT/EC borings and co-located soil borings completed are shown in Figure 6-2 with additional information provided in Table 6-2. HPT/EC raw data are provided in Appendix B.

The HPT/EC response observed for a given formation is influenced by several factors including permeability, grain size, mineralogy, moisture content, presence of dissolved ions in groundwater and temperature (Keys, 1997). Typically, the EC response of clays and fine-grained sediments is higher than that in silts, sands and gravel due to their mineralogy (Schulmeister et al., 2003, Wilson et al., 2005). Similarly, the HPT pressure required to inject water into the formation is indicative of the permeability of the formation; higher pressure indicates a lower permeability formation and vice-versa. Reviewing EC response curves and in conjunction with HPT pressure logs can indicate the presence of low permeability, clay-rich formations and higher permeability, sandy formations.

Soil boring logs that combine lithologic descriptions and HPT/EC responses for the five existing LTW-wells and ten additional soil borings are provided in Appendix C. Comparison of HPT/EC response in 15 borings where lithologic information was available from soil borings matched well with predicted responses. A comparison of HPT/EC response from HP-10 location with PIW-7 soil boring lithologic description is discussed here as an example.

Lithologic logs for PIW-7 indicate that silts and clays interbedded with some sands are observed between 5 to 15 ft bgs. This lithology transitions from fine-grained material to interbedded fine- to medium-grained sands with silt lenses and clay seams from approximately 15 to 30 ft bgs. The EC and HPT response for the 5 to 15 ft bgs interval [geometric mean values of 10 milliSiemens per meter (mS/m) and 15 psi, respectively] are generally greater than those observed for the underlying 15 to 30 ft bgs interval (8 mS/m and 6 psi, respectively). The HPT response also displays a peak characteristic of lower permeability lithologies in the shallower 5 to 15 ft interval. An overall increase in EC and HPT response with depth in this interval is indicative of a higher clay fraction and lower permeability. This trend of high EC response and characteristic HPT pressure are generally observed within the top 5 to 24 ft of this unit at most HPT locations along the Cape Fear River bank, which indicate that a fine grained, low permeability unit of variable thickness is observed at the surface along the Cape Fear River bank. Due to its proximity to the Cape Fear River and recurring flooding events, it is likely that this unit may be related to floodplain deposits.

Notably, the HPT/EC tool was sensitive enough to capture a clay seam that was less than a foot thick at 27 ft bgs through a spike in EC and HPT pressure response at this depth. This clay seam does not appear to be present at all locations (e.g., absent at HP-1 and PIW-1) and appears to be of variable thickness (e.g., 18 ft at HP-21 and 5 ft at HP-11). This clay unit is described as dark gray, fat clay, very hard and interbedded with silts and sand lenses, likely corresponding to the Black Creek Confining Unit.

The interval from 30 to 38 ft at HP-10 is marked by relatively low EC (geometric mean value of 4.5 mS/m) and HPT response (geometric mean value of 1.3 mS/m). Lithologic description indicates a dark gray, medium grained, well sorted sand with some banded lignitic material in this interval and is considered to be representative of the Black Creek Aquifer. Estimated hydraulic conductivity values modeled from measured HPT injection pressure and flow rates within the Black Creek Aquifer are generally an order of magnitude higher (geometric mean between 39 to

68 ft/day) than the floodplain deposits (geometric mean between 2 to 4 ft/day). Estimated hydraulic conductivity values for the Black Creek Aquifer are consistent with regional estimates, which range from 15 to 50 ft/day with an average value of approximately 28 ft/day (Winner and Coble, 1996). These estimates are also comparable with hydraulic conductivity estimated through slug testing for wells screened in Floodplain deposits (geometric mean of 5 ft/day) and Black Creek Aquifer (geometric mean of 40 ft/day).

The underlying interval from 38 ft to boring refusal at 44 ft bgs is marked by a relative increase in both EC response (geometric mean value of 12 mS/m) and corrected HPT pressure (geometric mean values of 12 mS/m and 27 psi, respectively), indicative of a clay-rich, very low permeability unit. This unit is described as a greenish-gray, very stiff, fat clay with trace sand, very micaceous and thin dark gray mineral banding. Lithologic descriptions and elevations from deep, onsite borings (e.g. BCA-03) refer to this unit as the Upper Cape Fear Confining Unit. This unit was encountered at all HPT boring locations along the Cape Fear River bank, with the exception of HP-07 where shallow refusal was encountered in the Black Creek Confining Unit. Approximate elevations of the top of the Cape Fear Confining Unit appear to correspond approximately to the bottom of the Cape Fear River channel, estimated at 5 ft NAVD88 elevation in the vicinity of the site (HEC-RAS, 2012). Cape Fear River channel depths are further refined during the river temperature assessment (Section 6.2).

Results from HPT/EC assessment were included in developing a site wide 3-D conceptual hydrostratigraphic model as described in Section 7.

6.1.4 Installation of Paired Wells

A total of 15 paired wells were installed along the Cape Fear River bank from Willis Creek to the southern property boundary to assess the vertical and horizontal hydraulic gradients and characterize groundwater-surface water interactions in this area (Figure 6-2). Spatial and vertical variations in HPT/EC responses along with lithologic information from co-located soil borings were utilized in selecting locations and screen depths for installation of one shallow and one deeper well at each location. Shallow wells were screened between 17 to 30 ft bgs to correspond to the lower permeability floodplain deposits or underlying the aquifer material (described as interbedded fine to medium grained sands with silt lenses and clay seams). Deeper wells were screened between 30 to 59 ft bgs in the Black Creek Aquifer consisting of medium grained sands with higher permeability. Shallow wells were typically installed using hollow stem augers, while deeper wells underlying confining units were cased and installed using sonic drilling. Well construction information is summarized in Table 6-3. Lithologic logs and well construction forms are provided in Appendix D.

Wells PW-02, PW-03, PW-04, PW-07, PW-10R, PW-12, and PW-13 had persistent elevated turbidity above 50 nephelometric turbidity units (NTUs) during development. These wells will be further developed and sampled again.

6.1.5 Slug testing LTW wells and select Black Creek Aquifer Wells

Hydraulic conductivity of the Perched Zone and Surficial Aquifers have previously been assessed through slug tests and pump tests (Parsons, 2018b). The objective of this assessment is to estimate the hydraulic conductivity of the Black Creek Aquifer and the Floodplain deposits in the vicinity of select wells through additional slug testing. Four wells screened in the Black Creek Aquifer (SMW-12, BCA-01, BCA-02 and BCA-04) and five LTW wells (LTW-01 through LTW-05) were selected for this assessment (Figure 6-3). Based on available lithologic descriptions for the LTW wells, LTW-01, LTW-03 and LTW-04 are presumed to be screened in the Floodplain deposits; LTW-02 screened within the Black Creek Aquifer, and; LTW-05 partially screened across the Floodplain deposits and the Black Creek Aquifer. Pneumatic slug tests were performed where measured water levels were sufficiently above well screen such that aquifer could be sufficiently stressed without dewatering the well screen. Manual slug tests were performed at all other locations. Both methods were performed at LTW-05 and no discernable method bias effect was noted. A minimum of four slug tests were performed at each location.

Hydraulic conductivities estimated from slug tests for the Black Creek Aquifer and Floodplain deposits in the immediate vicinity of selected wells are summarized in Table 6-4. Summarized results only include tests that displayed measured displacement response curves free of testing artifacts such as inertial effects or filter pack drainage. Detailed slug test results, AQTESOLV inputs and outputs are included in Appendix E. Results from the five wells screened in the Black Creek Aquifer (SMW-12, BCA-01, BCA-02, BCA-04 and LTW-02) indicate a geometric mean hydraulic conductivity of 28 ft/day. In comparison, wells screened within the Floodplain deposits (LTW-01 and LTW-03) display a geometric mean hydraulic conductivity of 0.9 ft/day, generally an order of magnitude lower than estimates from wells screened in the Black Creek Aquifer. LTW-05, presumed to be partially screened across the Floodplain and Black Creek Aquifer units, displayed an intermediate geometric mean hydraulic conductivity of 5.7 ft/day. Estimates of hydraulic conductivity from slug tests compare well with modeled estimates from measured HPT injection pressure and flow rates within the Black Creek Aquifer (geometric mean between 39 to 68 ft/day) and the floodplain deposits (geometric mean between 2 to 4 ft/day). Further, geometric mean hydraulic conductivity for the Black Creek Aquifer from slug test assessment also compares well with regional estimate of approximately 28 ft/day (Winner and Coble, 1996).

6.2 River Temperature Assessment

This subsection describes the task objectives, the methods used in data collection, and the results of the temperature survey conducted in the Cape Fear River along the Site shoreline.

6.2.1 Objectives

The objective of the temperature survey was to investigate whether there are areas in the Cape Fear River along the Site shoreline where sediment porewater temperatures are lower than overlying surface water temperatures. During times of year when surface water is either much warmer or much colder than groundwater temperatures, differences in temperatures between porewater and overlying surface water may indicate areas of groundwater upwelling. During summer months, groundwater is expected to be cooler than surface water (Kaandorp et al., 2019).

6.2.2 Methods

A general overview of the strategy and methods used during the temperature survey are described here. Temperatures were surveyed at 119 total locations between the Site shoreline and the deepest part of the channel, known as the thalweg, along the property boundary as indicated in Figure 6-4. The thalweg was evaluated along each sampling cross-section using a depth-finder mounted on the sampling vessel. The thalweg is located along the western riverbank in the northern portion of the Site, shifts away from the western bank towards the eastern riverbank between Areas 1 and 2 indicated on Figure 6-4, and then returns to the western bank in the central portion of Site shoreline.

After arrival at each survey location, the location of the survey point was collected using a handheld global positioning system (GPS) unit (Trimble GeoXH; Trimble Inc.; Sunnyvale, CA), and the water depth was measured with a graduated survey rod or weighted line. Temperature probes (TROLL700s data loggers [Insitu Inc.; Bingen, WA]) were deployed approximately 1 inch into the sediment surface, 3 inches above the sediment surface, and 6 inches above the sediment surface. The sampling assembly remained deployed until readings for the three temperature probes stabilized, and measurements were recorded. Where a temperature difference between the probes located in the porewater and at 6 inches above the sediment surface was more than 0.5 celsius (°C), additional step-out sampling locations were surveyed (Figure 6-5).

6.2.3 Results

Results of the temperature survey are depicted on Figure 6-5. The color of the symbol at each location corresponds with the temperature gradient measured between the porewater and six inches above the sediment surface. Of the 119 locations surveyed, 113 of the locations had temperature gradients less than 0.5°C; among these, the average temperature gradient was 0.07°C (Table 6-5). Six locations had temperature gradients greater than 0.5°C, with those gradients ranging from 0.61°C to 5.25°C (Table 6-5; Figure 6-5). These areas are shown with inset maps on Figure 6-5.

Where step-out locations were surveyed around areas where temperature gradients were measured above 0.5°C, temperature gradients generally return to background conditions within a few ft from the step-out location (Figure 6-5). Because temperature gradient measurements appear to be localized, it is possible that areas of upwelling exist which were not captured based on the density of measurement points recorded. Four of the five areas where temperature gradients exceeded 0.5°C coincide with above ground creeks and seeps. Step out sampling at seeps and creeks was performed following findings from the random, pre-determined location that coincided with the outflow locations of the seeps.

6.3 <u>Additional Onsite Characterization</u>

6.3.1 Objectives

In conjunction with the Black Creek Aquifer characterization, additional onsite characterization was performed to refine the understanding of site lithology and assess the extent and magnitude of

PFAS impacts in different stratigraphic layers to support flow modeling. Several wells were installed to assess conditions adjacent to nearby surface water bodies (such as Willis Creek) and may serve a dual purpose as performance monitoring wells for the CAP.

Additional wells were installed to assess vertical and horizontal hydraulic gradients. Soil samples were collected for lithologic classification and PFAS concentrations in unsaturated soils. Groundwater samples were collected from these new wells to assess PFAS concentrations.

6.3.2 Methods

The new wells were installed across the site to supplement the existing monitoring well network. Seven of the 14 wells were installed along the Old Outfall 002, Willis Creek, Georgia Branch Creek and the Cape Fear River to monitor groundwater quality adjacent to these surface water bodies and facilitate the collection of baseline PFAS concentrations (as per the requirements of paragraph 16 (c) of the CO). The remaining seven wells serve to delineate the horizontal and vertical distribution of PFAS in groundwater, both up- and down-gradient of the manufacturing areas and refine current understanding of site lithology (Figure 6-3).

Wells were installed with sonic drilling methods as described in Appendix A, and outer override casing was used to prevent cross formational flow between aquifer units during installation. Shallow wells were typically screened at depths between 11 to 75 ft bgs that correspond with the perched zone or the surficial aquifer. Deep wells were screened between 44 to 146 ft bgs in the Black Creek Aquifer generally consisting of medium grained sands with higher permeability. Well depths below ground surface to the Black Creek Aquifer vary considerably since some wells were installed adjacent to the Cape Fear River and some wells were installed at the top of the Bluff in the facility. Borings for the deep wells were advanced at least 5 ft into the underlying Upper Cape Fear confining unit to assess the spatial extent and competence of this formation across the site. These borings were then backfilled with bentonite and sand prior to well installation, after an appropriate hydration period specified by the bentonite product manufacturer. Well construction information is summarized in Table 6-3. Lithologic logs and well construction forms are provided in Appendix D. Following well installation, wells were developed and sampled as outlined in Appendix A.

Wells PIW-2D and PIW-4D had persistent elevated turbidity above 50 NTUs during development. These wells are being redeveloped and sampled again. This effort is anticipated to be completed in November 2019.

6.3.3 Results

Locations of the onsite monitoring wells are shown in Figure 6-3. Soil boring logs and well construction logs are provided in Appendix D. Seventeen unsaturated soil and groundwater samples collected during and after the paired well installation for the onsite Black Creek Aquifer characterization and the additional onsite characterization were analyzed for chemical parameters under the Table 3+ SOP Method and EPA Method 537 Mod; these results are discussed in detail in sections below. In addition, 44 representative samples from each lithologic unit encountered during drilling were analyzed for physical parameters and are also described in Section 7.

6.4 Offsite Characterization

6.4.1 Objectives

The primary objective of the offsite characterization was to assess the extent and magnitude of PFAS in soil and groundwater and geological and hydrogeological features that may influence movement, chemical or physical character of the contaminants and to facilitate comparison with results obtained from private wells being sampled as part of Paragraph 21.

Objective tasks for this activity included:

- installation of ten paired piezometers to assess vertical and horizontal hydraulic gradients;
- collection of up to two soil samples from each boring for a total of 23 samples for PFAS and physical soil characteristics; and
- collection of groundwater sample from each of the twenty wells to assess PFAS concentrations.

6.4.2 Methods

A total of ten pairs of wells were installed at offsite locations chosen to assess lithology and geochemistry conditions at locations relatively close to the Site and delineate potential offsite impacts. Four pairs were installed in Bladen County, one pair in Robeson County, and five pairs in Cumberland County. Right-of-Way Encroachment Agreements were negotiated with each county. Well permits and encroachment agreements are included in Appendix F. At each location, one shallow monitoring well was installed to target the surficial aquifer and a second deeper monitoring well to target the Black Creek Aquifer. The deeper of the two borings was advanced first to guide selection of well depth. Where appropriate, methods used for the offsite characterization were identical to those used for the drilling programs implemented during this Site assessment. Wells were installed with sonic drilling methods as described in Appendix A, and outer override casing was used to mitigate cross formational flow between aquifer units during installation. Following well installation, wells were developed and sampled as outlined in Appendix A.

Wells Bladen Bladen-3D and Cumberland- 2D had persistent elevated turbidity above 50 NTUs during development. These wells are being redeveloped and sampled. This effort is anticipated to be completed in November 2019.

6.4.3 Results

Locations of the 20 offsite monitoring wells are shown in Figure 6-6 with additional information provided in Table 6-3. Soil boring logs and well construction logs are provided in Appendix D.

Shallow wells were screened at depths between 5 to 30 ft bgs that correspond with the surficial aquifer stet. Deep wells were screened between 22 to 75 ft bgs in the Black Creek Aquifer consisting of medium grained sands with higher permeability. Eleven offsite soil samples and 19 groundwater samples were analyzed and reported for chemical parameters under Table 3+ SOP Method and EPA Method 537 Mod. In addition, 13 representative samples from Surficial and Black Creek Aquifers encountered during drilling were analyzed for physical parameters and are also described in Section 7.

7. SOIL CHARACTERIZATION SUMMARY

7.1 Lithology

As described in Section 3, the Site is within the Coastal Plain Physiographic Province, which consists of a wedge of sedimentary deposits ranging in age from Cretaceous to Recent. Paleozoic metamorphic and igneous rocks underlie these deposits. Lithologies that underlie the Site include, from stratigraphic top to bottom, (1) the Perched Zone, (2) Surficial Aquifer, (3) Black Creek Confining Unit, (4) Black Creek Aquifer, and (5) Upper Cape Fear Confining Unit. The Black Creek Formation and surficial deposits are the principal potable water aquifers in the area.

Beneath the manufacturing area, the uppermost sand unit, the Surficial Aquifer, is locally bisected by a clay lens. This clay lens gives rise to the Perched Zone which is limited in lateral extent to the east, north and south by local topography and terminates to the west of the manufacturing area, the Perched Clay Unit. The depth to the top of the clay lens is approximately 15 to 18 ft bgs. The clay lens becomes thinner moving west across the manufacturing area and ranges from approximately one foot to approximately 19 ft thick.

Based on the lithology logged during onsite investigations, a fine- to medium-grained sand unit with thin discontinuous interbedded silt/clay lenses underlies the Perched Zone and Perched Clay Unit. The sand extends to a depth of approximately 65 ft bgs (elevation of +80 ft MSL). The saturated portion of this unit has been identified as the Surficial Aquifer.

Below the Surficial Aquifer lies the Black Creek Confining Unit, which is characterized as lignitic clay with thin beds and laminae of fine-grained micaceous sand as well as thick lenses of cross-bedded sand. Locally, the upper portion of the Black Creek Confining Unit locally contains glauconitic, fossiliferous clayey sand lenses. The elevation of this unit is approximately +65 to +77 ft MSL. Beneath this confining unit is the Black Creek Aquifer, which is between 8 to 20 ft thick and encountered at depths between 80 and 100 ft bgs (elevation of approximately +45 to +65 ft MSL) at the top of the bluff. Beneath the Black Creek Aquifer is a massive dense clay (with minor sand) that has been identified as the Upper Cape Fear Confining Unit. This unit was not fully penetrated at the Site during this investigation; however, it extends to at least 200 ft bgs (elevation of -55 ft MSL) and is over 30 ft thick.

Prior to this investigation, knowledge of offsite lithology was limited to regional geologic overviews (NCGS, 1985; Farrell et al., 2001; Heron et al., 1968; Trapp and Meisler, 1992; Winner and Coble, 1996). A hydrogeologic framework database from the NCDEQ Groundwater Management Branch of the Division of Water Resources (DWR) was utilized to review well construction logs, geophysical logs, and aquifer characteristics of private and public water supply wells in Bladen, Robeson, and Cumberland Counties. However, besides two on Site USGS wells, this database revealed no information for wells in the immediate vicinity of the Site.

7.2 Background

The objectives of the additional characterization efforts were to improve the understanding of lithology and to assess the vertical and spatial extent and magnitude of PFAS impacts. As part of the field programs described in Section 6, soil samples collected during drilling activities were analyzed for physical soil matrix properties and PFAS. The physical properties characterized include bulk density, particle size distribution, Atterberg limits (which describe the water content of fine-grained materials), specific gravity, porosity (calculated), and moisture content. These parameters are used to estimate the hydraulic conductivity and to refine the lithological description of onsite and offsite hydrogeologic units. Soil samples were also analyzed for pH and for organic carbon content as these parameters may influence the distribution and mobility of PFAS in the subsurface.

7.3 Analytical Methods

Soil samples were analyzed for physical parameters by the following methods:

- Method D2937 – Bulk Density;
- Method D422 – Particle Size Distribution;
- Method D4318 – Atterberg Limits;
- Method D854 – Specific Gravity;
- Porosity Calculation using Methods D854 and D2937; and
- Moisture.

Soil samples were analyzed for chemical parameters by the following methods:

- Table 3+ Laboratory Standard Operating Procedure (SOP);
- EPA Method 537 Mod (Laboratory SOP);
- Method 9045D – Corrosivity (pH); and
- Walkley Black FOC.

Analytes reported under these PFAS-specific methods are listed in Table 2-1.

7.4 Results

7.4.1 Onsite Results

Physical Parameters

The physical parameters and lithological classification for onsite soils are provided in Table 7-1. Laboratory analytical reports and data review narratives are provided in Appendix G. In total, 44 samples from 22 onsite locations have been analyzed for physical parameters. These results include representative samples from the Upper Cape Fear Confining Unit, the Black Creek Aquifer, the Black Creek Confining Unit, the Surficial Aquifer, the Perched Clay, the Perched Zone, and the Floodplain Deposits near the shore of the Cape Fear River. The laboratory-determined grain size distribution and Atterberg limits (e.g., liquid limit and plastic limit) were used to refine the field classification of each formation using the Unified Soil Classification System (USCS).

In general, the lower permeability confining units encountered at the Site (Upper Cape Fear Confining Unit and the Black Creek Confining Unit) consist of high plasticity (fat) clay. Key characteristics that distinguish the Black Creek Confining Unit from the Upper Cape Fear Confining Unit are (1) darker color, (2) higher water content and higher plasticity, and (3) higher organic content in the Black Creek Confining Unit. Field descriptions of these formations consistently characterize the Black Creek Confining Unit as medium to dark gray compared with lighter gray colors observed in the Upper Cape Fear Confining Unit. Laboratory results indicate that both the liquid limit and the plastic limit of soil samples collected from the Black Creek Confining Unit (average values of 84 and 36, respectively) are significantly higher than those in the Upper Cape Fear Confining Unit (average values of 59.0 and 26.0). The fraction of organic carbon measured in Black Creek Confining Unit is approximately one order of magnitude higher than that in the Upper Cape Fear Confining Unit [average values of ~~0.019~~ 0.0424 grams per gram (g/g) and 0.0034 g/g respectively]. This higher organic carbon content is consistent with lithologic descriptions of this formation with thinly bedded organic material and lignite seams. The Perched Clay that intermittently underlies the manufacturing area footprint has an average organic carbon fraction of 0.011 g/g. The liquid limit and plastic limit of the Perched Clay is similar to the Black Creek Confining Unit (average values of 90 and 39, respectively). Empirical studies are currently in progress to assess PFAS fate and transport characteristics as described in Section 4.1.1. Measured soil pH ranged from approximately 4 to 6.8 standard units across all the hydrogeologic units. Measured soil pH is generally acidic onsite (less than pH of 6) with slight differences in average pH values measured between stratigraphic units. For instance, average pH of the Perched Zone, Surficial Aquifer and Black Creek Aquifer vary between 4.8 to 5.5 while the low permeability Perched Clay and Black Creek Confining Units vary between 4.2 to 4.5. Variations in soil pH are generally a function of the soil mineral composition and weathering, typical of warm, humid environment in North Carolina.

The higher permeability aquifer units encountered at the Site (Black Creek Aquifer and Surficial Aquifer) are both characterized as poorly graded sand with silt and clay. With the exception of four samples collected from interbedded clay within the aquifer units (at PW-05, PW-07, PW-10 and PW-12), both units consist of 60-95% sand with lower organic carbon content (typically less than 0.01 g/g) than low permeability confining units. Parameters such as percent moisture, porosity, density and void ratio are similar between the two units. The color of the Black Creek Aquifer is typically described as medium to dark gray (compared with white to tan or orange/red/light brown of the Surficial Aquifer), and color may be used as a distinguishing characteristic in the absence of the Black Creek Confining Unit separating these units. Physical parameters measured in samples from the Perched Zone are similar to those from the Surficial Aquifer. For example, the Perched Zone is predominantly consisted of 73-95% sand with 5-27%

of fine-grained material (silt and clay combined), and similar organic content (typically less than 0.01 g/g).

Samples from the Floodplain Deposits, near the Cape Fear River, exhibit more variable grain size distributions and consist of both fine-grained material (such as clay with silt observed at PIW-06) and beds of coarse-grained material (such as sand with fine to medium gravel observed at PIW-03). This variable composition supports the range of HPT/EC response measurements described in Section 6.1.3. With exception of PIW-3, the percentages of fine-grained material in samples collected from the Floodplain Deposits are 3 to 7 times higher than those in samples collected from the Surficial Aquifer. Similarly, the Floodplain Deposit material is consistently finer-grained than the Black Creek Aquifer.

The grain size analysis described above was also used to estimate the hydraulic conductivity of each hydrogeologic unit at the Site. Soil porosity, density, and grain size distribution can be used to calculate the hydraulic conductivity using several published methods (as incorporated into the open source software HydrogeoSieveXL version 2.1; Devlin, 2015). While this tool is intended as a quick yet relatively comprehensive estimate of hydraulic conductivities, these estimates compare well to conductivities determined from HPT profiling and onsite slug tests. The geometric means of estimated hydraulic conductivities for each water-bearing formation are as follows:

- Perched Zone is 9.6 ft/day;
- Floodplain Deposit is 5.4 ft/day;
- Surficial Aquifer is 24.1 ft/day; and
- Black Creek Aquifer is 39.6 ft/day.

Samples from the Perched Zone and Surficial Aquifer with greater than 10% clay were excluded as outliers from the geometric mean hydraulic conductivity estimates. Samples collected from the bottom of the Black Creek Aquifer displayed a higher fraction of fine-grained material (greater than 10% sum of silts and clays) and a corresponding lower geometric mean hydraulic conductivity estimate of 8 ft/day. Visual observations of cores and analytical results of physical parameters indicate that this zone is likely a transition zone between the Black Creek Aquifer and the underlying Upper Cape Fear Confining Unit, where a fining-downward sequence of grain size distribution is observed. This transition is consistent with an interstratified layer of fine-grained sands of the Black Creek Formation or upward-fining facies sequences of the Cape Fear Formation (Farrell et al., 2001). Hydraulic conductivities for the Perched Clay, Black Creek Confining Unit, and Upper Cape Fear Confining Unit were all less than 1.0 foot/day (as expected for low permeability clay units). Documentation and references for each model, input parameters, and estimated hydraulic conductivities are provided in Appendix H.

Chemical Parameters

The analytical results for onsite soils are summarized in Tables 7-2 and 7-3. In total, 17 samples of onsite soil as well as several duplicate and QA/QC samples have been analyzed for Table 3+ PFAS and EPA Method 537 Mod analytes. Soil samples were collected for PFAS analysis from the top and bottom of the vadose zone as determined in the field; in locations where the water table was relatively shallow, only one sample was collected from the bottom of the vadose zone. The objective was to collect samples from the unsaturated zone, however, samples from PW-12 and PW-15 appear to be collected at depths that correspond to saturated soils. Figure 7-1 plots on a map the locations and results of detected compounds for unsaturated zone soil samples. Unsaturated zone soils are a transmission pathway and potential secondary source of PFAS to underlying groundwater in the saturated zone. Groundwater results are discussed later in Section 9.

For the 17 samples (16 parent samples and one duplicate) the following PFAS detections were observed:

- 9 of 17 samples analyzed had detections of HFPO-DA;
- 2 of 17 samples analyzed had detections of another Table 3+ PFAS; and
- 1 sample analyzed had other PFAS detections (perfluoropentanoic acid at PW-10, 8-8.5 ft bgs)

Concentrations of HFPO-DA ranged from 570 nanograms per kilogram (ng/kg) (PW-10, 3.5-4 ft bgs) to 28,000 ng/kg (PW-10, 8-8.5 ft bgs) (Figure 7-1). The reporting limits for other Table 3+ analytes are higher than HFPO-DA (250 ng/kg vs. 1000 ng/kg) potentially influencing the frequency of detection of these compounds. The Table 3+ compounds that were detected in ~~both~~ onsite soils at PW-01 and PW-10 include PFMOAA, PFO2HxA, PMPA, and PFO5DA.

PFAS compounds were not detected above reporting limits in any equipment blank samples collected during the onsite soil characterization (Table 7-3). The water used during drilling activities was also sampled and analyzed for Table 3+ and EPA Method 537 Mod analytes. Detections for PFAS compounds from this water source were typically less than 5 ng/L. Concentrations of HFPO-DA and PMPA were 17 and 130 ng/L, respectively. These concentrations are unlikely to have resulted in a false positive in soil results since (a) the drill water had limited if any contact with the soil core and during sonic drilling care was taken to limit the introduction of excess water, (b) these concentrations are below the reporting limit for these compounds in soil since one liter of water is in contact with over one kilogram of soil, and this would lead to concentrations at least an order of magnitude less than the reporting limit, and (c) onsite groundwater concentrations are consistently higher than these values.

7.4.2 Offsite Analytical Results

Physical Parameters

The physical parameters and lithological descriptions for offsite soils are provided in Table 7-4. Thirteen soil samples from the Surficial and Black Creek Aquifers at ten different locations across three counties were analyzed for physical parameters (Table 7-4 and Figure 4-2B). This includes four locations in Bladen County, five locations in Cumberland County, and one location in Robeson County. The laboratory-determined grain size distribution and Atterberg limits (e.g., liquid limit and plastic limit) were used to estimate hydraulic conductivity and to refine the field classification of each formation using the Unified Soil Classification System (USCS).

The offsite samples from the Surficial and Black Creek Aquifers exhibit similar characteristics to those collected onsite and are characterized as silty to clayey poorly graded sands. Offsite soil samples from the Surficial and Black Creek Aquifers from both aquifers contain greater than 75% sand with 1-23% fines. The estimated hydraulic conductivities offsite are 8 ft/day in the Surficial Aquifer, and 21 ft/day in the Black Creek Aquifer

Chemical Parameters

The soil analytical results for offsite soils are summarized in Table 7-5 and 7-6. Eleven soil samples from the vadose zone at ten offsite locations and associated duplicate and QA/QC samples were analyzed. These include four locations in Bladen County, one location in Robeson County and five locations in Cumberland County (Figure 6-6). Appendix G contains the laboratory reports and data review narratives for the offsite soil samples.

No PFAS compounds were detected above the associated reporting limits in the six offsite soil samples. One 537 Mod compound, perfluorobutane sulfonic acid, was detected at 340 ng/kg (i.e. 0.34 parts per billion [ppb]) in the duplicate sample, DUP-1-081419, which was collected in conjunction with Bladen-1S-081419 between 6 and 7 ft bgs. No detection of perfluorobutane sulfonic acid was observed in the sample, though the reporting limit for this analysis (420 ng/kg) was slightly elevated compared to reporting limits (200 ng/kg) of other samples analyzed. This detection is within 5-times the reporting limit. In a field blank sample collected at Bladen 2S perfluorododecanoic acid (also a 537 Mod compound) was detected at 0.0025 ng/L, just above the reporting limit (0.002 ng/L). No Table 3+ PFAS compounds were detected.

8. CAPE FEAR RIVER AND SEDIMENT CHARACTERIZATION SUMMARY

8.1 Cape Fear River

The Cape Fear River is a dynamic system. River water levels vary spatially and over time. Figure 8-1 presents a summary of the river water levels measured for the period from January 1, 2014 to September 10, 2019 for at three USGS river gauging stations upstream, close to and adjacent the Site.

Over 75% of the recorded Cape Fear River water levels at each location are within a range of 10 ft. Cape Fear River water levels experience the most variation during precipitation events. For example, during Hurricane Florence in Fall 2018, maximum river water level of 67 ft NAVD88 was observed adjacent to the Site where the median river water level is approximately 30 ft NAVD88.

The chemical and spatial distribution of PFAS in the Cape Fear River has been evaluated and reported by Chemours over six separate field mobilization events and described in the *Assessment of the Chemical and Spatial Distribution of PFAS in the Cape Fear River Report* (Geosyntec, 2018a) and the *Seeps and Creeks Investigation Report* (Geosyntec, 2019a). Together these programs observed that PFCAs and PFSAs (i.e. PFOA, PFOS and similar compounds) were present in the Cape Fear River at similar concentrations upstream and downstream of the Site indicating that the Site did not contribute measurably to the concentration of these compounds in the Cape Fear River. Meanwhile, Table 3+ PFAS were detected in the Cape Fear River at highest concentrations adjacent to the Site where seeps, groundwater and the Old Outfall flowed into the Cape Fear River before the river became more well mixed downstream as described in the Mass Loading Model (Geosyntec, 2019f). In the data collected to date HFPO-DA, has remained below 140 ng/L since mid-October 2017.

8.2 Cape Fear River Sediments

Pursuant to paragraph 11.2 of the CO Chemours submitted to NCDEQ on August 21, 2019 *Sediment Characterization Plan* (Geosyntec, 2019b). This investigation to characterize Cape Fear River sediment PFAS concentrations will be completed once NCDEQ provides comments and approval.

9. GROUNDWATER CHARACTERIZATION SUMMARY

9.1 Overview of Site Hydrogeology

The hydrogeology of the Site includes the Perched Zone and two aquifers; the Surficial Aquifer and the Black Creek Aquifer (Parsons, 2018b). Potentiometric surface maps for all three zones for data collected during a synoptic event on October, 15 2019 are plotted in Figures 9-1 through Figures 9-3. The Perched Zone is aerially limited and generally located above the top of a discontinuous clay layer. The extent of the Perched Zone is controlled by topography and the lateral extent of the clay lens. Based on recent investigations and on-going evaluations, Perched Zone water levels may have been influenced by seepage of water through the previously unlined sedimentation basins and infiltration of non-contact cooling water from previously unlined drainage ditches. Groundwater elevations in December 2017 indicated a localized groundwater mound was observed around wells NAF-04 and NAF-01 (Parsons, 2018b). In 2018, the sedimentation basins and Cooling Water Channel were lined. Data from 2019 (Figure 9-1) show the groundwater mound is still present but is expected to dissipate over time. This localized groundwater mound was still present in October 2019.

The Surficial Aquifer is a shallow unconfined aquifer that underlies the Perched Zone. Surficial Aquifer water levels indicate that groundwater flow is generally toward the Cape Fear River. The Black Creek Aquifer underlies the Surficial and is mostly separated by the Black Creek confining unit, a clay layer. This clay layer is not fully confining as geological and geochemical data indicate water and PFAS transfer has occurred from the Surficial Aquifer to the Black Creek Aquifer. The Black Creek Aquifer is the uppermost identified regional hydrogeologic unit. The Black Creek Aquifer is typically under confined conditions and groundwater elevations indicate flow toward the Cape Fear River. The Cape Fear River stage is lower than the top of the Black Creek Aquifer, indicating that the Cape Fear River is likely a discharge boundary for the Black Creek Aquifer.

Below the Black Creek Aquifer is the Upper Cape Fear Confining Unit, a regional hydrogeologic clay unit. The well log for BCA-03 indicates that the clay layer likely associated with this unit is over 60-ft thick. Historic drilling logs for deep wells located onsite (between 170 to 320 ft deep) indicate that this clay unit may be up to 100 ft thick. NC DWR wells located on the western part of the Site (near NC highway 87) with high resolution geophysical data have characterized the Upper Cape Fear Confining Unit to be between 75 ft to 120 ft thick. Measured groundwater elevations in the Black Creek Aquifer are significantly higher than the Upper Cape Fear Aquifer (80 to 100 ft groundwater elevation difference), as measured at the co-located NC DWR wells between October 2018 and July 2019. These results demonstrate minimal hydraulic connection between the Black Creek Aquifer and the Upper Cape Fear Aquifer suggesting the Upper Cape Fear Confining unit is an aquitard.

Groundwater in the Surficial and Black Aquifers at the Site flows towards the bluff and the Cape Fear River; eastern part the Perched Zone also migrates toward the bluff. As groundwater reaches the bluff above the Cape Fear River, it is expressed at ground surface as seeps. The confluence of the "seeps" four channelized flows of expressed groundwater towards the river, designated as

Seeps A, B, C, and D. Chemours identified and investigated seeps at the Site reported results in the Seeps and Creeks Investigation Report (Geosyntec, 2019a) on August 26, 2019; a summary of the report's conclusions follows.

Over three field events (February, May and June 2019), field teams identified four seeps, of varying size and reach discharging to the Cape Fear River. These four seeps (A to D), Old Outfall 002 and Willis and Georgia Branch Creeks were gauged for flow, and samples were collected to assess PFAS concentrations. Sampling was conducted under wet and dry conditions. In total, 94 discrete water samples were collected from the seeps and creeks for PFAS analysis. A temperature survey of Old Outfall 002 was conducted to evaluate temperature variations as an indicator for groundwater upwelling and indicated discharge along the banks of the Old Outfall 002 at many locations and a few regions of sub-aqueous groundwater discharge confirming that Old Outfall 002 is primarily groundwater fed.

Seeps A and B have larger reaches compared to Seeps C and D and they were observed to have higher flow rates compared to Seeps C and D. Flow rates at the mouths of Seeps A and B were 60 to 110 GPM and 50 to 90 GPM, respectively, determined by salt dilution gauging, while flow rates at the mouths of Seeps C and D were 10 to 15 GPM and 20 to 50 GPM, respectively. Flow rates in the seeps were variable between February, May, and June. Flow rates in Willis Creek were highest in June compared to February and May, which is attributed to the precipitation observed prior to the June Event compared to the dry events in February and May.

9.2 <u>Onsite Groundwater</u>

9.2.1 Hydrogeology

Groundwater elevations were calculated for onsite wells screened in the Perched Zone, Surficial Aquifer and Black Creek Aquifer from a single synoptic water level measurement survey performed on 15 October 2019 (Table 9-1). Groundwater elevations calculated from the Site-wide synoptic water levels in October 2019 were used to develop potentiometric maps for the Perched Zone, Surficial Aquifer and Black Creek Aquifer (Figures 9-1, 9-2 and 9-3).

Similar to Perched Zone groundwater elevations discussed in the *Additional Site Investigation Report* (Parsons, 2018b), a localized groundwater mound was also observed near NAF-01 and NAF-04 in October 2019 (Figure 9-1). Groundwater elevations infer groundwater will flow radially away from the groundwater mound. Groundwater in the Perched Zone appears to be controlled by topography and the lateral extent of the clay lens. Perched Zone groundwater elevations are also shown to overlay with topographic contours and individual seeps that were identified in the Seeps and Creeks Investigation (Geosyntec, 2019a; Figure 9-1). This comparison shows that individual seeps identified in the upstream reaches of Seep A and Seep B are typically located in areas where Perched Zone groundwater elevation intersect topographic contours (e.g., 135-foot topographic elevation contour; Figure 9-1).

Groundwater elevations in Surficial Aquifer wells (Figure 9-2) indicate groundwater flow is likely to be east-northeast towards both Willis Creek and Cape Fear River, and at the southern end of the

Site towards Old Outfall 002. During the seeps and creeks investigation (Geosyntec, 2019a), multiple seeps were observed in the Old Outfall at elevations and sections corresponding to the Surficial Aquifer. Comparison of Surficial Aquifer groundwater elevations with topographic contours suggest that some of the individual seeps identified along the middle reaches of Seep A and Seep B (e.g., 90-foot topographic elevation contour at Seep B) are likely to originate from the Surficial Aquifer (Geosyntec, 2019a; Figure 9-2). Groundwater flow in the Surficial Aquifer towards the south of the Site is anticipated to flow to and discharge to the Old Outfall and indirectly to the Cape Fear River based on observed seeps in the Old Outfall and the presence of Seep B.

Groundwater flow in the Black Creek Aquifer is predominantly easterly towards the Cape Fear River (Figure 9-3) similar to groundwater elevations discussed in the *Additional Site Investigation Report* (Parsons, 2018b). Minor groundwater flow components to the northeast, towards Willis Creek (near SMW-12) and southeast, towards Old Outfall (east of PW-11 or Glengerry Road) are also likely. However, based on available lithology, the Black Creek Aquifer is likely to be in direct connection with only a portion of Willis Creek, near SMW-12, and a section of the Old Outfall in its lower reaches near the Cape Fear River. Vertical gradient assessment described below assess whether these sections are likely to be recharge or discharge boundaries. Similar to the *Additional Site Investigation Report* (Parsons, 2018b), the Cape Fear River stage was lower than the top of the Black Creek Aquifer on 15 October 2019, indicating that the Cape Fear River is likely a discharge boundary for the Black Creek Aquifer.

Groundwater elevations from synoptically measured water levels at co-located wells were used to compute vertical hydraulic gradients between various hydrogeologic units (Table 9-2, Figure 9-4). Generally, positive vertical gradients, representing potential downward flow, are observed at wells located on top of the bluff screened in the Perched Zone and Surficial Aquifer. Magnitude of calculated positive vertical gradients appear to be higher near NAF-08A and NAF-08B, where a localized groundwater mound is located. While positive vertical gradients were calculated for wells located on top of the bluff, negative gradients, representing potential upward flow were measured between wells located along the Cape Fear River bank (Figures 9-4).

Negative vertical gradients and potential upward flow are calculated between the Floodplain deposits and Surficial Aquifer, and Floodplain deposits and Black Creek Aquifer. The magnitude of calculated negative gradients is much lower than calculated positive vertical gradients. Vertical gradients between the Surficial Aquifer and Black Creek Aquifer appear to be positive or potentially downward in areas where the Black Creek Confining Unit is not extensive (e.g., 1 foot thick at PIW-9S and PIW-9D), while a negative or potentially upward gradient is observed in areas where the Black Creek Confining Unit is extensive (e.g., 20 ft thick at PIW-10S and PIW-10DR). One exception to this was observed at the Surficial Aquifer and Black Creek Aquifer well pair PW-05 and BCA-04, where a negative vertical gradient representing potential upward flow was observed. This well pair is located on the western portion of the Site, where a potential paleo-erosional feature may likely have eroded portions of the Surficial Aquifer and the Black Creek Confining Unit, further described in Section 10. Vertical gradients will continue to be evaluated in the future.

The distribution of downward gradients on the plateau area of site while upwelling gradients are present at the river is consistent with expectations. Onsite, recharging rainfall leads to downward gradients. The Cape Fear River is a regional groundwater discharge location and therefore upward gradients that lead to upwelling, i.e. discharge, is expected immediately adjacent the river.

Notably, the vertical gradient between PW-11, a Black Creek Aquifer well, and the Old Outfall 002 where high-resolution survey data existed of the Old Outfall elevation, was calculated (Table 9-2). The calculation indicated a positive gradient – i.e. downward flow was possible. At this specific location, portions of the Old Outfall 002 are interpreted to be underlain by the Black Creek Confining Unit (Figure 6-1 and Figure 9-4). This finding suggests, that in its lower reaches near the Cape Fear River the Old Outfall 002 may potentially recharge groundwater in areas where the Old Outfall is in contact with the Black Creek Aquifer. A high-resolution topographic survey assessment along Willis Creek is currently ongoing for a similar assessment of vertical gradients.

The influence of groundwater gradients will be further assessed in the numerical groundwater model being prepared to support the selection of a remedial approach for the Corrective Action Plan due December 31, 2019 and with additional synoptic groundwater level measurements to be collected.

9.2.2 PFAS Concentrations

The groundwater analytical results for 96 onsite wells sampled from June 2019 through September 2019 are presented in Table 9-3. Laboratory reports and data review narratives for the onsite groundwater data are provided in Appendix G. Historical PFAS groundwater analytical results are provided in Appendix I.

For multiple wells, the groundwater samples reported here are from the first time these wells have ever been sampled. Nine of these wells had elevated turbidity during development, which may have affected the results (Section 6.3). These newly installed wells with elevated turbidity will receive additional development and be re-sampled. Therefore, the observations from these data will be compared to future sampling events.

In general, the highest PFAS concentrations are present in areas of known sources and decrease with distance in the direction of groundwater flow. The PFAS compounds with the highest frequency of detections and highest concentrations are perfluoromethoxypropyl carboxylic acid (PMPA), perfluoro-2-methoxyaceticacid (PFMOAA) and HFPO-DA, and other Table 3+ compounds. Concentrations of PMPA, PFMOAA, and HFPO-DA at Site are plotted for all the Perched Zone, Surficial Aquifer Zone and Black Creek Aquifer Zone wells in Figures 9-6 through 9-8. Total Table 3+ PFAS concentrations per zone are plotted in Figures 9-9 through 9-11 alongside Total Table 3+ PFAS concentrations for surface water samples collected in February 2019 for Willis Creek, Seeps A, B, C, and D, and the Old Outfall 002. For other PFAS compounds, more than half of the compounds analyzed were not detected in any samples, and the other compounds were detected at concentrations orders of magnitude lower than the Table 3+ compounds.

PMPA, PFMOAA and HFPO-DA Distributions

As discussed above, PMPA appears to be a representative marker for aerial deposition. PMPA concentrations are highest near the Monomers IXM Area, the emissions source to air, and also a location of leakage from historical process water sewer lines (See Figure 9-6). Generally, the concentration of PMPA decreases with distance from the Monomers IXM Area.

Meanwhile, PFMOAA most appears to be associated with releases from conveyance of process water along the terracotta pipe and then to the WWTP and Outfalls. Figure 9-7 shows that the highest PFMOAA concentrations are often adjacent or downgradient of the Monomers IXM Area and the conveyance pathway towards the Cape Fear River (Figure 4-1; 9-7).

Notably, PFMOAA is at a relatively elevated concentration at Black Creek Aquifer well PW-11 close to the mouth of the Old Outfall 002. Here, the gradient analysis (Section 9.2.1) suggested the Old Outfall 002 was recharging groundwater. These two facts together suggest that the potential source of the elevated PFAS detections at PW-11 may be historical recharge of Old Outfall 002 water to groundwater prior to 2012 when the combined Monomers IXM process water containing PFAS was discharged to the Cape Fear River along with non-contact cooling water via the Old Outfall Channel.

A contrast between PFMOAA and PMPA is how PMPA concentrations decrease more slowly and equally in all directions from the primary emission location to air, the Monomers IXM Area, while PFMOAA concentrations are elevated downgradient of release points, but upgradient are much lower, reflecting the behavior expected from a direct release to groundwater. Further, recent characterization results suggest downward migration of PFMOAA and other PFAS to the Black Creek Aquifer has occurred. This is described in more detail in Section 10 where the present geological interpretation based on recent borings is presented.

Last, the distribution of HFPO-DA at Site shown in Figure 9-8 is intermediate to PMPA and PFMOAA reflecting that it has been present in multiple release pathways.

Total Table 3+ PFAS Distributions

The concentration of total Table 3+ PFAS in Site groundwater is higher by orders of magnitude compared to other PFAS detected at Site. The distributions of total Table 3+ PFAS for each zone: Perched Zone, Surficial Aquifer, and Black Creek Aquifer are plotted in Figures 9-6 through 9-9. Similar to the individual compounds, the highest concentrations of Total Table 3+ PFAS are detected near the Monomers IXM. The figures also show Total Table 3+ PFAS concentrations for Willis Creek, the Seeps and Old Outfall 002. These figures show a linkage between elevated perched zone and surficial zone concentrations and Seep and Old Outfall detections. Figure 9-9 also shows that floodplain deposit and Black Creek Aquifer groundwater Total Table 3+ PFAS concentrations are similar to seep concentrations suggesting that some of these observed PFAS in these wells may be infiltration of water expressed higher up the bluff face as seeps. The figures also indicate downward infiltration of PFAS into the Black Creek Aquifer. This connectivity between the upper and lower units is further described in Section 10.

PFAS Signatures to Assess Source Components

PFAS were released from the facility via aerial deposition from stack emissions and process wastewaters. A method to assess the source of PFAS (aerial versus wastewater) present in the environment is referred to as a PFAS signature. This can be used to refine and connect observations of PFAS chemistry with insights for hydrogeological identified flow paths. Multivariate statistical methods, e.g., hierarchical cluster analysis (HCA), can used as a tool to identify PFAS signatures. Multivariate methods allow for the analysis of relationships between all compounds simultaneously, as opposed to traditional univariate methods, where each compound is evaluated individually. HCA, in particular, is a method that can identify common groups, i.e., clusters, of wells within a large data set based on their PFAS concentration compositions. HCA was used to evaluate the relative proportions of Table 3+ PFAS concentrations in onsite and offsite groundwater to identify: (i) groups of groundwater wells that share similar concentration compositions and (ii) the Total Table 3+ PFAS compounds driving these groupings. The results of the HCA were used to infer PFAS signatures across onsite and offsite areas and provide a line of evidence regarding different PFAS pathways. Technical details and additional outputs from the HCA are provided in Appendix J.

The HCA identified four clusters of wells with differing Table 3+ PFAS compositions. The PFAS compositions across wells within a cluster were used to infer the following four PFAS signatures:

- Aerial deposition PFAS signature characterized by a predominant proportion of PMPA;
- Aerial deposition PFAS signature characterized by a mixture of PFAS compounds;
- Combined process water PFAS signature characterized with a predominant proportion of PFMOAA; and
- Combined process water PFAS signature characterized by a mixture of PFAS compounds.

For each PFAS signature, the concentration compositions for a select number of wells are shown in Table 9-5. An expanded table with all wells is provided in Appendix J. The spatial distribution of these PFAS signatures are provided in Figure 9-11.

There were 12 wells (four onsite wells and eight offsite wells) in the cluster representing the aerial deposition PFAS signature (predominant proportion of PMPA). PMPA accounted for 53% to 100% of the total Table 3+ concentrations in these wells; however, total Table 3+ concentrations were the lowest in these wells (Table 9-5; Figure 9-11). These wells were all screened in the Surficial and Black Creek Aquifers. The onsite wells (BCA-04, SMW-10, PW-09, and PW-12) are upgradient of the direct releases to soil and groundwater. The offsite wells are distant from direct releases to soil and groundwater, and either hydraulically upgradient or hydraulically not connected to the Site. In the wells shown in Table 9-5, Bladen-2S and Bladen-2D, PMPA accounts for 100% of the total Table 3+ concentrations. This signature is also observed onsite upgradient of the direct releases to soil and groundwater. For instance, PW-12, a Black Creek Aquifer well, reflects the same pattern of PFAS signature as Bladen-2S and Bladen-2D. Additional sampling of newly installed wells will be completed to confirm patterns are representative of aquifer conditions.

There were 50 wells (42 onsite wells and eight offsite wells) in the cluster representing the aerial deposition PFAS signature characterized by a mixture of PFAS compounds. This cluster of wells exhibits a more even distribution of Table 3+ PFAS concentrations compared to other clusters. Generally, PMPA is the highest concentration Table 3+ PFAS with HFPO-DA, PFO2HxA, PEPA and PFMOAA generally detected as well. This signature is referred to as an aerial signature since it and the aerial high PMPA signature are the only ones detected offsite. This aerial signature is also present onsite at highest concentrations close to the manufacturing facility where emissions to air occurred. However, this signature could also potentially be associated with historical process water release from historical underground process sewers. For instance, the vinyl ethers south manufacturing area is located in the southern portion of the Monomers IXM Area and is associated with PMPA, PEPA and HFPO-DA – three compounds that are key contributors to the aerial mixture of PFAS signature.

There were 32 onsite wells in the cluster representing the combined process water PFAS signature characterized with a predominant proportion of PFMOAA. PFMOAA accounted for 49% to 77% of the total Table 3+ concentrations and total Table 3+ concentrations varied by orders of magnitude based on proximity to known sources, aquifer, and groundwater flow paths (Table 9-5; Figure 9-11). For example, the Perched Zone and Surficial Aquifer wells with predominant proportions of PFMOAA are within the Monomers IXM Area (NAF-02), Chemours Polymer Processing Aid Area (SMW-08B), and in areas where process water was historically conveyed to the Cape Fear River along the terracotta pipe (MW-24; MW-14D) or via Outfall 002 (MW-27; PIW-9S). Additionally, Black Creek Aquifer wells with predominant proportions of PFMOAA are generally near the Seeps (LTW-05, PW-15R) suggesting that downward and horizontal (groundwater flows from east to west in the Black Creek Aquifer) migration towards the river.

There were 16 onsite wells in the cluster representing the combined process water signature characterized by a mixture of PFAS compounds. These wells follow the same trends as those above, except that HFPO-DA, PFMOAA, PFO2HxA, PMPA, and PEPA combined account for 53% to 100% of the total Table 3+ concentrations, which vary by orders of magnitude between the wells (Table 9-5; Figure 9-11). This signature where PFMOAA concentrations are not as high as in the other combined process water signature may have potentially resulted from mixing of combined process water releases with aerially deposited PFAS and/or mixing with other potential localized process water releases before the replacement of underground process water sewers (Section 4).

Across the Site, PFAS signatures are often a combination of different release mechanisms. The PFAS fingerprinting analysis may potentially be beneficial in providing a line of evidence to evaluate flow paths and groundwater mixing.

9.3 Offsite Groundwater

As described in Section 6.4, offsite groundwater characterization included installing ten well pairs in Bladen, Cumberland and Robeson counties (Figure 6-6).

Groundwater elevations computed for well pairs located in Bladen and Cumberland Counties generally indicate a higher groundwater elevation in the shallow well pair as compared to the deeper well pair, suggesting downward flow as expected outside of areas of groundwater discharge (Table 9-1, Figure 6-6). Shallow wells are screened in the Surficial Aquifer while deeper well screens are within the Black Creek Aquifer. These results suggest that potential downward groundwater flow is anticipated at these locations at the time of water level measurement (Table 9-1). Exceptions to this were observed at Bladen-4S/Bladen-4D, Cumberland-2S/Cumberland-2D, Cumberland-3S/Cumberland-3D and Robeson-1S/Robeson-1D, where a higher groundwater elevation was computed for the deeper well, suggesting a potential upward flow (Table 9-1). Upward flow is generally anticipated near groundwater discharge boundaries, which may include creeks and swamps. Bladen-4S/Bladen-4D, Cumberland-2S/Cumberland-2D and Cumberland-3S/Cumberland-3D are installed near Harrison Creek, Cape Fear River and Cedar Creek, respectively while Robeson-1S/Robeson-1D is located between Little Marsh Swamp and Big Marsh Swamp, areas that.

The groundwater analytical results for the offsite wells are presented in Table 9-5, except Bladen-1S, which was dry at the time of sample collection. Appendix G contains the laboratory reports and data review narratives for the offsite groundwater data. In general, detection frequencies and concentrations are low in wells for most PFAS compounds. For Table 3+ compounds, seven out of the 20 parameters were not detected in any samples, while the other 13 were detected in at least one sample (Table 9-5). The most frequently detected Table 3+ compounds with concentration ranges that exceeded 10 ng/L included:

- PMPA (eighteen samples detected) at concentrations that ranged from 9.2 ng/L to 330 ng/L;
- PFO2HxA (thirteen samples detected) at concentrations that ranged from 1.3 J ng/L to 110 ng/L;
- Byproduct 2 (PFESA-BP2) (twelve samples detected) at concentrations that ranged from 0.48 J ng/L to 14 ng/L;
- PEPA (seven samples detected) at concentrations that ranged from 2.1 J ng/L to 110 ng/L;
- PFMOAA (ten samples detected) at concentrations that ranged from 6.3 J ng/L to 39 ng/L;

- HFPO-DA (nine samples detected) at concentrations that ranged from 2.2 J ng/L to 190 ng/L;
- PFO3OA (eight samples detected) at concentrations that ranged from 0.96 J ng/L to 18 ng/L;
- PEPA (seven samples detected) at concentrations that ranged from 2.1 J ng/L to 110 ng/L;
- Byproduct 4 (six samples detected) at concentrations that ranged from 1.9 J ng/L to 74 J ng/L; and,
- R-EVE (four samples detected) at concentrations that ranged from 5.7 ng/L to 18 J ng/L.

Spatial distribution of the six most frequently detected Table 3+ compounds in offsite wells are shown in Figure 9-12.

For PFAS compounds analyzed by EPA Modified Method 537, 22 out of the 36 parameters (excluding HFPO-DA) were not detected in any samples, while the other 14 were detected in at least one sample.

Spatially, the highest concentrations were observed at Bladen-1D (closest to the Site) and the lowest were observed at locations farthest from the Site following the primary and secondary wind directions along the west-southwest to east-northeast and south to north quadrants, respectively (Bladen-4S/D, Cumberland-1S/D, Cumberland-2S/D and Cumberland-5S/D; Figure 9-12). For instance, concentrations at Bladen-1D were the highest, particularly for PEPA (110 ng/L), PMPA (330 ng/L) and HFPO-DA (190 ng/L), whereas the concentrations at Cumberland-2S/D which is approximately 11 miles from the Site along the primary wind direction were either non-detect or an order of magnitude lower for these same compounds (Figure 9-12).

Frequency of detections and concentrations are generally higher in Surficial Aquifer wells as compared to those screened in the deeper Black Creek Aquifer. For example, in Bladen-3S the concentrations of PEPA, PMPA, and HFPO-DA are 5.6 J ng/L, 39 ng/L, and 12 ng/L, respectively. Meanwhile in Bladen-3D the concentrations of PEPA, PMPA, and HFPO-DA are 2.1 J ng/L, 14 ng/L, and 2.2 J ng/L, respectively (Figure 9-12).

Offsite Wells with relatively low concentration levels for Table 3+ PFAS may have been potentially influenced by some Table 3+ PFAS present in drilling water (Table 7-3). The same drilling water source from a Bladen County fire hydrant near the Site was used for onsite and offsite well drilling. This water had a detection of PMPA at 130 ng/L, HFPO-DA at 17 ng/L, PFO2HxA at 10 ng/L and PFESA-BP2 at 6.7 ng/L. Previous samples of drilling water had been non-detect for Table 3+ PFAS compound from this water source, but at reporting limits of 200 ng/L. All wells were developed to enhance the connection to the geological formation and reduce potential artifacts from well installation. Offsite wells, and recently installed wells onsite with PMPA detections below 200 ng/L or with non-detect PMPA results at reporting limits above 200 ng/L (PIW-4D, PW-12, PW-13) will be further developed and re-sampled to assess concentrations at these wells over subsequent events.

The HFPO-DA concentrations in offsite groundwater are generally within the range of HFPO-DA concentrations reported in offsite drinking water and decrease with increasing distance from the Site (Figures 4-2A and 4-2B). These trends will continue to be evaluated as more data is collected from the various ongoing sampling programs under the Consent Order.

10. SUMMARY OF CURRENT CONCEPTUAL SITE MODEL

The Site is located in the Coastal Plain of North Carolina and is situated adjacent the Cape Fear River atop a bluff with a 100-foot elevation change to a floodplain area and the Cape Fear River. Willis Creek borders the Site to the north, which flows through an erosional channel and empties into the Cape Fear River. To the south is Georgia Branch Creek which also flows through erosional channels as it empties into the Cape Fear River. Onsite there are groundwater seeps where groundwater is expressed at surface and flows to the Cape Fear River. The largest of these groundwater-fed seeps is the Old Outfall 002, along with four seeps, A, B, C and D located on the bluff slope facing the Cape Fear River.

10.1 Geology and Hydrogeology

The geology at the Site consists of sands and clays. The geology and land use at the Site have influenced the hydrogeology of the Site. The geology of the Site is depicted in a series of cross sections identified in Figure 10-1 and presented in Figures 10-2 through 10-6. The list below describes geological features at Site from surface downward:

1. Perched Zone. The Perched Zone is a relatively thin, spatially limited layer of groundwater present in silty sands to a depth of about 20 ft bgs (Figures 10-2 to 10-6). Groundwater in the Perched Zone is recharged through precipitation onsite, and in the past, has received enhanced infiltration through unlined ditches and sedimentation ponds – these features have since been lined. Groundwater flows radially away from groundwater mounds in the Perched Zone. This leads to groundwater discharge to the east at seeps on the edge of the bluff, to the south toward the Old Outfall 002 and to the north and to the west downwards through the geological sequence towards the Surficial and Black Creek Aquifers.
2. Perched Clay Unit. The Perched Clay Unit gives rise to the Perched Zone as it presents a barrier to direct downward groundwater infiltration. The Perched Clay is spatially limited at the Site. To the north it pinches out. To the east and south it outcrops along the bluff face. To the west it terminates and becomes absent (Figure 10-6). In cross sections along the Site and observations of grainsizes and lithologic contact elevations from the boring logs suggest an erosional feature in the western portion of the geology underlying the manufacturing areas. This erosional surface, described later in this list, is interpreted to have eroded the Perched Clay Unit enabling downward migration of groundwater off the western edge of the Perched Zone.
3. Surficial Aquifer. The Surficial Aquifer is an unconfined silty sand aquifer lying atop the Black Creek Confining Unit and is present beneath the Perched Clay Unit. Groundwater in the Surficial Aquifer flows towards the bluff faces at the Site – It flows both north, east and west toward surface water bodies (Willis Creek, Seeps, Old Outfall 002) and discharges into them as seeps. The Surficial Aquifer is interpreted to be in contact with the Black Creek Aquifer in places due to an erosional feature. This feature is labeled on the cross sections and is interpreted to have enabled downward cross formational groundwater flow.

4. Black Creek Confining Unit. The Black Creek Confining Unit is a layer of silty or sandy clay that separates the Surficial Aquifer from the Black Creek Aquifer. The lithologic contact elevation with the overlying Surficial Aquifer is variable, as is the unit thickness – the Black Creek Confining Unit is interpreted to have been eroded under the western portion of the manufacturing areas at Site. In addition to the Black Creek Confining unit being discontinuous, the potential for downward cross formational flow, also exists based on multiple vertical joints (i.e., fractures in the clay) observed in the Black Creek Confining Unit where it outcropped at the Site.

5. Flood Plain Deposits. Surface soils in the flood plain immediately adjacent to the Cape Fear River are comprised of finer grained, likely more recently deposited sediments during river flood stages. These deposits have lower hydraulic conductivity than the Surficial and Black Creek Aquifers. The seeps at the Site cut into Floodplain Deposits as they flow towards the Cape Fear River.

6. Black Creek Aquifer. The Black Creek Aquifer is comprised of fine to medium grained sands. The Black Creek Aquifer is in contact with the Surficial Aquifer under the western portion of the manufacturing area at the Site and then is separated from the Surficial Aquifer under most of the manufacturing area by the Black Creek confining unit. The Black Creek Aquifer directly adjacent to the Cape Fear River is overlain by Flood Plain Deposits and the Black Creek Confining Unit. The Black Creek Aquifer is interpreted to be the only transmissive groundwater zone at Site in contact with the Cape Fear River. Groundwater in the Black Creek Aquifer flows from west to east towards the Cape Fear River.

7. Upper Cape Fear Confining Unit. The Upper Cape Fear Confining Unit underlies the Black Creek Aquifer. The Upper Cape Fear Confining unit is regionally extensive clay layer which is upwards of 75 ft thick at Site and is likely a barrier to downwards groundwater flow. Groundwater levels in the Upper Cape Fear Aquifer measured at NC DWR wells are 80 ft lower than Black Creek Aquifer groundwater levels immediately above the Upper Cape Fear Aquifer. If the two units were in hydraulic connection, they would have similar groundwater elevations. The dissimilarity in water levels for these co-located NC DWR wells demonstrates how the Upper Cape Fear Confining Unit is a barrier to downward cross formational flow.

8. Erosional Feature. A paleo-era process appears to have eroded the Perched Clay Unit, portions of the Surficial Aquifer and the Black Creek Confining Unit in the geological sequence under the western portion of the manufacturing area. This erosional feature potentially enables cross formational flow of water from the Perched Zone, through the Surficial Aquifer and into the Black Creek Aquifer. This feature is a likely controlling factor of the distribution of PFAS observed in the Surficial and Black Creek Aquifers at Site.

10.2 Sources of PFAS and Distribution of PFAS

Historically, Table 3+ PFAS originating from the Site have been released from stack emissions and from process water releases. Air sources result in a more distributed, diffuse concentration signature of deposited compounds that decrease in concentration in soil and groundwater gradually and radially away for the source. Meanwhile releases of water result in point sources and plumes of compounds in groundwater where high concentrations can be present in close proximity to lower concentrations and where migration and distribution of compounds is controlled by geology and hydrogeology.

With the data collected to date, PMPA appears to be the Table 3+ PFAS most representative of air emissions; it is the highest concentration PFAS in offsite groundwater samples. The presence of offsite Table 3+ PFAS in groundwater originate from emissions to air followed by association with particulates in air and then subsequent aerially deposition leading to infiltration through the unsaturated zone with rainfall and ending up in groundwater. The concentration of PMPA onsite is highest in the immediate vicinity of the Monomers IXM Area where it originates (Figure 9-6). The concentrations at the Site then decrease radially away from this area in all directions, consistent with air deposition patterns. Offsite, the most robust data set exists for HFPO-DA. Here again, with increasing distance away from the Site HFPO-DA concentrations decrease (Figure 4-2A and B).

With the data collected to date, PFMOAA appears to be the Table 3+ PFAS most representative of process water. Known releases of process water and process water mixed with non-contact cooling water to soil and groundwater occurred prior to 2000 in the Monomers IXM Area and prior to 2017 along the terracotta pipe and potentially along other parts of the conveyance network that transferred process water through the terracotta pipe, to the wastewater treatment plant, then to the Outfall Channel and prior to 2012 to the Old Outfall 002 and the Cape Fear River. The highest concentrations of PFMOAA at Site (Figure 9-7) are clustered along and near areas of known release of process water. Further high PFMOAA concentrations are observed near locations with much lower PFMOAA concentrations. The distribution of PFMOAA though is in part controlled by aerially deposition, but these concentrations are much lower than process water derived PFMOAA. The distribution of PFMOAA and other PFAS released is in part controlled by geology and hydrogeology.

10.2.1 PFAS Signatures

Four PFAS signatures were identified based on the different releases and emissions of Table 3+ PFAS to the environment and can be used to infer which PFAS source types are most contributing to detections in different environmental media and at different locations. The four signature types identified were:

- Aerial deposition PFAS signature characterized by a predominant proportion of PMPA;
- Aerial deposition PFAS signature characterized by a mixture of PFAS compounds;
- Combined process water PFAS signature characterized with a predominant proportion of PFMOAA;
- Combined process water PFAS signature characterized by a mixture of PFAS compounds; and

The PFAS patterns of the Old Outfall 002, the Seeps, Willis Creek, Georgia Branch Creek and Cape Fear River samples were compared against the identified PFAS signatures described earlier in Section 9.2.2 and are presented in Table 10-1. Observations include:

- Samples collected along the Old Outfall 002 most resemble the combined process water PFAS signature with a predominant proportion of PMPA, except for one sample (OLDOF-2J) that was collected from the seep water. The Old Outfall 002 is both near the WWTP to which the terracotta pipe conveyed combined Monomers IXM process water, and the Old Outfall 002 prior to 2012 conveyed combined process water from Monomers IXM;
- Samples collected from the seeps resemble the two combined process water signatures and the aerial signature characterized by a mixture of PFAS compounds. Seeps C and D most resemble the combined process water signature with predominant PFMOAA. These two seeps are nearest the present Outfall 002 and Old Outfall 002, both of which conveyed combined process water (Figure 4-1). Seep A and one sample from Seep B bear some resemblance to the combined process water signature with a mixture of PFAS compounds, while the other samples collected at Seep B resemble the aerial PFAS signature with a mixture of PFAS compounds, which could also be associated with historical process water release, as discussed in Section 9.2. Seeps A and B are found near the Monomers IXM area and other seeps at the top of the Bluff which drain the Perched Zone near Monomers IXM feed the flow of water in these two seeps;
- Sample collected from Georgia Branch Creek resemble the aerial deposition signature with a mixture of PFAS compounds, whereas Willis Creek resembles the combined process water signature with a mixture of PFAS compounds. The catchments of both creeks are predominantly outside of the Site, and consequently most of their flow is from outside the Site. However, Willis Creek has higher proportions of PFMOAA and Byproduct 5 compared to Georgia Branch Creek. Willis Creek is adjacent the Site, and some water from the Perched Zone and Surficial Aquifer are interpreted to flow towards Willis Creek.
- The sample collected upstream Cape Fear River at River Mile 76, which is directly upstream of the Site, resembles the aerial deposition signature with a mixture of PFAS compounds, though the total Table 3+ concentration (72 ng/L) in this sample was lowest among all of the seeps, creeks, and Old Outfall 002 samples.
- The samples collected downstream adjacent to drinking water intakes, Bladen Bluffs and Kings Bluff Intake Canal, resemble the combined process water signature with a mixture of PFAS compounds.

10.2.2 Influence of Geology on Table 3+ PFAS Distributions in Groundwater

Geology and Hydrogeology are interpreted to have influenced the detection of PFAS in groundwater at the Site. Directly under the manufacturing areas PFAS released to soil and groundwater have led to the formation of high PFAS concentration groundwater seeps to the east of the manufacturing area along the bluff face. To the west, a paleo-era erosional surface cuts through the perched clay unit and in places the Surficial Aquifer and the Black Creek Confining Unit. This erosional surface has enabled groundwater with PFAS to migrate downwards off the western edge of the perched clay unit downwards into the Surficial and Black Creek Aquifers.

These PFAS are then detected in Surficial Aquifer seeps along the bluff face, some minor seeps adjacent to Willis Creek, and the seeps that feed the groundwater flow and PFAS concentrations in Old Outfall 002.

The influence of geology and hydrogeology on Site will be further examined as part of the numerical groundwater model being prepared to evaluate groundwater flow in support of selecting and designing a groundwater remedy at the Site.

10.3 PFAS Mass Loading to the Cape Fear River

The findings of this report are consistent with the PFAS Mass Loading Model submitted to NCDEQ and CFRW (Geosyntec, 2019f). The PFAS Mass Loading Model assessed the contribution of different transport pathways to overall mass loading of PFAS originating from the facility to the Cape Fear River. Pathways contributing to loading are shown in Figure 10-6 and listed below as follows:

Transport Pathway 1: Upstream Cape Fear River and Groundwater – pathway is comprised of contributions from non-Chemours related PFAS sources on the Cape Fear River and tributaries upstream of the Site, and upstream offsite groundwater with Table 3+ compounds present from aerial deposition

Transport Pathway 2: Willis Creek – Groundwater and stormwater discharge and aerial deposition to Willis Creek and then to the Cape Fear River

Transport Pathway 3: Direct aerial deposition of PFAS on the Cape Fear River;

Transport Pathway 4: Outfall 002 – Comprised of (i) water drawn from the Cape Fear River and used as non-contact cooling water, (ii) treated non-Chemours process water and (iii) Site stormwater which are then discharged through Outfall 002;

Transport Pathway 5: Onsite Groundwater – Direct upwelling of site groundwater to Cape Fear River from Black Creek Aquifer;

Transport Pathway 6: Seeps – Groundwater Seeps (currently identified seeps are A, B, C and D) above the Cape Fear River water level on the bluff face from the facility that discharge into the Cape Fear River;

Transport Pathway 7: Old Outfall 002 – Groundwater discharge to Old Outfall 002 and stormwater runoff flows into the Cape Fear River;

Transport Pathway 8: Adjacent and Downstream Groundwater – Offsite groundwater adjacent and downstream of the Site upwelling to the Cape Fear River; and,

Transport Pathway 9: Georgia Branch Creek – Groundwater, stormwater discharge and aerial deposition to Georgia Branch Creek and then to the Cape Fear River.

PFAS loading to the Cape Fear River was estimated using a combination of measured and estimated data to develop mass loading estimates by pathway. The model was then calibrated and evaluated against observed downstream river PFAS mass loadings. The mass loading model estimated that the Old Outfall 002 and Seeps (Transport Pathways 6 and 7 respectively) have the highest contribution of Table 3+ PFAS mass loading to the Cape Fear River. These two pathways (Transport Pathways 6 and 7) combined are estimated to contribute greater than 50% of the loading to the Cape Fear River. Onsite groundwater (Transport Pathway 5) is the next highest mass loading pathway to the Cape Fear River with estimated loading of approximately 20%.

Mass Loading Model Total Table 3+ PFAS including HFPO-DA Contributions per Pathway

Pathway	**Total Table 3+ Estimated Loading Percentage per Pathway per Event**	
	May 2019 Event	**June 2019 Event**
[1] Upstream River Water and Groundwater	4%	15%
[2] Willis Creek	10%	4%
[3] Aerial Deposition on the River	< 2%	< 2%
[4] Outfall 002	4%	7%
[5] Onsite Groundwater	22%	17%
[6] Seeps	32%	24%
[7] Old Outfall 002	23%	29%
[8] Offsite Adjacent and Downstream Groundwater	< 2%	< 2%
[9] Georgia Branch Creek	4%	3%

For the Transport Pathways, the loading estimates will vary over time due to a range of potential factors, including but not limited to:

- Detections of PFAS at or near analytical practical quantitation limits have more variability;
- Elevated method reporting limits;
- Standard uncertainty (often ± 20%) in analytical laboratory results;
- Flow rate estimates in the river, seeps, groundwater and creeks are over- or under-predicted compared to actual flow rates.

Geosyntec will be refining the mass loading model through upcoming quarterly sampling events and a numerical groundwater model to more quantitatively bound groundwater mass loading to the Cape Fear River.

10.4 Recommendations

This report summarizes effort from 2019 and numerous prior investigations to present a current and robust CSM that can be used to develop remedial options for the impacted media at the Site. While there remain data from recent well installations to report and more studies to report (SLEA, the sediment characterization, the numerical model and the information generated from the onsite pilot studies) and these will undoubtedly further the CSM, the information collected is a suitable framework to begin remedy options selection and design. Geosyntec recommends the following:

- Additional sampling of recently installed wells to evaluate consistency of results;
- Additional development prior to any sampling of wells reporting higher turbidity or PMPA detections below 200 ng/L or non-detect PMPA values with reporting limits above 200 ng/L; and
- Installing a well south of Old Outfall 002, along Glengerry Road to evaluate PFAS concentrations in this area (given the observations at PW-11).

Chemours is currently performing additional development and sampling of recently installed wells. This effort is anticipated to be completed in 2019.

11. CONCLUSIONS

This On and Offsite Assessment Report and the 25+ reports it relies upon provide sufficient data such that an interpretation of the nature and extent of PFAS impacts are understood to a level that remedial selection to address groundwater containing PFAS originating from the Site is feasible. This assessment is based on:

- 25+ completed targeted scope investigations,
- 3,167 investigative samples reported to date, 142 reported since June 2019;
    - Over 300 groundwater samples, 115 reported since June 2019;
    - Over 150 soil samples, 27 reported since June 2019;
    - Over 800 surface water samples reported to date;
    - Over 1,700 private well samples reported to date; and
    - Over 100 soil borings and logs.

Point source releases of high concentration process water at Site have resulted in groundwater that contains elevated concentration of PFAS migrating through all three groundwater transmissive zones present at Site (i.e., Perched Zone, Surficial Aquifer, and Black Creek Aquifer) and discharging via groundwater seeps, seepage to Old Outfall 002 or direct groundwater discharge to the Cape Fear River.

The deepest zone at the Site established to have detectable concentration of PFAS is the Black Creek Aquifer. It is the only geologic unit at Site in direct connection with the Cape Fear River. The Black Creek Aquifer is underlain by a regionally extensive and thick aquitard, the Upper Cape Fear Confining Unit.

PFAS have also been detected in soils. For samples collected in 2019 onsite concentrations of individually detected PFAS were below 2,000 ng/kg except for detections at location PW-10 which was located on the bluff face near seeps. As reference, 2,000 ng/kg is equivalent to a water concentration of 9,600 ng/L assuming a soil density of 1.442 kg/L and a porosity of 0.3 where all PFAS detected in soil would be fully solubilized. A concentration of 9,600 ng/L is relatively low when compared to many observed concentrations in groundwater at Site, the Seeps and Old Outfall 002.

Offsite, PFAS have been aerially deposited and exist as a distributed, diffuse source potentially present over an area of 100 square miles (radius of 6 miles) where concentrations in groundwater gradually become lower further away from the Site. Ongoing air abatement measures and the installation and operation of the thermal oxidizer will lead to a 99% facility wide reduction in PFAS emissions to air. Correspondingly, the deposition of PFAS to offsite soils will be reduced by 99% and over time concentrations will decline. At present Chemours is providing replacement drinking water to offsite private well users with well water exceeding CO defined Attachment C

PFAS concentration criteria. Replacement water is first being supplied as bottled water to residents who qualify as an interim provision. Then more permanent replacement water is provided to residents including (i) point of use reverse osmosis systems, or (ii) whole house filtration systems, or (iii) connection to public water supplies.

PFAS in the offsite Georgia Branch Creek originate from aerially deposited PFAS that then discharge into the creek. Hence, the mass loading to Georgia Branch Creek is likely relatively uniform as it flows to the Cape Fear River.

The PFAS in Willis Creek originate from both aerially deposited PFAS and from PFAS in groundwater from the Site originating from process water releases. The aerially deposited fraction of PFAS in Willis Creek are similar to Georgia Branch Creek, likely a diffuse and uniform loading.

Chemours is preparing a Corrective Action Plan (CAP) for groundwater due December 31, 2019 as required by Paragraph 16 of CO. This CAP will be supported by:

- Characterization data (reported here and previously);
- Numerical groundwater model (prepared using data presented here); and
- Human health SLEA.

The CAP will describe specific remedial measures and schedules to address PFAS mass loading to the Cape Fear River and other surface water bodies from (a) seeping groundwater and (b) direct discharge of Black Creek Aquifer groundwater to the Cape Fear River. Control measures under consideration include hydraulic containment, in situ sorptive remedies, or in situ treatment remedies or some combination thereof.

12. REFERENCES

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TABLES

TABLE 2-1
SOIL AND GROUNDWATER ANALYTICAL METHODS - PFAS
Chemours Fayetteville Works, North Carolina

Analytical Method	Common Name	Chemical Name	CASN	Chemical Formula
Table 3+ Lab SOP	HFPO-DA*	Hexafluoropropylene oxide dimer acid	13252-13-6	C6HF11O3
	PFMOAA	Perfluoro-2-methoxyaceticacid	674-13-5	C3HF5O3
	PFO2HxA	Perfluoro(3,5-dioxahexanoic) acid	39492-88-1	C4HF7O4
	PFO3OA	Perfluoro(3,5,7-trioxaoctanoic) acid	39492-89-2	C5HF9O5
	PFO4DA	Perfluoro(3,5,7,9-tetraoxadecanoic) acid	39492-90-5	C6HF11O6
	PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	C7HF13O7
	PMPA	Perfluoromethoxypropyl carboxylic acid	13140-29-9	C4HF7O3
	PEPA	Perfluoroethoxypropyl carboxylic acid	267239-61-2	C5HF9O3
	PFESA-BP1	Byproduct 1	29311-67-9	C7HF13O5S
	PFESA-BP2	Byproduct 2	749836-20-2	C7H2F14O5S
	Byproduct 4	Byproduct 4	N/A	C7H2F12O6S
	Byproduct 5	Byproduct 5	N/A	C7H3F11O7S
	Byproduct 6	Byproduct 6	N/A	C6H2F12O4S
	NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	C4H2F8O4S
	EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	C8HF13O4
	Hydro-EVE Acid	Perfluoroethoxsypropanoic acid	773804-62-9	C8H2F14O4
	R-EVE	R-EVE	N/A	C8H2F12O5
	PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	C4HF9O4S
	PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	C5HF9O4
	PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	C12H9F9O3S
EPA Method 537 Mod	10:2 FTS	10:2-fluorotelomersulfonate acid	120226-60-0	C12H5F21O3
	8:2 FTS	8:2 fluorotelomersulfonic acid	39108-34-4	C10H5F17O3S
	4:2 FTS	4:2 fluorotelomersulfonic acid	757124-72-4	C6H5F9O3S
	NEtPFOSAE	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	1691-99-2	C8F17SO2N(C2H5)CH2CH2OH
	NMePFOSAE	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	24448-09-7	C8F17SO2N(CH3)CH2CH2OH
	6:2 FTS	6:2 fluorotelomer sulfonate	27619-97-2	C8H5F13SO3
	ADONA	Ammonium 4,8-dioxa-3H-perfluorononanoate	958445-44-8	CF3O(CF2)3OCHFCF2COONH4
	NaDONA	Sodium 4,8-dioxa-3H-perfluorononanoate	EVS1361	CF3O(CF2)3OCHFCF2COONa
	NEtFOSAA	N-ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	C8F17SO2N(C2H5)CH2COOH
	NEtPFOSA	N-ethylperfluoro-1-octanesulfonamide	4151-50-2	C8F17SO2NHCH2CH3
	NMePFOSA	N-methyl perfluoro-1-octanesulfonamide	31506-32-8	C8F17SO2NHCH3
	NMeFOSAA	N-methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	C8F17SO2N(CH3)CH2COOH
	PFBS	Perfluorobutane sulfonic acid	375-73-5	C4HF9SO
	PFBA	Perfluorobutanoic acid	375-22-4	C4HF7O2
	PFDS	Perfluorodecane sulfonic acid	335-77-3	C10HF21O3S
	PFDA	Perfluorodecanoic acid	335-76-2	C10HF19O2
	PFDOS	Perfluorododecane sulfonic acid	79780-39-5	C12HF25O3S
	PFDoA	Perfluorododecanoic acid	307-55-1	C12HF23O2
	PFHpS	Perfluoroheptane sulfonic acid	375-92-8	C7HF15O3S
	PFHpA	Perfluoroheptanoic acid	375-85-9	C7HF13O2
	PFHxDA	Perfluorohexadecanoic acid	67905-19-5	C16HF31O2
	PFHxS	Perfluorohexane sulfonic acid	355-46-4	C6HF13SO3
	PFHxA	Perfluorohexanoic acid	307-24-4	C6HF11O2
	PFNS	Perfluorononanesulfonic acid	68259-12-1	C9HF19O3S
	PFNA	Perfluorononanoic acid	375-95-1	C9HF17O2
	PFODA	Perfluorooctadecanoic acid	16517-11-6	C18HF35O2
	PFOSA	Perfluorooctane sulfonamide	754-91-6	C8H2F17NO2S
	PFPeS	Perfluoropentane sulfonic acid	2706-91-4	C5HF11O3S
	PFPeA	Perfluoropentanoic acid	2706-90-3	C5HF9O2
	PFTeA	Perfluorotetradecanoic acid	376-06-7	C14HF27O2
	PFTriA	Perfluorotridecanoic acid	72629-94-8	C13HF25O2
	PFUnA	Perfluoroundecanoic acid	2058-94-8	C11HF21O2
	PFOA	Perfluorooctanoic acid	335-67-1	C8HF15O
	PFOS	Perfluorooctane sulfonic acid	1763-23-1	C8HF17SO3
	F-53B Major	F-53B Major	73606-19-6	C8HClF16O4S
	F-53B Minor	F-53B Minor	83329-89-9	C10HClF20O4S

Notes:
*Depending on the laboratory, HFPO-DA may also appear on the EPA Method 537 Mod analyte list
EPA - Environmental Protection Agency
PFAS - per- and polyfluoroalkyl substances
SOP - Standard Operating Procedure

TABLE 4-1
CLASSIFICATION OF TABLE 3+ PFAS
Chemours Fayetteville Works, North Carolina

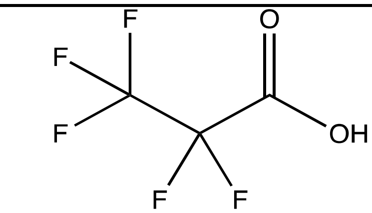
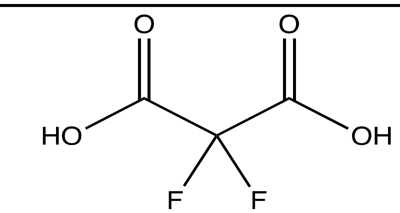
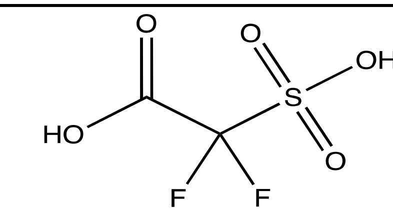
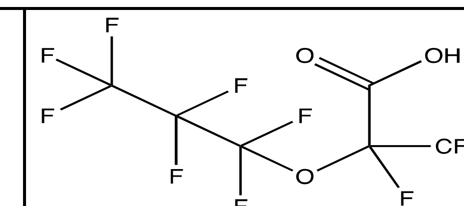
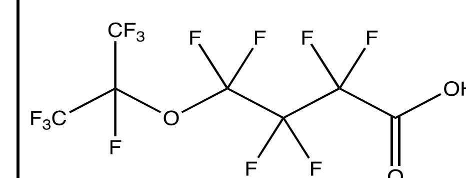
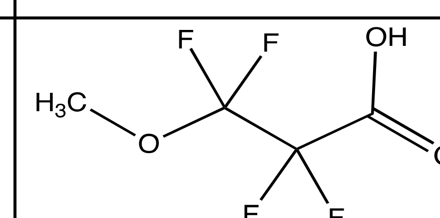
Common Name	Chemical Name	CAS #	Formula	Degree of Fluorination	Ether Bonds	Isomer type	Functional Groups			Diprotic[d]	Structure
							R-C=C[a]	$R\text{-}CO_2H$[b]	$R\text{-}SO_3H$[c]		
PFAS without ether linkages											
PPF Acid	Perfluoropropionic acid	422-64-0	$C_3HF_5O_2$	Per	0	Linear	--	✓	--	--	
MMF	Difluoromalonic acid	1514-85-8	$C_3H_2F_2O_4$	Per	0	Linear	--	✓	--	✓	
DFSA	Difluoro-sulfo-acetic acid	422-67-3	$C_2H_2F_2O_5S$	Per	0	Linear	--	✓	✓	✓	
Per- and polyfluoroalkyl ether carboxylic acids (PFECAs)											
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6	$C_6HF_{11}O_3$	Per	1	Branched	--	✓	--	--	
PFECA-G	Perfluoro-4-isopropoxybutanoic acid	801212-59-9	$C_7H_1F_{13}O_1$	Per	1	Branched	--	✓	--	--	
MTP	Perfluoro-2-methoxypropanoic acid	93449-21-9	$C_4H_4F_4O_3$	Poly	1	Linear	--	✓	--	--	

TABLE 4-1
CLASSIFICATION OF TABLE 3+ PFAS
Chemours Fayetteville Works, North Carolina

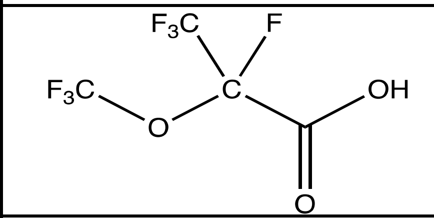
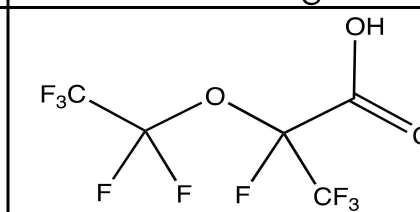
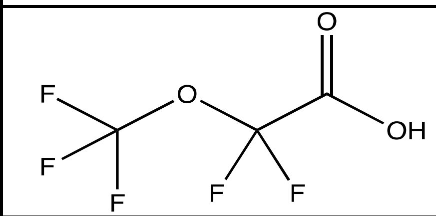
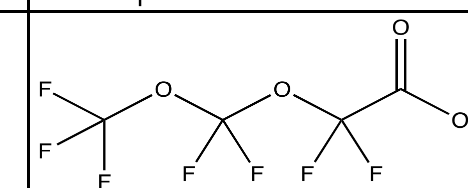
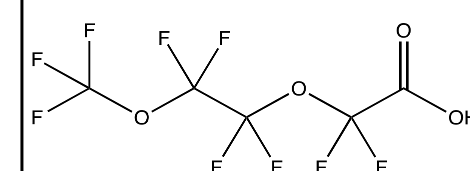
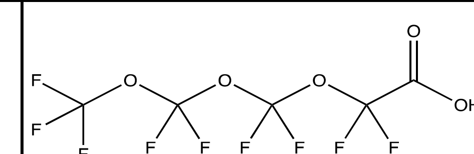
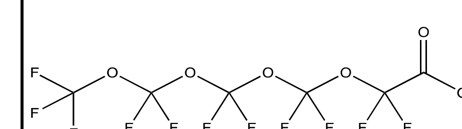
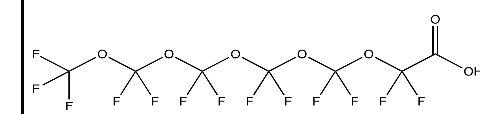
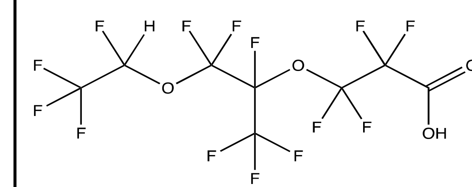
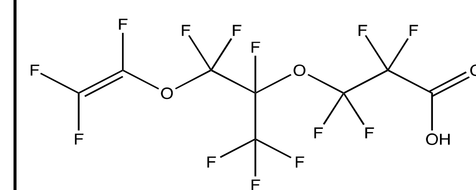
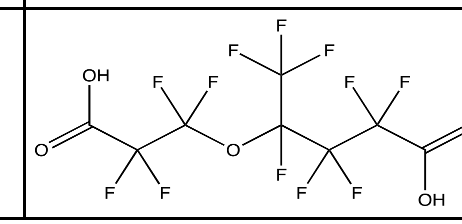
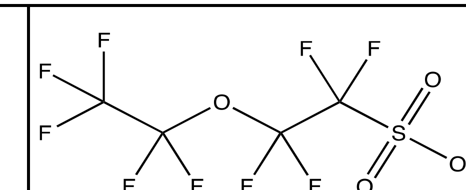
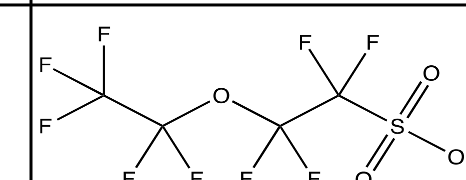
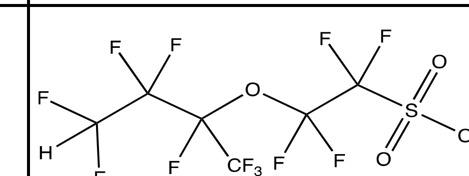
Common Name	Chemical Name	CAS #	Formula	Degree of Fluorination	Ether Bonds	Isomer type	Functional Groups			Diprotic[d]	Structure
							R-C=C[a]	R-CO_2H[b]	R-SO_3H[c]		
PMPA	Perfluoromethoxypropyl carboxylic acid	13140-29-9	$C_4HF_7O_3$	Per	1	Branched	--	✓	--	--	
PEPA	Perfluoroethoxypropyl carboxylic acid	267239-61-2	$C_5HF_9O_3$	Per	1	Branched	--	✓	--	--	
PFMOAA	Perfluoro-2-methoxyacetic acid	674-13-5	$C_3HF_5O_3$	Per	1	Linear	--	✓	--	--	
PFO2HxA	Perfluoro(3,5-dioxahexanoic) acid	39492-88-1	$C_4HF_7O_4$	Per	2	Linear	--	✓	--	--	
PFECA B	Perfluoro-3,6-dioxaheptanoic acid	151772-58-6	$C_5HF_9O_4$	Per	2	Linear	--	✓	--	--	
PFO3OA	Perfluoro(3,5,7-trioxaoctanoic) acid	39492-89-2	$C_5HF_9O_5$	Per	3	Linear	--	✓	--	--	
PFO4DA	Perfluoro(3,5,7,9-tetraoxadecanoic) acid	39492-90-5	$C_6HF_{11}O_6$	Per	4	Linear	--	✓	--	--	

TABLE 4-1
CLASSIFICATION OF TABLE 3+ PFAS
Chemours Fayetteville Works, North Carolina

Common Name	Chemical Name	CAS #	Formula	Degree of Fluorination	Ether Bonds	Isomer type	Functional Groups			Diprotic[d]	Structure
							R-C=C[a]	R-CO_2H[b]	R-SO_3H[c]		
PFO5DA	Perfluoro-3,5,7,9,11-pentaoxadodecanoic acid	39492-91-6	$C_7HF_{13}O_7$	Per	5	Linear	--	✓	--	--	
Hydro-EVE Acid	Perfluoroethoxsypropanoic acid	773804-62-9	$C_8H_2F_{14}O_4$	Poly	2	Branched	--	✓	--	--	
EVE Acid	Perfluoroethoxypropionic acid	69087-46-3	$C_8HF_{13}O_4$	Per	2	Branched	✓	✓	--	--	
R-EVE	R-EVE	N/A	$C_8H_2F_{12}O_5$	Per	1	Branched	--	✓	--	✓	
Per- and polyfluoroalkyl ether sulfonic acids (PFESAs)											
PES	Perfluoroethoxyethanesulfonic acid	113507-82-7	$C_4HF_9O_4S$	Per	1	Linear	--	--	✓	--	
NVHOS	Perfluoroethoxysulfonic acid	1132933-86-8	$C_4H_2F_8O_4S$	Poly	1	Linear	--	--	✓	--	
Byproduct 6	Byproduct 6	N/A	$C_6H_2F_{12}O_4S$	Poly	1	Branched	--	--	✓	--	

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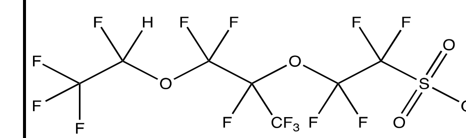
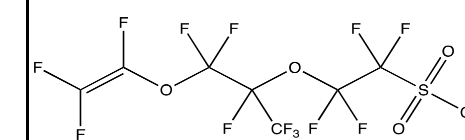
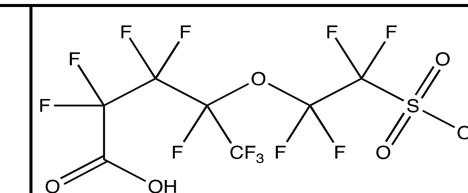
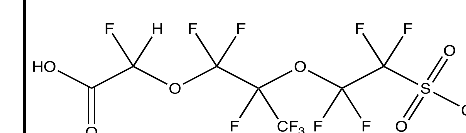
CLASSIFICATION OF TABLE 3+ PFAS
Chemours Fayetteville Works, North Carolina

Common Name	Chemical Name	CAS #	Formula	Degree of Fluorination	Ether Bonds	Isomer type	Functional Groups			Diprotic[d]	Structure
							R-C=C[a]	R-CO_2H[b]	R-SO_3H[c]		
Byproduct 2	Byproduct 2	749836-20-2	$C_7H_2F_{14}O_5S$	Poly	2	Branched	--	--	✓	--	
PFESA-BP1	Byproduct 1	29311-67-9	$C_7HF_{13}O_5S$	Per	2	Branched	✓	--	✓	--	
Per- and polyfluoroalkyl ether sulfonic and carboxylic acids (PFES-CAs)											
Byproduct 4	Byproduct 4	N/A	$C_7H_2F_{12}O_6S$	Per	1	Branched	--	✓	✓	✓	
Byproduct 5	Byproduct 5	N/A	$C_7H_3F_{11}O_7S$	Poly	2	Branched	--	✓	✓	✓	

Notes:
[a] Carbon double bond functional group
[b] Carboxylic acid functional group
[c] Sulfonic acid functional group
[d] Compound with two acid functional groups

TABLE 5-1
PUBLIC/ COMMUNITY WATER SUPPLY WELLS
Chemours Fayetteville Works, North Carolina

PWS ID	Location Name	Address	City	Location Description 1	Location Description 2	Depth (feet)	Distance from Site (miles)	Usage
0326127	BROOKWOOD COMM WTR SYSTEM	6902 SANDBRIDGE DRIVE	FAYETTEVILLE	SHENANDOAH, JUSTIN CT- 5718 JUSTIN COURT AWAY FROM FENCE.	OFFICE AT THE END OF BRYANSTONE WAY	80	14.9	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326341	STONEY POINT WS/FAYETTEVILLE PWC	-	FAYETTEVILLE	STONEY POINT & ROUSE DR	SR 2986 OFF SR 1112	90	13.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
5026009	CRYSTAL SPRINGS CHAPEL	1400 CRYSTAL SPRINGS RD	FAYETTEVILLE	NEXT TO PARKING AREA	ON CRYSTAL SPRINGS ROAD APPROX 1/2MILES OIW CAMDEN ROAD	30	12.5	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326310	RAINTREE MHP	3580 STATE ST	FAYETTEVILLE	BEHIND MHP@PLAYGOURND	OFF CAMDEN RD AT END OF STATE STREET	100	12.1	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326143	COPELAND ACRES S/D	583 REILLY RD	FAYETTEVILLE	OFF CRAMER IN POWER LINE EASEMENT	CAMDEN ROAD & ORION DRIVE - 1 MI EAST OF HOPE MILLS ROAD	75	12.1	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326428	MACEDONIA BAPTIST CHURCH	5064 MACEDONIA CHURCH RD	FAYETTEVILLE	IN FRONT OF OLD FELLOWSHIP HALL	SR2013 .4MI N OIW NC210 - 5064 MACEDONIA CHURCH RD	-	11.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326924	KINGDOM HALL (SR-2008)	JUDSON CHURCH ROAD	FAYETTEVILLE	@ NW CORNER OF CH IN REAR, BELOW GRADE	SR2008 0.6MI NE OIW NC53L BEHIND JUDSON CH RD	-	11.8	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326548	FANTASY LAKE	5869 PERMASTONE DR	HOPE MILLS	AT EQUIPMENT SHED PAST LOCKED GATE, EAST SIDE OF LAKE	@END OF PERMASTONE DRIVE OFF GOLFVIEW DR W OF HOPE MILLS	323	11.5	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326955	STRICKLAND GROCERY NO 2	5205 NC HWY 210 S	STEDMAN	NEXT TO ROAD	AT THE Y OF NC210 & SR2018	-	11.5	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326411	CHURCH OF GOD OF PROPHECY	5371 NC 210 S	STEDMAN	N SIDE OF CH NEXT TO REAR DOOR TOWARDS PARKING LOT	NC 210- 0.1MI SE OIW SR2018	-	11.4	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5026029	DOLLAR GENERRAL STORE #15984	2222 CEDAR CREEK RD	FAYETTEVILLE	FRONT RIGHT CORNER OF PARKING LOT	N ON GREEN ST RT ON GROVE ST RT ON CEDAR CREEK RD	33	11.4	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326143	COPELAND ACRES S/D	583 REILLY RD	FAYETTEVILLE	OFF BURGAW DRIVE	CAMDEN ROAD & ORION DRIVE - 1 MI EAST OF HOPE MILLS ROAD	85	11.4	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
5026017	ST JUDE BAPTIST CHURCH	3600 ACORDIA LN	HOPE MILLS	BESIDE CHURCH NEAR PARKING AREA	END OF ACORDIA LN OFF LEGION RD	91	11.2	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326342	TANGLEWOOD ESTATES S/D	HWY 301	FAYETTEVILLE	BACK OF DEVELOPMENT	HWY 301 PAST INTERSECTION WITH AIRPORT RD	75	11.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326342	TANGLEWOOD ESTATES S/D	HWY 301	FAYETTEVILLE	FRONT OF DEVELOPMENT IN MH SALES LOT	HWY 301 PAST INTERSECTION WITH AIRPORT RD	120	11.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326796	NC PRODUCTS OF FAYETTEVILLE	3960 CEDAR CREEK ROAD	FAYETTEVILLE	BACK OF SITE/ NORTH SIDE	NC 53 0.3 MI S OIW NC210 R	74	10.2	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5326406	HERITAGE BIBLE FELLOWSHIP	4519 CALICO ST	HOPE MILLS	NORTH EAST CORNER OF LOT	ON CALICO ROAD 1/2 MILE OFF CAMDEN ROAD	-	9.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326776	THE ARC OF HOPE MILLS	4124 PEACAN DRIVE	HOPE MILLS	AT REAR OF REST HOME	ON CAMERON RD APPX 1/2 MILE FROM HOPE MILL CITY LIMITS	200	9.8	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326302	LAZY ACRES CAMPGROUND	821 LAZY ACRES STREET	FAYETTEVILLE	BEHIND OFFICE	821 LAZY ACRES ST - OFF SR-2341 .3MI OIW SR-2219	69	9.7	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326701	VFW POST 670	3928 DOC BENNET	FAYETTEVILLE RD	REAR OF VFW LOT SE CORNER	2MI NO OIW NC 87 AND DOC BENNETTE RD NEAR AIRPORT	65	9.7	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326570	MT CALVARY MISSIONARY BAPTIST	3398 DOC BENNETT RD	FAYETTEVILLE	IN FRONT OF CHURCH	ON DOC BENNETT RD APPROX .1MI W OIW I-95 SOUTH -	-	9.4	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326516	SHORT STOP #63	-	FAYETTEVILLE	AT REAR OT STORE	HWY 53 IOW TABOR CHURCH RD	-	9.1	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326538	CEDAR CREEK BAPTIST CHURCH	4170 TABOR CHURCH ROAD	FAYETTEVILLE	NEXT TO BALL FIELD @OLD WELL	ON SR 2033 JUST OFF NC 53 INTER WITH THE CONVIENCE STORE - 4170 TABOR CHURCH RD	455	9.0	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5326413	FED EX FREIGHT	-	HOPE MILLS	S OF BLDG NEXT TO FENCE	ON SERVICE RD OFF NC 301S SO OF HOPE MILLS EXIT NC 301	-	8.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326864	GREATER FIRST BAPTIST CHURCH	3398 MCKINNON RD	FAYETTEVILLE	E OF CH NEXT TO DRIVEWAY	OFF MCKINNIN RD 1/2 MILE FROM INTER WNC53 CEDAR CK COMM	-	8.8	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5026028	NEW VISION CHRISTIAN CHURCH	6111 MCDONALD RD	PARKTON	IN FORNT OF CHURCH	ON MCDONALD RD, APPX 1 MILE W ON US 301	-	8.7	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326865	GREGORY POOLE EQUIPMENT CO	5663 US 301 S	HOPE MILLS	-	1 MILE S OIW US 301 & CHICKEN FOOT ROAD	78	8.7	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0378030	SAINT PAULS, TOWN OF	110 WEST MCLEAN ST	ST PAULS	ODOM RD	WATER TREATMENT PLANT	321	8.6	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326687	UNION OAK AME ZION CHURCH	6142 HIGHWAY 301 SOUTH	HOPE MILLS	SOUTH OF CHURCH NEXT TO FIELD	NEAR CO LINE ON NC 301	-	8.5	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0378030	SAINT PAULS, TOWN OF	110 WEST MCLEAN ST	ST PAULS		WATER TREATMENT PLANT	142	8.4	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0309040	TAR HEEL WATER CORP	-	TAR HEEL	SR 2354 MAIN ST-0.2 M S OF ARMFIELD	OFF HWY 87 IN TARHEEL	135	8.3	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.

TABLE 5-1
PUBLIC/ COMMUNITY WATER SUPPLY WELLS
Chemours Fayetteville Works, North Carolina

PWS ID	Location Name	Address	City	Location Description 1	Location Description 2	Depth (feet)	Distance from Site (miles)	Usage
0378030	SAINT PAULS, TOWN OF	110 WEST MCLEAN ST	ST PAULS	CLARK ST	WATER TREATMENT PLANT	340	8.1	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326503	MT PISGAH BAPTIST CHURCH	3350 BUTLER NURSERY RD	FAYETTEVILLE	IN FRONT OF CHURCH IN OLD BRICK PUMP HOUSE.	3350 BUTLER NURSERY RD, NC 87S OF FAYETTEVILLE OVER RIVER RD TO RT FROM F-VILLE NC	-	7.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5078003	MARSHLACK MHP #1	-	PARKTON	AT THE END OF SOUTHERN COMFORT DR	AT SOUTHERN COMFORT AIR RANCH LITTLE MARSH RD OFF HWY 301 SOUTH. ROBESON/CUMBERLAND CO LINE	100	7.8	(State Def) 2+ systems that are adjacent, owned or operated by same supplier of water, and together serve 15+ connections or 25+ people.
5078004	MARSHLACK MHP #2	ROBESON CUMBERLAND AND CO LINE	PARKTON	AT THE END OF SOUTHERN COMFORT DR	AT SOUTHERN COMFORT AIR RANCH LITTLE MARSH RD OFF HWY 301 SOUTH SOUTH SLIGHTLY NORTH WEST OF PROPERT	100	7.8	(State Def) 2+ systems that are adjacent, owned or operated by same supplier of water, and together serve 15+ connections or 25+ people.
0309040	TAR HEEL WATER CORP	-	TAR HEEL	HWY 87 JUST NORTH OF SCHOOL	OFF HWY 87 IN TARHEEL	115	7.5	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326572	BAPTIST UNION MISSIONARY BAPTIST CHURCH	1483 SAND HILL RD	HOPE MILLS	REAR OF CHURCH IN BRICK WELLHOUSE	ON SR2238 SANDHILL RD APPX .5MI E OIW SR2239 SANDHILL RD	60	7.3	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0309523	CAPE FEAR SCOUT RESERVATION	13165 HWY 53 WEST	WHITE OAK	BEHIND RANGERS HOME	ON NC 53 APPROX 2 MILE N OF WHITE OAK	98	7.3	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	EAST OF PLANT	HWY 87 N OF TAR HEEL 1 M	410	7.1	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	AT REAR OF LAGOON BETWEEN W01 AND WO2	HWY 87 N OF TAR HEEL 1 M	400	7.0	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	SO OF PLANT BELOW LAGOON	HWY 87 N OF TAR HEEL 1 M	409	6.8	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	IN FRONT OF PLANT NEAR HWY 87	HWY 87 N OF TAR HEEL 1 M	-	6.8	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0326167	GRAY`S CREEK MHP	-	FAYETTEVILLE	BEHIND PUMMILL RESIDENCE	87 SOUTH 1MILE FROM SR 2238	70	6.5	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326167	GRAY`S CREEK MHP	-	FAYETTEVILLE	AT FRONT BESIDE PRESSURE TANK	87 SOUTH 1MILE FROM SR 2238	63	6.5	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326737	SHERWOOD PRESBYTERIAN CHURCH	4857 NC HWY 87 SOUTH	FAYETTEVILLE	FRONT OF CHURCH	NC87 0.3 MI S - SR2220 L - 4857 NC 87 S	-	6.4	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	BEHIND TRUCK SCALES, N SIDE OF PLANT	HWY 87 N OF TAR HEEL 1 M	410	6.4	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0378055	ROBESON COUNTY WATER SYSTEM	265 MCGIRT RD	MAXTON	HWY 20 0.5MI E OIW SR 1907	SR1308 OFF HWY 71 AT CAMPBELL SOUP PLANT	170	6.3	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	BEHIND CAROLINA COLD STORAGE ABOUT 300 FT W OF OLD W5A	HWY 87 N OF TAR HEEL 1 M	405	6.1	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0326445	TABOR UNITED METHODIST CHURCH	6112 TABOR CHURCH ROAD	FAYETTEVILLE	FRONT OF CHURCH, TOWARDS ROAD; BELOW GRADE	SR 2023 0.1 MI S OIW SR 2229	-	6.0	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326853	FIRST UNITED BAPT CH GRAYS CK	2002 CHICKEN FOOT RD	HOPE MILLS	FRONT LEFT OF CHURCH	HWY 59 1.5MI EAST OIW 301 SO ON RIGHT	-	6.0	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0309060	BLADEN CO WTR DIST-EAST BLADEN	-	WHITE LAKE	HWY 53 AT SR 1327	US 701 NTH SR 1796 OFFICE-AGRICULTURE RD ELIZTOWN	245	6.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	WEST SIDE OF HWY 87 N OF PLANT	HWY 87 N OF TAR HEEL 1 M	380	5.7	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0326973	MJ TAYLOR CATERING & PARADISE	1965 JOHN MCMILLIAN RD	HOPE MILLS	BEHIND HOME OFFICE @DRIVEWAY, IN OLD PASTURE AREA	3 MILES FROM I-95S JUST OFF CHICKEN FOOT RD ON SR 2242 JOHN MCMILLIAN RD	90	5.6	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5009012	BLADEN BLUFFS WATER SYSTEM	17014 HWY 87	TAR HEEL	INSIDE THE PERIMETER WHERE PLANT IS LOCATED	HWY 87S TO TAR HEEL. THE PLANT IS ON THE OPPOSITE SIDE OF SMITHFIELD PLANT	-	5.5	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0309527	SMITHFIELD FARMLAND CORP-TAR HEEL DIV	15855 NC 87 W - 9307	TAR HEEL	EAST SIDE OF HWY 87 NORTH OF PLANT	HWY 87 N OF TAR HEEL 1 M	410	5.5	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0326682	SAVANNAH BAPTIST CHURCH	-	FAYETTEVILLE	FRONT OF CHURCH NEXT TO OLD WELL	SR2023 1.3MIL S OIW SR2230 L	-	5.1	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326536	GRAYS CREEK BAPTIST CHURCH	4750 GRAYS CREEK CHURCH RD	HOPE MILLS	FRONT OF CHURCH, NEXT TO PARKING AREA	NC HWY 875, LEFT ON BLOSSOM RD, RIGHT ON GRAYS CREEK CHURCH RD.	-	4.8	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326733	CUMBERLAND UNION BAPTIST CH	6957 TABOR CHURCH RD	FAYETTEVILLE	FRONT OF CH BELOW GROUND	SR2023 0.1 MI S OIW SR2228 L - 7096 TABOR CHURCH RD	-	4.7	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0378055	ROBESON COUNTY WATER SYSTEM	265 MCGIRT RD	MAXTON	4379NC20HWY(ACROSS FOR ROCCO)	SR1308 OFF HWY 71 AT CAMPBELL SOUP PLANT	146	4.4	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0378055	ROBESON COUNTY WATER SYSTEM	265 MCGIRT RD	MAXTON	HWY 20 BY RAILROAD TRACK	SR1308 OFF HWY 71 AT CAMPBELL SOUP PLANT	113	4.2	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.

TABLE 5-1
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Chemours Fayetteville Works, North Carolina

PWS ID	Location Name	Address	City	Location Description 1	Location Description 2	Depth (feet)	Distance from Site (miles)	Usage
5026008	GRAY`S CREEK CHURCH OF GOD	4018 CHICKEN FOOT ROAD	ST. PAULS	NORTH SIDE OF CHURCH	CHICKEN FOOT RD, APPX 5 MILES S. OF HOPE MILLS	-	4.1	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0378055	ROBESON COUNTY WATER SYSTEM	265 MCGIRT RD	MAXTON	NC 20 PECAN ORCHARD	SR1308 OFF HWY 71 AT CAMPBELL SOUP PLANT	106	4.1	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326860	SHORT TRIP	3634 CHICKENFOOT RD	HOPE MILLS	NEAR OLD WELL #2, BEHIND PINE TREES	ON CHICKEN FOOT ROAD	39	4.1	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326810	ALDERMAN ROAD ELEMENTARY	2860 ALDERMAN RD	FAYETTEVILLE	WEST SIDE OF SCHOOL	BETWEEN NC87 & SCHOOL RD	80	4.0	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
0378055	ROBESON COUNTY WATER SYSTEM	265 MCGIRT RD	MAXTON	NC 20 HAYFIELD	SR1308 OFF HWY 71 AT CAMPBELL SOUP PLANT	110	4.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
0326627	GRAYS CREEK ELEM SCHOOL	GRAY`S CREEK SCHOOL ROAD	HOPE MILLS	RIGHT OF BLDG	2964 SCHOOL RD	84	4.0	Serves at least 25 of the same persons 6+ months per year. ex. schools, daycares, industries.
5009010	MURPHY-BROWN SANITATION-TARHEEL	1023 PURDE HALL RD	TAR HEEL	BEHIND HYDRO TANK HOUSE	OFF PURDE HALL RD S OF IO NC 20 AND PURDE HALL	-	3.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
5009010	MURPHY-BROWN SANITATION-TARHEEL	1023 PURDE HALL RD	TAR HEEL	NORTH OF WELL HOUSE EDGE OF SITE	OFF PURDE HALL RD S OF IO NC 20 AND PURDE HALL	-	3.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326974	THE CREEK BAR & GRILL	4351 CHICKENFOOT RD	ST PAULS	REAR OF RESTAURANT NW CORNER	6.6 MILES OFF I95 ON SR 2252 CHICKEN FOOT RD - 4351 CHICKENFOOT RD	-	3.9	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326571	MARVIN UNITED METHODIST CHURCH	6740 NC 87 SOUTH	FAYETTEVILLE	E OF CHURCH NEXT TO DRIVEWAY TOWARDS HIGHWAY	INTER OF NC 87 AND SR 1500 NEAR BALDEN CO. LINE	-	3.6	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0309055	BLADEN CO WTR DIST-WEST BLADEN	-272 SMITH CIRCLE	ELIZABETHTOWN	SR 1300 1 MI NORTH NORTH OIW HWY 20	WESTERN PART OF BLADEN CO	98	3.0	Serves 15+ connections or regularly serves 25+ year-round residents. ex. cities, towns, subdivisions.
5026014	CHARITY BAPTIST CHURCH	5923 SHILOAH CHURCH DRIVE	FAYETTEVILLE	IN FRONT OF CHURCH	JUST OFF NC 87 SOUTH OF FAYETTEVILLE SHILOAH CH DR	60	2.5	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326569	MT VERNON BAPTIST CHURCH	3184 COUNTY LINE RD	FAYETTEVILLE	FRONT OF CHURCH	ON CO. LINE ROAD APPX 3 MILES FROM CHICKENFOOT ROAD - 3184 COUNTY LINE RD	-	2.2	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.
0326735	WILLIS CREEK AME ZION CHURCH	-	FAYETTEVILLE	WITHIN 3' OF WELL #1	NC 87 SOUTH 4MI. OIW SR 2232	-	1.8	Serves 25+ people at least 60 days per year. ex. restaurants, churches, DOT rest areas.

Notes
1. Information provided by North Carolina Corporate Geographic Database, retrieved from NC OneMap on September 24, 2019.
2. Wells listed here correspond to public supply wells identified in Figure 5-1.
'-' - No data available

TABLE 6-1
SUMMARY OF FINDINGS OF GEOLOGIC MAPPING STUDY
Chemours Fayetteville Works, North Carolina

Map ID	Station ID	Latitude	Longitude	Estimated Elevation (ft NAVD 88)	Unit	Outcrop Type	Thickness (ft)	Major Lithology	Minor Lithology	Strike	Dip	Type	Notes
1	1.1*	34.85156	-78.82931	77	Black Creek Confining Unit	Ledge	4	gray/black clay	lignite chips	320	4	Bedding	Ledge of dark gray, moderately plastic clay with lignite chips. No other outcrops were observed downstream.
	1.2*									219	56	Joint	
2	2.1*	34.85152	-78.82936	77	Black Creek Confining Unit	Ledge	3	gray/black clay	NA	50	7	Bedding	Ledge of fat gray clay with local orange discoloration and trace mica. Bedding is locally massive. Contact of sand observed above clay across creek.
	2.2*									50	21	Bedding	
	2.3*									49	24	Bedding	
3	3.1*	34.85151	-78.82937	76	Black Creek Confining Unit	Ledge w/ Waterfall	7	gray/black clay	NA	24	10	Bedding	Ledge/waterfall outcrop of tan, thinly bedded sand observed above dark gray clay. Local surficial weathering.
	3.2*									25	11	Bedding	
	3.3*									128	71	Joint	
4	4.1	34.84989	-78.82850	86	Surficial Aquifer	Bench	1	gray blue sandstone	NA	351	20	Bedding	Bench of quartz-rich, poorly graded, angular clasts, medium- to coarse-grained sand.
5	5.1	34.85442	-78.84142	65	Black Creek Confining Unit	Creek bed	1	gray/black clay	NA	NM	NM	NM	Dark gray, massive clay in creek bed.
6	6.1	34.85444	-78.84168	73	Black Creek Confining Unit	Creek bed	1	gray/black clay	NA	NM	NM	NM	Dark gray, massive clay in creek bed.
7	7.1	34.85437	-78.84213	73	Black Creek Confining Unit	Tree Root Ball	~10	gray/black clay	NA	NM	NM	NM	Outcrop inaccessible but appears to be dark gray, massive clay in creek bed.
8.1	8.1	34.85494	-78.83748	59	Black Creek Confining Unit	Creek bed	1	gray/black clay	NA	NM	NM	NM	Dark gray, massive clay in creek bed.
8.2	8.2	34.85515	-78.83779	55	Black Creek Confining Unit	Creek bed		gray/black clay	NA	NM	NM	NM	Dark gray, massive clay in creek bed.
9	9.1	34.83764	-78.83535	120	Perched Aquifer	Stream Cut Wall	1	sand	clay	81	7	Bedding	Reddish tan, fine- to medium-grained sand with 1 foot thick interbedded dark gray clay layer.
10	10.1	34.83678	-78.83484	105	Perched Clay	Stream Cut Wall	4	clay	NA	52	5	Bedding	Dark gray, thinly bedded clay with trace mica. First clay exposure since last station.
11	11.1	34.83559	-78.83350	90	Perched Clay	Stream Cut Wall	1.5	clay	NA	42	7	Bedding	Light gray (top 6 inches) and dark gray, fat clay. Lithology is similar to station 10.1 and 11.1.

TABLE 6-1
SUMMARY OF FINDINGS OF GEOLOGIC MAPPING STUDY
Chemours Fayetteville Works, North Carolina

Map ID	Station ID	Latitude	Longitude	Estimated Elevation (ft NAVD 88)	Unit	Outcrop Type	Thickness (ft)	Major Lithology	Minor Lithology	Strike	Dip	Type	Notes
12	12.1	34.83540	-78.83321	89	Perched Clay	Stream Cut Wall	3.25	clay	NA	8	8	Bedding	Light gray (top 6 inches) and dark gray, fat clay. Lithology is similar to station 10.1.
13	13.1	34.83465	-78.83266	98	Surficial Aquifer	Stream Cut Wall	6.5	silty clay	NA	0	0	Bedding	Dark gray clay with silt component. Top 6 inches of outcrop is highly oxidized. Burrows observed.
14	14.1**	34.83402	-78.83176	78	Surficial Aquifer	Stream Cut Wall	5	organic rich silt	NA	0	0	Bedding	Dark black, lignite-rich silt with trace clay.
	14.2**						1.5	claystone	NA	NM	NM	NM	Interlayered dark and light gray clay. Station was observed across stream from station 14.1, approximately 15 to 20 feet below elevation of 14.1.
15	15.1	34.83339	-78.83075	77	Surficial Aquifer	Stream Cut Wall	4	sand	clay	NM	NM	NM	White, poorly graded sand with cm- to mm-scale interlayers of black clay.
16	16.1	34.83320	-78.83058	81	Black Creek Confining Unit	Stream Cut Wall	7	clay	sand	19	7	Bedding	Fat dark gray clay with mm- to cm-scale interlayers of sand. First large exposure of clay since 12.1 and 13.1. Appears to begin approximately 30 feet upstream of this station.
17	17.1*	34.83308	-78.83014	82	Black Creek Confining Unit	Stream Cut Wall	17	clay	NA	0	0	Bedding	Dark gray, thinly bedded to massive clay with local oxidized surficial staining.
	17.2*									7	85	Joint	
18	18.1	34.83301	-78.82951	81	Black Creek Confining Unit	Stream Cut Wall	10	clay	NA	0	0	Bedding	Light and dark gray, thinly bedded clay with local surficial staining.
19	19.1	34.83316	-78.82911	81	Black Creek Confining Unit	Stream Cut Wall	2	clay	NA	0	0	Bedding	Dark gray, thinly bedded clay.
20	20.1	34.83264	-78.82603	67	Black Creek Confining Unit	Stream Cut Wall		gray clay	NA	NM	NM	NM	Unable to access outcrop but appears to be dark gray, fat clay.
21	21.1	34.83292	-78.82626	69	Black Creek Confining Unit	Stream Cut Wall		light gray clay	NA	0	0	Bedding	Gray, fat clay and interbedded sand with trace mica and lignite chips. Pieces of petrified wood observed upstream.
22	22.1	34.83335	-78.82749	73	Black Creek Confining Unit	Stream Cut Wall		light gray clay	NA	0	0	Bedding	Light gray clay and interbedded fine-grained, angular sand with abundant lignite chips.
23	23.1*	34.83355	-78.82854	73	Black Creek Confining Unit	Stream Cut Wall	15-20	light to dark gray clay	NA	0	0	Bedding	Light to dark gray clay. Appears to be continuous from station 23.1. Multiple joint sets observed that show surficial weathering and horizontal bedding.
	23.2*									37	82	Joint	
	23.3*									320	89	Joint	

TABLE 6-1
SUMMARY OF FINDINGS OF GEOLOGIC MAPPING STUDY
Chemours Fayetteville Works, North Carolina

Map ID	Station ID	Latitude	Longitude	Estimated Elevation (ft NAVD 88)	Unit	Outcrop Type	Thickness (ft)	Major Lithology	Minor Lithology	Strike	Dip	Type	Notes
24	24.1	34.83299	-78.82963	82	Black Creek Confining Unit	Stream Cut Wall		dark gray clay	NA	0	0	Bedding	Dark clay and interbedded fine-grained sand.
25	25.1	34.83689	-78.82464	61	Black Creek Confining Unit	NR	2	clay	NA	239	11	Bedding	Dark gray, thinly bedded clay. Identified as Seep D-D1 in Seep Investigation.
26	26.1	34.84158	-78.82854	99	Perched Clay	Waterfall	2	clay	NA	210	10	Bedding	Dark gray with orange surficial staining, thinly bedded to massive clay. First observed outcrop of clay in seep B.
27	27.1	34.84175	-78.82720	81	Black Creek Confining Unit	Ledge	2.5	clay	NA	NM	NM	NM	Gray, massive, fat clay. Large petrified boulder observed.
28	28.1*	34.84184	-78.82665	75	Black Creek Confining Unit	Waterfall	10	clay	NA	238	19	Bedding	Waterfall outcrop of dark gray, thinly bedded clay and interbedded fine-grained sand.
	28.2*									115	23	Bedding	
	28.3*									265	87	Joint	
29	29.1	34.84415	-78.82675	67	Black Creek Confining Unit	NR	2	clay	NA	224	9	Bedding	Dark gray, massive, lean clay, with iron-oxide surficial staining and small 1cm-scale interbedded sand laminations. First exposure observed on seep A. Seep A-6, A-1
30	30.1	34.84442	-78.82971	147	Perched Aquifer	NR		unconsolidated sand	clay	NM	NM	NM	Tan brown, fine- to medium-grained, unconsolidated sand. Identified as Seep A-7-B1 in Seep Investigation.
31	31.1	34.84424	-78.82683	68	Black Creek Confining Unit	NR	1		NA	0	0	Bedding	Dark gray clay with horizontal bedding. Identified as Seep A8 in Seep Investigation.
32	32.1	34.84505	-78.82794	99	Surficial Aquifer	NR	1	clayey sand	NA	NM	NM	NM	Red-brown, massive clayey sand with nodules of claystone and siltstone in dry creek bed.
33	33.1	34.84519	-78.82806	103	Surficial Aquifer	NR	4	sand	NA	NM	NM	NM	Red-brown, moist, fine- to coarse-grained sand with gravel sized quartz grains. Identified as Seep A-10.
34	34.1	34.84543	-78.82876	125	Perched Clay	NR	2-3	clay	NA	87	8	Bedding	Red-brown and orange, moist clay with interlayers of medium-grained sand.
35	35.1	34.84575	-78.82959	136	Perched Clay	NR	1	clay	sand	269	8		Reddish gray, clay overlying orange, medium- to coarse grained, hematite-rich sand and interbedded clay.
36	36.1	34.84860	-78.82790	62	Black Creek Confining Unit	NR	4	petrified wood	NA	NM	NM	NM	4 foot in diameter, petrified tree trunk and dark red to gray, massive fat clay. Identified as Seep A-5.

TABLE 6-1
SUMMARY OF FINDINGS OF GEOLOGIC MAPPING STUDY
Chemours Fayetteville Works, North Carolina

Map ID	Station ID	Latitude	Longitude	Estimated Elevation (ft NAVD 88)	Unit	Outcrop Type	Thickness (ft)	Major Lithology	Minor Lithology	Strike	Dip	Type	Notes
37	37.1	34.84860	-78.82799	65	Black Creek Confining Unit	NR	0.5	clay	NA	NM	NM	NM	Dark red to gray, massive, fat clay.
38	38.1	32.84858	-78.82819	72	Black Creek Confining Unit	NR	6-7	clay	NA	NM	NM	NM	Dark to light gray, intricately layer/interbedded clay and fine- to medium-grained sand.
39	39.1	34.85524	-78.83652	53	Black Creek Confining Unit	NR	10	clay	NA	352	46	Joint	Light to dark gray clay with cm-scale, fine-grained sand lenses throughout with local lignite layers. Outcrop is approximately 100 feet in length.
40	40.1	34.85582	-78.83624	54	Black Creek Confining Unit	NR	3.5	clay	NA	0	0	Bedding	Light to dark gray clay with cm-scale, fine-grained sand lenses throughout with local lignite layers. Outcrop is approximately 70 feet in length.
41	41.1	34.85572	-78.83624	53	Black Creek Confining Unit	NR	10	clay	NA	0	0		Light to dark gray clay with cm-scale, fine-grained sand lenses throughout with local lignite layers. Outcrop is approximately 50 feet in length.

Notes:
1. * indicates multiple station ID's at the same outcrop.
2. ** indicates station locations at different outcrops but within the same vicinity.
3. Latitude and longitude were measured by Parson's field staff using Arc Collector in conjuction with the Garmin Glow GPS.
4. Elevations were estimated from 2018 USGS topographic map.
5. ft above MSL - feet above mean sea level.
6. Strikes and dips were measured using a Brunton compass.
7. Seep ID's are referenced from Geosyntec 2019, *Seeps and Creeks Investigation Report.* Chemours Fayetteville Works. 26 August 2019.
8. Soil classification are based off of Unified Soil Classification System

ft - feet
NAVD 88 - North American Vertical Datum of 1988
NA - not applicable
NM - not measured
NR - not recorded

TABLE 6-2
BLACK CREEK AQUIFER HPT/EC AND SITE BORING LOCATIONS
Chemours Fayetteville Works, North Carolina

Location	Northing (ft NAD83)	Easting (ft NAD83)	Ground Surface Elevation (ft NAVD88)	Total depth (ft bgs)	Location notes
HP-1	400,542.77	2,051,769.54	53	45	co-located with PIW-1 soil boring
HP-2	399,790.41	2,050,646.37	142	62	co-located with BCA-01
HP-3	399,855.35	2,052,002.66	51	36	
HP-4	399,557.56	2,052,156.19	49	33	co-located with LTW-01
HP-5	399,072.61	2,052,255.15	49	41	
HP-6	398,840.96	2,052,354.26	48	47	co-located with LTW-02
HP-7	398,622.53	2,051,900.10	76	13.5	
HP-8	398,122.18	2,052,551.75	49	39	co-located with LTW-03, PIW-6 soil boring
HP-9	397,291.74	2,052,580.52	48	47	co-located with LTW-04
HP-10	396,797.17	2,052,590.10	45	44	co-located with PIW-7 soil boring
HP-11	396,461.16	2,052,738.02	48	48	co-located with LTW-05
HP-12	396,160.77	2,052,239.55	77	55	co-located with PIW-9D
HP-13	395,108.74	2,052,293.91	74	52	co-located with PIW-10 soil boring
HP-14	397,002.02	2,052,566.93	46	45	
HP-15	396,640.14	2,052,695.99	45	48	
HP-16	395,745.63	2,052,301.19	70	50	
HP-17	398,518.90	2,051,952.48	72	38	co-located with PIW-5S and PW-10
HP-18	398,293.08	2,052,261.92	46	44	
HP-19	397,889.29	2,052,569.27	50	47	
HP-20	398,154.53	2,052,324.27	47	45	
HP-21	398,820.85	2,052,095.97	48	46	
HP-22	398,965.01	2,052,327.94	50	37	
HP-23	399,254.49	2,052,205.62	50	35	
HP-24	399,707.38	2,052,092.32	50	32	co-located with PIW-3 soil boring
HP-25	400,010.14	2,051,444.05	90	44	
HP-26	400,478.43	2,051,814.36	55	44	
HP-27	399,929.02	2,051,252.78	92	44	co-located with PIW-2 soil boring
HP-28	399,842.95	2,050,933.40	118	42	
HP-29	395,470.22	2,052,350.89	70	45	
HP-30	395,945.14	2,052,345.55	69	43	
HP-32	396,411.92	2,052,674.49	44	45	co-located with PIW-8 soil boring
PIW-1 Soil Boring	400,540.61	2,051,792.59	50.78	42.5	
PIW-2 Soil Boring	399,922.75	2,051,317.64	98.16	79	
PIW-3 Soil Boring	399,711.75	2,052,088.80	50.51	30	
PIW-4 Soil Boring	398,817.36	2,052,102.82	50.37	40	
PIW-5 Soil Boring	398,520.38	2,051,951.26	72.68	45	
PIW-6 Soil Boring	398,118.14	2,052,540.57	49.85	40	
PIW-7 Soil Boring	396,787.00	2,052,589.49	45.81	50	
PIW-8 Soil Boring	396,403.38	2,052,682.02	45.92	40	
PIW-9 Soil Boring	396,148.11	2,052,251.10	76.80	49	
PIW-10 Soil Boring	395,104.67	2,052,297.04	73.32	59	

Notes:

1. Locations for HPT borings (HP-1 through HP-32) were not surveyed and are approximate. PIW-soil boring locations reported correspond to surveyed co-ordinates for a shallow well location where a shallow and a deep well were co-located. PIW-well locations are provided in Table 5.
2. Ground surface elevations for HPT borings are estimated from LIDAR ground surface elevations. LIDAR ground surface elevation from 20-Foot DEM Elevation Service collected by NC Floodplain Mapping Program and processed by NC DOT - GIS Unit.Service URL:https://services.nconemap.gov/secure/rest/services/Elevation/DEM20ft_DEM/ImageServer last accessed 6-19-2019 23:24
3. Ground surface elevations for PIW-soil borings correspond to surveyed co-ordinates for a shallow well location where a shallow and a deep well were co-located. PIW-well ground surface elevations are provided in Table 6-3.
4. LIDAR estimated ground surface elevations underestimate surveyed ground surface elevations by 0.4 - 1.0 feet.

ft bgs - feet below ground surface
ft - feet
NAD 83 - North America Datum 1983
NAVD 88 - North American Vertical Datum of 1988

TABLE 6-3
WELL CONSTRUCTION DETAILS
Chemours Fayetteville Works, North Carolina

Area	Well ID	Northing (ft, NAD83)	Easting (ft, NAD83)	Installation Date	Casing Construction	Casing Diameter (in)	Well Casing Depth (ft)	Screened Interval (ft)	Filter Pack Interval (ft)	Bentonite Seal Interval (ft)	Grout Interval (ft)	Ground Elevation (ft NAVD88)	TOC Elevation (ft NAVD88)	Aquifer	Sampled Between Jun 1, 2019 and Sept. 20, 2019?
Onsite	BCA-01	399,780.06	2,050,662.22	11/20/2017	PVC	2	101.0	91 to 101	88 to 101	83 to 88	0 to 83	143.26	146.3	Black Creek Aquifer	Yes
Onsite	BCA-02	396,242.32	2,051,062.21	11/16/2017	PVC	2	102.0	92 to 102	89 to 102	84 to 89	0 to 84	145.20	148.42	Black Creek Aquifer	Yes
Onsite	BCA-03R	398,582.23	2,049,522.22	11/7/2018	PVC	2	98.0	88 to 98	85.1 to 98	98to 108/82.5to85.1	0 to 82.5	148.15	150.82	Black Creek Aquifer	Yes
Onsite	BCA-04	395,877.67	2,047,823.11	11/28/2017	PVC	2	104.0	94 to 104	91 to 104	84 to 91	0 to 84	147.07	150.24	Black Creek Aquifer	Yes
Onsite	FTA-01	397,907.50	2,049,373.61	11/14/2002	PVC	2	22.0	12.0-22.0	10.0-22.0	8.0-10.0	0.0-8.0	147.20	150.63	Perched Zone	Yes
Onsite	FTA-02	397,786.43	2,049,206.27	11/13/2002	PVC	2	12.0-22.0	11.5-21.5	9.5-21.5	7.5-21.5	0.0-7.5	NM	150.28	Perched Zone	Yes
Onsite	FTA-03	397,767.09	2,049,313.86	11/13/2002	PVC	2	22.0	12.0-22.0	10.0-22.0	8.0-10.0	0.0-8.0	147.58	151.08	Perched Zone	Yes
Onsite	INSITU-01	401,658.20	2,046,077.31	12/13/2005	PVC	3/4	17.0	7.0-17.0	7.0-17.0	NA	0.0-7.0	115.99	118.2	Surficial Aquifer	Yes
Onsite	INSITU-02	401,863.46	2,049,136.62	12/13/2005	PVC	3/4	17.0	7.0-17.0	7.0-17.0	NA	0.0-7.0	110.71	113.12	Surficial Aquifer	--
Onsite	LTW-01	399,566.17	2,052,149.95	1/16/2006	PVC	2	26.0	11.0-26.0	9.0-26.0	6.0-9.0	0.0-6.0	51.22	53.83	Floodplain Deposits	Yes
Onsite	LTW-02	398,848.36	2,052,354.37	1/16/2006	PVC	2	38.0	28.0-38.0	25.8-38.0	23.5-25.8	0.0-23.5	50.03	52.48	Black Creek Aquifer	Yes
Onsite	LTW-03	398,115.15	2,052,557.52	1/5/2006	PVC	2	30.0	15.0-30.0	13.0-30.0	11.0-13.0	0.0-11.0	50.33	52.91	Floodplain Deposits	Yes
Onsite	LTW-04	397,280.24	2,052,583.60	12/22/2005	PVC	2	27.0	12.0-27.0	9.5-27.0	7.5-9.5	0.0-7.5	49.34	51.86	Floodplain Deposits	Yes
Onsite	LTW-05	396,430.68	2,052,738.06	12/21/2005	PVC	2	44.0	29.0-44.0	27.0-44.0	25.0-27.0	0.0-25.0	49.29	52.01	Black Creek Aquifer	Yes
Onsite	MW-1S	397,080.31	2,049,120.73	2/28/1972	Stainless Steel	4	32.3	21.0-24.0	NA	NA	NA	149.13	149.93	Perched Zone	Yes
Onsite	MW-2S	396,934.75	2,049,321.85	2/30/72	Stainless Steel	4	29.3	19.0-23.0	NA	NA	NA	149.70	149.91	Perched Zone	Yes
Onsite	MW-7S	397,444.52	2,049,809.73	7/21/1983	Stainless Steel	2	15.6	NA	NA	NA	NA	NM	147.47	Perched Zone	Yes
Onsite	MW-8S	397,096.48	2,049,867.77	7/23/1983	Stainless Steel	2	14.9	NA	NA	NA	NA	NM	146.48	Perched Zone	--
Onsite	MW-9S	396,760.16	2,049,734.30	11/3/1983	PVC	2	22.5	17.5-22.5	15.0-22.5	14.0-15.0	0.0-14.0	151.77	154.39	Perched Zone	Yes
Onsite	MW-11	396,544.40	2,049,051.06	5/31/2005	PVC	2	21.5	11.5-21.5	9.3-21.5	7.3-9.3	0.0-7.3	145.44	148.53	Perched Zone	--
Onsite	MW-12S	397,253.60	2,049,273.89	11/1/1983	PVC	2	22.5	17.5-22.5	15.5-22.5	14.5-15.5	0.0-14.5	149.89	152.06	Perched Zone	Yes
Onsite	MW-13D	397,119.02	2,049,821.12	3/20/2013	PVC	2	67.0	57 to 67	54 to 67	50 to 54	0 to 50	145.77	148.65	Surficial Aquifer	Yes
Onsite	MW-14D	396,974.49	2,049,074.56	3/21/2013	PVC	2	72.0	62 to 72	60 to 72	53.5 to 60	0 to 53.5	146.48	149.73	Surficial Aquifer	Yes
Onsite	MW-15DRR	398,580.71	2,049,511.75	11/8/2018	PVC	2	62.5	52.5 to 62.5	49 to 62.5	44 to 49	0 to 44	148.05	150.92	Surficial Aquifer	Yes
Onsite	MW-16D	398,493.70	2,048,402.84	4/2/2013	PVC	2	82.0	72 to 82	69 to 82	82 to 87 / 65 to 69	0 to 65	145.84	148.41	Surficial Aquifer	Yes
Onsite	MW-17D	398,401.74	2,047,366.50	4/3/2013	PVC	2	67.0	57 to 67	54 to 70	70 to 77 / 51 to 54	0 to 51	145.80	146.117	Surficial Aquifer	Yes
Onsite	MW-18D	400,947.38	2,046,574.72	11/17/2017	PVC	2	60.0	50 to 60	47 to 60	40 to 47	0 to 40	104.81	107.57	Surficial Aquifer	Yes
Onsite	MW-19D	401,151.33	2,048,272.99	11/18/2017	PVC	2	56.0	46 to 56	43 to 56	38 to 43	0 to 38	136.30	139.55	Surficial Aquifer	Yes
Onsite	MW-20D	400,791.28	2,048,733.91	11/18/2017	PVC	2	75.0	65 to 75	62 to 73	58 to 62	0 to 58	133.97	137.18	Surficial Aquifer	Yes
Onsite	MW-21D	399,501.70	2,047,074.96	11/22/2017	PVC	2	82.0	72 to 82	68 to 82	62 to 68	0 to 62	148.05	151.384	Surficial Aquifer	Yes
Onsite	MW-22D	398,518.18	2,048,362.68	12/1/2017	PVC	6	72.0	52 to 72	49 to 72	43 to 49	0 to 49	146.57	149.06	Surficial Aquifer	Yes
Onsite	MW-23	396,237.61	2,051,063.25	7/26/2018	PVC	2	14.5	9.5 to 14.5	7.5 14.5	4 to 7.5	0 to 4	145.17	148.34	Perched Zone	Yes
Onsite	MW-24	397,303.94	2,048,767.69	7/26/2018	PVC	2	23.8	18.8 to 23.8	16 to 23.8	14 to 16	0 to 14	147.11	150.31	Perched Zone	Yes
Onsite	MW-25	396,753.37	2,050,989.82	10/23/2018	PVC	2	17.0	12 to 17	9 to 20	7 to 9	0 to 7	145.00	147.59	Perched Zone	Yes
Onsite	MW-26	396,265.18	2,051,484.67	10/22/2018	PVC	2	10.0	5 to 10	4 to 15	2 to 4	0 to 2	144.90	147.7	Perched Zone	--
Onsite	MW-27	396,010.33	2,051,472.00	10/22/2018	PVC	2	15.0	10 to 15	8 to 20	6 to 8	0 to 6	144.39	146.83	Perched Zone	Yes
Onsite	MW-28	395,719.79	2,051,165.93	10/22/2018	PVC	2	14.0	9 to 14	7 to 15	5 to 7	0 to 5	141.52	144.7	Perched Zone	Yes
Onsite	MW-30	397,340.79	2,050,776.09	10/23/2018	PVC	2	15.0	10 to 15	8 to 20	6 to 8	0 to 6	144.95	147.67	Perched Zone	Yes
Onsite	MW-31	396,390.50	2,049,622.88	4/17/2019	PVC	2	22.0	17-22	14-17	12-14	0-12	145.48	147.699	Perched Zone	Yes
Onsite	MW-32	396,359.58	2,049,651.79	4/16/2019	PVC	2	18.5	13-18.5	10-18.5	8-10	0-8	144.63	147.106	Perched Zone	Yes
Onsite	MW-33	396,337.51	2,049,678.56	4/16/2019	PVC	2	17.0	12-17	10-17	8-10	0-8	144.28	146.82	Perched Zone	Yes
Onsite	MW-34	396,352.90	2,049,619.09	4/17/2019	PVC	2	22.0	17-22	14-22	12-14	0-12	145.17	147.972	Perched Zone	Yes
Onsite	MW-35	396,332.94	2,049,631.16	4/16/2019	PVC	2	19.0	14-19	12-19	10-12	0-10	145.03	147.541	Perched Zone	Yes
Onsite	MW-36	396,320.09	2,049,651.17	4/16/2019	PVC	2	17.0	12-17	10-17	8-10	0-8	144.68	147.889	Perched Zone	Yes
Onsite	NAF-01	398,349.77	2,050,338.81	12/5/2002	PVC	2	15.0	5.0-15.0	4.0-15.0	2.0-4.0	0.0-2.0	146.61	149.66	Perched Zone	Yes
Onsite	NAF-02	398,662.80	2,050,640.86	12/4/2002	Stainless Steel	2	15.0	5.0-15.0	4.0-15.0	2.0-4.0	0.0-2.0	147.05	150.31	Perched Zone	Yes

TABLE 6-3
WELL CONSTRUCTION DETAILS
Chemours Fayetteville Works, North Carolina

Area	Well ID	Northing (ft, NAD83)	Easting (ft, NAD83)	Installation Date	Casing Construction	Casing Diameter (in)	Well Casing Depth (ft)	Screened Interval (ft)	Filter Pack Interval (ft)	Bentonite Seal Interval (ft)	Grout Interval (ft)	Ground Elevation (ft NAVD88)	TOC Elevation (ft NAVD88)	Aquifer	Sampled Between Jun 1, 2019 and Sept. 20, 2019?
Onsite	NAF-03	398,580.65	2,050,755.43	12/4/2002	Stainless Steel	2	15.0	5.0-15.0	4.0-15.0	2.0-4.0	0.0-2.0	147.38	150.44	Perched Zone	Yes
Onsite	NAF-04	398,447.00	2,050,718.95	12/4/2002	Stainless Steel	2	15.0	5.0-15.0	4.0-15.0	2.0-4.0	0.0-2.0	147.90	148.1	Perched Zone	Yes
Onsite	NAF-05A	398,641.22	2,051,024.85	10/10/2005	Stainless Steel	2	NA	NA	NA	NA	NA	NA	NA	Perched Zone	--
Onsite	NAF-05B	398,660.23	2,051,021.81	10/12/2005	Stainless Steel	2	NA	NA	NA	NA	NA	NA	NA	Surficial Aquifer	--
Onsite	NAF-06	398,809.66	2,050,911.91	5/26/2005	Stainless Steel	2	12.75	2.75-12.75	2.0-12.75	0.25-2.0	0.0-0.25	143.17	146.43	Perched Zone	Yes
Onsite	NAF-07	398,899.33	2,050,616.50	5/20/2005	Stainless Steel	2	15.5	5.5-15.5	3.0-15.5	1.0-3.0	0.0-1.0	146.73	149.69	Perched Zone	Yes
Onsite	NAF-08A	398,097.99	2,050,886.62	6/1/2005	Stainless Steel	2	15.0	5.0-15.0	3.0-15.0	1.0-3.0	0.0-1.0	145.54	148.82	Perched Zone	Yes
Onsite	NAF-08B	398,095.64	2,050,879.94	6/1/2005	Stainless Steel	2	53.5	43.5-53.5	41.5-53.5	39.5-41.5	0.0-39.5	145.62	148.86	Surficial Aquifer	--
Onsite	NAF-09	397,711.09	2,050,806.52	5/19/2005	PVC	2	17.0	7.0-17.0	5.0-17.0	3.0-5.0	0.0-3.0	146.52	149.29	Perched Zone	Yes
Onsite	NAF-10	397,612.57	2,050,423.15	5/19/2005	PVC	2	18.25	8.25-18.25	6.25-18.25	4.25-6.25	0.0-4.25	146.94	150	Perched Zone	Yes
Onsite	NAF-11A	398,909.29	2,050,999.92	6/3/2005	PVC	2	7.5	2.5-7.5	2.0-7.5	0.5-2.0	0.0-0.5	137.55	140.59	Perched Zone	--
Onsite	NAF-11B	398,911.13	2,050,995.88	6/5/2005	PVC	2	43.5	33.5-43.5	31.5-43.5	26.5-31.5	0.0-26.5	137.55	140.74	Surficial Aquifer	--
Onsite	NAF-12	398,270.56	2,050,777.49	3/28/2013	PVC	2	23	18 to 23	16.2 to 23	13.1 to 16.2	0 to 13.1	NA	145.932	Perched Zone	Yes
Onsite	NAF-13	398,370.49	2,051,260.72	10/16/2018	PVC	2	16	11 to 16	8.5 to 20	5 to 8.5	0 to 5	149.64	152.29	Perched Zone	--
Onsite	PIW-1D	400,547.77	2,051,801.42	7/2/2019	PVC	2	29.5	24.5 to 29.5	23 - 30	20 - 23	0 - 20	49.53	52.33	Surficial Aquifer	Yes
Onsite	PIW-1S	400,540.61	2,051,792.59	6/28/2019	PVC	2	17.8	7.8 - 17.8	6 - 18	2 - 6	0 - 2	50.78	54.198	Floodplain Deposits	--
Onsite	PIW-2D	399,922.75	2,051,317.64	8/15/2019	PVC	2	50	40 - 50	38 - 50	36 - 38	0 - 36	98.16	100.85	Black Creek Aquifer	Yes
Onsite	PIW-3D	399,711.75	2,052,088.80	7/2/2019	PVC	2	24	19 - 24	17 - 24.8	15 - 17	0 - 15	50.51	53.315	Black Creek Aquifer	Yes
Onsite	PIW-4D	398,817.36	2,052,102.82	7/1/2019	PVC	2	37.3	32.3 - 37.3	30 - 38	28 - 30	0 - 28	50.37	53.041	Black Creek Aquifer	Yes
Onsite	PIW-5S	398,520.38	2,051,951.26	7/9/2019	PVC	2	19.8	9.8 - 19.8	8 - 20.2	6 - 8	0 - 6	72.68	75.188	Surficial Aquifer	Yes
Onsite	PIW-6S	398,118.14	2,052,540.57	6/28/2019	PVC	2	28	18 - 28	16 - 28.2	14 - 16	0 - 14	49.85	53.359	Floodplain Deposits	Yes
Onsite	PIW-7D	396,787.69	2,052,595.37	6/26/2019	PVC	2	34	29 - 34	26 - 34.2	22 - 26	0 - 22	45.78	48.597	Black Creek Aquifer	Yes
Onsite	PIW-7S	396,787.00	2,052,589.49	6/25/2019	PVC	2	17	7 - 17	5.2 - 18	2.2 - 5.2	0 - 2.2	45.81	48.392	Floodplain Deposits	Yes
Onsite	PIW-8D	396,403.38	2,052,682.02	6/26/2019	PVC	2	40.5	35.5 - 45.5	32 - 40.5	29 - 32	0 - 29	45.92	48.518	Black Creek Aquifer	Yes
Onsite	PIW-9D	396,155.97	2,052,250.91	7/2/2019	PVC	2	45	40 - 45	38.1 - 49	35.5 - 38.1	0 - 35.5	76.75	79.529	Black Creek Aquifer	Yes
Onsite	PIW-9S	396,148.11	2,052,251.10	6/26/2019	PVC	2	29.8	24.8 - 29.8	23 - 30	19 - 23	0 - 19	76.80	79.532	Surficial Aquifer	Yes
Onsite	PIW-10DR	395,093.99	2,052,297.30	8/16/2019	PVC	2	60.5	53 - 58	50.7 - 60.5	48 - 50.7	0 - 48	73.29	75.91	Black Creek Aquifer	Yes
Onsite	PIW-10S	395,104.67	2,052,297.04	6/25/2019	PVC	2	17	7 - 17	5.3 - 17.3	3 - 5.3	0 - 3	73.30	76.451	Surficial Aquifer	Yes
Onsite	PW-01	399,064.80	2,049,654.30	7/30/2019	PVC	2	21	11 - 21	9 - 21	7 - 9	0 - 7	146.63	149.547	Perched Zone	Yes
Onsite	PW-02	399,779.06	2,050,649.47	7/30/2019	PVC	2	60	50 - 60	47.5 - 60	45.5 - 47.5	0 - 45.5	143.76	146.431	Surficial Aquifer	Yes
Onsite	PW-03	397,339.81	2,050,765.32	7/23/2019	PVC	2	45	35 - 45	33 - 45	31 - 33	0 - 31	144.97	147.967	Surficial Aquifer	Yes
Onsite	PW-04	394,659.55	2,050,940.66	7/24/2019	PVC	2	27	17 - 27	15 - 27	13 - 15	0 - 13	94.74	97.751	Surficial Aquifer	Yes
Onsite	PW-05	395,873.10	2,047,812.93	7/26/2019	PVC	2	75	65 - 75	63 - 75	60.5 - 63	0 - 60.5	147.16	150.336	Surficial Aquifer	Yes
Onsite	PW-06	392,868.00	2,045,288.77	7/29/2019	PVC	2	29	19 - 29	17 - 29	15 - 17	0 - 15	144.76	147.691	Surficial Aquifer	Yes
Onsite	PW-07	390,847.71	2,049,258.26	7/24/2019	PVC	2	38	28 - 38	26 - 38	23.5 - 26	0 - 23.5	144.90	148.16	Surficial Aquifer	Yes
Onsite	PW-09	401,997.39	2,048,980.54	8/12/2019	PVC	2	54	44 - 54	42 - 54	40 - 42	0 - 40	74.76	72.03	Black Creek Aquifer	Yes
Onsite	PW-10R	398,516.12	2,051,936.59	8/9/2019	PVC	2	67	57 - 67	55 - 67	52 - 55	0 - 52	73.28	75.9	Black Creek Aquifer	Yes
Onsite	PW-11	394,354.36	2,052,226.72	7/25/2019	PVC	2	64	53 - 63	51 - 64	49 - 51	0 - 49	70.19	73.263	Black Creek Aquifer	Yes
Onsite	PW-12	399,500.45	2,047,063.51	8/1/2019	PVC	2	119	109 - 119	106 - 119	103 - 106	0 - 103	148.05	150.61	Black Creek Aquifer	Yes
Onsite	PW-13	397,584.26	2,048,029.18	8/23/2019	PVC	2	130	120 - 130	118 - 130	115 - 118	0 - 115	146.52	149.36	Black Creek Aquifer	Yes
Onsite	PW-14	397,325.65	2,050,766.36	8/27/2019	PVC	2	146	136 - 146	134 - 146	131 - 134	0 - 131	145.13	147.97	Black Creek Aquifer	Yes
Onsite	PW-15R	398,900.88	2,051,011.75	8/14/2019	PVC	2	120	110 - 120	108 - 120	105 - 108	0 - 105	133.33	136.14	Black Creek Aquifer	Yes
Onsite	PZ-11	398,646.25	2,049,820.94	3/12/2004	PVC	3/4	20	15-20	15-20	12-15	NA	148.48	151.03	Perched Zone	Yes
Onsite	PZ-12	399,094.96	2,048,981.78	3/12/2004	PVC	3/4	20.1	15.1-20.1	15.1-20.1	12.1-15.1	NA	148.31	150.91	Perched Zone	Yes
Onsite	PZ-13	397,708.07	2,050,991.73	3/17/2004	PVC	3/4	12.1	7.1-12.1	7.1-12.1	4.1-7.1	NA	146.69	149.2	Perched Zone	Yes
Onsite	PZ-14	397,589.92	2,050,618.27	3/11/2004	PVC	3/4	14	9.0-14.0	9.0-14.0	6.0-9.0	NA	146.75	148.38	Perched Zone	Yes

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Onsite	PZ-15	396,805.09	2,050,112.02	3/11/2004	PVC	3/4	15.2	10.2-15.2	10.2-15.2	7.2-10.2	NA	146.50	148.79	Perched Zone	Yes
Onsite	PZ-17	396,614.82	2,048,872.69	3/10/2004	PVC	3/4	26.1	21.1-26.1	21.1-26.1	18.1-21.1	NA	145.00	150.08	Perched Zone	--
Onsite	PZ-19R	397,998.66	2,049,919.52	4/25/2019	PVC	2	21	16-21	14-21	10-14	0-10	147.62	150.046	Perched Zone	Yes
Onsite	PZ-20R	398,185.81	2,049,784.60	4/25/2019	PVC	2	20	15-20	12-20	8.5-12	0-8.5	148.15	151.29	Perched Zone	Yes
Onsite	PZ-21R	398,445.16	2,049,883.13	4/29/2019	PVC	2	22	17-22	13-22	9-13	0-9	147.77	150.674	Perched Zone	Yes
Onsite	PZ-22	397,272.80	2,052,584.04	1/11/2006	PVC	3/4	46	36.0-46.0	34.0-46.0	32.0-34.0	0.0-32.0	49.03	51.81	Black Creek Aquifer	Yes
Onsite	PZ-24	396,117.94	2,050,744.07	10/18/2018	PVC	1	16	11 to 16	10 to 20	8 to 10	0 to 8	144.76	147.53	Perched Zone	Yes
Onsite	PZ-25	396,753.94	2,050,991.05	10/18/2018	PVC	1	19	14 to 19	12.5 to 40	8 to 12.5	0 to 8	145.00	147.59	Perched Zone	--
Onsite	PZ-26	396,059.78	2,050,382.35	10/18/2018	PVC	1	16	11 to 16	10 to 20	7 to 10	0 to 7	144.90	147.7	Perched Zone	Yes
Onsite	PZ-27	395,922.11	2,050,376.76	10/19/2018	PVC	1	17	12 to 17	11 to 20	8 to 11	0 to 8	145.02	147.17	Perched Zone	Yes
Onsite	PZ-28	396,304.55	2,049,933.79	10/18/2018	PVC	1	18	13 to 18	11 to 20	9 to 11	0 to 9	145.60	148.64	Perched Zone	Yes
Onsite	PZ-29	396,371.49	2,049,768.94	10/18/2018	PVC	1	18	13 to 18	10.5 to 20	8.5 to 10.5	0 to 8.5	145.07	147.74	Perched Zone	Yes
Onsite	PZ-31	396,428.73	2,049,594.36	4/23/2019	PVC	2	19	14-19	12-19	8.5-12	0-8.5	144.91	147.999	Perched Zone	Yes
Onsite	PZ-32	396,418.47	2,049,713.79	4/23/2019	PVC	2	18	13-18	12.5-18	10-12.5	0-10	145.36	148.471	Perched Zone	Yes
Onsite	PZ-33	396,308.92	2,049,707.66	4/15/2019	PVC	2	17.5	12.5-17.5	10-17.5	8-10	0-8	143.94	146.715	Perched Zone	Yes
Onsite	PZ-34	396,292.05	2,049,595.04	4/15/2019	PVC	2	13.5	13.5-18.5	11-18.5	9-11	0-9	144.94	147.695	Perched Zone	Yes
Onsite	PZ-35	398,232.64	2,050,020.49	4/29/2019	PVC	2	18	13-18	11-18	8-11	0-8	147.91	150.43	Perched Zone	Yes
Onsite	SMW-01	395,295.75	2,043,679.19	1/23/2003	PVC	2	15	5.0-15.0	4.0-15.0	2.0-4.0	0.0-2.0	NA	136.81	Surficial Aquifer	Yes
Onsite	SMW-02	399,983.75	2,050,654.77	1/23/2003	PVC	2	20	5.0-20.0	4.0-20.0	2.0-4.0	0.0-2.0	144.74	147.93	Perched Zone	Yes
Onsite	SMW-02B	399,983.48	2,050,660.48	10/6/2005	PVC	2	53	43.0-53.0	40.0-53.0	35.0-40.0	0.0-35.0	142.28	145.211	Surficial Aquifer	--
Onsite	SMW-03	399,778.25	2,049,445.96	6/4/2005	Stainless Steel	2	20	10.0-20.0	8.0-20.0	6.0-8.0	0.0-6.0	148.43	151.094	Perched Zone	--
Onsite	SMW-03B	399,785.75	2,049,421.54	4/4/2013	PVC	2	82	72 to 82	69 to 82	65.5 to 69	0 to 65.5	147.00	150.43	Black Creek Aquifer	Yes
Onsite	SMW-04A	399,668.71	2,048,387.57	6/4/2005	Stainless Steel	2	34.5	19.5-34.5	17.5-34.5	15.5-17.5	0.0-15.5	145.46	148.09	Perched Zone	--
Onsite	SMW-04B	399,667.12	2,048,390.30	10/5/2005	PVC	2	53	43.0-53.0	41.0-53.0	34.0-41.0	0.0-34.0	145.18	148.372	Surficial Aquifer	Yes
Onsite	SMW-05	399,334.07	2,048,557.33	10/10/2005	PVC	2	20	10.0-20.0	8.0-20.0	6.0-8.0	0.0-6.0	144.17	148.099	Perched Zone	--
Onsite	SMW-05P	399,338.61	2,048,559.26	2/21/2006	PVC	3/4	60	45.0-60.0	43.0-60.0	41.0-43.0	0.0-41.0	146.06	149.32	Surficial Aquifer	Yes
Onsite	SMW-06	399,172.35	2,048,759.48	10/10/2005	PVC	2	22	12.0-22.0	10.0-22.0	8.0-10.0	0.0-8.0	147.92	150.97	Perched Zone	--
Onsite	SMW-06B	399,144.74	2,048,764.94	4/3/2013	PVC	2	68	58 to 68	54.5 to 68	68 to 72 / 51 to 54.5	0 to 51	146.86	150.32	Surficial Aquifer	--
Onsite	SMW-07	398,932.91	2,048,611.16	10/10/2005	PVC	2	23	13.0-23.0	11.0-23.0	8.5-11.0	0.0-8.5	147.74	147.64	Perched Zone	Yes
Onsite	SMW-08	399,064.97	2,048,468.78	10/11/2005	PVC	2	31	21.0-31.0	18.5-21.0	14.5-18.5	0.0-14.5	147.93	151.017	Perched Zone	--
Onsite	SMW-08B	399,058.33	2,048,478.84	3/28/2013	PVC	2	68	58 to 68	56 to 68	52.5 to 56	0 to 52.5	146.75	148.81	Surficial Aquifer	Yes
Onsite	SMW-09	401,076.89	2,050,017.41	4/8/2013	PVC	2	62	52 to 62	49.5 to 62	62 to 67 / 45 to 49.5	0 to 45	138.16	141.43	Surficial Aquifer	Yes
Onsite	SMW-10	402,307.31	2,047,923.84	3/25/2013	PVC	2	49	39 to 49	36.5 to 49	33 to 36.5	0 to 33	73.09	76.26	Surficial Aquifer	Yes
Onsite	SMW-11	401,996.15	2,048,975.38	3/26/2013	PVC	2	23	13 to 23	11 to 23	8 to 11	0 to 8	69.04	71.95	Surficial Aquifer	Yes
Onsite	SMW-12	401,314.20	2,051,007.22	3/27/2013	PVC	2	98	88 to 98	86 to 98	83 to 86	0 to 83	113.723	118.22	Black Creek Aquifer	Yes
Offsite	Bladen-1S	387,516.28	2,050,234.78	8/14/2019	PVC	2	10.25	5 - 10	3 - 10.25	1 - 3	0 - 1	81.57	81.31	Surficial Aquifer	--
Offsite	Bladen-1D	387,519.56	2,050,248.83	8/13/2019	PVC	2	47.25	37 - 47	34 - 47.25	32 - 34	0 - 32	81.72	81.52	Black Creek Aquifer	Yes
Offsite	Bladen-2S	368,818.78	2,042,884.35	8/16/2019	PVC	2	20.6	10 - 20	8 - 20.6	43,624	0 - 6	143.01	142.62	Surficial Aquifer	Yes
Offsite	Bladen-2D	368,824.41	2,042,879.78	8/15/2019	PVC	2	75.25	70 - 75	67 - 75.25	66 - 67	0 - 66	143.11	142.85	Black Creek Aquifer	Yes
Offsite	Bladen-3S	396,859.62	2,059,014.36	8/20/2019	PVC	2	15.25	5 - 15	3 - 15.25	1 - 3	0 - 1	79.40	78.84	Surficial Aquifer	Yes
Offsite	Bladen-3D	396,854.29	2,059,007.99	8/19/2019	PVC	2	44	33.75 - 43.75	32 - 44	29 - 32	0 - 29	79.59	79.09	Black Creek Aquifer	Yes
Offsite	Bladen-4S	363,260.51	2,087,638.88	8/21/2019	PVC	2	15	4.75 - 14.75	43,539.00	1.5 - 3	0 - 1.5	64.65	64.26	Surficial Aquifer	Yes
Offsite	Bladen-4D	363,252.43	2,087,638.29	8/21/2019	PVC	2	52	46.75 - 51.75	44.5 - 51.75	41.5 - 44.5	0 - 41.5	64.67	64.23	Black Creek Aquifer	Yes
Offsite	Cumberland-1S	431,464.38	2,011,074.92	9/13/2019	PVC	2	25	15 - 25	13 - 25	11 - 13	0 - 13	179.70	179.41	Surficial Aquifer	Yes
Offsite	Cumberland-1D	431,457.26	2,011,072.83	9/12/2019	PVC	2	50	40 - 50	38 - 50	36 - 38	0 - 36	179.58	179.18	Black Creek Aquifer	Yes
Offsite	Cumberland-2S	449,976.40	2,074,022.29	9/12/2019	PVC	2	17	7 - 17	5 - 17	3 - 5	0 - 3	133.87	133.61	Surficial Aquifer	Yes

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Offsite	Cumberland-2D	449,984.84	2,074,020.57	9/12/2019	PVC	2	57	47 - 57	43 - 57	43 - 45	0 - 43	134.06	133.79	Black Creek Aquifer	Yes
Offsite	Cumberland-3S	423,251.95	2,060,414.73	9/12/2019	PVC	2	14	9 - 14	7 - 14	5 - 7	0 - 5	83.87	83.62	Surficial Aquifer	Yes
Offsite	Cumberland-3D	423,245.42	2,060,410.59	9/11/2019	PVC	2	27	22 - 27	20 - 27	18 - 20	0 - 18	83.59	83.34	Black Creek Aquifer	Yes
Offsite	Cumberland-4S	413,083.94	2,078,256.96	9/11/2019	PVC	2	20	10 - 20	8 - 20	6 - 8	0 - 6	124.15	123.93	Surficial Aquifer	Yes
Offsite	Cumberland-4D	413,093.08	2,078,251.38	9/10/2019	PVC	2	67	57 - 67	55 - 67	53 - 55	0 - 53	124.09	123.79	Black Creek Aquifer	Yes
Offsite	Cumberland-5S	405,623.27	2,138,233.37	9/11/2019	PVC	2	24	14 - 24	12 - 24	10 - 12	0 - 10	107.00	106.65	Surficial Aquifer	Yes
Offsite	Cumberland-5D	405,619.17	2,138,238.59	9/11/2019	PVC	2	57	52 - 57	49 - 57	47 - 49	0 - 49	107.02	106.67	Black Creek Aquifer	Yes
Offsite	Robeson-1S	381,405.51	2,020,158.29	9/9/2019	PVC	2	27	17 - 27	15 - 27	13 - 15	0 - 13	161.51	161.22	Surficial Aquifer	Yes
Offsite	Robeson-1D	381,413.60	2,020,160.37	9/4/2019	PVC	2	53	42.75 - 52.75	41 - 53	39 - 41	0 - 39	161.23	160.93	Black Creek Aquifer	Yes

Notes:
1. Survey completed by Freeland-Clinkscales & Associates of NC.
2. Northing and Easting provided in feet, State Plane Coordinates for North Carolina (zone 3200) in North American Datum of 1983.
3. Ground surface and top of casing elevation reported in North American Vertical Datum of 1988.
ft NAD83 - feet, State Plane Coordinate System North American Datum 1983
ft NAVD88 - feet, North American Vertical Datum of 1988
in - inches
ft - feet
ft bgs - feet below ground surface
NA - not available
NM - not measured

TABLE 6-4
SUMMARY OF ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

Hydrogeologic Zone	Geometric Mean Hydraulic Conductivity, K		
	K (cm/s)	K (ft/d)	Wells Included
Floodplain Deposits	3.23×10^{-4}	0.9	LTW-01 [4], LTW-03 [4]
Black Creek Aquifer	9.89×10^{-3}	28.0	SMW-12, LTW-02, BCA-02, BCA-04, BCA-01
Partially Screened across Floodplain and Black Creek Aquifer	1.86×10^{-3}	5.3	LTW-05

Notes:

1. Detailed slug test results, AQTESOLV inputs, displacement time curves and AQTESOLV outputs used to summarize results are included in Appendix E.
2. Geometric means calculated from both pneumatic and manual slug test results. No method bias was observed. Pneumatic slug tests were performed only at locations where well screen was fully saturated. Manual slug tests were performed at all other well locations.
3. LTW-04 results not included in calculating geometric mean because initial displacement for all tests at this well suspected to display oscillatory response likely due to inertial effects from water table across well screen.
4. Initial displacement response curve suspected to display double-straight line effect due to drainage from filter pack. Analytical solutions are fit to the second-straight line displacement curve representing post-filter drainage, aquifer response.

cm/s - centimeters per second

ft/d - indicates feet per day

K - hydraulic conductivity

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (°C)	3 inches Above Sediment Surface (°C)	1 inch into Sediment Surface (°C)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (°C)	Depth of Thalweg along Transect (ft)
1	8/7/2019	854	2051927.95	400688.81	24	28.48	28.5	28.54	0.06	25.25
2	8/6/2019	1633	2051867.71	400672.67	2.23	29.29	29.27	29.35	0.06	NM
3	8/9/2019	1508	2051864.40	400648.92	2.9	27.86	27.89	28	0.14	NM
4	8/6/2019	1626	2051869.61	400603.98	3.86	29.14	29.05	29.16	0.02	NM
5	8/7/2019	905	2051941.74	400569.49	22.73	28.49	28.45	28.54	0.05	25.25
6	8/6/2019	1620	2051902.25	400479.86	3.17	29.11	29.07	29.14	0.03	NM
7	8/7/2019	913	2051981.06	400450.18	20.92	28.62	28.48	28.58	0.04	21.65
8	8/6/2019	1612	2051926.53	400382.75	5.39	29.28	29.21	29.38	0.1	NM
9	8/7/2019	934	2052053.27	400327.71	24.25	28.51	28.47	28.56	0.05	24.35
10	8/6/2019	1605	2051943.54	400270.55	1.72	29.47	29.44	29.53	0.06	NM
11	8/7/2019	957	2052010.65	400241.65	22.3	28.56	28.53	28.62	0.06	NM
12	8/5/2019	1510	2052011.79	400163.91	8.5	28.78	28.73	28.82	0.04	NM
13	8/7/2019	1018	2052131.34	400119.72	24.5	28.63	28.56	28.6	0.03	NM
14	8/5/2019	1522	2052069.26	400062.48	11.5	28.86	28.8	28.89	0.03	NM
15	8/7/2019	1139	2052126.57	399998.68	23	28.81	28.63	28.79	0.02	27.35
16	8/5/2019	1531	2052117.71	399938.94	9.1	29.25	29.2	29.27	0.02	NM
17	8/7/2019	1154	2052179.91	399886.97	21.4	28.68	28.61	28.72	0.04	26.35
18	8/5/2019	1548	2052170.35	399811.83	2.4	29.26	29.24	29.41	0.15	NM
19	8/7/2019	1204	2052214.08	399811.78	22.1	28.7	28.63	28.74	0.04	26.35
20	8/5/2019	1646	2052225.50	399737.20	19.6	28.8	28.71	28.77	0.03	NM
21	8/7/2019	1211	2052256.29	399658.05	22.9	28.8	28.74	28.81	0.01	25.35
22	8/5/2019	1653	2052243.48	399624.04	9.13	29.08	29.1	29.17	0.09	NM

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (°C)	3 inches Above Sediment Surface (°C)	1 inch into Sediment Surface (°C)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (°C)	Depth of Thalweg along Transect (ft)
23	8/7/2019	1222	2052276.72	399585.31	20.4	28.77	28.72	28.78	0.01	22.35
24	8/6/2019	821	2052276.14	399534.91	13.78	28.89	28.68	28.75	0.14	22.35
25	8/7/2019	1240	2052346.66	399454.93	24.22	28.76	28.68	28.77	0.01	25.35
26	8/6/2019	828	2052334.43	399409.60	12.13	28.73	28.7	28.8	0.07	NM
27	8/7/2019	1251	2052379.34	399359.14	20.15	28.81	28.75	28.82	0.01	25.95
28	8/6/2019	835	2052381.06	399286.39	5.57	28.74	28.72	28.78	0.04	NM
29	8/7/2019	1309	2052414.92	399258.49	20.86	28.76	28.72	28.81	0.05	25.85
30	8/6/2019	841	2052405.69	399207.92	8.53	28.81	28.76	28.84	0.03	NM
31	8/7/2019	1349	2052453.15	399143.02	20.3	28.94	29.04	29.07	0.13	25.35
32	8/6/2019	847	2052470.92	399026.46	9.19	28.73	28.7	28.79	0.06	NM
33	8/7/2019	1400	2052508.45	399016.99	20.1	28.96	28.92	28.98	0.02	22.95
34	8/6/2019	855	2052504.53	398929.07	11.2	28.83	28.76	28.79	0.04	NM
35	8/7/2019	1421	2052532.25	398900.49	20.2	28.93	28.89	28.97	0.04	24.5
36	8/6/2019	901	2052523.62	398840.41	6.42	28.65	28.61	28.75	0.1	23.35
37	8/7/2019	1421	2052555.07	398784.04	17.5	28.96	28.92	28.99	0.03	23.35
38	8/6/219	910	2052558.47	398724.32	6.8	28.88	28.94	28.82	0.06	NM
39	8/8/2019	920	2052599.58	398716.13	22.5	28.95	28.94	29.01	0.06	21.75
40	8/7/2019	1430	2052600.19	398696.34	22	28.78	28.9	28.98	0.2	21.65
41	8/8/2019	913	2052638.07	398694.60	20.7	28.94	28.94	29.01	0.07	22.5
42	8/8/2019	901	2052574.46	398657.64	11.42	28.98	29.04	29.05	0.07	24.15
43	8/8/2019	907	2052625.36	398651.56	21.7	28.9	28.95	29.01	0.11	24.15
44	8/6/2019	923	2052576.31	398616.16	1.95	27.9	25.88	24.45	3.45	NM

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (°C)	3 inches Above Sediment Surface (°C)	1 inch into Sediment Surface (°C)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (°C)	Depth of Thalweg along Transect (ft)
45	8/6/2019	933	2052565.83	398609.02	0.82	24.27	20.5	20.62	3.65	NM
46	8/8/2019	925	2052634.22	398591.59	20.1	28.96	28.95	29.02	0.06	23.5
47	8/7/2019	1740	2052675.76	398528.44	19.6	29.23	29.34	29.38	0.15	23.35
48	8/8/2019	932	2052616.72	398516.34	15.7	28.97	28.97	29.02	0.05	22.75
49	8/6/2019	943	2052618.96	398477.23	11.66	28.55	28.29	28.24	0.31	NM
50	8/8/2019	943	2052643.92	398455.50	18.1	28.97	28.97	29.02	0.05	NM
51	8/8/2019	950	2052789.66	398448.77	19.3	28.95	28.93	29	0.05	23.55
52	8/7/2109	1735	2052718.88	398401.65	19.2	29.32	29.31	29.37	0.05	22.45
53	8/6/2019	949	2052605.12	398373.59	1.83	28.89	28.85	28.82	0.07	NM
54	8/8/2019	957	2052795.08	398347.82	20.8	28.93	28.94	29	0.07	21.65
55	8/7/2019	1728	2052737.13	398280.66	19.6	29.28	29.34	29.39	0.11	21.85
56	8/6/2019	956	2052638.10	398253.94	1.78	29.1	29.01	29.04	0.06	NM
57	8/8/2019	1004	2052837.14	398217.07	20.12	28.93	28.93	29.01	0.08	22.35
58	8/7/2019	1723	2052696.54	398176.49	18.6	29.28	29.28	29.32	0.04	21.45
59	8/6/2019	1004	2052654.44	398152.47	2.23	29.21	29.06	29.11	0.1	NM
60	8/8/2019	1010	2052815.45	398097.21	19.32	28.84	28.91	28.98	0.14	21.15
61	8/7/2019	1717	2052760.08	398064.46	18	29.26	29.19	29.29	0.03	21.45
62	8/6/2019	1016	2052680.39	397995.58	1.37	29.23	29.07	29.19	0.04	NM
63	8/8/2019	1017	2052854.15	397975.47	20.8	28.91	28.94	29	0.09	22.15
64	8/7/2019	1708	2052741.75	397951.82	20.2	29.17	29.24	29.27	0.1	20.65
65	8/6/2019	1030	2052705.78	397868.41	2.31	29	28.92	29.11	0.11	NM
66	8/7/219	1700	2052743.54	397845.88	20.1	29.29	29.31	29.31	0.02	21.85

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (°C)	3 inches Above Sediment Surface (°C)	1 inch into Sediment Surface (°C)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (°C)	Depth of Thalweg along Transect (ft)
67	8/8/2019	1026	2052812.81	397827.23	18.22	28.89	28.99	29.05	0.16	22.65
68	8/6/2019	1039	2052729.84	397753.40	2.16	28.94	28.98	29.07	0.13	NM
69	8/7/2019	1657	2052779.36	397700.72	19.7	29.22	29.22	29.26	0.04	21.15
70	8-Aug	1035	2052721.38	397674.71	0.96	29.29	29.26	29.35	0.06	21.15
71	8/6/2019	1047	2052732.24	397632.42	1.17	28.96	29.07	29.18	0.22	NM
72	8/8/2019	1114	2052787.90	397628.95	21	29.02	28.99	29.04	0.02	22.65
73	8/8/2019	1132	2052727.29	397588.40	0.8	27.87	24.41	22.62	5.25	NM
74	8-Aug	1148	2052728.34	397586.32	0.9	29.61	29.46	29.39	0.22	NM
75	8/7/2019	1644	2052783.78	397572.91	20.9	29.08	29.21	29.12	0.04	23.5
76	8/8/2019	1119	2052773.98	397546.72	11.53	28.99	28.99	29.08	0.09	NM
77	8/6/2019	1332	2052754.05	397515.07	1.67	29.94	29.86	29.92	0.02	NM
78	8/7/2019	1633	2052789.22	397426.72	19.1	29.1	29.1	29.16	0.06	22.85
79	8/6/2019	1551	2052783.81	397365.65	7.84	29.26	29.18	29.3	0.04	NM
80	8/7/2019	1624	2052809.44	397289.03	22.6	29.18	29.16	29.17	0.01	23.95
81	8/6/2019	1444	2052780.80	397242.45	2.8	29.52	29.51	29.5	0.02	NM
82	8/7/2019	1616	2052817.47	397160.43	19	29.11	29.07	29.14	0.03	23.35
83	8/6/2019	1436	2052794.61	397107.69	1.32	29.53	29.54	29.6	0.07	NM
84	8/7/2019	1610	2052819.35	397061.10	13.1	29.1	29.08	29.13	0.03	22.35
85	8/6/2019	1429	2052815.50	396971.19	2.56	29.51	29.49	29.58	0.07	NM
86	8/7/2019	1603	2052836.75	396947.33	13.1	29.1	29.05	29.11	0.01	23.35
87	8/6/2019	1417	2052835.73	396883.71	4.7	29.17	29.07	29.28	0.11	NM
88	8/7/2019	1557	2052861.87	396840.00	20.79	28.98	28.94	29.02	0.04	24.5

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (°C)	3 inches Above Sediment Surface (°C)	1 inch into Sediment Surface (°C)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (°C)	Depth of Thalweg along Transect (ft)
89	8/6/2019	1410	2052842.43	396784.31	5.71	29.27	29.16	29.28	0.01	NM
90	8/7/2019	1546	2052877.37	396741.11	23.27	28.96	28.92	29	0.04	23.95
91	8/6/2019	1403	2052853.13	396695.94	2.93	29.45	29.37	29.32	0.13	NM
92	8/7/2019	1535	2052880.52	396668.16	18.22	28.94	28.88	28.96	0.02	23.15
93	8/8/2019	1222	2052851.42	396630.08	1.34	29.72	29.7	29.75	0.03	NM
94	8/6/2019	1353	2052864.10	396606.77	4.42	29.68	29.48	29.37	0.31	NM
95	8/8/2019	1226	2052878.64	396604.32	12.42	29.21	29.22	29.22	0.01	NM
96	8/8/2019	1233	2052866.77	396581.15	1.22	29.61	29.59	29.65	0.04	NM
97	8/9/2019	14.57	2052891.16	396543.37	11.1	29.7	29.77	29.6	0.1	NM
98	8/8/2019	1245	2052916.85	396487.21	20.2	29.13	29.12	29.17	0.04	22.35
99	8/6/2019	1135	2052873.66	396478.63	1.8	30.08	29.83	29.47	0.61	NM
100	8/9/2019	1444	2052904.82	396390.59	14.75	29.53	29.66	29.69	0.16	22.45
101	8/6/2019	1144	2052892.59	396301.20	1.72	30.07	30.05	30.08	0.01	NM
102	8/9/2019	1431	2052917.29	396277.98	13.2	29.64	29.54	29.71	0.07	23.95
103	8/6/2019	1154	2052897.30	396173.56	1.68	29.8	29.74	29.66	0.14	NM
104	8/9/2019	1418	2052914.55	396158.69	6.05	29.63	29.62	29.35	0.28	23.35
105	8/8/2019	1328	2052902.18	396070.43	0.84	29.52	26.4	25.63	3.89	NM
106	8/8/2019	1346	2052906.18	396065.65	1.15	30	29.89	29.68	0.32	22.85
107	8/6/2019	1201	2052914.75	396065.35	3.78	29.3	29.25	29.29	0.01	NM
108	8/9/2019	1358	2052930.71	396018.09	11.94	29.38	29.5	29.51	0.13	21.85

TABLE 6-5
SURVEY OF TEMPERATURE DIFFERENTIALS IN CAPE FEAR RIVER
Chemours Fayetteville Works, North Carolina

Location	Date	Time of Readings	X-coordinate (ft)	Y-coordinate (ft)	Water Depth (ft)	6 Inches Above Sediment Surface (ºC)	3 inches Above Sediment Surface (ºC)	1 inch into Sediment Surface (ºC)	Temperature Difference between Porewater and 6 inches Above Sediment Surface (ºC)	Depth of Thalweg along Transect (ft)
109	8/6/2019	1210	2052918.36	395957.91	3.88	29.28	29.19	29.3	0.02	NM
110	8/9/2019	1344	2052944.33	395923.99	12.69	29.63	29.57	29.46	0.17	22.35
111	8/6/2019	1220	2052926.60	395820.42	2	29.79	29.75	29.63	0.16	NM
112	8/9/2019	1336	2052947.62	395791.01	12.16	29.57	29.46	29.6	0.03	21.65
113	8/9/2019	1324	2052954.26	395729.04	13.55	29.31	29.29	29.33	0.02	21.95
114	8/6/2019	1229	2052927.99	395721.82	1.95	29.71	29.62	29.63	0.08	NM
115	8/9/2019	1305	2052920.02	395663.84	0.72	23.96	22.97	22.75	1.21	NM
116	8/8/2019	1410	2052925.27	395656.87	0.7	22.16	22.13	22.2	0.04	NM
117	8/9/2019	1240	2052961.84	395617.96	14.61	29.16	29.24	29.19	0.03	21.65
118	8/6/2019	1240	2052932.01	395590.98	4.84	29.23	29.11	29.15	0.08	NM
119	8/6/2019	1247	2052938.48	395491.44	2.5	29.42	29.3	29.37	0.05	NM

Notes:
ºC - celsius
ft - feet
NM - not measured
Green shading Indicates temperature differential > 0.5 ºC

TABLE 7-1
ONSITE SOIL CHARACTERISTICS
Chemours Fayetteville Works, North Carolina

Sample ID	Well ID	Top (ft bgs)	Bottom (ft bgs)	Visual Description	USCS Classification	pH (s.u.)	Fraction Organic Carbon (g/g)	Specific Gravity	Liquid Limit of Soils	Plastic Limit of Soils	Plasticity Index (PI)	Percent Moisture (%)	Grain Size Distribution (%)				Porosity Calculation (%)	In Place Density (g/cc)	Void Ratio
													Clay	Silt	Sand	Gravel			
PIW-1-24-25-20190627	PIW-1	24	25	Fine to medium grained sand	SP-SC	4.6	0.0021	2.66	--	--	NP	17	9	2	89	0	35.6	1.7	0.6
PIW-1-41.5-42.5-20190627	PIW-1	41.5	42.5	Clay	CH	--	0.0053	2.66	57	27	30	17	67	16	17	0	47.9	1.4	0.9
PIW-2D-Soil-24-25-20190815	PIW-2D	24	25	Clay	CH	4.2	0.0220	2.68	92	35	57	39	45	27	28	0	59	1.1	1.4
PIW-2D-Soil-46-47-20190815	PIW-2D	46	47	Silty sand	SP-SM	4	0.0034	2.66	--	--	NP	27	4	7	89	0	41.5	1.6	0.7
PIW-3-14-15-20190702	PIW-3	14	15	Sand with fine to medium gravel	GP	--	0.0012	2.65	--	--	NP	14	3	2	46	49	18.7	2.2	0.2
PIW-3-24-25-20190702	PIW-3	24	25	Gravelly sand with clay	SP-SC	--	0.0100	2.63	--	--	NP	17	5	1	93	0	37	1.7	0.6
PIW-4-13-14-20190701	PIW-4	13	14	Sandy clay	CH	--	0.0120	2.66	102	43	59	27	48	30	22	0	54.1	1.2	1.2
PIW-4-33-34.2-20190701	PIW-4	33	34.2	Fine to medium grained sand	SP-SM	3.9	0.0024	2.67	--	--	NP	13	2	5	93	0	26.1	2.0	0.4
PIW-6-19-20-20190628	PIW-6	19	20	Clay with silt	CL	--	0.0011	2.69	48	29	19	23	38	39	24	0	40.5	1.6	0.7
PIW-7-24-25-20190625	PIW-7	24	25	Fine to medium grained sand	SP-SC	4.6	0.0013	2.64	39	18	21	20	12	5	83	0	39.6	1.6	0.7
PIW-7-37-38-20190625	PIW-7	37	38	Fine grained sand and silt	SP-SM	--	0.0016	2.65	--	--	NP	14	3	2	95	0	32	1.8	0.5
PIW-7-44-45-20190625	PIW-7	44	45	Clay	CH	--	0.0015	2.67	61	25	36	20	58	19	23	0	35.9	1.7	0.6
PIW-9-19-20-20190626	PIW-9	19	20	Sand	SP-SC	5.5	0.0006	2.66	--	--	NP	8	5	2	93	0	31.3	1.8	0.5
PIW-10-42-43-20190624	PIW-10	42	43	Clay	CH	--	0.0220	2.67	104	38	66	33	71	18	12	0	52.5	1.3	1.1
PW-01-SOIL-14-15-20190730	PW-01	14	15	Sand with silt	SP	5.6	0.0013	2.68	--	--	NP	24	2	3	95	0	44.7	1.5	0.8
PW-02-SOIL-14-15-20190729	PW-02	14	15	Clayey sand medium grained	SC	5.2	0.0012	2.68	--	--	NP	19	10	4	87	0	--	1.5	--
PW-02-SOIL-16-17-20190729	PW-02	16	17	Silty clay	CH	4.9	0.0012	2.69	89	31	58	20	58	28	14	0	--	1.3	--
PW-02-SOIL-35-36-20190729	PW-02	35	36	Clayey sand	SC	4.7	0.0008	2.71	--	--	NP	13	4	13	83	0	--	1.5	--
PW-03-SOIL-6.5-7-20190723	PW-03	6.5	7	Clayey sand	SC	5.7	0.0031	2.66	29	18	11	9	18	9	73	0	--	1.4	--
PW-03-SOIL-16-17-20190723	PW-03	16	17	Clay	CH	4.7	0.0020	2.71	80	33	47	27	64	14	22	0	--	1.1	--
PW-03-SOIL-43-44-20190723	PW-03	43	44	Silty sand	SM	4.1	0.0033	2.68	--	--	NP	33	10	7	83	0	--	1.4	--
PW-04-SOIL-23-24-20190724	PW-04	23	24	Silty sand	SM	3.1	0.0069	2.69	--	--	NP	16	10	12	78	0	--	1.4	--
PW-04-SOIL-29-29.5-20190724	PW-04	29	29.5	Clay	CH	3.7	0.0360	2.72	67	32	35	23	50	23	28	0	--	1.2	--
PW-05-Soil-12-13-20190726	PW-05	12	13	Clayey sand	SC	6.3	0.0011	2.67	38	23	15	9	18	14	69	0	--	1.5	--
PW-05-Soil-51-52-20190726	PW-05	51	52	Silty clay	CH	4.4	0.0650	2.62	60	31	29	36	54	27	18	0	--	1.2	--
PW-05-Soil-76-77-20190726	PW-05	76	77	Clay	CH	4.7	0.1000	2.66	90	37	53	56	51	42	7	0	--	1.0	--
PW-06-SOIL-16-17-20190726	PW-06	16	17	Sand with silt	SP	5.3	0.0012	2.65	--	--	NP	13	4	4	92	0	--	1.5	--
PW-07-SOIL-14-15-20190724	PW-07	14	15	Sand	SP-SC	5.2 J	<0.0011	2.65	--	--	--	9	5.3	3.2	91.5	0	--	1.6	--
PW-07-SOIL-44-45-20190724	PW-07	44	45	Clay with sand	CH	4.1 J	0.12	2.58	90	42	48	41.8	54.2	20.3	25.5	0	--	1.22	--
PW-09-SOIL-23-24-20190812	PW-09	23	24	Silty sand	CH	4.3	0.025	2.63	75	37	38	32.7	50	35.9	14.1	0	56.1	1.16	1.3
PW-09-SOIL-52-53-20190812	PW-09	52	53	Clayey sand with silt	SP-SM	6.1	0.0034	2.68	--	--	--	24.4	3.2	10.2	85.5	1.1	41.5	1.56	0.7
PW-10-SOIL-59-60-20190808	PW-10*	59	60	Silty clay	SC	5.4	0.0170	2.67	--	--	--	26	27	18	55	0	43.6	1.5	0.8
PW-11-SOIL-16-17-20190725	PW-11	16	17	Sand with silt	SW-SC	4.9	0.0007	2.68	--	--	NP	10	11	6	83	0	--	1.5	--
PW-11-SOIL-61-62-20190725	PW-11	61	62	Sand with silt	SC	4.1	0.0190	2.67	40	19	21	26	13	6	81	0	--	1.5	--
PW-12-SOIL-83-84-20190731	PW-12	83	84	Clay	CH	4.3	0.0370	2.67	93	40	53	27	61	30	9	0	58.2	1.1	1.4
PW-12-SOIL-110-111-20190731	PW-12	110	111	Sand with silt	SP-SC	4.8	0.0110	2.67	--	--	NP	25	6	4	90	0	43.4	1.5	0.8
PW-13-SOIL-25-26-20190821	PW-13	25	26	Sand	SP	5.2	0.0012	2.67	--	--	NP	14	3	4	93	0	45.6	1.5	0.8
PW-13-SOIL-73-74-20190821	PW-13	73	74	Clay	CH	4.5	0.0520	2.66	91	38	53	30	54	38	8	0	58.1	1.1	1.4
PW-13-SOIL-124-125-20190822	PW-13	124	125	Silty Sand	SM	6.8	0.0014	2.66	--	--	NP	18	7	8	85	0	45.3	1.5	0.8
PW-14-SOIL-144-145-20190826	PW-14	144	145	Clayey sand	SC	5.7	0.0028	2.66	--	--	NP	21	3	14	83	0	42.9	1.5	0.8
PW-15-SOIL-17.5-18-20190813	PW-15	17.5	18	Clay	CH	4.0	0.0290	2.63	100	52	48	37	49	48	3	0	65.1	0.9	1.9
PW-15-SOIL-38-39-20190813	PW-15	38	39	Silty sand	SM	4.1	0.0007	2.7	--	--	--	3	7	33	60	0	38.5	1.7	0.6
PW-15-SOIL-55-56-20190813	PW-15	55	56	Clay	CH	4.1	0.0530	2.67	68	33	35	35	54	33	14	0	53.2	1.3	1.1
PW-15-SOIL-112-113-20190813	PW-15	112	113	Silty sand	SM	4.1	0.0051	2.67	--	--	NP	18	7	12	81	0	36.2	1.7	0.6

TABLE 7-1
ONSITE SOIL CHARACTERISTICS
Chemours Fayetteville Works, North Carolina

Sample ID	Well ID	Top (ft bgs)	Bottom (ft bgs)	Visual Description	USCS Classification	Coefficient of Uniformity (C_u)	Coefficient of Curvature (C_c)	K from Grain Size Geometric Mean (ft/d)	Lithologic Unit
PIW-1-24-25-20190627	PIW-1	24	25	Fine to medium grained sand	SP-SC	8.8	3.2	13.4	Surficial Aquifer
PIW-1-41.5-42.5-20190627	PIW-1	41.5	42.5	Clay	CH	4.1	0.7	0.8	Upper Cape Fear Confining Unit
PIW-2D-Soil-24-25-20190815	PIW-2D	24	25	Clay	CH	5.0	0.8	0.9	Black Creek Confining Unit
PIW-2D-Soil-46-47-20190815	PIW-2D	46	47	Silty sand	SP-SM	8.7	3.1	13.9	Black Creek Aquifer
PIW-3-14-15-20190702	PIW-3	14	15	Sand with fine to medium gravel	GP	52.3	0.2	46.4	Floodplain Deposit
PIW-3-24-25-20190702	PIW-3	24	25	Gravelly sand with clay	SP-SC	2.6	1.5	46.6	Black Creek Aquifer
PIW-4-13-14-20190701	PIW-4	13	14	Sandy clay	CH	4.4	0.7	0.9	Black Creek Confining Unit
PIW-4-33-34.2-20190701	PIW-4	33	34.2	Fine to medium grained sand	SP-SM	4.0	1.4	54.7	Black Creek Aquifer
PIW-6-19-20-20190628	PIW-6	19	20	Clay with silt	CL	4.6	0.8	0.9	Floodplain Deposit
PIW-7-24-25-20190625	PIW-7	24	25	Fine to medium grained sand	SP-SC	8.9	3.5	4.0	Floodplain Deposit
PIW-7-37-38-20190625	PIW-7	37	38	Fine grained sand and silt	SP-SM	3.1	1.2	69.4	Black Creek Aquifer
PIW-7-44-45-20190625	PIW-7	44	45	Clay	CH	4.5	0.8	0.9	Upper Cape Fear Confining Unit
PIW-9-19-20-20190626	PIW-9	19	20	Sand	SP-SC	3.2	1.1	43.5	Surficial Aquifer
PIW-10-42-43-20190624	PIW-10	42	43	Clay	CH	3.7	0.7	0.8	Black Creek Confining Unit
PW-01-SOIL-14-15-20190730	PW-01	14	15	Sand with silt	SP	2.1	1.2	27.4	Perched Zone
PW-02-SOIL-14-15-20190729	PW-02	14	15	Clayey sand medium grained	SC	13.3	5.8	12.0	Perched Zone
PW-02-SOIL-16-17-20190729	PW-02	16	17	Silty clay	CH	3.9	0.7	0.8	Perched Clay
PW-02-SOIL-35-36-20190729	PW-02	35	36	Clayey sand	SC	21.7	7.7	6.1	Surficial Aquifer
PW-03-SOIL-6.5-7-20190723	PW-03	6.5	7	Clayey sand	SC	16.5	1.6	2.7	Perched Zone
PW-03-SOIL-16-17-20190723	PW-03	16	17	Clay	CH	4.4	0.7	0.9	Perched Clay
PW-03-SOIL-43-44-20190723	PW-03	43	44	Silty sand	SM	3.9	1.9	6.6	Surficial Aquifer
PW-04-SOIL-23-24-20190724	PW-04	23	24	Silty sand	SM	6.5	2.6	3.1	Surficial Aquifer
PW-04-SOIL-29-29.5-20190724	PW-04	29	29.5	Clay	CH	4.9	0.8	0.9	Black Creek Confining Unit
PW-05-Soil-12-13-20190726	PW-05	12	13	Clayey sand	SC	25.8	0.6	2.2	Surficial Aquifer
PW-05-Soil-51-52-20190726	PW-05	51	52	Silty clay	CH	4.2	0.7	0.8	Clay Lens in Surficial Aquifer
PW-05-Soil-76-77-20190726	PW-05	76	77	Clay	CH	3.5	0.1	0.8	Black Creek Confining Unit
PW-06-SOIL-16-17-20190726	PW-06	16	17	Sand with silt	SP	4.5	1.7	36.7	Surficial Aquifer
PW-07-SOIL-14-15-20190724	PW-07	14	15	Sand	SP-SC	4.5	1.8	33.6	Surficial Aquifer
PW-07-SOIL-44-45-20190724	PW-07	44	45	Clay with sand	CH	4.7	0.8	0.9	Clay Lens in Surficial Aquifer
PW-09-SOIL-23-24-20190812	PW-09	23	24	Silty sand	CH	3.89	0.73	0.79	Black Creek Confining Unit
PW-09-SOIL-52-53-20190812	PW-09	52	53	Clayey sand with silt	SP-SM	13.7	5.36	12.76	Black Creek Aquifer
PW-10-SOIL-59-60-20190808	PW-10*	59	60	Silty clay	SC	28.9	0.3	1.0	Clay Lens in Black Creek Aquifer
PW-11-SOIL-16-17-20190725	PW-11	16	17	Sand with silt	SW-SC	8.5	2.8	2.7	Surficial Aquifer
PW-11-SOIL-61-62-20190725	PW-11	61	62	Sand with silt	SC	22.1	5.1	5.0	Black Creek Aquifer
PW-12-SOIL-83-84-20190731	PW-12	83	84	Clay	CH	3.6	0.7	0.8	Clay Lens in Black Creek Aquifer
PW-12-SOIL-110-111-20190731	PW-12	110	111	Sand with silt	SP-SC	3.9	1.9	16.7	Black Creek Aquifer
PW-13-SOIL-25-26-20190821	PW-13	25	26	Sand	SP	2.3	1.2	94.9	Surficial Aquifer
PW-13-SOIL-73-74-20190821	PW-13	73	74	Clay	CH	3.5	0.7	0.8	Black Creek Confining Unit
PW-13-SOIL-124-125-20190822	PW-13	124	125	Silty Sand	SM	9.1	3.6	8.6	Black Creek Aquifer
PW-14-SOIL-144-145-20190826	PW-14	144	145	Clayey sand	SC	23.8	4.8	6.0	Black Creek Aquifer
PW-15-SOIL-17.5-18-20190813	PW-15	17.5	18	Clay	CH	3.3	0.7	0.7	Perched Clay
PW-15-SOIL-38-39-20190813	PW-15	38	39	Silty sand	SM	23.8	0.5	1.0	Surficial Aquifer
PW-15-SOIL-55-56-20190813	PW-15	55	56	Clay	CH	3.8	0.7	0.8	Black Creek Confining Unit
PW-15-SOIL-112-113-20190813	PW-15	112	113	Silty sand	SM	20.3	2.9	4.7	Black Creek Aquifer

Notes:

1. * PW-10 was properly abandoned and replaced with PW-10R.
2. "USCS Classification" is the Unified Soil Classification System from the standard practice outlined in ASTM D2487-17.
3. Coefficient of Uniformity (C_u) = D_{60} / D_{10}
4. Coefficient of Curvature (C_c) = $(D_{30})^2$ / (D_{60} * D_{10})
5. Hydraulic Conductivity (K) from grain size calculated using HydrogeoSieveXL (Devlin, 2015).
6. Atterberg limits (Liquid Limit and Plastic Limit) are only tested for fine-grained materials.
7. Visual descriptions are transcribed from field logs.
8. USCS classifications are derived from laboratory data.

-- not measured
% - percent
cc - cubic centimeter
CH - fat clay
CL - lean clay
ft bgs - feet below ground surface
ft/d - feet per day
g - gram
NP - no plasticity
SC - clayey sand
SM - silty sand
SP - poorly graded sand
GP - poorly graded gravel
SW - well graded sand
USCS - Unified Soil Classification System

TABLE 7-2
ONSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	PW-01	PW-01	PW-02	PW-03
Field Sample ID	PW-01-SOIL-14-15-20190730	PW-01-SOIL-11-12-20190731	PW-02-SOIL-14-15-20190729	PW-03-SOIL-6.5-7-20190723
Sample Date	7/30/2019	7/31/2019	7/29/2019	7/23/2019
QA/QC	--	--	--	--
Vadose Zome Sample*	Y	Y	Y	Y
Depth (ft)	14-15	11-12	14-15	6.5-7
SDG	200-49879-2	200-49879-2	200-49846-2	200-49745-3
Lab Sample ID	200-49879-1	200-49879-3	200-49846-2	200-49745-1
Table 3+ Lab SOP (ng/kg)				
HFPO-DA (EPA Method 537 Mod)	**1,800**	**1,200**	**1,500**	**1,700**
PFMOAA	**1,300**	<1,000	<1,000 UJ	<1,000
PFO2HxA	**1,300**	<1,000	<1,000 UJ	1,290 U
PFO3OA	<1,000	<1,000	<1,000 UJ	<1,000
PFO4DA	<1,000	<1,000	<1,000 UJ	<1,000
PFO5DA	<1,000	<1,000	<1,000	1,160 U
PMPA	<1,000	<1,000	<1,000	2,460 U
PEPA	<1,000	<1,000	<1,000	<1,000
PFESA-BP1	<1,000	<1,000	<1,000	<1,000
PFESA-BP2	<1,000	<1,000	<1,000	<1,000
Byproduct 4	<1,000 UJ	<1,000 R	<1,000 R	<1,000 R
Byproduct 5	<1,000 UJ	<1,000 R	<1,000 R	<1,000 R
Byproduct 6	<1,000	<1,000	<1,000	<1,000
NVHOS	<1,000	<1,000	<1,000	<1,000
EVE Acid	<1,000	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000	<1,000	<1,000 UJ	<1,000
R-EVE	<1,000 UJ	<1,000 R	<1,000 R	<1,000 R
PES	<1,000	<1,000	<1,000	<1,000
PFECA B	<1,000	<1,000	<1,000 UJ	<1,000
PFECA-G	<1,000	<1,000	<1,000 UJ	<1,000
Other PFAS (ng/kg)				
10:2 Fluorotelomer sulfonate	<200	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000	<2,000
ADONA	<210	<210	<210	<210
F-53B Major	<200	<200	<200	<200
F-53B Minor	<200	<200	<200	<200
NaDONA	<210	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200	<200
PFOA	<200	<200	<200	<200
PFOS	<500	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
N-ethylperfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000
N-methyl perfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000

Notes:
1. Associated equipment blank and field blank results reported in Table 7-3.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
J - Analyte detected. Reported value may not be accurate or precise
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.

< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-2
ONSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	PW-05	PW-06	PW-07	PW-07
Field Sample ID	PW-05 Soil-12-13-20190726	PW-06-SOIL-16-17-20190729	DUP1-072419	PW-07SOIL-14-15-20190724
Sample Date	7/26/2019	7/29/2019	7/24/2019	7/24/2019
QA/QC	--	--	Field Duplicate	--
Vadose Zone Sample*	Y	Y	Y	Y
Depth (ft)	12-13	16-17	14-15	14-15
SDG	200-49809-2	200-49846-2	200-49770-2	200-49770-2
Lab Sample ID	200-49809-1	200-49846-1	200-49770-5	200-49770-3
Table 3+ Lab SOP (ng/kg)				
HFPO-DA (EPA Method 537 Mod)	**850**	<250	<250	<250
PFMOAA	<1,000 R	<1,000	<1,000	<1,000
PFO2HxA	<1,000 UJ	<1,000	<1,000	<1,000
PFO3OA	<1,000 UJ	<1,000	<1,000	<1,000
PFO4DA	<1,000 UJ	<1,000	<1,000	<1,000
PFO5DA	<1,000 UJ	<1,000	<1,000	<1,000
PMPA	<1,000 UJ	<1,000	<1,000	<1,000
PEPA	<1,000 UJ	<1,000	<1,000	<1,000
PFESA-BP1	<1,000 UJ	<1,000	<1,000	<1,000
PFESA-BP2	<1,000 UJ	<1,000	<1,000	<1,000
Byproduct 4	<1,000 R	<1,000 R	<1,000 R	<1,000 R
Byproduct 5	<1,000 R	<1,000 R	<1,000 R	<1,000 R
Byproduct 6	<1,000 UJ	<1,000	<1,000	<1,000
NVHOS	<1,000 UJ	<1,000	<1,000	<1,000
EVE Acid	<1,000 UJ	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000 UJ	<1,000	<1,000	<1,000
R-EVE	<1,000 R	<1,000 R	<1,000 R	<1,000 R
PES	<1,000 UJ	<1,000	<1,000	<1,000
PFECA B	<1,000 UJ	<1,000	<1,000	<1,000
PFECA-G	<1,000 UJ	<1,000	<1,000	<1,000
Other PFAS (ng/kg)				
10:2 Fluorotelomer sulfonate	<200 UJ	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000 UJ	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000 UJ	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000 UJ	<2,000	<2,000	<2,000
ADONA	<210	<210	<210	<210
F-53B Major	<200	<200	<200	<200
F-53B Minor	<200	<200	<200	<200
NaDONA	<210	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000 UJ	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000 UJ	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200	<200
PFOA	<200	<200	<200	<200
PFOS	<500 UJ	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
N-ethylperfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000
N-methyl perfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000

Notes:
1. Associated equipment blank and field blank results reported in Table 7-3.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
J - Analyte detected. Reported value may not be accurate or precise
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.

< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-2
ONSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	**PW-09**	**PW-09**	**PW-10**	**PW-10**
Field Sample ID	**PW-09-SOIL-10-11-20190812**	**PW-09-SOIL-8.5-9-20190812**	**PW-10-SOIL-3.5-4-20190808**	**PW-10-SOIL-8-8.5-20190808**
Sample Date	**8/12/2019**	**8/12/2019**	**8/8/2019**	**8/8/2019**
QA/QC	**--**	**--**	**--**	**--**
Vadose Zome Sample*	**Y**	**Y**	**Y**	**Y**
Depth (ft)	**10-11**	**8.5-9**	**3.5-4**	**8-8.5**
SDG	**200-50062-2**	**200-50062-2**	**200-50014-2**	**200-50014-2**
Lab Sample ID	**200-50062-1**	**200-50062-2**	**200-50014-1**	**200-50014-2**
Table 3+ Lab SOP (ng/kg)				
HFPO-DA (EPA Method 537 Mod)	<250	<250	**570**	**28,000**
PFMOAA	<1,000 UJ	<1,000 UJ	<1,000	**7,300**
PFO2HxA	<1,000 UJ	<1,000 UJ	<1,000	10,000 J
PFO3OA	<1,000 UJ	<1,000 UJ	<1,000	**4,000**
PFO4DA	<1,000 UJ	<1,000 UJ	<1,000	**4,700**
PFO5DA	<1,000 UJ	<1,000 UJ	1,260 U	**5,200**
PMPA	<1,000 UJ	<1,000 UJ	<1,000	27,000 J
PEPA	<1,000 UJ	<1,000 UJ	<1,000	13,000 J
PFESA-BP1	<1,000 UJ	<1,000 UJ	<1,000	<1,000
PFESA-BP2	<1,000 UJ	<1,000 UJ	<1,000	**1,400**
Byproduct 4	<1,000 R	<1,000 R	<1,000 R	<1,000 R
Byproduct 5	<1,000 R	<1,000 R	<1,000 R	<1,000 R
Byproduct 6	<1,000 UJ	<1,000 UJ	<1,000	<1,000
NVHOS	<1,000 UJ	<1,000 UJ	<1,000	<1,000
EVE Acid	<1,000 UJ	<1,000 UJ	<1,000	<1,000
Hydro-EVE Acid	<1,000 UJ	<1,000 UJ	<1,000	**1,500**
R-EVE	<1,000 R	<1,000 R	<1,000 R	<1,000 R
PES	<1,000 UJ	<1,000 UJ	<1,000	<1,000
PFECA B	<1,000 UJ	<1,000 UJ	<1,000	<1,000
PFECA-G	<1,000 UJ	<1,000 UJ	<1,000	<1,000
Other PFAS (ng/kg)				
10:2 Fluorotelomer sulfonate	<200	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000	<2,000
ADONA	<210	<210	<210	<210
F-53B Major	<200	<200	<200	<200
F-53B Minor	<200	<200	<200	<200
NaDONA	<210	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200	**310**
Perfluorotetradecanoic Acid	<200	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200	<200
PFOA	<200	<200	<200	<200
PFOS	<500	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<1,000	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<1,000	<1,000
N-ethylperfluoro-1-octanesulfonamide	--	--	<1,000	<1,000
N-methyl perfluoro-1-octanesulfonamide	--	--	<1,000	<1,000

Notes:
1. Associated equipment blank and field blank results reported in Table 7-3.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
J - Analyte detected. Reported value may not be accurate or precise
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.

< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-2
ONSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	PW-11	PW-12	PW-12	PW-13
Field Sample ID	PW-11-SOIL-16-17-20190725	PW-12-SOIL-36-37-20190731	PW-12-SOIL-45-46-20190731	PW-13-Soil-25-26-20190821
Sample Date	7/25/2019	7/31/2019	7/31/2019	8/21/2019
QA/QC	--	--	--	--
Vadose Zome Sample*	Y	N	N	Y
Depth (ft)	16-17	36-37	45-46	25-26
SDG	200-49801-2	200-49879-2	200-49879-2	200-50221-2
Lab Sample ID	200-49801-1	200-49879-4	200-49879-5	200-50221-1
Table 3+ Lab SOP (ng/kg)				
HFPO-DA (EPA Method 537 Mod)	**620**	**830**	<250	<250
PFMOAA	<1,000	<1,000	<1,000	<1,000
PFO2HxA	<1,000	<1,000	<1,000	<1,000
PFO3OA	<1,000	<1,000	<1,000	<1,000
PFO4DA	<1,000	<1,000	<1,000	<1,000
PFO5DA	<1,000	<1,000	<1,000	<1,000
PMPA	<1,000	<1,000	<1,000	<1,000
PEPA	<1,000	<1,000	<1,000	<1,000
PFESA-BP1	<1,000	<1,000	<1,000	<1,000
PFESA-BP2	<1,000	<1,000	<1,000	<1,000
Byproduct 4	<1,000 R	<1,000 R	<1,000 UJ	<1,000
Byproduct 5	<1,000 R	<1,000 R	<1,000 UJ	<1,000
Byproduct 6	<1,000	<1,000	<1,000	<1,000
NVHOS	<1,000	<1,000	<1,000	<1,000
EVE Acid	<1,000	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000	<1,000	<1,000	<1,000
R-EVE	<1,000 R	<1,000 R	<1,000 R	<1,000
PES	<1,000	<1,000	<1,000	<1,000
PFECA B	<1,000	<1,000	<1,000	<1,000
PFECA-G	<1,000	<1,000	<1,000	<1,000
Other PFAS (ng/kg)				
10:2 Fluorotelomer sulfonate	<200	<200	<200 UJ	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000	<2,000
ADONA	<210	<210	<210	<210
F-53B Major	<200	<200	<200	<200
F-53B Minor	<200	<200	<200	<200
NaDONA	<210	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200 UJ	<200
Perfluorododecanoic Acid	<200	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200	<200
PFOA	<200	<200	<200	<200
PFOS	<500	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<1,000	<1,000	<1,000	<1,000
N-ethylperfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000
N-methyl perfluoro-1-octanesulfonamide	<1,000	<1,000	<1,000	<1,000

Notes:
1. Associated equipment blank and field blank results reported in Table 7-3.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
J - Analyte detected. Reported value may not be accurate or precise
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.

< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-2
ONSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	**PW-15**
Field Sample ID	**PW-15-SOIL-38-39-20190813**
Sample Date	**8/13/2019**
QA/QC	**--**
Vadose Zome Sample*	**N**
Depth (ft)	**38-39**
SDG	**200-50083-2**
Lab Sample ID	**200-50083-2**
Table 3+ Lab SOP (ng/kg)	
HFPO-DA (EPA Method 537 Mod)	<250
PFMOAA	<1,000
PFO2HxA	<1,000
PFO3OA	<1,000
PFO4DA	<1,000
PFO5DA	<1,000
PMPA	<1,000
PEPA	<1,000
PFESA-BP1	<1,000
PFESA-BP2	<1,000
Byproduct 4	<1,000
Byproduct 5	<1,000
Byproduct 6	<1,000
NVHOS	<1,000
EVE Acid	<1,000
Hydro-EVE Acid	<1,000
R-EVE	<1,000
PES	<1,000
PFECA B	<1,000
PFECA-G	<1,000
Other PFAS (ng/kg)	
10:2 Fluorotelomer sulfonate	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000
6:2 Fluorotelomer sulfonate	<2,000
ADONA	<210
F-53B Major	<200
F-53B Minor	<200
NaDONA	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000
Perfluorobutane Sulfonic Acid	<200
Perfluorobutanoic Acid	<200
Perfluorodecane Sulfonic Acid	<200
Perfluorodecanoic Acid	<200
Perfluorododecane sulfonic acid (PFDoS)	<200
Perfluorododecanoic Acid	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200
Perfluoroheptanoic Acid	<200
Perfluorohexadecanoic acid (PFHxDA)	<200
Perfluorohexane Sulfonic Acid	<200
Perfluorohexanoic Acid	<200
Perfluorononanesulfonic acid	<200
Perfluorononanoic Acid	<200
Perfluorooctadecanoic acid	<200
Perfluorooctane Sulfonamide	<200
Perfluoropentane sulfonic acid (PFPeS)	<200
Perfluoropentanoic Acid	<200
Perfluorotetradecanoic Acid	<200
Perfluorotridecanoic Acid	<200
Perfluoroundecanoic Acid	<200
PFOA	<200
PFOS	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<1,000
N-ethylperfluoro-1-octanesulfonamide	<1,000
N-methyl perfluoro-1-octanesulfonamide	<1,000

Notes:
1. Associated equipment blank and field blank results reported in Table 7-3.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
J - Analyte detected. Reported value may not be accurate or precise
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.

< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-3
ONSITE SOIL ANALYTICAL RESULTS - QUALITY CONTROL SAMPLES
Chemours Fayetteville Works, North Carolina

Location	DRILL WATER*	EB	EB	EB
Field Sample ID	DRILL WATER-20190731	PW-EQBLK-1-20190725	PW-EQBLK-2-20190726	PW-EQBLK-3
Sample Date	7/31/2019	7/25/2019	7/26/2019	7/30/2019
QA/QC	--	Equipment Blank	Equipment Blank	Equipment Blank
Depth (ft)	-	-	-	-
SDG	200-49879-2	200-49801-2	200-49809-2	200-49879-2
Lab Sample ID	200-49879-8	200-49801-3	200-49809-4	200-49879-2
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**17**	<4	<3.6	<4
PFMOAA	<5	--	<5	<5
PFO2HxA	**10**	--	<2	<2
PFO3OA	<2	--	<2	<2
PFO4DA	<2	--	<2	<2
PFO5DA	<2	--	<2	<2
PMPA	**130**	--	<10	<10
PEPA	<20	--	<20	<20
PFESA-BP1	<2	--	<2	<2
PFESA-BP2	**6.7**	--	<2	<2
Byproduct 4	<2	--	<2	<2
Byproduct 5	<2	--	<2	<2
Byproduct 6	<2	--	<2	<2
NVHOS	<2	--	<2	<2
EVE Acid	<2	--	<2	<2
Hydro-EVE Acid	<2	--	<2	<2
R-EVE	<2	--	<2	<2
PES	<2	--	<2	<2
PFECA B	<2	--	<2	<2
PFECA-G	<2	--	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<1.8	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<18	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<18	<20
6:2 Fluorotelomer sulfonate	<20	<20	<18	<20
ADONA	<2.1	<2.1	<1.9	<2.1
F-53B Major	<2	<2	<1.8	<2
F-53B Minor	<2	<2	<1.8	<2
NaDONA	<2.1	<2.1	<1.9	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<18	<20
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<18	<20
Perfluorobutane Sulfonic Acid	**2.2**	<2	<1.8	<2
Perfluorobutanoic Acid	<2	<2	**0.32**	<2
Perfluorodecane Sulfonic Acid	<2	<2	<1.8	<2
Perfluorodecanoic Acid	<2	<2	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<1.8	<2
Perfluorododecanoic Acid	<2	<2	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<1.8	<2
Perfluoroheptanoic Acid	<2	<2	<1.8	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<1.8	<2
Perfluorohexane Sulfonic Acid	<2	<2	**0.24**	<2
Perfluorohexanoic Acid	<2	<2	**0.92**	<2
Perfluorononanesulfonic acid	<2	<2	<1.8	<2
Perfluorononanoic Acid	<2	<2	<1.8	<2
Perfluorooctadecanoic acid	<2	<2	<1.8	<2
Perfluorooctane Sulfonamide	<2	<2	<1.8	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<1.8	<2
Perfluoropentanoic Acid	<2	<2	<1.8	<2
Perfluorotetradecanoic Acid	<2	<2	<1.8	<2
Perfluorotridecanoic Acid	<2	<2	<1.8	<2
Perfluoroundecanoic Acid	<2	<2	<1.8	<2
PFOA	<2	<2	<1.8	<2
PFOS	<2	<2	<1.8	<2
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	--	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2	--	<2	<2
N-ethylperfluoro-1-octanesulfonamide	<2	--	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	--	<2	<2

Notes:

1. Associated soil analytical results reported in Table 7-2.

2. * Drill Water was sourced from offsite fire hydrant. Water is from Bladen County Water System.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-4
OFFSITE SOIL CHARACTERISTICS
Chemours Fayetteville Works, North Carolina

Sample ID	Well ID	Top (ft bgs)	Bottom (ft bgs)	Visual Description	USCS Classification	pH (s.u.)	Fraction Organic Carbon (g/g)	Specific Gravity	Liquid Limit of Soils	Plastic Limit of Soils	Plasticity Index (PI)	Percent Moisture (%)
BLADEN-1S-081419	Bladen-1S	6	7	Fine to medium grained Silty Sand	SC	4.0	0.0025	2.67	0	0	NP	20.3
BLADEN-2D-081519-72-73	Bladen-2D	72	73	Medium grained sand trace mica	SP-SM	4.2	0.0023	4.66	0	0	NP	33.8
BLADEN-3D-Soil-081919-42-43	Bladen-3D	42	43	Sand with clay	SC	6.0	0.0086	2.69	0	0	NP	22.6
Bladen-3S-Soil-082019-5-6	Bladen-3S	5	6	Coarse grained sand	SW	--	--	--	--	--	--	8.7
Bladen-4S-Soil-082119-5-6	Bladen-4S	5	6	Medium to coarse sand with gravel	SP-SM	7.8	0.0005	2.65	0	0	NP	20.1
CUMBERLAND-1D-46-47-20190912	Cumberland-1D	46	47	Fine Grained Sand	SP	4.4 J	0.0077	2.67	--	--	--	27.5
CUMBERLAND-1S-6-7-20190913	Cumberland-1S	6	7	Medium grained sand with silt	SP	5.2 J	0.0021	2.66	--	--	--	7.1
Cumberland-2D-soil-49-50-0912	Cumberland-2D	49	50	Fine to medium grained sand	SP	5.6	0.0068	2.69	--	--	--	23.9
Cumberland-2S-soil-5-6-0912	Cumberland-2S	5	6	Fine grained clayey sand	SP-SM	5.3	0.0080	2.65	--	--	--	19.3
Cumberland-3D-24-25-20190911	Cumberland-3D	24	25	Medium to coarse grained sand	SP-SM	5.0	0.0028	2.66	--	--	--	11.7
Cumberland-4S-soil-5-6-0911	Cumberland-4S	5	6	Fine to medium grained sand	SP-SC	4.7	0.0018	2.68	--	--	--	14.3
Cumberland-5D-54-55-20190911	Cumberland-5D	54	55	Fine grained sand	SP-SM	4.9	0.0160	2.63	--	--	--	17.8
Robeson-1S-soil-15-16-20190909	Robeson-1S	15	16	Fine grained silty sand	SP-SM	8.2	0.0012	2.67	0	0	NP	18.4

Notes:

1. Laboratory results available as of 09/24/2019 are reported. Additional data will be presented in an addendum to this report.
2. "USCS Classification" is the Unified Soil Classification System from the standard practice outlined in ASTM D2487-17.
3. Coefficient of Uniformity (C_u) = D_{60} / D_{10}
4. Coefficient of Curvature (C_c) = $(D_{30})^2$ / (D_{60} * D_{10})
5. Hydraulic Conductivity (K) from grain size calculated using HydrogeoSieveXL (Devlin, 2015).
6. Atterberg limits (Liquid Limit and Plastic Limit) are only tested for fine-grained materials.
7. Visual descriptions are transcribed from field logs.
8. USCS classifications are derived from laboratory data.

-- not measured
% - percent
cc - cubic centimeter
NP - no plasticity
ft/d - feet per day
g - gram
USCS - Unified Soil Classification System
ft bgs - feet below ground surface
CH - fat clay
CL - lean clay
SC - clayey sand
SM - silty sand
SP - poorly graded sand
SW - well graded sand

TABLE 7-4
OFFSITE SOIL CHARACTERISTICS
Chemours Fayetteville Works, North Carolina

Sample ID	Well ID	Top (ft bgs)	Bottom (ft bgs)	Visual Description	USCS Classification	Grain Size Distribution (%)				Porosity Calculation (%)	In Place Density (g/cc)	Void Ratio	Coefficient of Uniformity (C_u)
						Clay	Silt	Sand	Gravel				
BLADEN-1S-081419	Bladen-1S	6	7	Fine to medium grained Silty Sand	SC	9.2	8.6	81.7	0.5	39.6	1.61	0.7	10.18
BLADEN-2D-081519-72-73	Bladen-2D	72	73	Medium grained sand trace mica	SP-SM	2.9	9.1	88	0	39.1	1.62	0.6	9.17
BLADEN-3D-Soil-081919-42-43	Bladen-3D	42	43	Sand with clay	SC	10.6	7.3	82.1	0	46.2	1.44	0.9	5.89
Bladen-3S-Soil-082019-5-6	Bladen-3S	5	6	Coarse grained sand	SW	--	--	--	--	--	--	--	--
Bladen-4S-Soil-082119-5-6	Bladen-4S	5	6	Medium to coarse sand with gravel	SP-SM	2.6	8.8	88.6	0	42	1.54	0.7	4.71
CUMBERLAND-1D-46-47-20190912	Cumberland-1D	46	47	Fine Grained Sand	SP	6.2	3.2	90.6	0	42.9	1.52	0.8	3.52
CUMBERLAND-1S-6-7-20190913	Cumberland-1S	6	7	Medium grained sand with silt	SP	3.3	16.1	80.6	0	36.6	1.69	0.6	17.48
Cumberland-2D-soil-49-50-0912	Cumberland-2D	49	50	Fine to medium grained sand	SP	1.3	-0.03	94.6	4.1	44.7	1.48	0.8	1.61
Cumberland-2S-soil-5-6-0912	Cumberland-2S	5	6	Fine grained clayey sand	SP-SM	7.8	14.8	77.4	0	40.7	1.57	0.7	19.12
Cumberland-3D-24-25-20190911	Cumberland-3D	24	25	Medium to coarse grained sand	SP-SM	1.2	6.7	91.2	1	47.3	1.4	0.9	2.43
Cumberland-4S-soil-5-6-0911	Cumberland-4S	5	6	Fine to medium grained sand	SP-SC	7.9	3.3	88.8	0	39	1.63	0.6	6.34
Cumberland-5D-54-55-20190911	Cumberland-5D	54	55	Fine grained sand	SP-SM	5.5	10.7	83.8	0	54.9	1.19	1.2	5.3
Robeson-1S-soil-15-16-20190909	Robeson-1S	15	16	Fine grained silty sand	SP-SM	2.6	7.1	90.3	0	41.9	1.55	0.7	2.53

Notes:

1. Laboratory results available as of 09/24/2019 are reported. Additional data will be presented in an addendum to this report.
2. "USCS Classification" is the Unified Soil Classification System from the standard practice outlined in ASTM D2487-17.
3. Coefficient of Uniformity (C_u) = D_{60} / D_{10}
4. Coefficient of Curvature (C_c) = $(D_{30})^2$ / (D_{60} * D_{10})
5. Hydraulic Conductivity (K) from grain size calculated using HydrogeoSieveXL (Devlin, 2015).
6. Atterberg limits (Liquid Limit and Plastic Limit) are only tested for fine-grained materials.
7. Visual descriptions are transcribed from field logs.
8. USCS classifications are derived from laboratory data.

-- not measured
% - percent
cc - cubic centimeter
NP - no plasticity
ft/d - feet per day
g - gram
USCS - Unified Soil Classification System
ft bgs - feet below ground surface
CH - fat clay
CL - lean clay
SC - clayey sand
SM - silty sand
SP - poorly graded sand
SW - well graded sand

TABLE 7-4
OFFSITE SOIL CHARACTERISTICS
Chemours Fayetteville Works, North Carolina

Sample ID	Well ID	Top (ft bgs)	Bottom (ft bgs)	Visual Description	USCS Classification	Coefficient of Curvature (C_c)	K from Grain Size Geometric Mean (ft/d)	Lithologic Unit
BLADEN-1S-081419	Bladen-1S	6	7	Fine to medium grained Silty Sand	SC	3.26	4.24	Surficial Aquifer
BLADEN-2D-081519-72-73	Bladen-2D	72	73	Medium grained sand trace mica	SP-SM	3.03	13.33	Black Creek Aquifer
BLADEN-3D-Soil-081919-42-43	Bladen-3D	42	43	Sand with clay	SC	3.49	4.4	Black Creek Aquifer
Bladen-3S-Soil-082019-5-6	Bladen-3S	5	6	Coarse grained sand	SW	--	--	Surficial Aquifer
Bladen-4S-Soil-082119-5-6	Bladen-4S	5	6	Medium to coarse sand with gravel	SP-SM	2.22	12.8	Surficial Aquifer
CUMBERLAND-1D-46-47-20190912	Cumberland-1D	46	47	Fine Grained Sand	SP	1.8	26.35	Black Creek Aquifer
CUMBERLAND-1S-6-7-20190913	Cumberland-1S	6	7	Medium grained sand with silt	SP	5.57	5.96	Surficial Aquifer
Cumberland-2D-soil-49-50-0912	Cumberland-2D	49	50	Fine to medium grained sand	SP	1.06	128.36	Black Creek Aquifer
Cumberland-2S-soil-5-6-0912	Cumberland-2S	5	6	Fine grained clayey sand	SP-SM	6.85	4.42	Surficial Aquifer
Cumberland-3D-24-25-20190911	Cumberland-3D	24	25	Medium to coarse grained sand	SP-SM	1.19	88.21	Black Creek Aquifer
Cumberland-4S-soil-5-6-0911	Cumberland-4S	5	6	Fine to medium grained sand	SP-SC	3.38	7.81	Surficial Aquifer
Cumberland-5D-54-55-20190911	Cumberland-5D	54	55	Fine grained sand	SP-SM	2.69	5.5	Black Creek Aquifer
Robeson-1S-soil-15-16-20190909	Robeson-1S	15	16	Fine grained silty sand	SP-SM	1.56	18.18	Surficial Aquifer

Notes:

1. Laboratory results available as of 09/24/2019 are reported. Additional data will be presented in an addendum to this report.
2."USCS Classification" is the Unified Soil Classification System from the standard practice outlined in ASTM D2487-17.
3. Coefficient of Uniformity (C_u) = D_{60} / D_{10}
4. Coefficient of Curvature (C_c) = $(D_{30})^2$ / (D_{60} * D_{10})
5. Hydraulic Conductivity (K) from grain size calculated using HydrogeoSieveXL (Devlin, 2015).
6. Atterberg limits (Liquid Limit and Plastic Limit) are only tested for fine-grained materials.
7. Visual descriptions are transcribed from field logs.
8. USCS classifications are derived from laboratory data.

-- not measured
% - percent
cc - cubic centimeter
NP - no plasticity
ft/d - feet per day
g - gram
USCS - Unified Soil Classification System
ft bgs - feet below ground surface
CH - fat clay
CL - lean clay
SC - clayey sand
SM - silty sand
SP - poorly graded sand
SW - well graded sand

TABLE 7-5
OFFSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	BLADEN-1S	BLADEN-1S	BLADEN-2S	BLADEN-3S
Field Sample ID	BLADEN-1S-081419	DUP-1-081419	BLADEN-2S-081619-9.5-10.5	Bladen-3S-Soil-082019-5-6
Sample Date	8/14/2019	8/14/2019	8/16/2019	8/20/2019
QA/QC	--	Field Duplicate	--	--
Vadose Zone Sample*	N	N	N	N
Depth (ft)	6-7	6-7	9.5-10.5	5-6
SDG	200-50099-2	200-50099-2	200-50148-2	200-50185-2
Lab Sample ID	200-50099-1	200-50099-2	200-50148-2	200-50185-2
Table 3+ Lab SOP (ng/kg)				
HFPO-DA (EPA Method 537 Mod)	<250	<250	<250	<250 UJ
PFMOAA	<1,000	<1,000	<1,000 UJ	<1,000
PFO2HxA	<1,000	<1,000	<1,000 UJ	<1,000
PFO3OA	<1,000	<1,000	<1,000 UJ	<1,000
PFO4DA	<1,000	<1,000	<1,000	<1,000
PFO5DA	<1,000	<1,000	<1,000	<1,000
PMPA	<1,000	<1,000	<1,000	<1,000
PEPA	<1,000	<1,000	<1,000	<1,000
PFESA-BP1	<1,000	<1,000	<1,000	<1,000
PFESA-BP2	<1,000	<1,000	<1,000	<1,000
Byproduct 4	<1,000 UJ	<1,000 UJ	<1,000 R	<1,000 R
Byproduct 5	<1,000 UJ	<1,000 UJ	<1,000 R	<1,000 R
Byproduct 6	<1,000	<1,000	<1,000	<1,000
NVHOS	<1,000	<1,000	<1,000	<1,000
EVE Acid	<1,000	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000	<1,000	<1,000 UJ	<1,000
R-EVE	<1,000 R	<1,000 R	<1,000 R	<1,000 R
PES	<1,000	<1,000	<1,000	<1,000
PFECA B	<1,000	<1,000	<1,000 UJ	<1,000
PFECA-G	<1,000	<1,000	<1,000 UJ	<1,000
Other PFAS (ng/kg)				
10:2 Fluorotelomer sulfonate	<200 UJ	<200	<200	<200 UJ
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000	<2,000 UJ
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000	<2,000 UJ
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000	<2,000 UJ
ADONA	<210	<210	<210	<210 UJ
F-53B Major	<200	<200	<200	<200 UJ
F-53B Minor	<200 UJ	<200	<200	<200 UJ
NaDONA	<210	<210	<210	<210 UJ
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000	<2,000 UJ
Perfluorobutane Sulfonic Acid	<420	**340**	<200 UJ	<200 UJ
Perfluorobutanoic Acid	<200	<200	<200	<200 UJ
Perfluorodecane Sulfonic Acid	<200	<200	<200	<200 UJ
Perfluorodecanoic Acid	<200	<200	<200	<200 UJ
Perfluorododecane sulfonic acid (PFDoS)	<200 UJ	<200	<200	<200 UJ
Perfluorododecanoic Acid	<200	<200	<200	<200 UJ
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200	<200 UJ
Perfluoroheptanoic Acid	<200	<200	<200	<200 UJ
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200	<200 UJ
Perfluorohexane Sulfonic Acid	<200	<200	<200	<200 UJ
Perfluorohexanoic Acid	<200	<200	<200	<200 UJ
Perfluorononanesulfonic acid	<200	<200	<200	<200 UJ
Perfluorononanoic Acid	<200	<200	<200	<200 UJ
Perfluorooctadecanoic acid	<200	<200	<200	<200 UJ
Perfluorooctane Sulfonamide	<200	<200	<200	<200 UJ
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200	<200 UJ
Perfluoropentanoic Acid	<200	<200	<200	<200 UJ
Perfluorotetradecanoic Acid	<200	<200	<200	<200 UJ
Perfluorotridecanoic Acid	<200	<200	<200	<200 UJ
Perfluoroundecanoic Acid	<200	<200	<200	<200 UJ
PFOA	<200	<200	<200	<200 UJ
PFOS	<500	<500	<500	<500 UJ
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200 UJ	<200 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200 UJ	<200 UJ
N-ethylperfluoro-1-octanesulfonamide	<200	<200	<200	<200 UJ
N-methyl perfluoro-1-octanesulfonamide	<200	<200	<200	<200 UJ
Other				
Percent Moisture	20.3	11.3	12.2	8.7
Percent Solids	--	88.7	87.8	91.3

Notes:
1. Associated equipment blank and field blank results reported in Table 7-6.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-5
OFFSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	BLADEN-4S	CUMBERLAND-1S	CUMBERLAND-2S
Field Sample ID	Bladen-4S-Soil-082119-5-6	CUMBERLAND-1S-6-7-20190913	Cumberland-2S-soil-5-6-0912
Sample Date	8/21/2019	9/13/2019	9/12/2019
QA/QC	--	--	--
Vadose Zone Sample*	N	N	N
Depth (ft)	5-6	6-7	5-6
SDG	200-50202-2	200-50567-2	200-50537-2
Lab Sample ID	200-50202-1	200-50567-2	200-50537-2
Table 3+ Lab SOP (ng/kg)			
HFPO-DA (EPA Method 537 Mod)	<250	<250	<250
PFMOAA	<1,000	<1,000	<1,000 UJ
PFO2HxA	<1,000	<1,000	<1,000 UJ
PFO3OA	<1,000	<1,000	<1,000 UJ
PFO4DA	<1,000	<1,000	<1,000 UJ
PFO5DA	<1,000	<1,000	<1,000 UJ
PMPA	<1,000	<1,000	<1,000 UJ
PEPA	<1,000	<1,000	<1,000 UJ
PFESA-BP1	<1,000	<1,000	<1,000 UJ
PFESA-BP2	<1,000	<1,000	<1,000 UJ
Byproduct 4	<1,000	<1,000	<1,000 R
Byproduct 5	<1,000	<1,000	<1,000 UJ
Byproduct 6	<1,000	<1,000	<1,000 UJ
NVHOS	<1,000	<1,000	<1,000 UJ
EVE Acid	<1,000	<1,000	<1,000 UJ
Hydro-EVE Acid	<1,000	<1,000	<1,000 UJ
R-EVE	<1,000	<1,000	<1,000 UJ
PES	<1,000	<1,000	<1,000 UJ
PFECA B	<1,000	<1,000	<1,000 UJ
PFECA-G	<1,000	<1,000	<1,000 UJ
Other PFAS (ng/kg)			
10:2 Fluorotelomer sulfonate	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000
ADONA	<210	<210	<210
F-53B Major	<200	<200	<200
F-53B Minor	<200	<200	<200
NaDONA	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200
PFOA	<200	<200	<200
PFOS	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200
N-ethylperfluoro-1-octanesulfonamide	<200	<200	<200
N-methyl perfluoro-1-octanesulfonamide	<200	<200	<200
Other			
Percent Moisture	20.1	7.1	19.3
Percent Solids	--	--	--

Notes:

1. Associated equipment blank and field blank results reported in Table 7-6.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-5
OFFSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	CUMBERLAND-3S	CUMBERLAND-4S	CUMBERLAND-4S
Field Sample ID	**Cumberland-3S-soil-6-7-0912**	**Cumberland-4S-soil-5-6-0911**	**Dup1-20190911**
Sample Date	**9/12/2019**	**9/11/2019**	**9/11/2019**
QA/QC	**--**	**--**	**Field Duplicate**
Vadose Zone Sample*	**N**	**N**	**N**
Depth (ft)	**6-7**	**5-6**	**5-6**
SDG	**200-50537-2**	**200-50518-2**	**200-50518-2**
Lab Sample ID	**200-50537-4**	**200-50518-1**	**200-50518-2**
Table 3+ Lab SOP (ng/kg)			
HFPO-DA (EPA Method 537 Mod)	<320	**320**	**390**
PFMOAA	<1,000	<1,000	<1,000
PFO2HxA	<1,000	<1,000	<1,000
PFO3OA	<1,000	<1,000	<1,000
PFO4DA	<1,000	<1,000	<1,000
PFO5DA	<1,000	<1,000	<1,000
PMPA	<1,000	<1,000	<1,000
PEPA	<1,000	<1,000	<1,000
PFESA-BP1	<1,000	<1,000	<1,000
PFESA-BP2	<1,000	<1,000	<1,000
Byproduct 4	<1,000	<1,000 R	<1,000 R
Byproduct 5	<1,000	<1,000 R	<1,000 R
Byproduct 6	<1,000	<1,000	<1,000
NVHOS	<1,000	<1,000	<1,000
EVE Acid	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000	<1,000	<1,000
R-EVE	<1,000	<1,000 R	<1,000 R
PES	<1,000	<1,000	<1,000
PFECA B	<1,000	<1,000	<1,000
PFECA-G	<1,000	<1,000	<1,000
Other PFAS (ng/kg)			
10:2 Fluorotelomer sulfonate	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000
ADONA	<210	<210	<210
F-53B Major	<200	<200	<200
F-53B Minor	<200	<200	<200
NaDONA	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200
PFOA	<200	<200	<200
PFOS	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<200	<200	<200
N-ethylperfluoro-1-octanesulfonamide	<200	<200	<200
N-methyl perfluoro-1-octanesulfonamide	<200	<200	<200
Other			
Percent Moisture	3.7	14.3	16.1
Percent Solids	96.3	--	83.9

Notes:

1. Associated equipment blank and field blank results reported in Table 7-6.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-5
OFFSITE SOIL ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Location	CUMBERLAND-5S	ROBESON-1S	ROBESON-1S
Field Sample ID	Cumberland-5S-3-4-20190911	Robeson-1S-soil-15-16-20190909	Robeson-1S-soil-5-6-20190909
Sample Date	9/11/2019	9/9/2019	9/9/2019
QA/QC	--	--	--
Vadose Zone Sample*	N	N	N
Depth (ft)	3-4	15-16	5-6
SDG	200-50518-2	200-50460-2	200-50460-2
Lab Sample ID	200-50518-4	200-50460-1	200-50460-2
Table 3+ Lab SOP (ng/kg)			
HFPO-DA (EPA Method 537 Mod)	<250	<250	<250
PFMOAA	<1,000	<1,000	<1,000 UJ
PFO2HxA	<1,000	<1,000	<1,000 UJ
PFO3OA	<1,000 UJ	<1,000	<1,000 UJ
PFO4DA	<1,000	<1,000	<1,000 UJ
PFO5DA	<1,000	<1,000	<1,000
PMPA	<1,000	<1,000	<1,000
PEPA	<1,000	<1,000	<1,000
PFESA-BP1	<1,000	<1,000	<1,000
PFESA-BP2	<1,000	<1,000	<1,000
Byproduct 4	<1,000	<1,000 R	<1,000 R
Byproduct 5	<1,000	<1,000 R	<1,000 R
Byproduct 6	<1,000	<1,000	<1,000
NVHOS	<1,000	<1,000	<1,000
EVE Acid	<1,000	<1,000	<1,000
Hydro-EVE Acid	<1,000	<1,000	<1,000
R-EVE	<1,000 UJ	<1,000 R	<1,000 R
PES	<1,000	<1,000	<1,000
PFECA B	<1,000	<1,000	<1,000 UJ
PFECA-G	<1,000	<1,000	<1,000 UJ
Other PFAS (ng/kg)			
10:2 Fluorotelomer sulfonate	<200	<200	<200
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<2,000	<2,000	<2,000
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,000	<2,000	<2,000
6:2 Fluorotelomer sulfonate	<2,000	<2,000	<2,000
ADONA	<210	<210	<210
F-53B Major	<200	<200	<200
F-53B Minor	<200	<200	<200
NaDONA	<210	<210	<210
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
N-methyl perfluorooctane sulfonamidoacetic acid	<2,000	<2,000	<2,000
Perfluorobutane Sulfonic Acid	<200	<200	<200
Perfluorobutanoic Acid	<200	<200	<200
Perfluorodecane Sulfonic Acid	<200	<200	<200
Perfluorodecanoic Acid	<200	<200	<200
Perfluorododecane sulfonic acid (PFDoS)	<200	<200	<200
Perfluorododecanoic Acid	<200	<200	<200
Perfluoroheptane sulfonic acid (PFHpS)	<200	<200	<200
Perfluoroheptanoic Acid	<200	<200	<200
Perfluorohexadecanoic acid (PFHxDA)	<200	<200	<200
Perfluorohexane Sulfonic Acid	<200	<200	<200
Perfluorohexanoic Acid	<200	<200	<200
Perfluorononanesulfonic acid	<200	<200	<200
Perfluorononanoic Acid	<200	<200	<200
Perfluorooctadecanoic acid	<200	<200	<200
Perfluorooctane Sulfonamide	<200	<200	<200
Perfluoropentane sulfonic acid (PFPeS)	<200	<200	<200
Perfluoropentanoic Acid	<200	<200	<200
Perfluorotetradecanoic Acid	<200	<200	<200
Perfluorotridecanoic Acid	<200	<200	<200
Perfluoroundecanoic Acid	<200	<200	<200
PFOA	<200	<200	<200
PFOS	<500	<500	<500
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<200	<1,000	<1,000
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<200	<1,000	<1,000
N-ethylperfluoro-1-octanesulfonamide	<200	<1,000	<1,000
N-methyl perfluoro-1-octanesulfonamide	<200	<1,000	<1,000
Other			
Percent Moisture	18.2	18.4 J	12.3
Percent Solids	81.8	--	87.7

Notes:
1. Associated equipment blank and field blank results reported in Table 7-6.
2. * Select soil samples collected from saturated zone for soil physical parameters were also inadvertently analyzed for PFAS.

Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/kg - nanograms per kilogram
QA/QC - Quality assurance/ quality control
R - Result rejected based on QA/QC criteria
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 7-6
OFFSITE SOIL ANALYTICAL RESULTS - QUALITY CONTROL SAMPLES
Chemours Fayetteville Works, North Carolina

Location	EB	EQBLK	FBLK	FBLK
Field Sample ID	BLADEN-2S-SOIL-EQBLK-RINSATE	BLADEN-SOIL-EQBLK-1-RINSATE	BLADEN-SOIL-EQBLK-1-FIELD	BLADEN-2S-SOIL-EQBLK-FIELD BLA
Sample Date	8/16/2019	8/14/2019	8/14/2019	8/16/2019
QA/QC	Equipment Blank	Equipment Blank	Field Blank	Field Blank
Depth (ft)	--	--	--	--
SDG	200-50148-2	200-50099-2	200-50099-2	200-50148-2
Lab Sample ID	200-50148-4	200-50099-3	200-50099-4	200-50148-3
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4	<4
PFMOAA	<5	<5	<5	<5
PFO2HxA	<2	<2	<2	<2
PFO3OA	<2	<2	<2	<2
PFO4DA	<2	<2	<2	<2
PFO5DA	<2	<2	<2	<2
PMPA	<10	<10	<10	<10
PEPA	<20	<20	<20	<20
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	<2	<2	<2	<2
Byproduct 4	<2	<2	<2	<2
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	<2	<2	<2	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2	<2
R-EVE	<2	<2	<2	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2	<2
F-53B Minor	<2	<2	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	**2.5**
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	<2	<2
PFOS	<2	<2	<2	<2
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--

Notes:
1. Associated soil analytical results reported in Table 7-5.
Bold - Analyte detected above associated reporting limit
EPA - Environmental Protection Agency
ft - feet
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
< - Analyte not detected above associated reporting limit.
-- - No data reported

TABLE 9-1
GROUNDWATER ELEVATIONS
Chemours Fayetteville Works, North Carolina

Area	Aquifer	Well ID	Gauging Date	Northing (ft, SPCS NAD83)	Easting (ft, SPCS NAD83)	Screened Interval (ft bgs)	TOC Elevation (ft NAVD 88)	Depth to Water (ft, from TOC)	Groundwater Elevation (ft NAVD88)
Onsite	Black Creek Aquifer	BCA-01	15-Oct-19	399,780.06	2,050,662.22	91 - 101	146.30	58.92	87.38
Onsite	Black Creek Aquifer	BCA-02	15-Oct-19	396,242.32	2,051,062.21	92 - 102	148.42	73.87	74.55
Onsite	Black Creek Aquifer	BCA-03R	15-Oct-19	398,582.23	2,049,522.22	88 - 98	150.82	49.55	101.27
Onsite	Black Creek Aquifer	BCA-04	15-Oct-19	395,877.67	2,047,823.11	94 - 104	150.24	28.69	121.55
Onsite	Perched Zone	FTA-01	15-Oct-19	397,907.50	2,049,373.61	12.0 - 22.0	150.63	17.02	133.61
Onsite	Perched Zone	FTA-02	15-Oct-19	397,786.43	2,049,206.27	11.5 - 21.5	150.28	18.00	132.28
Onsite	Perched Zone	FTA-03	15-Oct-19	397,767.09	2,049,313.86	12.0 - 22.0	151.08	18.18	132.90
Onsite	Surficial Aquifer	INSITU-01	15-Oct-19	401,658.20	2,046,077.31	7.0 - 17.0	118.20	6.46	111.74
Onsite	Surficial Aquifer	INSITU-02	15-Oct-19	401,863.46	2,049,136.62	7.0 - 17.0	113.12	DRY	--
Onsite	Floodplain Deposits	LTW-01	15-Oct-19	399,566.17	2,052,149.95	11.0 - 26.0	53.83	16.53	37.30
Onsite	Black Creek Aquifer	LTW-02	15-Oct-19	398,848.36	2,052,354.37	28.0 - 38.0	52.48	10.29	42.19
Onsite	Floodplain Deposits	LTW-03	15-Oct-19	398,115.15	2,052,557.52	15.0 - 30.0	52.91	13.20	39.71
Onsite	Floodplain Deposits	LTW-04	15-Oct-19	397,280.24	2,052,583.60	12.0 - 27.0	51.86	9.31	42.55
Onsite	Black Creek Aquifer	LTW-05	15-Oct-19	396,430.68	2,052,738.06	29.0 - 44.0	52.01	9.66	42.35
Onsite	Perched Zone	MW-11	15-Oct-19	396,544.40	2,049,051.06	11.5 - 21.5	148.53	23.40	125.13
Onsite	Perched Zone	MW-12S	15-Oct-19	397,253.60	2,049,273.89	17.5 - 22.5	152.06	20.45	131.61
Onsite	Surficial Aquifer	MW-13D	15-Oct-19	397,119.02	2,049,821.12	57 - 67	148.65	44.32	104.33
Onsite	Surficial Aquifer	MW-14D	15-Oct-19	396,974.49	2,049,074.56	62 - 72	149.73	40.06	109.67
Onsite	Surficial Aquifer	MW-15DRR	15-Oct-19	398,580.71	2,049,511.75	52.5 - 62.5	150.92	47.55	103.37
Onsite	Surficial Aquifer	MW-16D	15-Oct-19	398,493.70	2,048,402.84	72 - 82	148.41	35.39	113.02
Onsite	Surficial Aquifer	MW-17D	15-Oct-19	398,401.74	2,047,366.50	57 - 67	146.12	29.03	117.09
Onsite	Surficial Aquifer	MW-18D	15-Oct-19	400,947.38	2,046,574.72	50 - 60	107.57	20.29	87.28
Onsite	Surficial Aquifer	MW-19D	15-Oct-19	401,151.33	2,048,272.99	46 - 56	139.55	51.31	88.24
Onsite	Perched Zone	MW-1S	15-Oct-19	397,080.31	2,049,120.73	21.0-24.0	149.93	19.24	130.69
Onsite	Surficial Aquifer	MW-20D	15-Oct-19	400,791.28	2,048,733.91	65 - 75	137.18	47.67	89.51
Onsite	Surficial Aquifer	MW-21D	15-Oct-19	399,501.70	2,047,074.96	72 - 82	151.38	45.67	105.71
Onsite	Surficial Aquifer	MW-22D	15-Oct-19	398,518.18	2,048,362.68	52 - 72	149.06	35.24	113.82
Onsite	Perched Zone	MW-23	15-Oct-19	396,237.61	2,051,063.25	9.5 - 14.5	148.34	14.41	133.93
Onsite	Perched Zone	MW-24	15-Oct-19	397,303.94	2,048,767.69	18.8 - 23.8	150.31	NM	--
Onsite	Perched Zone	MW-25	15-Oct-19	396,753.37	2,050,989.82	12 - 17	147.59	14.30	133.29
Onsite	Perched Zone	MW-26	15-Oct-19	396,265.18	2,051,484.67	5 - 10	147.70	11.71	135.99
Onsite	Perched Zone	MW-27	15-Oct-19	396,010.33	2,051,472.00	10 - 15	146.83	14.84	131.99
Onsite	Perched Zone	MW-28	15-Oct-19	395,719.79	2,051,165.93	9 - 14	144.70	14.50	130.20
Onsite	Perched Zone	MW-2S	15-Oct-19	396,934.75	2,049,321.85	19.0 - 23.0	149.91	19.55	130.36
Onsite	Perched Zone	MW-30	15-Oct-19	397,340.79	2,050,776.09	10 - 15	147.67	14.66	133.01
Onsite	Perched Zone	MW-31	15-Oct-19	396,390.50	2,049,622.88	17-22	147.70	15.72	131.98
Onsite	Perched Zone	MW-32	15-Oct-19	396,359.58	2,049,651.79	13-18.5	147.11	14.75	132.36
Onsite	Perched Zone	MW-33	15-Oct-19	396,337.51	2,049,678.56	12-17	146.82	14.26	132.56
Onsite	Perched Zone	MW-34	15-Oct-19	396,352.90	2,049,619.09	17-22	147.97	15.78	132.19
Onsite	Perched Zone	MW-35	15-Oct-19	396,332.94	2,049,631.16	14-19	147.54	15.25	132.29
Onsite	Perched Zone	MW-36	15-Oct-19	396,320.09	2,049,651.17	12-17	147.89	15.81	132.08
Onsite	Perched Zone	MW-7S	15-Oct-19	397,444.52	2,049,809.73	NA	147.47	11.36	136.11
Onsite	Perched Zone	MW-8S	15-Oct-19	397,096.48	2,049,867.77	NA	146.48	DRY	--
Onsite	Perched Zone	MW-9S	15-Oct-19	396,760.16	2,049,734.30	17.5-22.5	154.39	21.58	132.81
Onsite	Perched Zone	NAF-01	15-Oct-19	398,349.77	2,050,338.81	5.0-15.0	149.66	10.25	139.41
Onsite	Perched Zone	NAF-02	15-Oct-19	398,662.80	2,050,640.86	5.0-15.0	150.31	10.88	139.43
Onsite	Perched Zone	NAF-03	15-Oct-19	398,580.65	2,050,755.43	5.0-15.0	150.44	NM	--
Onsite	Perched Zone	NAF-04	15-Oct-19	398,447.00	2,050,718.95	5.0-15.0	148.10	8.11	139.99
Onsite	Perched Zone	NAF-05A	15-Oct-19	398,641.22	2,051,024.85	NA	NA	exclusion zone	--
Onsite	Surficial Aquifer	NAF-05B	15-Oct-19	398,660.23	2,051,021.81	NA	NA	exclusion zone	--
Onsite	Perched Zone	NAF-06	15-Oct-19	398,809.66	2,050,911.91	2.75 - 12.75	146.43	11.95	134.48
Onsite	Perched Zone	NAF-07	15-Oct-19	398,899.33	2,050,616.50	5.5 - 15.5	149.69	10.77	138.92
Onsite	Perched Zone	NAF-08A	15-Oct-19	398,097.99	2,050,886.62	5.0 - 15.0	148.82	10.28	138.54
Onsite	Surficial Aquifer	NAF-08B	15-Oct-19	398,095.64	2,050,879.94	43.5 - 53.5	148.86	52.87	95.99
Onsite	Perched Zone	NAF-09	15-Oct-19	397,711.09	2,050,806.52	7.0 - 17.0	149.29	12.91	136.38
Onsite	Perched Zone	NAF-10	15-Oct-19	397,612.57	2,050,423.15	8.25 - 18.25	150.00	14.24	135.76
Onsite	Perched Zone	NAF-11A	15-Oct-19	398,909.29	2,050,999.92	2.5 - 7.5	140.59	10.01	130.58
Onsite	Surficial Aquifer	NAF-11B	15-Oct-19	398,911.13	2,050,995.88	33.5 - 43.5	140.74	46.50	94.24
Onsite	Perched Zone	NAF-12	15-Oct-19	398,270.56	2,050,777.49	18 - 23	145.93	NM	--
Onsite	Perched Zone	NAF-13	15-Oct-19	398,370.49	2,051,260.72	11 - 16	152.29	17.35	134.94
Onsite	Black Creek Aquifer	PIW-10DR	15-Oct-19	395,093.99	2,052,297.30	53 - 58	75.91	14.63	61.28
Onsite	Surficial Aquifer	PIW-10S	15-Oct-19	395,104.67	2,052,297.04	7 - 17	76.45	18.79	57.66
Onsite	Surficial Aquifer	PIW-1D	15-Oct-19	400,547.77	2,051,801.42	24.5 - 29.5	52.33	19.52	32.81
Onsite	Floodplain Deposits	PIW-1S	15-Oct-19	400,540.61	2,051,792.59	7.8 - 17.8	54.20	21.61	32.59
Onsite	Black Creek Aquifer	PIW-2D	15-Oct-19	399,922.75	2,051,317.64	40 - 50	100.85	36.30	64.55
Onsite	Black Creek Aquifer	PIW-3D	15-Oct-19	399,711.75	2,052,088.80	19 - 24	53.32	17.51	35.80
Onsite	Black Creek Aquifer	PIW-4D	15-Oct-19	398,817.36	2,052,102.82	32.3 - 37.3	53.04	11.36	41.68
Onsite	Surficial Aquifer	PIW-5S	15-Oct-19	398,520.38	2,051,951.26	9.8 - 19.8	75.19	14.73	60.46
Onsite	Floodplain Deposits	PIW-6S	15-Oct-19	398,118.14	2,052,540.57	18 - 28	53.36	14.76	38.60
Onsite	Black Creek Aquifer	PIW-7D	15-Oct-19	396,787.69	2,052,595.37	29 - 34	48.60	5.91	42.69
Onsite	Floodplain Deposits	PIW-7S	15-Oct-19	396,787.00	2,052,589.49	7 - 17	48.39	5.88	42.51
Onsite	Black Creek Aquifer	PIW-8D	15-Oct-19	396,403.38	2,052,682.02	35.5 - 45.5	48.52	7.41	41.11
Onsite	Black Creek Aquifer	PIW-9D	15-Oct-19	396,155.97	2,052,250.91	40 - 45	79.53	37.45	42.08
Onsite	Surficial Aquifer	PIW-9S	15-Oct-19	396,148.11	2,052,251.10	24.8 - 29.8	79.53	30.47	49.06
Onsite	Perched Zone	PW-01	15-Oct-19	399,064.80	2,049,654.30	11 - 21	149.55	16.00	133.55
Onsite	Surficial Aquifer	PW-02	15-Oct-19	399,779.06	2,050,649.47	50 - 60	146.43	56.38	90.05
Onsite	Surficial Aquifer	PW-03	15-Oct-19	397,339.81	2,050,765.32	35 - 45	147.97	42.40	105.57
Onsite	Surficial Aquifer	PW-04	15-Oct-19	394,659.55	2,050,940.66	17 - 27	97.75	27.85	69.90
Onsite	Surficial Aquifer	PW-05	15-Oct-19	395,873.10	2,047,812.93	65 - 75	150.34	29.09	121.25
Onsite	Surficial Aquifer	PW-06	15-Oct-19	392,868.00	2,045,288.77	19 - 29	147.69	19.50	128.19
Onsite	Surficial Aquifer	PW-07	15-Oct-19	390,847.71	2,049,258.26	28 - 38	148.16	39.49	108.67
Onsite	Black Creek Aquifer	PW-09	15-Oct-19	401,997.39	2,048,980.54	44 - 54	77.49	25.25	52.24
Onsite	Black Creek Aquifer	PW-10R	15-Oct-19	398,516.12	2,051,936.59	57 - 67	75.90	27.76	48.15
Onsite	Black Creek Aquifer	PW-11	15-Oct-19	394,354.36	2,052,226.72	53 - 63	73.26	33.66	39.60
Onsite	Black Creek Aquifer	PW-12	15-Oct-19	399,500.45	2,047,063.51	109 - 119	150.61	57.96	92.65
Onsite	Black Creek Aquifer	PW-13	15-Oct-19	397,584.26	2,048,029.18	120 - 130	149.36	29.57	119.79
Onsite	Black Creek Aquifer	PW-14	15-Oct-19	397,325.65	2,050,766.36	136 - 146	147.97	61.11	86.86
Onsite	Black Creek Aquifer	PW-15R	15-Oct-19	398,900.88	2,051,011.75	110 - 120	136.14	59.18	76.96
Onsite	Perched Zone	PZ-11	15-Oct-19	398,646.25	2,049,820.94	15 - 20	151.03	14.01	137.02
Onsite	Perched Zone	PZ-12	15-Oct-19	399,094.96	2,048,981.78	15.1 - 20.1	150.91	20.17	130.74
Onsite	Perched Zone	PZ-13	15-Oct-19	397,708.07	2,050,991.73	7.1 - 12.1	149.20	12.47	136.73
Onsite	Perched Zone	PZ-14	15-Oct-19	397,589.92	2,050,618.27	9.0 - 14.0	148.38	16.26	132.12
Onsite	Perched Zone	PZ-15	15-Oct-19	396,805.09	2,050,112.02	10.2 - 15.2	148.79	13.67	135.12
Onsite	Perched Zone	PZ-17	15-Oct-19	396,614.82	2,048,872.69	21.1 - 26.1	150.08	28.27	121.81
Onsite	Perched Zone	PZ-19R	15-Oct-19	397,998.66	2,049,919.52	16 - 21	150.05	14.51	135.54
Onsite	Perched Zone	PZ-20R	15-Oct-19	398,185.81	2,049,784.60	15 - 20	151.29	15.82	135.47
Onsite	Perched Zone	PZ-21R	15-Oct-19	398,445.16	2,049,883.13	17 - 22	150.67	14.45	136.22
Onsite	Black Creek Aquifer	PZ-22	15-Oct-19	397,272.80	2,052,584.04	36.0 - 46.0	51.81	7.75	44.06

TABLE 9-1
GROUNDWATER ELEVATIONS
Chemours Fayetteville Works, North Carolina

Area	Aquifer	Well ID	Gauging Date	Northing (ft, SPCS NAD83)	Easting (ft, SPCS NAD83)	Screened Interval (ft bgs)	TOC Elevation (ft NAVD 88)	Depth to Water (ft, from TOC)	Groundwater Elevation (ft NAVD88)
Onsite	Perched Zone	PZ-24	15-Oct-19	396,117.94	2,050,744.07	11 - 16	147.53	14.17	133.36
Onsite	Perched Zone	PZ-25	15-Oct-19	396,753.94	2,050,991.05	14 - 19	147.59	21.35	126.24
Onsite	Perched Zone	PZ-26	15-Oct-19	396,059.78	2,050,382.35	11 - 16	147.70	12.90	134.80
Onsite	Perched Zone	PZ-27	15-Oct-19	395,922.11	2,050,376.76	12 - 17	147.17	13.20	133.97
Onsite	Perched Zone	PZ-28	15-Oct-19	396,304.55	2,049,933.79	13 - 18	148.64	13.50	135.14
Onsite	Perched Zone	PZ-29	15-Oct-19	396,371.49	2,049,768.94	13 - 18	147.74	14.45	133.29
Onsite	Perched Zone	PZ-31	15-Oct-19	396,428.73	2,049,594.36	14 - 19	148.00	17.30	130.70
Onsite	Perched Zone	PZ-32	15-Oct-19	396,418.47	2,049,713.79	13 - 18	148.47	15.31	133.16
Onsite	Perched Zone	PZ-33	15-Oct-19	396,308.92	2,049,707.66	12.5 - 17.5	146.72	14.00	132.72
Onsite	Perched Zone	PZ-34	15-Oct-19	396,292.05	2,049,595.04	13.5 - 18.5	147.70	15.81	131.88
Onsite	Perched Zone	PZ-35	15-Oct-19	398,232.64	2,050,020.49	13 - 18	150.43	14.11	136.32
Onsite	Surficial Aquifer	SMW-01	15-Oct-19	395,295.75	2,043,679.19	5.0 - 15.0	136.81	13.30	123.51
Onsite	Perched Zone	SMW-02	15-Oct-19	399,983.75	2,050,654.77	5.0 - 20.0	147.93	15.98	131.95
Onsite	Surficial Aquifer	SMW-02B	15-Oct-19	399,983.48	2,050,660.48	43.0 - 53.0	145.21	DRY	--
Onsite	Perched Zone	SMW-03	15-Oct-19	399,778.25	2,049,445.96	10.0 - 20.0	151.09	DRY	--
Onsite	Black Creek Aquifer	SMW-03B	15-Oct-19	399,785.75	2,049,421.54	72 - 82	150.43	57.03	93.40
Onsite	Perched Zone	SMW-04A	15-Oct-19	399,668.71	2,048,387.57	19.5 - 34.5	148.09	37.11	110.98
Onsite	Surficial Aquifer	SMW-04B	15-Oct-19	399,667.12	2,048,390.30	43.0 - 53.0	148.37	45.43	102.94
Onsite	Perched Zone	SMW-05	15-Oct-19	399,334.07	2,048,557.33	10.0 - 20.0	148.10	23.05	125.05
Onsite	Surficial Aquifer	SMW-05P	15-Oct-19	399,338.61	2,048,559.26	45.0 - 60.0	149.32	44.01	105.31
Onsite	Perched Zone	SMW-06	15-Oct-19	399,172.35	2,048,759.48	12.0 - 22.0	150.97	24.93	126.04
Onsite	Surficial Aquifer	SMW-06B	15-Oct-19	399,144.74	2,048,764.94	58 - 68	150.32	47.17	103.15
Onsite	Perched Zone	SMW-07	15-Oct-19	398,932.91	2,048,611.16	13.0 - 23.0	147.64	19.66	127.98
Onsite	Perched Zone	SMW-08	15-Oct-19	399,064.97	2,048,468.78	21.0 - 31.0	151.02	DRY	--
Onsite	Surficial Aquifer	SMW-08B	15-Oct-19	399,058.33	2,048,478.84	58 - 68	148.81	40.52	108.29
Onsite	Surficial Aquifer	SMW-09	15-Oct-19	401,076.89	2,050,017.41	52 - 62	141.43	56.23	85.20
Onsite	Black Creek Aquifer	SMW-10	15-Oct-19	402,307.31	2,047,923.84	39 - 49	76.26	29.57	46.69
Onsite	Surficial Aquifer	SMW-11	15-Oct-19	401,996.15	2,048,975.38	13 - 23	71.95	14.08	57.87
Onsite	Black Creek Aquifer	SMW-12	15-Oct-19	401,314.20	2,051,007.22	88 - 98	118.22	84.78	33.44
Offsite	Black Creek Aquifer	Bladen-1D	15-Oct-19	387,519.56	2,050,248.83	37 - 47	81.52	19.72	61.80
Offsite	Surficial Aquifer	Bladen-1S	15-Oct-19	387,516.28	2,050,234.78	5 - 10	81.31	10.14	71.17
Offsite	Black Creek Aquifer	Bladen-2D	15-Oct-19	368,824.41	2,042,879.78	70 - 75	142.85	20.50	122.35
Offsite	Surficial Aquifer	Bladen-2S	15-Oct-19	368,818.78	2,042,884.35	10 - 20	142.62	6.99	135.63
Offsite	Black Creek Aquifer	Bladen-3D	15-Oct-19	396,854.29	2,059,007.99	33.75 - 43.75	79.09	10.32	68.77
Offsite	Surficial Aquifer	Bladen-3S	15-Oct-19	396,859.62	2,059,014.36	5 - 15	78.84	9.51	69.33
Offsite	Black Creek Aquifer	Bladen-4D	15-Oct-19	363,252.43	2,087,638.29	46.75 - 51.75	64.23	1.43	62.80
Offsite	Surficial Aquifer	Bladen-4S	15-Oct-19	363,260.51	2,087,638.88	4.75 - 14.75	64.26	5.84	58.42
Offsite	Black Creek Aquifer	Cumberland-1D	15-Oct-19	431,477.66	2,011,002.07	40 - 50	179.18	7.27	171.91
Offsite	Surficial Aquifer	Cumberland-1S	15-Oct-19	431,477.66	2,011,002.07	15 - 25	179.41	7.16	172.25
Offsite	Black Creek Aquifer	Cumberland-2D	15-Oct-19	450,054.48	2,074,001.35	47 - 57	133.79	5.68	128.11
Offsite	Surficial Aquifer	Cumberland-2S	15-Oct-19	450,054.48	2,074,001.35	7 - 17	133.61	5.91	127.70
Offsite	Black Creek Aquifer	Cumberland-3D	15-Oct-19	423,131.53	2,060,380.35	22 - 27	83.34	8.17	75.17
Offsite	Surficial Aquifer	Cumberland-3S	15-Oct-19	423,131.53	2,060,380.35	9 - 14	83.62	8.73	74.89
Offsite	Black Creek Aquifer	Cumberland-4D	15-Oct-19	413,160.26	2,078,233.75	57 - 67	123.79	13.82	109.97
Offsite	Surficial Aquifer	Cumberland-4S	15-Oct-19	413,160.26	2,078,233.75	10 - 20	123.93	7.51	116.42
Offsite	Black Creek Aquifer	Cumberland-5D	15-Oct-19	405,673.82	2,138,069.54	52 - 57	106.67	8.38	98.29
Offsite	Surficial Aquifer	Cumberland-5S	15-Oct-19	405,673.82	2,138,069.54	14 - 24	106.65	4.77	101.88
Offsite	Black Creek Aquifer	Robeson-1D	15-Oct-19	381,338.72	2,020,239.81	42.75 - 52.75	160.93	13.74	147.19
Offsite	Surficial Aquifer	Robeson-1S	15-Oct-19	381,338.72	2,020,239.81	17 - 27	161.22	18.15	143.07

Notes:

1. Area - refers to location of well within site property boundary (“Onsite”) and outside property boundary (“Offsite”)
2. Aquifer - refers to primary aquifer unit well screen is estimated to be screened within
3. DRY - Water levels could not be calculated because well was dry.
4. NM - Not Measured. Water levels were not measured because well location was not accessible at the time of measurement due to well located within the "blast zone" or well was pumping (NAF-03, NAF-12 and M
5. -- - Groundwater elevation data not available because well was either dry, not accessible or was pumping at the time of measurement
6. NAF-05A and NAF-05B located in exclusion zone - Well location not safely accessible at the time of measurement.
7. Water levels were measured during a single synoptic event over a continuous 24-hour period.
8. Survey completed by Freeland-Clinkscales & Associates of NC.
9. Northing and Easting provided in North Carolina State Plane System (zone 3200), North American Datum 1983.
10. Vertical datum is North American Vertical Datum of 1988.

ft bgs - feet below ground surface
NAVD88 - North American Vertical Datum of 1988
TOC - Top of Casing
ft SPCS NAD83 - feet State Plane Coordinate System, North American Datum of 1983

TABLE 9-2
VERTICAL GRADIENTS
Chemours Fayetteville Works, North Carolina

	Aquifer	Well Pair ID	Well ID	Gauging Date	Northing (NAD 83)	Easting (NAD 83)	Screened Interval (ft bgs)	Ground Elevation (ft NAVD88)	TOC Elevation (ft NAVD88)	Shallow/Deep	Groundwater Elevation (ft-NAVD88)	Vertical Gradient (feet/feet)	Direction
Perched / Surficial	Perched Zone	WP1	NAF-11A	10/15/2019	398,909.29	2,050,999.92	2.5 - 7.5	137.55	140.59	s	130.58	36.34	Downward (NAF-11A to NAF-11B)
	Surficial Aquifer		NAF-11B	10/15/2019	398,911.13	2,050,995.88	33.5 - 43.5	137.55	140.74	d	94.24		
	Perched Zone	WP2	SMW-06	10/15/2019	399,172.35	2,048,759.48	12.0 - 22.0	147.92	150.97	s	126.04	22.89	Downward (SMW-06 to SMW-06B)
	Surficial Aquifer		SMW-06B	10/15/2019	399,144.74	2,048,764.94	58.0 - 68.0	NA	150.32	d	103.15		
	Perched Zone	WP3	SMW-04A	10/15/2019	399,668.71	2,048,387.57	19.5 - 34.5	145.46	148.09	s	110.98	8.04	Downward (SMW-04A to SMW-04B)
	Surficial Aquifer		SMW-04B	10/15/2019	399,667.12	2,048,390.30	43.0 - 53.0	145.18	148.37	d	102.94		
	Perched Zone	WP4	SMW-05	10/15/2019	399,334.07	2,048,557.33	10.0 - 20.0	144.17	148.10	s	125.05	19.74	Downward (SMW-05 to SMW-05P)
	Surficial Aquifer		SMW-05P	10/15/2019	399,338.61	2,048,559.26	45.0 - 60.0	146.06	149.32	d	105.31		
	Perched Zone	WP5	MW-30	10/15/2019	397,340.79	2,050,776.09	10 - 15	144.95	147.67	s	133.01	27.44	Downward (MW-30 to PW-03)
	Surficial Aquifer		PW-03	10/15/2019	397,339.81	2,050,765.32	35 - 45	144.97	147.97	d	105.57		
	Perched Zone	WP6	NAF-08A	10/15/2019	398,097.99	2,050,886.62	5.0 - 15.0	145.54	148.82	s	138.54	42.55	Downward (NAF-08A to NAF-08B)
	Surficial Aquifer		NAF-08B	10/15/2019	398,095.64	2,050,879.94	43.5 - 53.5	145.62	148.86	d	95.99		
Perched / Black Creek	Perched Zone	WP7	MW-23	10/15/2019	396,233.43	2,051,061.52	9.5 - 14.5	145.17	148.34	s	133.93	59.38	Downward (MW-23 to BCA-02)
	Black Creek Aquifer		BCA-02	10/15/2019	396,242.32	2,051,062.21	92.0 - 102.0	145.20	148.42	d	74.55		
Surficial / Black Creek	Surficial Aquifer	WP8	PIW-9S	10/15/2019	396,148.11	2,052,251.10	24.75 - 29.75	76.80	79.53	s	49.06	6.98	Downward (PIW-9S to PIW-9D)
	Black Creek Aquifer		PIW-9D	10/15/2019	396,155.97	2,052,250.91	40.0 - 45.0	76.75	79.53	d	42.08		
	Surficial Aquifer	WP9	PIW-10S	10/15/2019	395,104.67	2,052,297.04	7.0 - 17.0	73.30	76.45	s	57.66	-3.62	Upward (PIW-10S to PIW-10DR)
	Black Creek Aquifer		PIW-10DR	10/15/2019	395,098.79	2,052,293.84	53.0 - 58.0	73.34	75.91	d	61.28		
	Surficial Aquifer	WP10	PIW-5S	10/15/2019	398,520.38	2,051,951.26	9.8 - 19.8	72.68	75.19	s	60.46	12.31	Downward (PIW-5S to PW-10R)
	Black Creek Aquifer		PW-10R	10/15/2019	398,516.12	2,051,936.59	57 - 67	73.28	75.90	d	48.15		
	Surficial Aquifer	WP11	PW-02	10/15/2019	399,779.06	2,050,649.47	50 - 60	143.76	146.43	s	90.05	2.67	Downward (PW-02 to BCA-01)
	Black Creek Aquifer		BCA-01	10/15/2019	399,780.06	2,050,662.22	91 - 101	143.26	146.30	d	87.38		
	Surficial Aquifer	WP12	SMW-11	10/15/2019	401,996.15	2,048,975.38	13 - 23	69.04	71.95	s	57.87	5.63	Downward (SMW-11 to PW-09)
	Black Creek Aquifer		PW-09	10/15/2019	401,997.39	2,048,980.54	44 - 54	74.76	77.49	d	52.24		
	Surficial Aquifer	WP13	MW-21D	10/15/2019	399,501.70	2,047,074.96	72 - 82	148.05	151.38	s	105.71	13.06	Downward (MW-21D to PW-12)
	Black Creek Aquifer		PW-12	10/15/2019	399,500.45	2,047,063.51	109 - 119	148.31	150.61	d	92.65		
	Surficial Aquifer	WP14	PW-05	10/15/2019	395,873.10	2,047,812.93	65 - 75	147.16	150.34	s	121.25	-0.30	Upward (BCA-04 to PW-05)
	Black Creek Aquifer		BCA-04	10/15/2019	395,877.67	2,047,823.11	94 - 104	147.07	150.24	d	121.55		
	Surficial Aquifer	WP15	PW-03	10/15/2019	397,339.81	2,050,765.32	35 - 45	144.97	147.97	s	105.57	18.71	Downward (PW-03 to PW-14)
	Black Creek Aquifer		PW-14	10/15/2019	397,325.65	2,050,766.36	136 - 146	145.13	147.97	d	86.86		
Floodplain / Surficial	Floodplain	WP16	PIW-1S	10/15/2019	400,540.61	2,051,792.59	7.8 - 17.8	50.78	54.20	s	32.59	-0.22	Upward (PIW-1S to PIW-1D)
	Surficial Aquifer		PIW-1D	10/15/2019	400,547.77	2,051,801.42	24.5 - 29.5	49.53	52.33	d	32.81		
Floodplain/ Black Creek	Floodplain	WP17	PIW-7S	10/15/2019	396,787.00	2,052,589.49	7.0 - 17.0	45.81	48.39	s	42.51	-0.18	Upward (PIW-7S to PIW-7D)
	Black Creek Aquifer		PIW-7D	10/15/2019	396,787.69	2,052,595.37	29.0 - 34.0	45.78	48.60	d	42.69		
	Floodplain	WP18	LTW-04	10/15/2019	397,280.24	2,052,583.60	12.0 - 27.0	49.34	51.86	s	42.55	-1.51	Upward (LTW-04 to PZ-22)
	Black Creek Aquifer		PZ-22	10/15/2019	397,272.80	2,052,584.04	36.0 - 46.0	49.03	51.81	d	44.06		
Other	Perched Zone	WP19	MW-25	10/15/2019	396,753.37	2,050,989.82	12.0 - 17.0	145.00	147.59	s	133.29	7.05	Downward (MW-25 to PZ-25)
	Perched Zone		PZ-25	10/15/2019	396,753.94	2,050,991.05	14.0 - 19.0	145.00	147.59	s	126.24		
	Old Outfall 002	WP20	Old Outfall 002	6/7/2019	--	--	--	40.25	--	s	40.63	1.03	Downward (Old Outfall 002 to PW-11)
	Black Creek Aquifer		PW-11	10/15/2019	394,354.00	2,052,227.00	53.0 - 63.0	70.19	73.26	d	39.60		

TABLE 9-2
VERTICAL GRADIENTS
Chemours Fayetteville Works, North Carolina

	Aquifer	Well Pair ID	Well ID	Gauging Date	Northing (NAD 83)	Easting (NAD 83)	Screened Interval (ft bgs)	Ground Elevation (ft NAVD88)	TOC Elevation (ft NAVD88)	Shallow/Deep	Groundwater Elevation (ft-NAVD88)	Vertical Gradient (feet/feet)	Direction
Offsite	Surficial Aquifer	WP21	Bladen-1S	10/15/2019	387,516.28	2,050,234.78	5 - 10	81.57	81.31	s	71.17	9.37	Downward (Bladen-1S to Bladen-1D)
	Black Creek Aquifer		Bladen-1D	10/15/2019	387,519.56	2,050,248.83	37 - 47	81.72	81.52	d	61.80		
	Surficial Aquifer	WP22	Bladen-2S	10/15/2019	368,818.78	2,042,884.35	10 - 20	143.01	142.62	s	135.63	13.28	Downward (Bladen-2S to Bladen-2D)
	Black Creek Aquifer		Bladen-2D	10/15/2019	368,824.41	2,042,879.78	70 - 75	143.11	142.85	d	122.35		
	Surficial Aquifer	WP23	Bladen-3S	10/15/2019	396,859.62	2,059,014.36	5 - 15	79.40	78.84	s	69.33	0.56	Downward (Bladen-3S to Bladen-3D)
	Black Creek Aquifer		Bladen-3D	10/15/2019	396,854.29	2,059,007.99	33.75 - 43.75	79.59	79.09	d	68.77		
	Surficial Aquifer	WP24	Bladen-4S	10/15/2019	363,260.51	2,087,638.88	4.75 - 14.75	64.65	64.26	s	58.42	-4.38	Upward (Bladen-4D to Bladen-4S)
	Black Creek Aquifer		Bladen-4D	10/15/2019	363,252.43	2,087,638.29	46.75 - 51.75	64.67	64.23	d	62.80		
	Surficial Aquifer	WP25	Cumberland-1S	10/15/2019	431,477.66	2,011,002.07	15 - 25	179.70	179.41	s	172.25	0.34	Downward (Cumberland-1S to Cumberland-1D)
	Black Creek Aquifer		Cumberland-1D	10/15/2019	431,477.66	2,011,002.07	40 - 50	179.58	179.18	d	171.91		
	Surficial Aquifer	WP26	Cumberland-2S	10/15/2019	450,054.48	2,074,001.35	7 - 17	133.87	133.61	s	127.70	-0.41	Upward (Cumberland-2D to Cumberland-2S)
	Black Creek Aquifer		Cumberland-2D	10/15/2019	450,054.48	2,074,001.35	47 - 57	134.06	133.79	d	128.11		
	Surficial Aquifer	WP27	Cumberland-3S	10/15/2019	423,131.53	2,060,380.35	9 - 14	83.87	83.62	s	74.89	-0.28	Upward (Cumberland-3D to Cumberland-3S)
	Black Creek Aquifer		Cumberland-3D	10/15/2019	423,131.53	2,060,380.35	22 - 27	83.59	83.34	d	75.17		
	Surficial Aquifer	WP28	Cumberland-4S	10/15/2019	413,160.26	2,078,233.75	10 - 20	124.15	123.93	s	116.42	6.45	Downward (Cumberland-4S to Cumberland-4D)
	Black Creek Aquifer		Cumberland-4D	10/15/2019	413,160.26	2,078,233.75	57 - 67	124.09	123.79	d	109.97		
	Surficial Aquifer	WP29	Cumberland-5S	10/15/2019	405,673.82	2,138,069.54	14 - 24	107.00	106.65	s	101.88	3.59	Downward (Cumberland-5S to Cumberland-5D)
	Black Creek Aquifer		Cumberland-5D	10/15/2019	405,673.82	2,138,069.54	52 - 57	107.02	106.67	d	98.29		
	Surficial Aquifer	WP30	Robeson-1S	10/15/2019	381,338.72	2,020,239.81	17 - 27	161.51	161.22	s	143.07	-4.12	Upward (Robeson-1D to Robeson-1S)
	Black Creek Aquifer		Robeson-1D	10/15/2019	381,338.72	2,020,239.81	42.75 - 52.75	161.23	160.93	d	147.19		

Notes:
1. Well pairs only include locations where depth to water level in both wells were synoptically measured in October 2019.
2. Calculated negative vertical gradient values represent potential for upward flow and positive vertical gradient values represent potential for downward flows.
3. "s" and "d" represent shallower and deeper well screens between the wells in each pair.
4. Direction indicates potential for upward or downward groundwater flow in each well pair.
5. Water column depth from Old Outfall 002 channel bottom presented. Measurements collected during volumetric flow measurements presented in the *Seeps and Creeks Investigation Report* (Geosyntec, 2019).

NAD83 - North American Datum of 1983; horizontal control datum
NAVD88 - North American Vertical Datum of 1988; vertical control datum established in 1991
ft bgs - feet below ground surface
TOC - top of casing
-- data not available

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	**BCA-01**	**BCA-02**	**BCA-02**	**BCA-03R**
Field Sample ID	**GW0619-BCA-01**	**GW0619-BCA-02-D**	**GW0619-BCA-02**	**BCA-03R-091219**
Sample Date	**7/8/2019**	**7/9/2019**	**7/9/2019**	**9/12/2019**
QA/QC	**--**	**Field Duplicate**	**--**	**--**
SDG	**320-52171-1**	**320-52149-1**	**320-52149-1**	**320-54314-1**
Lab Sample ID	**320-52171-4**	**320-52149-6**	**320-52149-5**	**320-54314-1**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**9,700**	**12,000 J**	**18,000 J**	**12,000**
PFMOAA	**70,000**	**110,000**	**120,000**	**330,000**
PFO2HxA	**22,000**	**26,000**	**29,000**	**69,000**
PFO3OA	**3,000**	**8,600**	**8,600**	**15,000**
PFO4DA	**79**	**3,300**	**4,000**	**1,200**
PFO5DA	<34	**610**	**590**	<170
PMPA	**5,900**	**6,700**	**7,300**	**29,000**
PEPA	**1,400**	**2,300**	**2,500**	**7,100**
PFESA-BP1	<27	**60**	**80**	**200**
PFESA-BP2	<30	**420**	**520**	**160**
Byproduct 4	**300**	**720**	**810**	**2,000**
Byproduct 5	**1,100**	**2,000**	**2,100**	**19,000**
Byproduct 6	<15	**18**	**19**	<77
NVHOS	**570**	**1,000**	**1,100**	**2,400**
EVE Acid	<24	**24**	**27**	<120
Hydro-EVE Acid	<28	**1,400**	**1,600**	**200**
R-EVE	**230**	**500**	**560**	**730**
PES	<46	<46	<46	<230
PFECA B	<60	<60	<60	<300
PFECA-G	<41	<41	<41	<200
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	<2.1
F-53B Major	--	--	--	<2
F-53B Minor	--	--	--	<2
NaDONA	--	--	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<2
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	**2.9**	**2.8**	<2
Perfluorobutanoic Acid	**70**	**120**	**120**	**160**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	**3.8**	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**8.7**	**46**	**46**	**72**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<2
Perfluorohexane Sulfonic Acid	<2	**5.2**	**5**	<2
Perfluorohexanoic Acid	**7.9**	**24**	**25**	**24**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	**11**	**10**	<2
Perfluorooctadecanoic acid	<2	<2	<2 UJ	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**280**	**170**	**170**	**600**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	**2**	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	**32**	**30**	**5.8**
PFOS	<2	**4.2**	**3.4**	<2

Notes:
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SDG - Sample Delivery Group
SOP - standard operating procedure
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**
Location ID	**BCA-04**	**LTW-02**	**LTW-05**	**PIW-2D**
Field Sample ID	**GW0619-BCA-04**	**GW0619-LTW-02**	**GW0619-LTW-05**	**PIW-2D-091219**
Sample Date	**7/9/2019**	**7/17/2019**	**7/16/2019**	**9/12/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-52149-1**	**320-52454-1**	**320-52322-1**	**320-54314-1**
Lab Sample ID	**320-52149-4**	**320-52454-2**	**320-52322-4**	**320-54314-2**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**6.9**	**9,500**	**26,000 B**	**1,800**
PFMOAA	<5	**38,000**	**240,000**	**14,000**
PFO2HxA	<2	**16,000**	**68,000**	**2,900**
PFO3OA	<2	**3,000**	**22,000**	**100**
PFO4DA	<2	**250**	**2,900**	<79
PFO5DA	<2	<34	<340	<34
PMPA	**20**	**6,500**	<5,700	**1,300**
PEPA	<20	**2,100**	<470	**92**
PFESA-BP1	<2	<27	<270	<27
PFESA-BP2	<2	**30**	**310**	<30
Byproduct 4	<2	**490 J**	**1,600**	<160
Byproduct 5	<2	**1,200**	**3,100**	<58
Byproduct 6	<2	<15	<150	<15
NVHOS	<2	**370**	**1,900**	**110 J**
EVE Acid	<2	<24	<240	<24
Hydro-EVE Acid	<2	**45**	**1,400**	<28
R-EVE	<2	**420**	**2,100**	<70
PES	<2	<46	<460	<46
PFECA B	<2	<60	<600	<60
PFECA-G	<2	<41	<410	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<45	<20	<52
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<8.5
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<14
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	<2.1
F-53B Major	--	--	--	<2.4
F-53B Minor	--	--	--	<3.2
NaDONA	--	--	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<8.7
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<4.3
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<27	<20	<31
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	**71**	**330**	**18**
Perfluorodecane Sulfonic Acid	<2	<2.7	<2	<3.2
Perfluorodecanoic Acid	<2	<2.7	<2	<3.1
Perfluorododecane sulfonic acid (PFDoS)	<2	<3.9	<2	<4.5
Perfluorododecanoic Acid	<2	<4.7	<2	<5.5
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	**13**	**360**	<2.5
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<8.9
Perfluorohexane Sulfonic Acid	<2	<2	<2	**3**
Perfluorohexanoic Acid	<2	**10**	**100**	<5.8
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2.3	<2	<2.7
Perfluorooctadecanoic acid	<2	<3.9	<2	<4.6
Perfluorooctane Sulfonamide	<2	<3	<2	<3.5
Perfluoropentane sulfonic acid (PFPeS)	<2	<2.6	<2	<3
Perfluoropentanoic Acid	<2	**290**	**2,600**	**70**
Perfluorotetradecanoic Acid	<2	<2.5	<2	<2.9
Perfluorotridecanoic Acid	<2	<11	<2	<13
Perfluoroundecanoic Acid	<2	<9.4	<2	<11
PFOA	<2	<7.3	**3.6**	<8.5
PFOS	<2	<4.6	<2	<5.4

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	PIW-2D	PIW-3D	PIW-4D	PIW-04D
Field Sample ID	PIW-2D-091219-Z	GW0619-PIW-3D	PIW-04D-091119	PIW-4D-091119-Z
Sample Date	9/12/2019	7/18/2019	9/11/2019	9/11/2019
QA/QC	--	--	--	--
SDG	320-54316-1	320-52464-1	320-54317-1	320-54319-1
Lab Sample ID	320-54316-1	320-52464-2	320-54317-2	320-54319-2
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,800**	**9,600**	**6.7**	**6.7**
PFMOAA	**13,000**	**5,400**	<210	<210
PFO2HxA	**3,000**	**9,100**	<81	<81
PFO3OA	**100**	**1,700**	<58	<58
PFO4DA	<79	**780**	<79	<79
PFO5DA	<34	**95**	<34	<34
PMPA	**1,200**	**12,000**	<570	<570
PEPA	**89**	**4,400**	<47	<47
PFESA-BP1	<27	<2.7	<27	<27
PFESA-BP2	<30	**150**	<30	<30
Byproduct 4	<160	**500**	<160	<160
Byproduct 5	<58	<5.8	<58	<58
Byproduct 6	<15	**5.1**	<15	<15
NVHOS	**130**	**83**	<54	<54
EVE Acid	<24	<2.4	<24	<24
Hydro-EVE Acid	<28	**52**	<28	<28
R-EVE	<70	**290**	<70	<70
PES	<46	<4.6	<46	<46
PFECA B	<60	<6	<60	<60
PFECA-G	<41	<4.1	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	--	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<52	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<8.5	--	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<14	--	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	--	<2.1	<2.1
F-53B Major	<2.4	--	<2	<2
F-53B Minor	<3.2	--	<2	<2
NaDONA	<2.1	--	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<8.7	--	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<4.3	--	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<31	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	**2.2**	<2	<2
Perfluorobutanoic Acid	**19**	**84**	<2	<2
Perfluorodecane Sulfonic Acid	<3.2	<2	<2	<2
Perfluorodecanoic Acid	<3.1	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<4.5	<2	<2	<2
Perfluorododecanoic Acid	<5.5	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2.5	**30**	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<8.9	--	<2	<2
Perfluorohexane Sulfonic Acid	**3.5**	**3.1**	<2	<2
Perfluorohexanoic Acid	<5.8	**21**	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2.7	**4.2**	<2	<2
Perfluorooctadecanoic acid	<4.6	<2	<2	<2
Perfluorooctane Sulfonamide	<3.5	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<3	<2	<2	<2
Perfluoropentanoic Acid	**76**	**130**	<2	<2
Perfluorotetradecanoic Acid	**3.1**	<2	<2	<2
Perfluorotridecanoic Acid	<13	<2	<2	<2
Perfluoroundecanoic Acid	<11	<2	<2	<2
PFOA	<8.5	**35**	<2	<2
PFOS	<5.4	**9.5**	<2	<2

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	PIW-7D	PIW-8D	PIW-9D	PIW-10DR
Field Sample ID	GW0619-PIW-7D	GW0619-PIW-8D	GW0619-PIW-9D	PIW-10DR-091019
Sample Date	7/19/2019	7/19/2019	7/23/2019	9/10/2019
QA/QC	--	--	--	--
SDG	320-52624-1	320-52624-1	320-52722-1	320-54176-1
Lab Sample ID	320-52624-3	320-52624-2	320-52722-1	320-54176-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**11,000**	**54,000 J**	**33,000**	**19,000**
PFMOAA	**150,000**	**400,000**	**150,000**	**45,000**
PFO2HxA	**27,000**	**140,000**	**41,000**	**19,000**
PFO3OA	**2,400**	**51,000**	**12,000**	**6,000**
PFO4DA	**570**	**7,200**	**3,100**	**1,200 J**
PFO5DA	<34	<340	**84**	<34 UJ
PMPA	**3,500**	**15,000**	**9,900**	**9,100**
PEPA	**530**	**4,500**	**3,400**	**3,400**
PFESA-BP1	<27	<270	**29**	<27
PFESA-BP2	**53**	**770**	**370**	**160 J**
Byproduct 4	**280**	**4,400**	**1,900 J**	**1,500**
Byproduct 5	**690**	**10,000**	**2,700**	**6,400 J**
Byproduct 6	<15	<150	**18**	**15**
NVHOS	**810**	**3,600**	**1,700**	**510**
EVE Acid	<24	<240	<24	<24
Hydro-EVE Acid	**170 J**	**3,700**	**1,600**	**790 J**
R-EVE	**350 J**	**4,500**	**1,700**	**1,200**
PES	<46	<460	<46	<46
PFECA B	<60	<600	<60	<60
PFECA-G	<41	<410	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<38	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<44	<98	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<4
6:2 Fluorotelomer sulfonate	<20	<38	<20	**34**
ADONA	--	--	--	<2.1
F-53B Major	--	--	--	<2
F-53B Minor	--	--	--	<2
NaDONA	--	--	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<36	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<2
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<26	<58	<20	<20
Perfluorobutane Sulfonic Acid	<2	<3.8	<2	<2
Perfluorobutanoic Acid	**100**	**930**	**240**	**240**
Perfluorodecane Sulfonic Acid	<2.7	<6	<2	<2
Perfluorodecanoic Acid	<2.6	<5.8	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<3.8	<8.5	<2	<2
Perfluorododecanoic Acid	<4.6	<10	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<3.6	<2	<2
Perfluoroheptanoic Acid	**41**	**920**	**100**	**120**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<2
Perfluorohexane Sulfonic Acid	<2	<3.2	<2	<2
Perfluorohexanoic Acid	**14**	**290**	**81**	**56**
Perfluorononanesulfonic acid	<2	<3	<2	<2
Perfluorononanoic Acid	<2.3	<5.1	<2	<2
Perfluorooctadecanoic acid	<3.9	<8.7	<2 UJ	<2
Perfluorooctane Sulfonamide	<2.9	<6.6	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2.5	<5.6	<2	<2
Perfluoropentanoic Acid	**820**	**3,900**	**790**	**750**
Perfluorotetradecanoic Acid	<2.4	<5.5	<2	<2
Perfluorotridecanoic Acid	<11	<24	<2	<2
Perfluoroundecanoic Acid	<9.2	<21	<2	<2
PFOA	<7.1	<16	**17**	**2.9**
PFOS	<4.5	<10	<2	<2

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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	**PW-09**	**PW-09**	**PW-10R**	**PW-10R**
Field Sample ID	**PW-09-091119**	**PW-09-091119-Z**	**GW0619-PW-10R**	**GW0619-PW-10R-Z**
Sample Date	**9/11/2019**	**9/11/2019**	**9/19/2019**	**9/19/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-54274-1**	**320-54278-1**	**320-54522-1**	**320-54524-1**
Lab Sample ID	**320-54274-2**	**320-54278-2**	**320-54522-1**	**320-54524-1**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<4	**9,900**	**8,400**
PFMOAA	<210	<210	**130,000**	**120,000**
PFO2HxA	**170 J**	**160**	**23,000**	**22,000**
PFO3OA	<58	<58	**1,100**	**980**
PFO4DA	<79	<79	<79	<79
PFO5DA	<34	<34	<34	<34
PMPA	**1,600**	**1,900**	**3,200**	**3,100**
PEPA	**220**	**160**	**440**	**440**
PFESA-BP1	**160 J**	**79**	<27	<27
PFESA-BP2	**81**	**37**	<30	<30
Byproduct 4	<160	<160	<160	<160
Byproduct 5	**94**	**65 J**	**160**	**160**
Byproduct 6	<15	<15	<15	<15
NVHOS	<54	<54	**680**	**640**
EVE Acid	<24	<24	<24	<24
Hydro-EVE Acid	<28	<28	<28	<28
R-EVE	<70	<70	**230**	**210**
PES	<46	<46	<46	<46
PFECA B	<60	<60	<60	<60
PFECA-G	<41	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<22	<19
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<230	<200
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<600	<530
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<97	<87
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<160	<140
6:2 Fluorotelomer sulfonate	<20	<20	<230	<200
ADONA	<2.1	<2.1	--	--
F-53B Major	<2	<2	--	--
F-53B Minor	<2	<2	--	--
NaDONA	<2.1	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<220	<190
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<100	<89
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<49	<44
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<350	<320
Perfluorobutane Sulfonic Acid	<2	<2	**130**	**95**
Perfluorobutanoic Acid	<2	<2	**66**	**67**
Perfluorodecane Sulfonic Acid	<2	<2	<37	<33
Perfluorodecanoic Acid	<2	<2	<35	<32
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<52	<46
Perfluorododecanoic Acid	<2	<2	<63	<56
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<22	<19
Perfluoroheptanoic Acid	<2	<2	<29	<26
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<100	<91
Perfluorohexane Sulfonic Acid	<2	<2	<19	<17
Perfluorohexanoic Acid	<2	<2	<66	<59
Perfluorononanesulfonic acid	<2	<2	<18	<16
Perfluorononanoic Acid	<2	<2	<31	<28
Perfluorooctadecanoic acid	<2	<2	<53	<47
Perfluorooctane Sulfonamide	<2	<2	<40	<36
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<34	<31
Perfluoropentanoic Acid	<2	<2	**530**	**560**
Perfluorotetradecanoic Acid	<2	<2	<33	<30
Perfluorotridecanoic Acid	<2	<2	<150	<130
Perfluoroundecanoic Acid	<2	<2	<130	<110
PFOA	<2	<2	<97	<87
PFOS	<2	<2	<62	<55

Notes:
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SDG - Sample Delivery Group
SOP - standard operating procedure
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	PW-11	PW-11	PW-12	PW-12
Field Sample ID	PW-11-091019	PW-11-091019-Z	PW-12-091119	PW-12-091119-Z
Sample Date	9/10/2019	9/10/2019	9/11/2019	9/11/2019
QA/QC	--	--	--	--
SDG	320-54231-1	320-54229-1	320-54299-1	320-54299-1
Lab Sample ID	320-54231-2	320-54229-1	320-54299-4	320-54299-5
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**16,000**	**20,000**	<4	<4
PFMOAA	**280,000**	**310,000**	<5	<5
PFO2HxA	**56,000 J**	**59,000**	<2	<2
PFO3OA	**32,000 J**	**33,000**	<2	<2
PFO4DA	**16,000**	**16,000**	<2	<2
PFO5DA	**670 J**	**480**	<2	<2
PMPA	**8,200**	**9,000**	**15**	<10
PEPA	**3,100**	**3,200**	<20	<20
PFESA-BP1	**410**	**320**	<2	<2
PFESA-BP2	**910**	**720**	<2	<2
Byproduct 4	**1,400**	**1,700**	<2	<2
Byproduct 5	**3,200**	**3,300**	<2	<2
Byproduct 6	**93**	**78**	<2	<2
NVHOS	**3,000**	**3,100**	<2	<2
EVE Acid	<120	<120	<2	<2
Hydro-EVE Acid	**940**	**820**	<2	<2
R-EVE	**540**	**640**	<2	<2
PES	<230	<230	<2	<2
PFECA B	<300	<300	<2	<2
PFECA-G	<200	<200	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<500	<48	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<82	<7.8	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<13	<13	<4	<4
6:2 Fluorotelomer sulfonate	**21**	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2.3	<2.2	<2	<2
F-53B Minor	<3.1	<2.9	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<84	<7.9	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<4.1	<3.9	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<300	<28	<20	<20
Perfluorobutane Sulfonic Acid	<2	**3.2**	<2	<2
Perfluorobutanoic Acid	**150**	**150**	<2	<2
Perfluorodecane Sulfonic Acid	<3.1	<2.9	<2	<2
Perfluorodecanoic Acid	<3	<2.8	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<4.3	<4.1	<2	<2
Perfluorododecanoic Acid	<5.3	<5	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**430**	**410**	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<8.6	<8.1	<2 UJ	<2 UJ
Perfluorohexane Sulfonic Acid	**3.5**	**5.1**	<2	<2
Perfluorohexanoic Acid	**39**	**35**	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.2**	**3.1**	<2	<2
Perfluorooctadecanoic acid	<4.4	<4.2	<2 UJ	<2 UJ
Perfluorooctane Sulfonamide	<3.4	<3.2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2.9	<2.7	<2	<2
Perfluoropentanoic Acid	**1,300**	**1,400**	<2	<2
Perfluorotetradecanoic Acid	<2.8	<2.6	<2	<2
Perfluorotridecanoic Acid	<13	<12	<2	<2
Perfluoroundecanoic Acid	<11	<10	<2	<2
PFOA	**25**	**23**	<2	<2
PFOS	<5.2	<4.9	<2	<2

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
Location ID	**PW-13**	**PW-13**	**PW-14**	**PW-15R**
Field Sample ID	**PW-13-091019**	**PW-13-091019-Z**	**PW-14-091119**	**GW0619-PW-15R-D**
Sample Date	**9/10/2019**	**9/10/2019**	**9/11/2019**	**9/19/2019**
QA/QC	**--**	**--**	**--**	**Field Duplicate**
SDG	**320-54231-1**	**320-54229-1**	**320-54274-1**	**320-54519-1**
Lab Sample ID	**320-54231-3**	**320-54229-2**	**320-54274-3**	**320-54519-2**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<15	<15	**22,000**	**11,000 J**
PFMOAA	<210	<2,100	**9,500,000**	**340,000**
PFO2HxA	<81	<810	**3,400,000**	**64,000**
PFO3OA	<58	<580	**1,100,000**	**14,000**
PFO4DA	<79	<790	**610,000**	**2,200**
PFO5DA	<34	<340	**390,000**	<67
PMPA	<570	<5,700	**1,400,000**	**36,000**
PEPA	<47	<470	**390,000**	**9,300**
PFESA-BP1	<27	<270	**6,000**	**4,100**
PFESA-BP2	<30	<300	**250,000**	**670**
Byproduct 4	<160	<1,600	**150,000**	**1,800 J**
Byproduct 5	<58	<580	**190,000**	**21,000**
Byproduct 6	<15	<150	**5,000**	**34**
NVHOS	<54	<540	**96,000**	**3,500**
EVE Acid	<24	<240	<2,400	**190**
Hydro-EVE Acid	<28	<280	**210,000**	**510**
R-EVE	<70	<700	**130,000**	**560**
PES	<46	<460	<4,600	<92
PFECA B	<60	<600	<6,000	<120
PFECA-G	<41	<410	<4,100	<82
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<18
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<180
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<52	<52	<20	<480
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<8.5	<8.5	<2	<78
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<14	<14	<4	<130
6:2 Fluorotelomer sulfonate	<20	**38**	<20	<180
ADONA	<2.1	<2.1	<2.1	--
F-53B Major	<2.4	<2.4	<2	--
F-53B Minor	<3.2	<3.2	<2	--
NaDONA	<2.1	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<180
N-ethylperfluoro-1-octanesulfonamide	<8.7	<8.7	<2	<75
N-methyl perfluoro-1-octanesulfonamide	<4.3	<4.3	<2	<40
N-methyl perfluorooctane sulfonamidoacetic acid	<31	<31	<20	<290
Perfluorobutane Sulfonic Acid	<2	**16**	<2	**20**
Perfluorobutanoic Acid	<3.5	<3.5	**420**	**140**
Perfluorodecane Sulfonic Acid	<3.2	<3.2	<2	<30
Perfluorodecanoic Acid	<3.1	<3.1	**2.4**	<29
Perfluorododecane sulfonic acid (PFDoS)	<4.5	<4.5	<2	<42
Perfluorododecanoic Acid	<5.5	<5.5	<2	<51
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<18
Perfluoroheptanoic Acid	<2.5	<2.5	**280**	**56 J**
Perfluorohexadecanoic acid (PFHxDA)	<8.9	<8.9	<2	<82
Perfluorohexane Sulfonic Acid	**2.3**	**2.1**	**4.2**	<16
Perfluorohexanoic Acid	<5.8	<5.8	**130**	<54
Perfluorononanesulfonic acid	<2	<2	<2	<15
Perfluorononanoic Acid	<2.7	<2.7	**190**	<25
Perfluorooctadecanoic acid	<4.6	<4.6	<2	<42
Perfluorooctane Sulfonamide	<3.5	<3.5	<2	<32
Perfluoropentane sulfonic acid (PFPeS)	<3	<3	<2	<28
Perfluoropentanoic Acid	<4.9	<4.9	**1,300**	**580**
Perfluorotetradecanoic Acid	<2.9	**4.8**	<2	<27
Perfluorotridecanoic Acid	<13	<13	<2	<120
Perfluoroundecanoic Acid	<11	<11	<2	<100
PFOA	<8.5	<8.5	**120**	<78
PFOS	<5.4	<5.4	**16**	<50

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**
Location ID	**PW-15R**	**PZ-22**	**SMW-10**	**SMW-11**
Field Sample ID	**GW0619-PW-15R**	**GW0619-PZ-22**	**GW0619-SMW-10**	**GW0619-SMW-11**
Sample Date	**9/19/2019**	**7/23/2019**	**6/27/2019**	**6/26/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-54519-1**	**320-52722-1**	**320-51903-1**	**320-51903-1**
Lab Sample ID	**320-54519-1**	**320-52722-2**	**320-51903-4**	**320-51903-7**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**8,700 J**	**10,000**	<4	**4,000**
PFMOAA	**330,000**	**180,000**	<210 UJ	**1,600 J**
PFO2HxA	**63,000**	**38,000**	<81 UJ	**2,400 J**
PFO3OA	**14,000**	**3,800**	<58 UJ	**400 J**
PFO4DA	**2,200**	**340**	<79 UJ	**190 J**
PFO5DA	<67	<67	**51 J**	**62 J**
PMPA	**36,000**	**4,700**	**780 J**	**2,900 J**
PEPA	**8,900**	**1,100**	<47 UJ	**760 J**
PFESA-BP1	**3,300**	<53	<27 UJ	<27 UJ
PFESA-BP2	**640 J**	<61	<30 UJ	**72 J**
Byproduct 4	**1,500 J**	**760 J**	<160 UJ	**180 J**
Byproduct 5	**19,000**	**1,900**	<58 UJ	<58 UJ
Byproduct 6	**270**	<31	<15 UJ	<15 UJ
NVHOS	**3,500**	**1,200**	<54 UJ	<54 UJ
EVE Acid	**250 J**	<49	<24 UJ	<24 UJ
Hydro-EVE Acid	**550 J**	**130**	<28 UJ	**30 J**
R-EVE	**700 J**	**680**	<70 UJ	**140 J**
PES	**210**	<92	<46 UJ	<46 UJ
PFECA B	**220**	<120	<60 UJ	<60 UJ
PFECA-G	**210**	<82	<41 UJ	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<28	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<180	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<470	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	**240**	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	**270**	--	--	--
6:2 Fluorotelomer sulfonate	<180	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<170	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	**210**	--	--	--
N-methyl perfluoro-1-octanesulfonamide	**220**	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<280	<20	<20	<20
Perfluorobutane Sulfonic Acid	<33	<2	<2	<2
Perfluorobutanoic Acid	**170**	**140**	<2	**24**
Perfluorodecane Sulfonic Acid	<36	<2	<2	<2
Perfluorodecanoic Acid	<36	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<41	<2	<2	<2
Perfluorododecanoic Acid	<50	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<31	<2	<2	<2
Perfluoroheptanoic Acid	**94 J**	**33**	<2	**9.8**
Perfluorohexadecanoic acid (PFHxDA)	<81	--	--	--
Perfluorohexane Sulfonic Acid	<32	<2	<2	<2
Perfluorohexanoic Acid	<60	**43**	<2	**7.8**
Perfluorononanesulfonic acid	<30	<2	<2	<2
Perfluorononanoic Acid	<39	<2	<2	<2
Perfluorooctadecanoic acid	<42	<2	<2	<2
Perfluorooctane Sulfonamide	<32	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<33	<2	<2	<2
Perfluoropentanoic Acid	**660**	**810**	<2	**29**
Perfluorotetradecanoic Acid	<36	<2	<2	<2
Perfluorotridecanoic Acid	<120	<2	<2	<2
Perfluoroundecanoic Acid	<100	<2	<2	<2
PFOA	<77	**4**	<2	**34**
PFOS	<49	<2	<2	<2

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
Location ID	**SMW-12**	**LTW-01**	**LTW-03**	**LTW-04**
Field Sample ID	**GW0619-SMW-12**	**GW0619-LTW-01**	**GW0619-LTW-03**	**GW0619-LTW-04**
Sample Date	**7/11/2019**	**7/17/2019**	**7/17/2019**	**7/17/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-52290-1**	**320-52454-1**	**320-52454-1**	**320-52454-1**
Lab Sample ID	**320-52290-1**	**320-52454-1**	**320-52454-4**	**320-52454-6**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,700**	**19,000**	**12,000**	**16,000**
PFMOAA	**3,900**	**45,000**	**150,000**	**96,000**
PFO2HxA	**1,300**	**30,000**	**34,000**	**31,000**
PFO3OA	**53**	**6,100**	**4,900**	**5,400**
PFO4DA	<7.9	**1,200**	**160**	**620**
PFO5DA	<3.4	**210**	<34	**36**
PMPA	**1,900**	**23,000**	**9,300**	**19,000**
PEPA	**440**	**8,300**	**2,400**	**7,100**
PFESA-BP1	<2.7	<27	<27	<27
PFESA-BP2	<3	**260**	**33**	**160**
Byproduct 4	**120**	**1,200**	**600**	**2,000**
Byproduct 5	<5.8	**970**	**2,600**	**4,300**
Byproduct 6	<2	<15	<15	<15
NVHOS	**38**	**490**	**1,000**	**1,600**
EVE Acid	<2.4	<24	<24	<24
Hydro-EVE Acid	<2.8	**140**	**42**	**510**
R-EVE	**110**	**720**	**480**	**2,300**
PES	<4.6	<46	<46	<46
PFECA B	<6	<60	<60	<60
PFECA-G	<4.1	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<47	<46	<46
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<28	<27	<27
Perfluorobutane Sulfonic Acid	<2	**2.4**	<2	<2
Perfluorobutanoic Acid	**19**	**170**	**140**	**440**
Perfluorodecane Sulfonic Acid	<2	<2.9	<2.8	<2.8
Perfluorodecanoic Acid	<2	<2.8	<2.7	<2.7
Perfluorododecane sulfonic acid (PFDoS)	<2	<4	<4	<4
Perfluorododecanoic Acid	<2	<4.9	<4.9	<4.9
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	**43**	**19**	**68**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	**4.6**	<2	**2.9**
Perfluorohexanoic Acid	<2	**28**	**15**	**44**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2.4	<2.4	<2.4
Perfluorooctadecanoic acid	<2	<4.1	<4.1	<4.1
Perfluorooctane Sulfonamide	<2	<3.1	<3.1	<3.1
Perfluoropentane sulfonic acid (PFPeS)	<2	<2.7	<2.7	<2.7
Perfluoropentanoic Acid	**41**	**420**	**700**	**1,500**
Perfluorotetradecanoic Acid	<2	<2.6	<2.6	<2.6
Perfluorotridecanoic Acid	<2	<12	<12	<12
Perfluoroundecanoic Acid	<2	<9.9	<9.8	<9.7
PFOA	<2	**37**	<7.5	**8**
PFOS	<2	**11**	<4.8	<4.8

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ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Perched Zone	Perched Zone
Location ID	PIW-6S	PIW-7S	FTA-01	FTA-02
Field Sample ID	GW0619-PIW-6S	GW0619-PIW-7S	GW0619-FTA-01	GW0619-FTA-02
Sample Date	7/17/2019	7/19/2019	6/27/2019	6/27/2019
QA/QC	--	--	--	--
SDG	320-52454-1	320-52624-1	320-51903-1	320-51903-1
Lab Sample ID	320-52454-5	320-52624-4	320-51903-3	320-51903-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**13,000**	**1,400**	**520**	**22,000**
PFMOAA	**160,000**	**12,000**	<210 UJ	**11,000 J**
PFO2HxA	**35,000**	**2,400**	**390 J**	**8,800 J**
PFO3OA	**5,000**	**180**	**58 J**	**2,000 J**
PFO4DA	**150**	<79	<79 UJ	**1,700 J**
PFO5DA	<34	<34	**77 J**	**2,400 J**
PMPA	**8,700**	**1,100**	**1,500 J**	**6,400 J**
PEPA	**2,300**	<47	**290 J**	**2,400 J**
PFESA-BP1	<27	<27	<27 UJ	**1,300 J**
PFESA-BP2	**31**	<30	**32 J**	**3,500 J**
Byproduct 4	**470**	<160	<160 UJ	**1,500 J**
Byproduct 5	**1,700**	<58	<58 UJ	**950 J**
Byproduct 6	<15	<15	<15 UJ	**19 J**
NVHOS	**1,100**	**88**	<54 UJ	**450 J**
EVE Acid	<24	<24	<24 UJ	**24,000 J**
Hydro-EVE Acid	**43**	<28	<28 UJ	**1,100 J**
R-EVE	**490**	**130**	<70 UJ	**560 J**
PES	<46	<46	<46 UJ	<46 UJ
PFECA B	<60	<60	<60 UJ	<60 UJ
PFECA-G	<41	<41	<41 UJ	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<47	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	**120**
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<28	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	**2.5**
Perfluorobutanoic Acid	**150**	**26**	**11**	**140**
Perfluorodecane Sulfonic Acid	<2.9	<2	<2	<2
Perfluorodecanoic Acid	<2.8	<2	<2	**2.9**
Perfluorododecane sulfonic acid (PFDoS)	<4.1	<2	<2	<2
Perfluorododecanoic Acid	<5	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	**2.1**
Perfluoroheptanoic Acid	**18**	<2	**5.1**	**87**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	**2.1**	**21**
Perfluorohexanoic Acid	**16**	<2	**4.5**	**110**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2.4	<2	<2	**17**
Perfluorooctadecanoic acid	<4.2	<2	<2	<2
Perfluorooctane Sulfonamide	<3.2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2.7	<2	<2	**2.1**
Perfluoropentanoic Acid	**830**	**130**	**15**	**270**
Perfluorotetradecanoic Acid	<2.6	<2	<2	<2
Perfluorotridecanoic Acid	<12	<2	<2	<2
Perfluoroundecanoic Acid	<9.9	<2	<2	<2
PFOA	<7.7	<2	**6.7**	**83**
PFOS	<4.9	<2	**3.8**	**24**

Notes:
1. **Bold -** Analyte detected above associated reporting limit
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B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
Location ID	**FTA-03**	**MW-1S**	**MW-2S**	**MW-7S**
Field Sample ID	**GW0619-FTA-03**	**GW0619-MW-1S**	**GW0619-MW-2S**	**GW0619-MW-7S**
Sample Date	**6/27/2019**	**6/28/2019**	**7/10/2019**	**7/10/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-51903-1**	**320-51904-1**	**320-52165-1**	**320-52165-1**
Lab Sample ID	**320-51903-2**	**320-51904-3**	**320-52165-1**	**320-52165-2**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**13,000**	**14,000**	**17,000**	**17,000**
PFMOAA	**3,200 J**	**21,000**	**28,000**	**4,600**
PFO2HxA	**6,500 J**	**11,000**	**12,000**	**8,700**
PFO3OA	**780 J**	**1,600**	**2,500**	**1,500**
PFO4DA	**820 J**	**1,300 J**	**1,600**	**1,200**
PFO5DA	**1,200 J**	**1,300**	**2,500**	**1,800**
PMPA	**6,500 J**	**9,700**	**12,000**	**13,000**
PEPA	**2,200 J**	**3,300**	**4,100**	**5,200**
PFESA-BP1	**550 J**	**48**	**27 J**	**58 J**
PFESA-BP2	**610 J**	**1,000**	**2,100**	**830**
Byproduct 4	**1,400 J**	**620**	**730 J**	**1,400**
Byproduct 5	**1,100 J**	**430**	**320**	**650**
Byproduct 6	<15 UJ	<15	**19**	**17**
NVHOS	**170 J**	**210**	**290**	**260**
EVE Acid	**97 J**	<24	<24	<24
Hydro-EVE Acid	**150 J**	**230**	**450**	**270**
R-EVE	**2,100 J**	**370**	**510**	**1,100**
PES	<46 UJ	<46	<46	<46
PFECA B	<60 UJ	<60	<60	<60
PFECA-G	<41 UJ	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**68**	**140**	**200**	**130**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**2.2**	**18**	**9**	**6.2**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**21**	**50**	**77**	**43**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**5.1**	**2.3**	**4.2**	**2.8**
Perfluorohexanoic Acid	**15**	**26**	**40**	**22**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**11**	**62**	**75**	**15**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**87**	**290**	**340**	**160**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	**10**	**4.7**	<2
PFOA	**51**	**94**	**86**	**82**
PFOS	**9.9**	**13**	**14**	**7.8**

Notes:
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	**MW-9S**	**MW-12S**	**MW-23**	**MW-24**
Field Sample ID	**GW0619-MW-9S**	**GW0619-MW-12S**	**GW0619-MW-23**	**GW0619-MW-24**
Sample Date	**6/25/2019**	**7/8/2019**	**6/25/2019**	**7/17/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-51746-1**	**320-52171-1**	**320-51746-1**	**320-52464-1**
Lab Sample ID	**320-51746-4**	**320-52171-3**	**320-51746-2**	**320-52464-6**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**5,600**	**17,000**	**17,000**	**15,000**
PFMOAA	**1,600 J**	**6,600**	**790 J**	**720,000**
PFO2HxA	**2,700 J**	**9,600**	**2,200 J**	**130,000**
PFO3OA	**360 J**	**1,500**	**180 J**	**31,000**
PFO4DA	**360 J**	**980**	**250 J**	**7,400**
PFO5DA	**220 J**	**980**	**130 J**	**1,400**
PMPA	**7,000 J**	**10,000**	**4,400 J**	**8,100**
PEPA	**2,800 J**	**3,900**	**1,600 J**	**3,200**
PFESA-BP1	**38 J**	<27	<27 UJ	**1,400**
PFESA-BP2	**200 J**	**540**	**150 J**	**1,200**
Byproduct 4	**310 J**	**540**	**450 J**	**2,100**
Byproduct 5	<58 UJ	**63**	<58 UJ	**8,200**
Byproduct 6	<15 UJ	<15	<15 UJ	<150
NVHOS	<54 UJ	**140**	<54 UJ	**7,100**
EVE Acid	<24 UJ	<24	<24 UJ	<240
Hydro-EVE Acid	**53 J**	**120**	**41 J**	**420**
R-EVE	**170 J**	**330**	**290 J**	<700
PES	<46 UJ	<46	<46 UJ	<460
PFECA B	<60 UJ	<60	<60 UJ	<600
PFECA-G	<41 UJ	<41	<41 UJ	<410
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**140**	**130**	**45**	**200**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	**3.8**	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**10**	**30**	**7.7**	**110**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	**2**	<2	<2
Perfluorohexanoic Acid	**5.1**	**23**	**6.5**	**21**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**2.2**	**16**	<2	**16**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**61**	**150**	**35**	**1,100**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	**6.9**	<2	**6.1**
PFOA	**16**	**63**	**23**	**89**
PFOS	**2.7**	**7.7**	<2	**2.2**

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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	MW-25	MW-27	MW-28	MW-30
Field Sample ID	GW0619-MW-25	GW0619-MW-27	GW0619-MW-28	GW0619-MW-30
Sample Date	6/25/2019	6/25/2019	6/26/2019	7/2/2019
QA/QC	--	--	--	--
SDG	320-51746-1	320-51746-1	320-51904-1	320-52030-1
Lab Sample ID	320-51746-11	320-51746-5	320-51904-1	320-52030-2
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**17,000**	**11,000**	**2,900**	**18,000**
PFMOAA	**2,700 J**	**240,000 J**	<210 UJ	**3,300**
PFO2HxA	**8,100 J**	**62,000 J**	<81 UJ	**9,400**
PFO3OA	**1,400 J**	**17,000 J**	<58 UJ	**1,000 J**
PFO4DA	**1,400 J**	**4,500 J**	<79 UJ	**1,600 J**
PFO5DA	**750 J**	**260 J**	<34 UJ	**2,100 J**
PMPA	**25,000 J**	**7,800 J**	<570 UJ	**29,000**
PEPA	**9,800 J**	**2,900 J**	<47 UJ	**11,000**
PFESA-BP1	<27 UJ	<53 UJ	<27 UJ	<27
PFESA-BP2	**410 J**	**550 J**	<30 UJ	**480**
Byproduct 4	**1,700 J**	**570 J**	<160 UJ	**640**
Byproduct 5	**360 J**	**810 J**	<58 UJ	<58
Byproduct 6	<15 UJ	**35 J**	<15 UJ	<15
NVHOS	**180 J**	**3,100 J**	<54 UJ	**95**
EVE Acid	<24 UJ	<49 UJ	<24 UJ	<24
Hydro-EVE Acid	**190 J**	**240 J**	<28 UJ	**150**
R-EVE	**1,400 J**	**220 J**	<70 UJ	**270**
PES	<46 UJ	<92 UJ	<46 UJ	<46
PFECA B	<60 UJ	<120 UJ	<60 UJ	<60
PFECA-G	<41 UJ	<82 UJ	<41 UJ	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**190**	**110**	**28**	**190**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**33**	**23**	**7.3**	**33**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**2.4**	**2.8**	<2	<2
Perfluorohexanoic Acid	**15**	**16**	**4.3**	**10**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.2**	<2	<2	**6.3**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**160**	**130**	**35**	**160**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**80**	**23**	**20**	**61**
PFOS	**4.2**	<2	<2	**3**

Notes:

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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	**NAF-01**	**NAF-02**	**NAF-03**	**NAF-04**
Field Sample ID	**GW0619-NAF-01**	**GW0619-NAF-02**	**GW0619-NAF-03**	**GW0619-NAF-04**
Sample Date	**7/10/2019**	**6/27/2019**	**6/27/2019**	**7/15/2019**
QA/QC	--	--	--	--
SDG	**320-52165-1**	**320-51904-1**	**320-51904-1**	**320-52288-1**
Lab Sample ID	**320-52165-3**	**320-51904-4**	**320-51904-2**	**320-52288-5**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**22,000**	**160,000 J**	**54,000 J**	**270,000 J**
PFMOAA	**20,000**	**2,900,000 J**	**260,000 J**	**240,000**
PFO2HxA	**20,000**	**780,000 J**	**110,000 J**	**420,000**
PFO3OA	**5,000**	**240,000 J**	**39,000 J**	**110,000 J**
PFO4DA	**6,200**	**100,000 J**	**21,000 J**	**49,000**
PFO5DA	**6,000 J**	**36,000 J**	**19,000 J**	**32,000 J**
PMPA	**17,000**	**74,000 J**	**47,000 J**	**85,000**
PEPA	**7,400**	**32,000 J**	**23,000 J**	**28,000**
PFESA-BP1	**840**	**23,000 J**	**57,000 J**	**1,100,000**
PFESA-BP2	**2,900**	**17,000 J**	**9,200 J**	**110,000**
Byproduct 4	**2,700**	**21,000 J**	**6,000 J**	**100,000**
Byproduct 5	**1,700**	**210,000 J**	**37,000 J**	**1,200,000**
Byproduct 6	**70**	<770 UJ	**600 J**	**6,500**
NVHOS	**750**	**27,000 J**	**4,900 J**	**60,000**
EVE Acid	**480**	**7,300 J**	**6,800 J**	**340,000**
Hydro-EVE Acid	**820**	**14,000 J**	**3,300 J**	**160,000**
R-EVE	**5,600**	**12,000 J**	**4,400 J**	**36,000**
PES	<46	<2,300 UJ	<230 UJ	<920
PFECA B	<60	<3,000 UJ	<300 UJ	<1,200
PFECA-G	<41	<2,000 UJ	<200 UJ	<820
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<170
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<450
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<170
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<160
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<270
Perfluorobutane Sulfonic Acid	**2.4**	**2.4**	<2	<17
Perfluorobutanoic Acid	**490**	**3,300**	**1,100**	**4,800**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<27
Perfluorodecanoic Acid	**6.8**	**48**	**18**	**77**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<39
Perfluorododecanoic Acid	**2.4**	**41**	**6.8**	<47
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<16
Perfluoroheptanoic Acid	**73**	**1,000**	**140**	**7,700**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**2.9**	**2.9**	<2	<15
Perfluorohexanoic Acid	**54**	**610**	**190**	**980**
Perfluorononanesulfonic acid	<2	<2	<2	<14
Perfluorononanoic Acid	**49**	**400**	**47**	**1,900**
Perfluorooctadecanoic acid	<2	<2	<2	<39 UJ
Perfluorooctane Sulfonamide	<2	<2	<2	<30
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<26
Perfluoropentanoic Acid	**330**	**8,000**	**870**	**34,000 J**
Perfluorotetradecanoic Acid	<2	<2	<25	<25
Perfluorotridecanoic Acid	<2	**44**	<2	<110
Perfluoroundecanoic Acid	**10**	**170**	**46**	<94
PFOA	**130**	**260**	**140**	**540**
PFOS	**8.5**	**6.5**	**2.7**	<46

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SDG - Sample Delivery Group
SOP - standard operating procedure
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	NAF-06	NAF-07	NAF-08A	NAF-09
Field Sample ID	GW0619-NAF-06	GW0619-NAF-07	GW0619-NAF-08A	GW0619-NAF-09
Sample Date	7/11/2019	6/27/2019	7/15/2019	7/2/2019
QA/QC	--	--	--	--
SDG	320-52282-1	320-51903-1	320-52288-1	320-52028-1
Lab Sample ID	320-52282-1	320-51903-6	320-52288-4	320-52028-4
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**100,000 J**	**37,000 J**	**37,000 J**	**42,000 J**
PFMOAA	**810,000**	**93,000 J**	**7,400**	**5,900**
PFO2HxA	**300,000**	**46,000 J**	**17,000**	**22,000**
PFO3OA	**120,000**	**14,000 J**	**5,100 J**	**9,400**
PFO4DA	**66,000**	**7,800 J**	**4,400**	**11,000**
PFO5DA	**45,000 J**	**4,300 J**	**2,700 J**	**2,200 J**
PMPA	**47,000**	**26,000 J**	**200,000**	**54,000**
PEPA	**20,000**	**10,000 J**	**110,000**	**35,000**
PFESA-BP1	**78,000 J**	**610 J**	**5,500**	**480**
PFESA-BP2	**29,000**	**2,000 J**	**2,100**	**1,100**
Byproduct 4	**6,800**	**5,100 J**	**3,000**	**1,100 J**
Byproduct 5	**92,000**	**32,000 J**	**21,000**	**1,300**
Byproduct 6	**600**	**63 J**	<77	**42**
NVHOS	**8,600**	**1,800 J**	**790**	**800**
EVE Acid	**6,100**	**270 J**	**4,400**	**52**
Hydro-EVE Acid	**5,500**	**850 J**	**2,600**	**520**
R-EVE	**4,700 J**	**2,400 J**	**1,800**	**860**
PES	<230	<46 UJ	<230	<46
PFECA B	<300	<60 UJ	<300	<60
PFECA-G	<200	<41 UJ	<200	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**2.3**	**2.4**	<2	**10**
Perfluorobutanoic Acid	**1,400**	**220**	**3,300**	**1,300**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**20**	**8.8**	**4.3**	**7**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	**4.3**	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**480**	**110**	**200**	**120**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**3.2**	**2.6**	**2.2**	**4.4**
Perfluorohexanoic Acid	**350**	**60**	**89**	**85**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**270**	**34**	**38**	**19**
Perfluorooctadecanoic acid	<2 UJ	<2	<2 UJ	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**2,300**	**430**	**1,300**	**610**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	**39**	**3.8**	**3.8**	<2
PFOA	**230**	**110**	**54**	**100**
PFOS	**12**	**12**	**7.6**	**10**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	NAF-10	NAF-12	PW-01	PW-01
Field Sample ID	GW0619-NAF-10	GW0619-NAF-12	PW-01-090919-D	PW-01-090919
Sample Date	7/3/2019	7/17/2019	9/9/2019	9/9/2019
QA/QC	--	--	Field Duplicate	--
SDG	320-52030-1	320-52464-1	320-54217-1	320-54217-1
Lab Sample ID	320-52030-3	320-52464-4	320-54217-2	320-54217-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**23,000**	**120,000 J**	**7,500**	**8,300**
PFMOAA	**4,700**	**230,000**	**23,000**	**25,000**
PFO2HxA	**10,000**	**400,000**	**9,400**	**10,000**
PFO3OA	**1,600 J**	**160,000**	**1,900**	**2,000 J**
PFO4DA	**1,200**	**90,000**	**960**	**1,000 J**
PFO5DA	**1,000 J**	**59,000**	**540**	**660 J**
PMPA	**28,000**	**330,000**	**3,600**	**4,100 J**
PEPA	**9,800**	**31,000**	**1,200**	**1,300**
PFESA-BP1	**88**	**670,000**	**410**	**490**
PFESA-BP2	**740**	**230,000**	**400**	**490 J**
Byproduct 4	**2,700**	**200,000**	**470**	**610**
Byproduct 5	**410**	**1,100,000**	**880 J**	**900 J**
Byproduct 6	**21**	**11,000**	<15	<15
NVHOS	**470**	**560,000**	**270**	**280 J**
EVE Acid	**67**	**710,000**	**100**	**110 J**
Hydro-EVE Acid	**480**	**380,000**	**110**	**130 J**
R-EVE	**1,600**	**120,000**	**260**	**310**
PES	<46	<460	<46	<46
PFECA B	<60	<600	<60	<60
PFECA-G	<41	<410	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	<2.1	<2.1
F-53B Major	--	--	<2	<2
F-53B Minor	--	--	<2	<2
NaDONA	--	--	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<2	<2
N-methyl perfluoro-1-octanesulfonamide	--	--	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**4.6**	<2	<2	<2
Perfluorobutanoic Acid	**240**	**6,500 J**	**58**	**61**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**4.1**	**220**	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**46**	**9,300**	**25**	**25**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<2	<2
Perfluorohexane Sulfonic Acid	<2	**5.3 J**	<2	<2
Perfluorohexanoic Acid	**24**	**1,700 J**	**12**	**13**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**16**	**4,600 J**	**6.4**	**6.4**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**270**	**18,000 J**	**100**	**110**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	**42 J**	<2	<2
PFOA	**99**	**750 J**	**100**	**95**
PFOS	**11**	**42**	**6.4**	**6.6**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
Location ID	**PZ-11**	**PZ-11**	**PZ-12**	**PZ-13**
Field Sample ID	**GW0619-PZ-11**	**GW0619-PZ-11-D**	**GW0619-PZ-12**	**GW0619-PZ-13**
Sample Date	**7/16/2019**	**7/16/2019**	**7/11/2019**	**6/25/2019**
QA/QC	**--**	**Field Duplicate**	**--**	**--**
SDG	**320-52322-1**	**320-52322-1**	**320-52282-1**	**320-51746-1**
Lab Sample ID	**320-52322-1**	**320-52322-2**	**320-52282-2**	**320-51746-6**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**4,900 B**	**6,200 B**	**6,800**	**44,000 J**
PFMOAA	**7,100**	**7,500**	**63,000 J**	**8,000 J**
PFO2HxA	**4,800**	**5,000**	**13,000**	**20,000 J**
PFO3OA	**830**	**910**	**3,000**	**3,200 J**
PFO4DA	**650**	**710**	**990**	**3,300 J**
PFO5DA	**800**	**920**	**360**	**4,600 J**
PMPA	**3,300**	**3,600**	**5,300**	**110,000 J**
PEPA	**1,100**	**1,200**	**1,200**	**62,000 J**
PFESA-BP1	**530**	**560**	**7,600**	**320 J**
PFESA-BP2	**320**	**350**	**770**	**1,300 J**
Byproduct 4	**220**	**260**	**480**	**3,200 J**
Byproduct 5	**1,200**	**1,200**	**5,800 J**	**1,600 J**
Byproduct 6	<15	<15	**18**	**28 J**
NVHOS	**140**	**130**	**450**	**290 J**
EVE Acid	**29**	**30**	**150**	**200 J**
Hydro-EVE Acid	**120**	**110**	**210**	**320 J**
R-EVE	**110 J**	**110 J**	**200 J**	**2,300 J**
PES	<46	<46	<46	<46 UJ
PFECA B	<60	<60	<60	<60 UJ
PFECA-G	<41	<41	<41	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**2.8**	**2.6**	<2	<2
Perfluorobutanoic Acid	**43**	**43**	**67**	**2,400**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**3**	**3.2**	<2	**3.1**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**23**	**23**	**38**	**120**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**5.2**	**4.9**	**3.2**	<2
Perfluorohexanoic Acid	**20**	**20**	**24**	**55**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**6.2**	**6**	**4.4**	**55**
Perfluorooctadecanoic acid	<2	<2	<2 UJ	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**64**	**65**	**150**	**910**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	**2.2**	<2	<2	**3.5**
PFOA	**42**	**43**	**120**	**78**
PFOS	**16**	**15**	**8.9**	**6.9**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	PZ-14	PZ-15	PZ-19R	PZ-20R
Field Sample ID	GW0619-PZ-14	GW0619-PZ-15	GW0619-PZ-19R	GW0619-PZ-20R
Sample Date	7/3/2019	6/25/2019	7/1/2019	7/1/2019
QA/QC	--	--	--	--
SDG	320-52030-1	320-51746-1	320-52028-1	320-52028-1
Lab Sample ID	320-52030-4	320-51746-3	320-52028-2	320-52028-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**32,000**	**10,000**	**6,500**	**3,500**
PFMOAA	**5,300**	**2,800 J**	**3,000**	**820**
PFO2HxA	**14,000**	**9,000 J**	**6,100**	**2,600**
PFO3OA	**2,800 J**	**1,300 J**	**720**	**240**
PFO4DA	**2,100 J**	**1,100 J**	**740**	**190**
PFO5DA	**3,100 J**	**1,000 J**	**450 J**	**160 J**
PMPA	**48,000**	**19,000 J**	**4,400**	**2,000**
PEPA	**17,000**	**7,600 J**	**1,900**	**870**
PFESA-BP1	<27	<27 UJ	**31**	<2
PFESA-BP2	**620**	**550 J**	**230**	**98**
Byproduct 4	**980**	**970 J**	**390**	**75**
Byproduct 5	**72**	**180 J**	**70**	**3.2**
Byproduct 6	**22**	<15 UJ	**5**	<2
NVHOS	**380**	**130 J**	**76**	**20**
EVE Acid	<24	<24 UJ	**23**	<2
Hydro-EVE Acid	**410**	**140 J**	**57**	**17**
R-EVE	**280**	**620 J**	**250**	**38**
PES	<46	<46 UJ	<4.6	<2.3
PFECA B	<60	<60 UJ	<6	<3
PFECA-G	<41	<41 UJ	<4.1	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	**4.2**	**5**
Perfluorobutanoic Acid	**460**	**160**	**63**	**28**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	**3.7**	**6**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**52**	**27**	**34**	**36**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	**6.9**	**8.2**
Perfluorohexanoic Acid	**22**	**11**	**31**	**38**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**20**	**5.2**	**7.5**	**5.8**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**310**	**160**	**90**	**67**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**130**	**44**	**32**	**24**
PFOS	**6.5**	**4.9**	**16**	**22**

Notes:
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SDG - Sample Delivery Group
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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	PZ-21R	PZ-24	PZ-26	PZ-27
Field Sample ID	GW0619-PZ-21R	GW0619-PZ-24	GW0619-PZ-26	GW0619-PZ-27
Sample Date	7/2/2019	6/25/2019	6/25/2019	6/25/2019
QA/QC	--	--	--	--
SDG	320-52030-1	320-51746-1	320-51746-1	320-51746-1
Lab Sample ID	320-52030-1	320-51746-10	320-51746-9	320-51746-8
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**2,100**	**36,000**	**240**	**500**
PFMOAA	**920**	**1,300 J**	<210 UJ	**5,800 J**
PFO2HxA	**1,800**	**4,100 J**	**190 J**	**1,300 J**
PFO3OA	**190 J**	**810 J**	<58 UJ	**310 J**
PFO4DA	**220 J**	**710 J**	<79 UJ	**150 J**
PFO5DA	**150 J**	**190 J**	**58 J**	**120 J**
PMPA	**1,000**	**14,000 J**	<570 UJ	**660 J**
PEPA	**410**	**5,200 J**	**140 J**	**270 J**
PFESA-BP1	**4.3**	<27 UJ	<27 UJ	**29 J**
PFESA-BP2	**97**	**180 J**	<30 UJ	**180 J**
Byproduct 4	**88**	**330 J**	<160 UJ	<160 UJ
Byproduct 5	**15 J**	<58 UJ	<58 UJ	**440 J**
Byproduct 6	**2.3**	<15 UJ	<15 UJ	<15 UJ
NVHOS	**22**	**93 J**	<54 UJ	**110 J**
EVE Acid	**12**	<24 UJ	<24 UJ	<24 UJ
Hydro-EVE Acid	**20**	**82 J**	<28 UJ	<28 UJ
R-EVE	**41**	**280 J**	<70 UJ	<70 UJ
PES	<2.3	<46 UJ	<46 UJ	<46 UJ
PFECA B	<3	<60 UJ	<60 UJ	<60 UJ
PFECA-G	<2	<41 UJ	<41 UJ	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**4**	**2.3**	**5.5**	**3.6**
Perfluorobutanoic Acid	**20**	**140**	**15**	**12**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**4**	<2	**4.4**	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**27**	**25**	**19**	**11**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**7.1**	<2	**7.6**	**5.2**
Perfluorohexanoic Acid	**29**	**16**	**27**	**13**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**6.9**	**2.4**	**3.2**	**2**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**46**	**110**	**28**	**27**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**28**	**160**	**14**	**13**
PFOS	**19**	**3.9**	**23**	**12**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
Location ID	PZ-28	PZ-35	SMW-02	SMW-07
Field Sample ID	GW0619-PZ-28	GW0619-PZ-35	GW0619-SMW-02	GW0619-SMW-07
Sample Date	6/25/2019	7/2/2019	7/17/2019	7/8/2019
QA/QC	--	--	--	--
SDG	320-51746-1	320-52028-1	320-52454-1	320-52171-1
Lab Sample ID	320-51746-7	320-52028-3	320-52454-3	320-52171-5
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,400**	**1,600**	**18,000**	**12,000**
PFMOAA	**460 J**	**560**	**2,900**	**750**
PFO2HxA	**1,300 J**	**1,500**	**20,000**	**2,200**
PFO3OA	**160 J**	**260**	**3,200**	**220**
PFO4DA	**190 J**	**390**	**1,100**	**280**
PFO5DA	**46 J**	**410 J**	**56**	**72 J**
PMPA	**3,200 J**	**1,100**	**21,000**	**2,700**
PEPA	**1,100 J**	**530**	**9,900**	**770**
PFESA-BP1	<2 UJ	**11**	<27	<27
PFESA-BP2	**54 J**	**140**	**120**	**150**
Byproduct 4	**150 J**	**92 J**	**810**	**180**
Byproduct 5	<2.9 UJ	**33 J**	<58	<58
Byproduct 6	<2 UJ	**2.1**	**17**	<15
NVHOS	**30 J**	**18**	**320**	<54
EVE Acid	<2 UJ	**6.1**	<24	<24
Hydro-EVE Acid	**16 J**	**29**	**67**	**43**
R-EVE	**82 J**	**53 J**	**510**	**130**
PES	<2.3 UJ	<2	<46	<46
PFECA B	<3 UJ	<2	<60	<60
PFECA-G	<2 UJ	<2	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<46	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<27	<20
Perfluorobutane Sulfonic Acid	<2	**3.7**	**2.1**	**5**
Perfluorobutanoic Acid	**28**	**23**	**88**	**25**
Perfluorodecane Sulfonic Acid	<2	<2	<2.8	<2
Perfluorodecanoic Acid	**2.6**	**4**	<2.7	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<4	<2
Perfluorododecanoic Acid	<2	<2	<4.9	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**11**	**24**	**41**	**48**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**3**	**5.5**	<2	**25**
Perfluorohexanoic Acid	**11**	**26**	**22**	**23**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.3**	**9**	<2.4	<2
Perfluorooctadecanoic acid	<2	<2	<4.1	<2
Perfluorooctane Sulfonamide	<2	<2	<3.1	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2.7	**3.9**
Perfluoropentanoic Acid	**35**	**43**	**230**	**27**
Perfluorotetradecanoic Acid	<2	<2	<2.6	<2
Perfluorotridecanoic Acid	<2	<2	<12	<2
Perfluoroundecanoic Acid	<2	<2	<9.7	<2
PFOA	**14**	**26**	**34**	**1,300**
PFOS	**8.9**	**16**	<4.8	**2.2**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	INSITU-01	MW-13D	MW-14D	MW-15DRR
Field Sample ID	GW0619-INSITU-01	GW0619-MW-13D	GW0619-MW-14D	MW-15DRR-091119
Sample Date	6/20/2019	7/11/2019	7/11/2019	9/12/2019
QA/QC	--	--	--	--
SDG	320-51662-1	320-52282-1	320-52282-1	320-54317-1
Lab Sample ID	320-51662-3	320-52282-5	320-52282-4	320-54317-3
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**580**	**37,000 J**	**9,700**	**3,500**
PFMOAA	**210 J**	**180,000**	**180,000**	**31,000**
PFO2HxA	**460 J**	**66,000**	**35,000**	**6,300**
PFO3OA	**36 J**	**16,000**	**8,600**	**940**
PFO4DA	**5.1 J**	**5,200**	**3,000**	**320**
PFO5DA	<5 UJ	**400**	**700**	**130**
PMPA	**800 J**	**21,000**	**7,900**	**3,600**
PEPA	**230 J**	**5,900**	**3,100**	**1,000**
PFESA-BP1	<2 UJ	<270	**660**	**8,800**
PFESA-BP2	**17 J**	**2,100**	**450**	**1,200**
Byproduct 4	**38 J**	**1,600**	<1,600	**960**
Byproduct 5	<2 UJ	**3,000 J**	**2,300**	**21,000**
Byproduct 6	<2 UJ	<150	<150	**30**
NVHOS	**5 J**	**1,500**	**1,700**	**320**
EVE Acid	<2 UJ	<240	<240	**1,100**
Hydro-EVE Acid	<2 UJ	**1,700**	**540**	**370**
R-EVE	**25 J**	**2,800**	<700	**170**
PES	<2 UJ	<460	<460	<46
PFECA B	<2 UJ	<600	<600	<60
PFECA-G	<2 UJ	<410	<410	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2 UJ	--	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2 UJ	--	--	<4
6:2 Fluorotelomer sulfonate	--	<20	**38**	<20
ADONA	--	--	--	<2.1
F-53B Major	--	--	--	<2
F-53B Minor	--	--	--	<2
NaDONA	--	--	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2 UJ	--	--	<2
N-methyl perfluoro-1-octanesulfonamide	<2 UJ	--	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	**8.2**
Perfluorobutanoic Acid	--	**590**	**160**	**41**
Perfluorodecane Sulfonic Acid	--	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	**3.3**
Perfluorododecane sulfonic acid (PFDoS)	--	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<2	<2	<2
Perfluoroheptanoic Acid	<2	**270**	**120**	**18**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<2
Perfluorohexane Sulfonic Acid	<2	**2.8**	**3.3**	**13**
Perfluorohexanoic Acid	**4.1**	**120**	**90**	**18**
Perfluorononanesulfonic acid	--	<2	<2	<2
Perfluorononanoic Acid	<2	**5.8**	**11**	**5.8**
Perfluorooctadecanoic acid	--	<2 UJ	<2 UJ	<2
Perfluorooctane Sulfonamide	--	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	--	<2	<2	<2
Perfluoropentanoic Acid	**11**	**2,400**	**560**	**85**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	**29**	**400**	**62**
PFOS	<2	<2	**7.3**	**35**

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	MW-16D	MW-17D	MW-18D	MW-19D
Field Sample ID	GW0619-MW-16D	GW0619-MW-17D	GW0619-MW-18D	GW0619-MW-19D
Sample Date	7/15/2019	7/15/2019	7/15/2019	7/9/2019
QA/QC	--	--	--	--
SDG	320-52288-1	320-52288-1	320-52288-1	320-52149-1
Lab Sample ID	320-52288-2	320-52288-3	320-52288-6	320-52149-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,300**	**690**	**810**	**1,100**
PFMOAA	**500**	**260**	**58**	**720**
PFO2HxA	**430 J**	**490**	**110**	**830**
PFO3OA	**76 J**	**81 J**	**4.6 J**	**170**
PFO4DA	**39**	**14**	<2	**78**
PFO5DA	**12 J**	<2	<2	<2
PMPA	**1,300**	**1,700**	**430**	**1,100**
PEPA	**330**	**510**	**100**	**360**
PFESA-BP1	**38**	<2	<2	<2
PFESA-BP2	**22**	**20**	<2	**15**
Byproduct 4	**31**	**25**	**4.1**	**27**
Byproduct 5	**65**	<2.9	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	**12**	**7.4**	**2.9**	**12**
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	**12**	**5.9**	<2	**4.8**
R-EVE	**17**	**10**	**2.1**	**18**
PES	<2.3	<2.3	<2	<2
PFECA B	<3	<3	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**10**	**11**	**3.8**	**11**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**3.9**	**2.9**	<2	**4.7**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	**4.2**	**4.1**	<2	**5.6**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2 UJ	<2 UJ	<2 UJ	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**13**	**16**	**9**	**21**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**21**	**3.6**	<2	**21**
PFOS	<2	<2	<2	<2

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	MW-20D	MW-21D	MW-22D	PIW-1D
Field Sample ID	GW0619-MW-20D	GW0619-MW-21D	GW0619-MW-22D	GW0619-PIW-1D
Sample Date	7/9/2019	7/11/2019	7/15/2019	7/19/2019
QA/QC	--	--	--	--
SDG	320-52149-1	320-52282-1	320-52288-1	320-52621-1
Lab Sample ID	320-52149-2	320-52282-3	320-52288-1	320-52621-1
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,900**	**380**	**1,800**	**11,000 J**
PFMOAA	**14,000**	**110**	**290**	**14,000**
PFO2HxA	**3,300**	**290**	**580**	**9,700**
PFO3OA	**600**	**28**	**83 J**	**1,800**
PFO4DA	**120**	<2	**49**	**300**
PFO5DA	<34	<2	**5.5 J**	<34
PMPA	**2,700**	**860**	**1,400**	**9,900**
PEPA	**650**	**290**	**450**	**3,600**
PFESA-BP1	<27	<2	<2	<27
PFESA-BP2	<30	**6.1**	**18**	**48**
Byproduct 4	<160	**8.3 J**	**29**	**420**
Byproduct 5	**87**	<2	<2.9	<58
Byproduct 6	<15	<2	<2	<15
NVHOS	**110**	**6**	**12**	**150**
EVE Acid	<24	<2	<2	<24
Hydro-EVE Acid	<28	<2	**11**	**37**
R-EVE	**82**	**4.6**	**17**	**290 J**
PES	<46	<2	<2.3	<46
PFECA B	<60	<2	<3	<60
PFECA-G	<41	<2	<2	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<46
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<27
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**21**	**7.1**	**12**	**70**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2.8
Perfluorodecanoic Acid	<2	<2	<2	<2.7
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<4
Perfluorododecanoic Acid	<2	<2	<2	<4.9
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**11**	<2	**5.5**	**14**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	**13**	**2.4**	**5.7**	**11**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2.4
Perfluorooctadecanoic acid	<2	<2 UJ	<2 UJ	<4.1
Perfluorooctane Sulfonamide	<2	<2	<2	<3.1
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2.6
Perfluoropentanoic Acid	**44**	**11**	**16**	**140**
Perfluorotetradecanoic Acid	<2	<2	<2	<2.6
Perfluorotridecanoic Acid	<2	<2	<2	<11
Perfluoroundecanoic Acid	<2	<2	<2	<9.7
PFOA	**68**	<2	**20**	<7.5
PFOS	<2	<2	<2	<4.8

Notes:
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SOP - standard operating procedure
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	PIW-1D	PIW-5S	PIW-9S	PIW-10S
Field Sample ID	GW0619-PIW-1D-D	GW0619-PIW-5S	GW0619-PIW-9S	GW0619-PIW-10S
Sample Date	7/19/2019	7/19/2019	7/18/2019	7/22/2019
QA/QC	Field Duplicate	--	--	--
SDG	320-52621-1	320-52624-1	320-52464-1	320-52621-1
Lab Sample ID	320-52621-2	320-52624-5	320-52464-1	320-52621-3
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**8,700 J**	**79,000 J**	**7,300**	**4,400**
PFMOAA	**15,000**	**35,000**	**150,000**	**1,500**
PFO2HxA	**9,700**	**38,000**	**34,000**	**3,000**
PFO3OA	**1,800**	**10,000**	**8,400**	**520**
PFO4DA	**320**	**8,700**	**1,500**	**210**
PFO5DA	<34	**4,800**	<34	<34
PMPA	**10,000**	**100,000**	**7,500**	**5,700**
PEPA	**3,600**	**44,000**	**2,700**	**2,100**
PFESA-BP1	<27	**4,300**	<27	<27
PFESA-BP2	**51**	**1,300**	**170**	**150**
Byproduct 4	**480**	**4,700**	**800**	**190**
Byproduct 5	<58	**16,000**	**800**	<58
Byproduct 6	<15	**65**	<15	<15
NVHOS	**160**	**770**	**1,500**	<54
EVE Acid	<24	**1,800**	<24	<24
Hydro-EVE Acid	**33**	**1,600**	**690**	<28
R-EVE	**350 J**	**3,000**	**650**	**130**
PES	<46	<46	<46	<46
PFECA B	<60	<60	<60	<60
PFECA-G	<41	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<180	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<24	<470	<20	<24
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<180	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<170	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<280	<20	<20
Perfluorobutane Sulfonic Acid	<2	<18	<2	<2
Perfluorobutanoic Acid	**70**	**1,100**	**120**	**49**
Perfluorodecane Sulfonic Acid	<2	<29	<2	<2
Perfluorodecanoic Acid	<2	<28	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2.1	<41	<2	<2.1
Perfluorododecanoic Acid	<2.6	<50	<2	<2.6
Perfluoroheptane sulfonic acid (PFHpS)	<2	<17	<2	<2
Perfluoroheptanoic Acid	**14**	**140**	**43**	**7.9**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<15	<2	<2
Perfluorohexanoic Acid	**11**	**58**	**23**	**6.6**
Perfluorononanesulfonic acid	<2	<14	<2	<2
Perfluorononanoic Acid	<2	<24	<2	<2
Perfluorooctadecanoic acid	<2.2	<42	<2	<2.1
Perfluorooctane Sulfonamide	<2	<32	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<27	<2	<2
Perfluoropentanoic Acid	**140**	**910**	**250**	**47**
Perfluorotetradecanoic Acid	<2	<26	<2	<2
Perfluorotridecanoic Acid	<6.1	<120	<2	<6.1
Perfluoroundecanoic Acid	<5.1	<99	<2	<5.1
PFOA	**4.4**	<77	**13**	**12**
PFOS	<2.5	<49	<2	<2.5

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
Location ID	**PW-02**	**PW-02**	**PW-03**	**PW-03**
Field Sample ID	**PW-02-091119**	**PW-02-091119-Z**	**PW-03-091119**	**PW-03-091119-Z**
Sample Date	**9/11/2019**	**9/11/2019**	**9/11/2019**	**9/11/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-54274-1**	**320-54278-1**	**320-54317-1**	**320-54319-1**
Lab Sample ID	**320-54274-1**	**320-54278-1**	**320-54317-1**	**320-54319-1**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**7,400**	**8,100**	**78,000**	**54,000**
PFMOAA	**9,500,000**	**9,900,000**	**5,900**	**5,100**
PFO2HxA	**2,800,000**	**3,000,000**	**18,000**	**16,000**
PFO3OA	**750,000**	**800,000**	**5,800**	**5,200**
PFO4DA	**250,000**	**270,000**	**1,800**	**1,400**
PFO5DA	**90,000**	**85,000**	**46**	<34
PMPA	**470,000**	**520,000**	**130,000**	**120,000**
PEPA	**180,000**	**180,000**	**76,000**	**69,000**
PFESA-BP1	**35,000**	**39,000**	**130**	**93**
PFESA-BP2	**43,000**	**40,000**	**750**	**460**
Byproduct 4	**75,000**	**78,000**	**11,000**	**9,600**
Byproduct 5	**250,000**	**270,000**	**47,000**	**42,000**
Byproduct 6	**1,900**	**2,600**	**93**	**69**
NVHOS	**110,000**	**110,000**	**8,000**	**7,100**
EVE Acid	**2,200**	**3,600**	**520**	**440**
Hydro-EVE Acid	**18,000**	**19,000**	**4,900**	**3,600**
R-EVE	**36,000**	**33,000**	**12,000**	**11,000**
PES	<2,300	<4,600	<46	<46
PFECA B	<3,000	<6,000	<60	<60
PFECA-G	<2,000	<4,100	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<52	<52
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<8.5	<8.5 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<14	<14 UJ
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2.4	<2.4
F-53B Minor	<2	<2	<3.2	<3.2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<8.7	<8.7
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<4.3	<4.3
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<31	<31
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**68**	**82**	**5,400**	**4,700**
Perfluorodecane Sulfonic Acid	<2	<2	<3.2	<3.2
Perfluorodecanoic Acid	<2	<2	<3.1	<3.1
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<4.5	<4.5
Perfluorododecanoic Acid	<2	<2	<5.5	<5.5
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**26**	**31**	**310**	**260**
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<8.9	<8.9
Perfluorohexane Sulfonic Acid	<2	<2	**3.3**	**3.6**
Perfluorohexanoic Acid	**13**	**16**	**150**	**120**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.7**	**5.4**	<2.7	<2.7
Perfluorooctadecanoic acid	<2	<2	<4.6	<4.6
Perfluorooctane Sulfonamide	<2	<2	<3.5	<3.5
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<3	<3
Perfluoropentanoic Acid	**120**	**140**	**3,700**	**3,400**
Perfluorotetradecanoic Acid	<2	<2	<2.9	<2.9
Perfluorotridecanoic Acid	<2	<2	<13	<13
Perfluoroundecanoic Acid	<2	<2	<11	<11
PFOA	**85**	**100**	**16**	**13**
PFOS	**3.6**	**2.3**	<5.4	<5.4

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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	**PW-04**	**PW-04**	**PW-05**	**PW-06**
Field Sample ID	**PW-04-091119**	**PW-04-091119-Z**	**PW-05-090919**	**PW-06-091019**
Sample Date	**9/11/2019**	**9/11/2019**	**9/9/2019**	**9/10/2019**
QA/QC	--	--	--	--
SDG	**320-54294-1**	**320-54294-1**	**320-54174-1**	**320-54231-1**
Lab Sample ID	**320-54294-4**	**320-54294-5**	**320-54174-1**	**320-54231-1**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**940**	**880**	**1,600**	**950**
PFMOAA	**270**	**320**	<210	<210
PFO2HxA	**770**	**870**	**730**	**510**
PFO3OA	**280**	**310**	**73**	**74**
PFO4DA	**66**	**68**	**130**	<79
PFO5DA	<2	<2	<34 UJ	<34
PMPA	**710**	**790**	**1,600**	**1,100**
PEPA	**310**	**340**	**430**	**380**
PFESA-BP1	<2	<2	<27	<27
PFESA-BP2	**8.4**	**4.3**	**50**	<30
Byproduct 4	**120**	**160 J**	<160	<160
Byproduct 5	**4.4**	**4.4 J**	<58	<58
Byproduct 6	<2	<2	<15	<15
NVHOS	**6.7**	**8**	<54	<54
EVE Acid	<2	<2	<24	<24
Hydro-EVE Acid	**5.9**	**5**	<28	<28
R-EVE	**47**	**64**	<70	<70
PES	<2	<2	<46	<46
PFECA B	<2	<2	<60	<60
PFECA-G	<2	<2	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2	<2
F-53B Minor	<2	<2	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2 UJ	<2	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**11**	**11**	**13**	**8.8**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**5.1**	**6.1**	**4.5**	**3.7**
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	**3.5**	**3.7**	**3**	**3**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**17**	**17**	**15**	**12**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	**7.7**	**4.1**
PFOS	<2	<2	<2	<2

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TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	**PW-07**	**PW-07**	**SMW-01**	**SMW-03B**
Field Sample ID	**PW-07-091319**	**PW-07-091319-Z**	**GW0619-SMW-01**	**GW0619-SMW-03B**
Sample Date	**9/13/2019**	**9/13/2019**	**6/25/2019**	**7/12/2019**
QA/QC	**--**	**--**	**--**	**--**
SDG	**320-54328-1**	**320-54328-1**	**320-51746-1**	**320-52285-1**
Lab Sample ID	**320-54328-2**	**320-54328-3**	**320-51746-12**	**320-52285-2**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**1,100**	**1,000**	**2,100**	**12,000**
PFMOAA	**400**	**360**	**360 J**	**460,000**
PFO2HxA	**1,000**	**960**	**980 J**	**72,000**
PFO3OA	**140**	**140**	**210 J**	**10,000 J**
PFO4DA	**87**	**81**	**54 J**	<790
PFO5DA	<2	<2	**3.1 J**	<340
PMPA	**1,400**	**1,300**	**1,700 J**	**56,000**
PEPA	**440**	**420**	**570 J**	**11,000**
PFESA-BP1	<2	<2	<2 UJ	**430**
PFESA-BP2	**5.1**	**3.1**	**55 J**	<300
Byproduct 4	**41**	**59 J**	**110 J**	**2,200**
Byproduct 5	<2	<2	<2 UJ	**27,000**
Byproduct 6	<2	<2	<2 UJ	<150
NVHOS	**9.1**	**8.8**	**11 J**	**4,800**
EVE Acid	<2	<2	<2 UJ	<240
Hydro-EVE Acid	**6.4**	**6**	**4.9 J**	<280
R-EVE	**13**	**16 J**	**43 J**	**710**
PES	<2	<2	<2 UJ	<460
PFECA B	<2	<2	<2 UJ	<600
PFECA-G	<2	<2	<2 UJ	<410
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<24
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	--	--
F-53B Major	<2	<2	--	--
F-53B Minor	<2	<2	--	--
NaDONA	<2.1	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	--	--
N-methyl perfluoro-1-octanesulfonamide	<2	<2	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	**2**	**2.4**
Perfluorobutanoic Acid	**33**	**32**	**17**	**210**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2.1
Perfluorododecanoic Acid	<2	<2	<2	<2.6
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**6.2**	**4.4**	**9.2**	**41**
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	**4.7**	**4.2**	**6.2**	**45**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2.2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**21**	**21**	**25**	**600**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<6.1
Perfluoroundecanoic Acid	<2	<2	<2	<5.2
PFOA	**2.7**	<2	**9.9**	**120**
PFOS	<2	<2	**2.9**	<2.5

Notes:
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B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
Location ID	**SMW-04B**	**SMW-05P**	**SMW-08B**	**SMW-09**
Field Sample ID	**GW0619-SMW-04B**	**GW0619-SMW-05P**	**GW0619-SMW-08B**	**GW0619-SMW-09**
Sample Date	**7/12/2019**	**7/25/2019**	**7/16/2019**	**7/11/2019**
QA/QC	--	--	--	--
SDG	**320-52285-1**	**320-52722-1**	**320-52322-1**	**320-52282-1**
Lab Sample ID	**320-52285-3**	**320-52722-3**	**320-52322-3**	**320-52282-6**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**13,000**	**19,000**	**8,700 B**	**14,000**
PFMOAA	**41,000**	**220,000**	**260,000**	**1,800**
PFO2HxA	**7,000**	**45,000**	**47,000**	**3,100**
PFO3OA	**1,600 J**	**13,000**	**12,000**	**920**
PFO4DA	**430**	**4,700**	**2,900**	**890**
PFO5DA	**61 J**	**460**	**540**	**66**
PMPA	**4,800**	**27,000**	**7,700**	**4,800**
PEPA	**990**	**5,100**	**2,800**	**1,400**
PFESA-BP1	**46**	**1,200**	**550**	**22,000**
PFESA-BP2	**56**	**210**	<300	**560**
Byproduct 4	**180**	**1,300 J**	<1,600	**2,000**
Byproduct 5	**550**	**6,500**	**4,400**	**54,000 J**
Byproduct 6	<15	**40**	<150	**88**
NVHOS	**450**	**3,100**	**2,900**	**260**
EVE Acid	<24	**240**	<240	**610**
Hydro-EVE Acid	**64**	**390**	**300**	**2,000**
R-EVE	**89**	**500**	<700	**360 J**
PES	<46	<92	<460	<46
PFECA B	<60	<120	<600	<60
PFECA-G	<41	<82	<410	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<24	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	--	--
F-53B Major	--	--	--	--
F-53B Minor	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**2.9**	**3.4**	**3.1**	**3.1**
Perfluorobutanoic Acid	**42**	**120**	**110**	**340**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2.1	<2	<2	<2
Perfluorododecanoic Acid	<2.6	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**46**	**140**	**81**	**66**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**4.2**	**3.5**	**4.9**	**16**
Perfluorohexanoic Acid	**36**	**120**	**34**	**79**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	**4.9**	**4.2**	<2
Perfluorooctadecanoic acid	<2.2	<2	<2	<2 UJ
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	**2.6**
Perfluoropentanoic Acid	**95**	**260**	**550**	**200**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<6.1	<2	<2	<2
Perfluoroundecanoic Acid	<5.2	<2	<2	<2
PFOA	**5,800**	**6,900**	**360**	**91**
PFOS	<2.5	**2.7**	**6.1**	<2

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
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SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**
Location ID	**EB**	**EB**	**EB**
Field Sample ID	**GW0619-EQBLK-062719**	**GW0619-EQBLK-070819**	**GW0619-EQBLK-070819-0**
Sample Date	**6/27/2019**	**7/8/2019**	**7/8/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-51903-1**	**320-52171-1**	**320-52171-1**
Lab Sample ID	**320-51903-5**	**320-52171-1**	**320-52171-2**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<210 UJ	<5	<5
PFO2HxA	<81 UJ	<2	<2
PFO3OA	<58 UJ	<2	<2
PFO4DA	<79 UJ	<2	<2
PFO5DA	<34 UJ	<2	<2
PMPA	<570 UJ	<10	<10
PEPA	<47 UJ	<20	<20
PFESA-BP1	<27 UJ	<2	<2
PFESA-BP2	<30 UJ	<2	<2
Byproduct 4	<160 UJ	<2	<2
Byproduct 5	<58 UJ	<2	<2
Byproduct 6	<15 UJ	<2	<2
NVHOS	<54 UJ	<2	<2
EVE Acid	<24 UJ	<2	<2
Hydro-EVE Acid	<28 UJ	<2	<2
R-EVE	<70 UJ	<2	<2
PES	<46 UJ	<2	<2
PFECA B	<60 UJ	<2	<2
PFECA-G	<41 UJ	<2	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
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SDG - Sample Delivery Group
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**
Location ID	**EB**	**EB**	**EB**
Field Sample ID	**GW0619-EQBLK-070919**	**GW0619-EQBLK-071019**	**GW0619-EB-02-071119**
Sample Date	**7/9/2019**	**7/10/2019**	**7/11/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-52149-1**	**320-52165-1**	**320-52290-1**
Lab Sample ID	**320-52149-3**	**320-52165-4**	**320-52290-3**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	**6.7**	<5	<5
PFO2HxA	<2	<2	<2
PFO3OA	<2	<2	<2
PFO4DA	<2	<2	<2
PFO5DA	<2	<2	<2
PMPA	<10	<10	<10
PEPA	<20	<20	<20
PFESA-BP1	<2	<2	<2
PFESA-BP2	<2	<2	<2
Byproduct 4	<2	<2	<2
Byproduct 5	<2	<2	<2
Byproduct 6	<2	<2	<2
NVHOS	<2	<2	<2
EVE Acid	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2
R-EVE	<2	<2	<2
PES	<2	<2	<2
PFECA B	<2	<2	<2
PFECA-G	<2	<2	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**
Location ID	**EB**	**EB**	**EB**
Field Sample ID	**GW0619-EB-071119**	**GW0619-EB-071219**	**GW0619-EB-02-071519**
Sample Date	**7/11/2019**	**7/12/2019**	**7/15/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-52290-1**	**320-52285-1**	**320-52285-1**
Lab Sample ID	**320-52290-2**	**320-52285-1**	**320-52285-5**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<5	<5	<5
PFO2HxA	<2	<2	<2
PFO3OA	<2	<2	<2
PFO4DA	<2	<2	<2
PFO5DA	<2	<2	<2 UJ
PMPA	<10	<10	<10
PEPA	<20	<20	<20
PFESA-BP1	<2	<2	<2
PFESA-BP2	<2	<2	<2
Byproduct 4	<2	<2	<2
Byproduct 5	<2	<2	<2
Byproduct 6	<2	<2	<2
NVHOS	<2	<2	<2
EVE Acid	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2
R-EVE	<2	<2	<2
PES	<2	<2	<2
PFECA B	<2	<2	<2
PFECA-G	<2	<2	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--
Location ID	EB	EB	EB
Field Sample ID	GW0619-EB-071519	GW0619-EB-01-071619	GW0619-EB-02-071619
Sample Date	7/15/2019	7/16/2019	7/16/2019
QA/QC	Equipment Blank	Equipment Blank	Equipment Blank
SDG	320-52285-1	320-52322-1	320-52322-1
Lab Sample ID	320-52285-4	320-52322-5	320-52322-6
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	**72**	<4
PFMOAA	<5	<5	<5
PFO2HxA	<2	<2	<2
PFO3OA	<2	<2	<2
PFO4DA	<2	<2	<2
PFO5DA	<2	<2	<2
PMPA	<10	<10	<10
PEPA	<20	<20	<20
PFESA-BP1	<2	<2	<2
PFESA-BP2	<2	<2	<2
Byproduct 4	<2	<2	<2
Byproduct 5	<2	<2	<2
Byproduct 6	<2	<2	<2
NVHOS	<2	<2	<2
EVE Acid	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2
R-EVE	<2	<2	<2
PES	<2	<2	<2
PFECA B	<2	<2	<2
PFECA-G	<2	<2	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--
Location ID	**EB**	**EB**	**EB**
Field Sample ID	**GW0619-EB-071719**	**GW0619-EB-071819**	**GW0619-EB-071919**
Sample Date	**7/17/2019**	**7/18/2019**	**7/19/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-52464-1**	**320-52464-1**	**320-52624-1**
Lab Sample ID	**320-52464-5**	**320-52464-3**	**320-52624-1**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<5	<5	<210
PFO2HxA	<2	<2	<81
PFO3OA	<2	<2	<58
PFO4DA	<2	<2	<79
PFO5DA	<2	<2	<34
PMPA	<10	<10	<570
PEPA	<20	<20	<47
PFESA-BP1	<2	<2	<27
PFESA-BP2	<2	<2	<30
Byproduct 4	<2	<2	<160
Byproduct 5	<2	<2	<58
Byproduct 6	<2	<2	<15
NVHOS	<2	<2	<54
EVE Acid	<2	<2	<24
Hydro-EVE Acid	<2	<2	<28
R-EVE	<2	<2	<70
PES	<2	<2	<46
PFECA B	<2	<2	<60
PFECA-G	<2	<2	<41
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--
Location ID	EB	EB	EB
Field Sample ID	GW0619-EQBLK-072219	EQBLK-090919-01	EQBLK-090919-02
Sample Date	7/22/2019	9/9/2019	9/9/2019
QA/QC	Equipment Blank	Equipment Blank	Equipment Blank
SDG	320-52621-1	320-54174-1	320-54174-1
Lab Sample ID	320-52621-4	320-54174-2	320-54174-3
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<210	<210	<210
PFO2HxA	<81	<81	<81
PFO3OA	<58	<58	<58
PFO4DA	<79	<79	<79
PFO5DA	<34	<34 UJ	<34 UJ
PMPA	<570	<570	<570
PEPA	<47	<47	<47
PFESA-BP1	<27	<27	<27
PFESA-BP2	<30	<30	<30
Byproduct 4	<160	<160	<160
Byproduct 5	<58	<58	<58
Byproduct 6	<15	<15	<15
NVHOS	<54	<54	<54
EVE Acid	<24	<24	<24
Hydro-EVE Acid	<28	<28	<28
R-EVE	<70	<70	<70
PES	<46	<46	<46
PFECA B	<60	<60	<60
PFECA-G	<41	<41	<41
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	<2.1	<2.1
F-53B Major	--	<2	<2
F-53B Minor	--	<2	<2
NaDONA	--	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<2	<2
N-methyl perfluoro-1-octanesulfonamide	--	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**
Location ID	**EB**	**EB**	**EB**
Field Sample ID	**EQBLK-091019-01**	**EQBLK-091019-02**	**EB-091919**
Sample Date	**9/10/2019**	**9/10/2019**	**9/19/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-54176-1**	**320-54176-1**	**320-54522-1**
Lab Sample ID	**320-54176-2**	**320-54176-3**	**320-54522-2**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<210	<210	<5
PFO2HxA	<81	<81	<2
PFO3OA	<58	<58	<2
PFO4DA	<79	<79	<2
PFO5DA	<34	<34 UJ	<2
PMPA	**780**	**570**	<10
PEPA	<47	<47	<20
PFESA-BP1	<27	<27	<2
PFESA-BP2	<30	<30	<2
Byproduct 4	<160	<160	<2
Byproduct 5	<58	<58	<2
Byproduct 6	<15	<15	<2
NVHOS	<54	<54	<2
EVE Acid	<24	<24	<2
Hydro-EVE Acid	<28	<28	<2
R-EVE	<70	<70	<2
PES	<46	<46	<2
PFECA B	<60	<60	<2
PFECA-G	<41	<41	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	<2.1	<2.1	--
F-53B Major	<2	<2	--
F-53B Minor	<2	<2	--
NaDONA	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

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EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--
Location ID	EQBLK	EQBLK	EQBLK
Field Sample ID	GW0619-EQBLK-061919	GW0619-EQBLK-062019	GW0619-EQBLK-062119
Sample Date	6/19/2019	6/20/2019	6/21/2019
QA/QC	Equipment Blank	Equipment Blank	Equipment Blank
SDG	320-51662-1	320-51662-1	320-51662-1
Lab Sample ID	320-51662-4	320-51662-5	320-51662-6
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<5 UJ	<5 UJ	<5 UJ
PFO2HxA	<2 UJ	<2 UJ	<2 UJ
PFO3OA	<2 UJ	<2 UJ	<2 UJ
PFO4DA	<2 UJ	<2 UJ	<2 UJ
PFO5DA	<5 UJ	<5 UJ	<5 UJ
PMPA	<10 UJ	<10 UJ	<10 UJ
PEPA	<20 UJ	<20 UJ	<20 UJ
PFESA-BP1	<2 UJ	<2 UJ	<2 UJ
PFESA-BP2	<2 UJ	<2 UJ	<2 UJ
Byproduct 4	<2 UJ	<2 UJ	<2 UJ
Byproduct 5	<2 UJ	<2 UJ	<2 UJ
Byproduct 6	<2 UJ	<2 UJ	<2 UJ
NVHOS	<2 UJ	<2 UJ	<2 UJ
EVE Acid	<2 UJ	<2 UJ	<2 UJ
Hydro-EVE Acid	<2 UJ	<2 UJ	<2 UJ
R-EVE	<2 UJ	<2 UJ	<2 UJ
PES	<2 UJ	<2 UJ	<2 UJ
PFECA B	<2 UJ	<2 UJ	<2 UJ
PFECA-G	<2 UJ	<2 UJ	<2 UJ
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2 UJ	<2 UJ	<2 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2 UJ	<2 UJ	<2 UJ
6:2 Fluorotelomer sulfonate	--	--	--
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--
N-ethylperfluoro-1-octanesulfonamide	<2 UJ	<2 UJ	<2 UJ
N-methyl perfluoro-1-octanesulfonamide	<2 UJ	<2 UJ	<2 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	--	--	--
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	--	--	--
Perfluorooctane Sulfonamide	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:

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2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

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EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--
Location ID	**EQBLK**	**EQBLK**	**EQBLK**
Field Sample ID	**GW0619-EQBLK**	**GW0619-EQBLK-062619**	**GW0619-EQBLK-062819**
Sample Date	**6/25/2019**	**6/26/2019**	**6/28/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-51746-1**	**320-51904-1**	**320-51904-1**
Lab Sample ID	**320-51746-1**	**320-51904-5**	**320-51904-6**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<5 UJ	<210 UJ	<210
PFO2HxA	<2 UJ	<81 UJ	<81
PFO3OA	<2 UJ	<58 UJ	<58
PFO4DA	<2 UJ	<79 UJ	<79
PFO5DA	<2 UJ	**58 J**	**59**
PMPA	<10 UJ	<570 UJ	<570
PEPA	<20 UJ	<47 UJ	<47
PFESA-BP1	<2 UJ	<27 UJ	<27
PFESA-BP2	<2 UJ	<30 UJ	<30
Byproduct 4	<2 UJ	<160 UJ	<160
Byproduct 5	<2 UJ	<58 UJ	<58
Byproduct 6	<2 UJ	<15 UJ	<15
NVHOS	<2 UJ	<54 UJ	<54
EVE Acid	<2 UJ	<24 UJ	<24
Hydro-EVE Acid	<2 UJ	<28 UJ	<28
R-EVE	<2 UJ	<70 UJ	<70
PES	<2 UJ	<46 UJ	<46
PFECA B	<2 UJ	<60 UJ	<60
PFECA-G	<2 UJ	<41 UJ	<41
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**
Location ID	**EQBLK**	**EQBLK**	**EQBLK**
Field Sample ID	**GW0619-EQBLK-070119**	**GW0619-EQBLK-070219**	**GW0619-EQBLK-070319**
Sample Date	**7/1/2019**	**7/2/2019**	**7/3/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-52028-1**	**320-52028-1**	**320-52030-1**
Lab Sample ID	**320-52028-5**	**320-52028-6**	**320-52030-5**
Table 3+ Lab SOP (ng/L)			
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4
PFMOAA	<5	<5	<5
PFO2HxA	<2	<2	<2
PFO3OA	<2	<2	<2
PFO4DA	<2	<2	<2
PFO5DA	<2	<2	<2 UJ
PMPA	<10	<10	<10
PEPA	<20	<20	<20
PFESA-BP1	<2	<2	<2
PFESA-BP2	<2	<2	<2
Byproduct 4	<2	<2	<2
Byproduct 5	<2	<2	<2
Byproduct 6	<2	<2	<2
NVHOS	<2	<2	<2
EVE Acid	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2
R-EVE	<2	<2	<2
PES	<2	<2	<2
PFECA B	<2	<2	<2
PFECA-G	<2	<2	<2
Other PFAS (ng/L)			
10:2 Fluorotelomer sulfonate	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20
ADONA	--	--	--
F-53B Major	--	--	--
F-53B Minor	--	--	--
NaDONA	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2
PFOA	<2	<2	<2
PFOS	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**	**--**
Location ID	**EQBLK**	**EQBLK**	**EQBLK**	**EQBLK**
Field Sample ID	**GW0619-EB-02-072319**	**GW0619-EB-072519**	**EB-09119-01**	**EB-09119-02**
Sample Date	**7/23/2019**	**7/25/2019**	**9/11/2019**	**9/11/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**
SDG	**320-52722-1**	**320-52722-1**	**320-54299-1**	**320-54299-1**
Lab Sample ID	**320-52722-5**	**320-52722-6**	**320-54299-2**	**320-54299-3**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4	<4
PFMOAA	<210	<210	<5	<5
PFO2HxA	<81	<81	<2	<2
PFO3OA	<58	<58	<2	<2
PFO4DA	<79	<79	<2	<2
PFO5DA	<34	<34	<2	<2
PMPA	<570	<570	<10	<10
PEPA	<47	<47	<20	<20
PFESA-BP1	<27	<27	<2	<2
PFESA-BP2	<30	<30	<2	<2
Byproduct 4	<160	<160	<2	<2
Byproduct 5	<58	<58	<2	<2
Byproduct 6	<15	<15	<2	<2
NVHOS	<54	<54	<2	<2
EVE Acid	<24	<24	<2	<2
Hydro-EVE Acid	<28	<28	<2	<2
R-EVE	<70	<70	<2	<2
PES	<46	<46	<2	<2
PFECA B	<60	<60	<2	<2
PFECA-G	<41	<41	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	--	<2.1	<2.1
F-53B Major	--	--	<2	<2
F-53B Minor	--	--	<2	<2
NaDONA	--	--	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<2	<2
N-methyl perfluoro-1-octanesulfonamide	--	--	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	<2	<2
PFOS	<2	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--	--
Location ID	**EQBLK**	**EQBLK**	**EQBLK**	**FBLK**
Field Sample ID	**EB-091219-01**	**EB-091219-02**	**EB-091319**	**GW0619-FB-01-072319**
Sample Date	**9/12/2019**	**9/12/2019**	**9/13/2019**	**7/23/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**	**Field Blank**
SDG	**320-54294-1**	**320-54294-1**	**320-54328-1**	**320-52722-1**
Lab Sample ID	**320-54294-1**	**320-54294-2**	**320-54328-1**	**320-52722-4**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4	<4
PFMOAA	<5	<5	<5	<210
PFO2HxA	<2	<2	<2	<81
PFO3OA	<2	<2	<2	<58
PFO4DA	<2	<2	<2	<79
PFO5DA	<2	<2	<2	<34
PMPA	<10	<10	<10	<570
PEPA	<20	<20	<20	<47
PFESA-BP1	<2	<2	<2	<27
PFESA-BP2	<2	<2	<2	<30
Byproduct 4	<2	<2	<2	<160
Byproduct 5	<2	<2	<2	<58
Byproduct 6	<2	<2	<2	<15
NVHOS	<2	<2	<2	<54
EVE Acid	<2	<2	<2	<24
Hydro-EVE Acid	<2	<2	<2	<28
R-EVE	<2	<2	<2	<70
PES	<2	<2	<2	<46
PFECA B	<2	<2	<2	<60
PFECA-G	<2	<2	<2	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	--
F-53B Major	<2	<2	<2	--
F-53B Minor	<2	<2	<2	--
NaDONA	<2.1	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<2	--
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2	--
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	<2	<2
PFOS	<2	<2	<2	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

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EPA - Environmental Protection Agency
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	--	--	--	--
Location ID	**FBLK**	**FBLK**	**FBLK**	**FBLK**
Field Sample ID	**FBLK-090919**	**FB-091019-01**	**FB-091119**	**FB-091219**
Sample Date	**9/9/2019**	**9/10/2019**	**9/11/2019**	**9/12/2019**
QA/QC	**Field Blank**	**Field Blank**	**Field Blank**	**Field Blank**
SDG	**320-54174-1**	**320-54176-1**	**320-54299-1**	**320-54294-1**
Lab Sample ID	**320-54174-4**	**320-54176-4**	**320-54299-1**	**320-54294-3**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<4	<4	<4
PFMOAA	<210	<210	<5	<5
PFO2HxA	<81	<81	<2	<2
PFO3OA	<58	<58	<2	<2
PFO4DA	<79	<79	<2	<2
PFO5DA	<34 UJ	<34	<2	<2
PMPA	<570	**570**	<10	<10
PEPA	<47	<47	<20	<20
PFESA-BP1	<27	<27	<2	<2
PFESA-BP2	<30	<30	<2	<2
Byproduct 4	<160	<160	<2	<2
Byproduct 5	<58	<58	<2	<2
Byproduct 6	<15	<15	<2	<2
NVHOS	<54	<54	<2	<2
EVE Acid	<24	<24	<2	<2
Hydro-EVE Acid	<28	<28	<2	<2
R-EVE	<70	<70	<2	<2
PES	<46	<46	<2	<2
PFECA B	<60	<60	<2	<2
PFECA-G	<41	<41	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2	<2
F-53B Minor	<2	<2	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2	<2
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	<2	<2
PFOS	<2	<2	<2	<2

Notes:
1. **Bold -** Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-3
ONSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**
Location ID	**FBLK**
Field Sample ID	**FB-091319**
Sample Date	**9/13/2019**
QA/QC	**Field Blank**
SDG	**320-54328-1**
Lab Sample ID	**320-54328-4**
Table 3+ Lab SOP (ng/L)	
HFPO-DA (EPA Method 537 Mod)	<4
PFMOAA	<5
PFO2HxA	<2
PFO3OA	<2
PFO4DA	<2
PFO5DA	<2
PMPA	<10
PEPA	<20
PFESA-BP1	<2
PFESA-BP2	<2
Byproduct 4	<2
Byproduct 5	<2
Byproduct 6	<2
NVHOS	<2
EVE Acid	<2
Hydro-EVE Acid	<2
R-EVE	<2
PES	<2
PFECA B	<2
PFECA-G	<2
Other PFAS (ng/L)	
10:2 Fluorotelomer sulfonate	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4
6:2 Fluorotelomer sulfonate	<20
ADONA	<2.1
F-53B Major	<2
F-53B Minor	<2
NaDONA	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20
N-ethylperfluoro-1-octanesulfonamide	<2
N-methyl perfluoro-1-octanesulfonamide	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20
Perfluorobutane Sulfonic Acid	<2
Perfluorobutanoic Acid	<2
Perfluorodecane Sulfonic Acid	<2
Perfluorodecanoic Acid	<2
Perfluorododecane sulfonic acid (PFDoS)	<2
Perfluorododecanoic Acid	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2
Perfluoroheptanoic Acid	<2
Perfluorohexadecanoic acid (PFHxDA)	<2
Perfluorohexane Sulfonic Acid	<2
Perfluorohexanoic Acid	<2
Perfluorononanesulfonic acid	<2
Perfluorononanoic Acid	<2
Perfluorooctadecanoic acid	<2
Perfluorooctane Sulfonamide	<2
Perfluoropentane sulfonic acid (PFPeS)	<2
Perfluoropentanoic Acid	<2
Perfluorotetradecanoic Acid	<2
Perfluorotridecanoic Acid	<2
Perfluoroundecanoic Acid	<2
PFOA	<2
PFOS	<2

Notes:
1. **Bold** - Analyte detected above associated reporting limit
2. Field sample IDs with "-Z" appended indicates sample was filtered at the time of sample of collection

B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.
-- not reported

TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Surficial Aquifer	Black Creek Aquifer
Location ID	BLADEN-1D	BLADEN-1D	BLADEN-2S	BLADEN-2D
Field Sample ID	BLADEN-1D-082719	DUP-1-082719	BLADEN-2S-082719	BLADEN-2D-082719
Sample Date	8/27/2019	8/27/2019	8/27/2019	8/27/2019
QA/QC	--	Field Duplicate	--	--
Sample Delivery Group	280-127778-1	280-127778-1	280-127778-1	280-127778-1
Lab Sample ID	280-127778-1	280-127778-2	280-127778-3	280-127778-4
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**180**	**190**	**4.6**	**11**
PFMOAA	**33**	**30**	**11**	<5
PFO2HxA	**81**	**80**	**19 J**	**6.3**
PFO3OA	**6.2**	**6.2**	**1.8 J**	**0.96 J**
PFO4DA	<2	<2	**1.5 J**	<2
PFO5DA	<2	<2	**0.53**	<2
PMPA	**330**	**330**	**68**	**77 J**
PEPA	**110**	**110**	**6.8 J**	**12 J**
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	**0.48 J**	**0.48 J**	**14**	**3.9**
Byproduct 4	**13 J**	**11 J**	<2	<2
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	**2.2**	**1.9 J**	**1.5 J**	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	<2	**0.31 J**	**0.36**	<2
R-EVE	**6.2**	**5.7**	<2	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<1.7	<1.7	<1.7	<1.7
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<17	<17	<17	<17
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<17	<17	<17	<17
6:2 Fluorotelomer sulfonate	<17	<17	<17	<17
ADONA	<1.7	<1.7	<1.8	<1.8
F-53B Major	<1.7	<1.7	<1.7	<1.7
F-53B Minor	<1.7	<1.7	<1.7	<1.7
NaDONA	<1.7	<1.7	<1.8	<1.8
N-ethyl perfluorooctane sulfonamidoacetic acid	<17	<17	<17	<17
N-methyl perfluorooctane sulfonamidoacetic acid	<17	<17	<17	<17
Perfluorobutane Sulfonic Acid	**0.43 J**	**0.39 J**	**1.3 J**	**1.5 J**
Perfluorobutanoic Acid	**3.6**	**3.6**	**3.4**	**2.1 J**
Perfluorodecane Sulfonic Acid	<1.7	<1.7	<1.7	<1.7
Perfluorodecanoic Acid	<1.7	<1.7	<1.7	<1.7
Perfluorododecane sulfonic acid (PFDoS)	<1.7	<1.7	<1.7	<1.7
Perfluorododecanoic Acid	<1.7	<1.7	<1.7	<1.7
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<1.7	**0.26 J**	<1.7
Perfluoroheptanoic Acid	**0.27 J**	**0.26 J**	**0.43 J**	**0.22 J**
Perfluorohexadecanoic acid (PFHxDA)	<1.7	<1.7	<1.7	<1.7
Perfluorohexane Sulfonic Acid	**0.33 B**	**0.32 B**	**1.1 B**	**0.52 B**
Perfluorohexanoic Acid	**1.1 J**	**1.1 J**	**0.62 J**	<1.7
Perfluorononanesulfonic acid	<1.7	<1.7	<1.7	<1.7
Perfluorononanoic Acid	<1.7	<1.7	<1.7	<1.7
Perfluorooctadecanoic acid	<1.7	<1.7	<1.7	<1.7
Perfluorooctane Sulfonamide	**0.48 J**	<1.7	**0.48 J**	<1.7
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<1.7	<1.7	<1.7
Perfluoropentanoic Acid	**3.9**	**3.8**	**0.98 J**	**0.46 J**
Perfluorotetradecanoic Acid	**0.36 B**	<1.7	**0.24 B**	<1.7
Perfluorotridecanoic Acid	<1.7	<1.7	<1.7	<1.7
Perfluoroundecanoic Acid	<1.7	<1.7	<1.7	<1.7
PFOA	<1.7	<1.7	**1.3 J**	<1.7
PFOS	<1.7	<1.7	**3.7**	**0.6 J**
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1.7	<1.7	<1.7	<1.7
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<3.3	<3.3	<3.4	<3.4
N-ethylperfluoro-1-octanesulfonamide	<1.7	<1.7	<1.7	<1.7
N-methyl perfluoro-1-octanesulfonamide	<1.7	<1.7	<1.7	<1.7

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Black Creek Aquifer	Surficial Aquifer	Black Creek Aquifer
Location ID	**BLADEN-3S**	**BLADEN-3D**	**BLADEN-4S**	**BLADEN-4D**
Field Sample ID	**BLADEN-3S-082819**	**BLADEN-3D-082819**	**BLADEN-4S-082819**	**BLADEN-4D-082819**
Sample Date	**8/28/2019**	**8/28/2019**	**8/28/2019**	**8/28/2019**
QA/QC	--	--	--	--
Sample Delivery Group	**280-127778-1**	**280-127778-1**	**280-127778-1**	**280-127778-1**
Lab Sample ID	**280-127778-5**	**280-127778-6**	**280-127778-10**	**280-127778-7**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**12**	**2.2 J**	<3.7	<3.6
PFMOAA	**15**	<5	<5	<5 UJ
PFO2HxA	**31**	**1.3 J**	**3**	<2
PFO3OA	**3.8**	<2	<2	<2
PFO4DA	**3.1**	<2	<2	<2
PFO5DA	**0.98 J**	<2	<2	<2 UJ
PMPA	**39**	**14**	**12**	**9.2 J**
PEPA	**5.6 J**	**2.1 J**	<20	<20
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	**3.6**	**0.63 J**	**1.5 J**	<2
Byproduct 4	**1.9 J**	<2	<2	<2
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	<2	<2	<2	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	**0.46 J**	<2	<2	<2
R-EVE	<2	<2	<2	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<1.7	<1.8	<1.8	<1.8
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<17	<18	<18	<18
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<17	<18	<18	<18
6:2 Fluorotelomer sulfonate	<17	<18	<18	<18
ADONA	<1.8	<1.9	<1.9	<1.9
F-53B Major	<1.7	<1.8	<1.8	<1.7
F-53B Minor	<1.7	<1.8	<1.8	<1.7
NaDONA	<1.8	<1.9	<1.9	<1.9
N-ethyl perfluorooctane sulfonamidoacetic acid	<17	<18	<18	<18
N-methyl perfluorooctane sulfonamidoacetic acid	<17	<18	<18	<18
Perfluorobutane Sulfonic Acid	**0.26 J**	**0.33 J**	**0.5 J**	<1.8
Perfluorobutanoic Acid	**2.1**	<1.8	**1.1 J**	<1.8
Perfluorodecane Sulfonic Acid	<1.7	<1.8	<1.8	<1.8
Perfluorodecanoic Acid	<1.7	<1.8	<1.8	<1.8
Perfluorododecane sulfonic acid (PFDoS)	<1.7	<1.8	<1.8	<1.8
Perfluorododecanoic Acid	<1.7	<1.8	<1.8	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<1.8	<1.8	<1.8
Perfluoroheptanoic Acid	**0.81 J**	<1.8	**0.48 J**	<1.8
Perfluorohexadecanoic acid (PFHxDA)	<1.7	<1.8	<1.8	<1.8
Perfluorohexane Sulfonic Acid	**0.27 B**	**0.26 B**	**0.76 B**	**0.26 B**
Perfluorohexanoic Acid	**0.65 J**	<1.8	**0.75 J**	<1.8
Perfluorononanesulfonic acid	<1.7	<1.8	<1.8	<1.8
Perfluorononanoic Acid	**0.38 J**	<1.8	<1.8	<1.8
Perfluorooctadecanoic acid	<1.7	<1.8	<1.8	<1.8
Perfluorooctane Sulfonamide	**0.33 J**	<1.8	<1.8	<0.57
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<1.8	<1.8	<1.8
Perfluoropentanoic Acid	**0.93 J**	<1.8	**0.8 J**	<1.8
Perfluorotetradecanoic Acid	<1.7	<1.8	<1.8	<1.8
Perfluorotridecanoic Acid	<1.7	<1.8	<1.8	<1.8
Perfluoroundecanoic Acid	<1.7	<1.8	<1.8	<1.8
PFOA	**2**	<1.8	**1.5 J**	<1.8
PFOS	**2.2**	<1.8	**4.8**	<1.8
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1.7	<1.8	<1.8	<1.7
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<3.4	<3.5	<3.7	<3.4
N-ethylperfluoro-1-octanesulfonamide	<1.7	<1.8	<1.8	<1.7
N-methyl perfluoro-1-octanesulfonamide	<1.7	<1.8	<1.8	<1.7

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Black Creek Aquifer	Surficial Aquifer	Black Creek Aquifer
Location ID	CUMBERLAND-1S	CUMBERLAND-1D	CUMBERLAND-2S	CUMBERLAND-2D
Field Sample ID	CUMBER-1S-09162019	CUMBER-1D-09162019	Cumber-2S-09162019	Cumber-2D-09162019
Sample Date	9/16/2019	9/16/2019	9/16/2019	9/16/2019
QA/QC	--	--	--	--
Sample Delivery Group	320-54439-1	320-54439-1	320-54378-1	320-54378-1
Lab Sample ID	320-54439-1	320-54439-2	320-54378-7	320-54378-8
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<3.7	<3.8	<4 UJ	<4 UJ
PFMOAA	<5	<5 UJ	**22**	<5
PFO2HxA	**11**	<2	**4.3**	<2
PFO3OA	**1.9 J**	<2	<2	<2
PFO4DA	**0.81 J**	<2	<2	<2
PFO5DA	<2 UJ	<2 UJ	<2	<2
PMPA	**13**	<10	**20**	**10**
PEPA	<20	<20	<20	<20
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	**1.8 J**	<2	<2	<2
Byproduct 4	<2	<2	<2	<2
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	<2	<2	<2	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2	<2
R-EVE	<2	<2	<2	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<1.9	<1.9	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<19	<19	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<19	<19	<20	<470
6:2 Fluorotelomer sulfonate	<19	<19	<20	<20
ADONA	<2	<2	<2.1	<2.1
F-53B Major	<1.9	<1.9	<2	<2
F-53B Minor	<1.9	<1.9	<2	<2
NaDONA	<2	<2	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<19	<19	<20	<20
N-methyl perfluorooctane sulfonamidoacetic acid	<19	<19	<20	<20
Perfluorobutane Sulfonic Acid	**35**	<1.9	<2	<2
Perfluorobutanoic Acid	**7**	**0.52 J**	**2.9**	<2
Perfluorodecane Sulfonic Acid	<1.9	<1.9	<2	<2
Perfluorodecanoic Acid	<1.9	<1.9	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<1.9	<1.9	<2	<2
Perfluorododecanoic Acid	<1.9	<1.9	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	**0.32 J**	<1.9	<2	<2
Perfluoroheptanoic Acid	**4.4**	**0.47 J**	**2.9**	**2.7**
Perfluorohexadecanoic acid (PFHxDA)	<1.9	<1.9	<2	<2
Perfluorohexane Sulfonic Acid	**2.8**	**0.6 B**	**2.1**	**2.9**
Perfluorohexanoic Acid	**6.4**	**0.87 J**	**3.8**	**4.3**
Perfluorononanesulfonic acid	<1.9	<1.9	<2	<2
Perfluorononanoic Acid	**0.93 J**	<1.9	<2	<2
Perfluorooctadecanoic acid	<1.9	<1.9	<2	<2
Perfluorooctane Sulfonamide	**1 B**	**0.88 B**	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	**0.35 J**	<1.9	<2	<2
Perfluoropentanoic Acid	**6.5**	<1.9	**3.9**	**3.8**
Perfluorotetradecanoic Acid	<1.9	<1.9	<2	<2
Perfluorotridecanoic Acid	<1.9	<1.9	<2	<2
Perfluoroundecanoic Acid	<1.9	<1.9	<2	<2
PFOA	**13**	<1.9	**5**	**2.1**
PFOS	**15**	**0.61 J**	**4.3**	**4.4**
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1.9	<1.9	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<3.7	<3.8	<4	<4
N-ethylperfluoro-1-octanesulfonamide	<1.9	<1.9	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<1.9	<1.9	<2	<2

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
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TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Black Creek Aquifer	Surficial Aquifer	Black Creek Aquifer
Location ID	**CUMBERLAND-3S**	**CUMBERLAND-3D**	**CUMBERLAND-4S**	**CUMBERLAND-4D**
Field Sample ID	**Cumber-3S-09162019**	**Cumber-3D-09162019**	**Cumber-4S-09162019**	**Cumber-4D-09162019**
Sample Date	**9/16/2019**	**9/16/2019**	**9/16/2019**	**9/16/2019**
QA/QC	--	--	--	--
Sample Delivery Group	**320-54378-1**	**320-54378-1**	**320-54378-1**	**320-54378-1**
Lab Sample ID	**320-54378-5**	**320-54378-6**	**320-54378-2**	**320-54378-1**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	**10 J**	<4 UJ	**110 J**	<4 UJ
PFMOAA	**30**	**17 J**	**39**	<5
PFO2HxA	**63**	<2	**110**	<2
PFO3OA	**9.8 J**	<2	**18**	<2
PFO4DA	**8.7**	<2	**5.1**	<2
PFO5DA	**7.6**	<2	<2	<2
PMPA	**44**	**12**	**140**	**12**
PEPA	<20	<20	**42**	<20
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	**4**	<2	**4.8**	<2
Byproduct 4	**20 J**	<2	**74 J**	**2.7 J**
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	<2	<2	**2.1**	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2	<2
R-EVE	**11 J**	<2	**18 J**	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<18	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<190	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<470	<480	<20	<20
6:2 Fluorotelomer sulfonate	<20	<190	<20	**29 J**
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2	<2
F-53B Minor	<2	<2	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	**5.6**	<2	**8.6**	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**5**	**2.2**	**2.9**	**2.5**
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2 UJ	<2
Perfluorohexane Sulfonic Acid	**2.9**	<2	<2	<2
Perfluorohexanoic Acid	**5.3**	**3.4**	**3.1**	**3.4**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**2.2**	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2 UJ	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**6.2**	**2.9**	**5.2**	**3.4**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**10**	<2	**6**	<2
PFOS	**16**	**2.6**	**5.9**	**2.7**
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	<4
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	<2

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Black Creek Aquifer**	**Surficial Aquifer**	**Black Creek Aquifer**
Location ID	**CUMBERLAND-5S**	**CUMBERLAND-5D**	**ROBESON-1S**	**ROBESON-1D**
Field Sample ID	**Cumber-5S-09162019**	**Cumber-5D-09162019**	**ROBESON-1S-091219**	**ROBESON-1D-091219**
Sample Date	**9/16/2019**	**9/16/2019**	**9/12/2019**	**9/12/2019**
QA/QC	**--**	**--**	**--**	**--**
Sample Delivery Group	**320-54378-1**	**320-54378-1**	**280-128413-1**	**280-128413-1**
Lab Sample ID	**320-54378-4**	**320-54378-3**	**280-128413-1**	**280-128413-2**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4 UJ	<4 UJ	<4 UJ	**6 J**
PFMOAA	**22**	<5	**6.3**	<5
PFO2HxA	<2	<2	**6.2**	**2.8**
PFO3OA	<2	<2	<2	<2
PFO4DA	<2	<2	<2	<2
PFO5DA	<2	<2	<2 UJ	<2 UJ
PMPA	**14**	<10	**34**	**35**
PEPA	<20	<20	<20	<20
PFESA-BP1	<2	<2	<2	<2
PFESA-BP2	<2	<2	**7.1**	**3**
Byproduct 4	<2	<2	<2	<2
Byproduct 5	<2	<2	<2	<2
Byproduct 6	<2	<2	<2	<2
NVHOS	<2	<2	<2	<2
EVE Acid	<2	<2	<2	<2
Hydro-EVE Acid	<2	<2	<2	<2
R-EVE	<2	<2	<2	<2
PES	<2	<2	<2	<2
PFECA B	<2	<2	<2	<2
PFECA-G	<2	<2	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<480	<20	<20	<20
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
F-53B Major	<2	<2	<2	<2
F-53B Minor	<2	<2	<2	<2
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	<2	<2
Perfluorobutanoic Acid	<2	<2	<2	<2
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2	<2	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<2	<2
Perfluorohexane Sulfonic Acid	<2	<2	<2	<2
Perfluorohexanoic Acid	<2	<2	<2	**2.3**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	<2	<2	<2	**2**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	<2	<2	<2	<2
PFOS	<2	<2	**3.5**	<2
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<4	<4
N-ethylperfluoro-1-octanesulfonamide	<2	<2 UJ	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<2	<2

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE 9-4
OFFSITE GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**--**	**--**	**--**	**--**
Location ID	**EB**	**EQBLK**	**EQBLK**	**FBLK**
Field Sample ID	**EquipBlank1-20190912**	**BLADEN EQBLK-1**	**BLADEN EQBLK-2**	**FIELDBLK-20190913**
Sample Date	**9/12/2019**	**8/28/2019**	**8/28/2019**	**9/13/2019**
QA/QC	**Equipment Blank**	**Equipment Blank**	**Equipment Blank**	**Field Blank**
Sample Delivery Group	**200-50537-2**	**280-127778-1**	**280-127778-1**	**200-50567-2**
Lab Sample ID	**200-50537-3**	**280-127778-8**	**280-127778-9**	**200-50567-3**
Table 3+ Lab SOP (ng/L)				
HFPO-DA (EPA Method 537 Mod)	<4	<3.8	<3.8	**9.2**
PFMOAA	<5	<2.1	<2.1	<5
PFO2HxA	<2	<0.8	<0.8	<2
PFO3OA	<2	<0.6	<0.6	<2
PFO4DA	<2	<0.8	<0.8	<2
PFO5DA	<2	<0.3	<0.3	<2
PMPA	<10	<5.7	<5.7	<10
PEPA	<20	<0.5	<0.5	<20
PFESA-BP1	<2	<0.3	<0.3	<2
PFESA-BP2	<2	<0.3	<0.3	<2
Byproduct 4	<2	<1.6	<1.6	<2
Byproduct 5	<2	<0.6	<0.6	<2
Byproduct 6	<2	<0.2	<0.2	<2
NVHOS	<2	<0.5	<0.5	<2
EVE Acid	<2	<0.2	<0.2	<2
Hydro-EVE Acid	<2	<0.3	<0.3	<2
R-EVE	<2	<0.7	<0.7	<2
PES	<2	<0.5	<0.5	<2
PFECA B	<2	<0.6	<0.6	<2
PFECA-G	<2	<0.4	<0.4	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<1.9	<1.9	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<19	<19	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<19	<19	<20
6:2 Fluorotelomer sulfonate	<20	<19	<19	<20
ADONA	<2.1	<2	<2	<2.1
F-53B Major	<2	<1.9	<1.9	<2
F-53B Minor	<2	<1.9	<1.9	<2
NaDONA	<2.1	<2	<2	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<19	<19	<20
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<19	<19	<20
Perfluorobutane Sulfonic Acid	<2	<1.9	<1.9	<2
Perfluorobutanoic Acid	<2	<1.9	<1.9	<2
Perfluorodecane Sulfonic Acid	<2	<1.9	<1.9	<2
Perfluorodecanoic Acid	<2	<1.9	<1.9	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<1.9	<1.9	<2
Perfluorododecanoic Acid	<2	<1.9	<1.9	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<1.9	<1.9	<2
Perfluoroheptanoic Acid	<2	<1.9	<1.9	<2
Perfluorohexadecanoic acid (PFHxDA)	<2	<1.9	<1.9	<2
Perfluorohexane Sulfonic Acid	<2	**0.34 J**	**0.26 J**	<2
Perfluorohexanoic Acid	<2	<1.9	<1.9	<2
Perfluorononanesulfonic acid	<2	<1.9	<1.9	<2
Perfluorononanoic Acid	<2	<1.9	<1.9	<2
Perfluorooctadecanoic acid	<2	<1.9	<1.9	<2
Perfluorooctane Sulfonamide	<2	<1.9	<1.9	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<1.9	<1.9	<2
Perfluoropentanoic Acid	<2	<1.9	<1.9	<2
Perfluorotetradecanoic Acid	<2	**0.3 J**	<1.9	<2
Perfluorotridecanoic Acid	<2	<1.9	<1.9	<2
Perfluoroundecanoic Acid	<2	<1.9	<1.9	<2
PFOA	<2	<1.9	<1.9	<2
PFOS	<2	<1.9	<1.9	<2
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<1.9	<1.9	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<3.8	<3.8	<4
N-ethylperfluoro-1-octanesulfonamide	<2	<1.9	<1.9	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<1.9	<1.9	<2

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
EPA - Environmental Protection Agency
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE 9-5
SELECT MONITORING WELL LOCATIONS SHOWING PROPSOED PFAS SIGNATURES
Chemours Fayetteville Works, North Carolina

Proposed PFAS Signature	Area	Aquifer	Location ID	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PFESA-BP1	PFESA-BP2	Byproduct 4	Byproduct 5	Byproduct 6	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	Total Table 3+ (ng/L)
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	BLADEN-2D	10%	0%	6%	1%	0%	0%	69%	11%	0%	4%	0%	0%	0%	0%	0%	0%	0%	110
Aerial - Predominant PMPA	Offsite	Surficial Aquifer	BLADEN-2S	4%	9%	15%	1%	1%	0%	53%	5%	0%	11%	0%	0%	0%	1%	0%	0%	0%	130
Aerial - Predominant PMPA	Onsite	Black Creek Aquifer	PW-12	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15
Aerial - Mixture of PFAS	Offsite	Black Creek Aquifer	BLADEN-1D	24%	4%	11%	1%	0%	0%	43%	14%	0%	0%	2%	0%	0%	0%	0%	0%	1%	760
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	BLADEN-3S	10%	13%	27%	3%	3%	1%	33%	5%	0%	3%	2%	0%	0%	0%	0%	0%	0%	120
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-3S	5%	14%	30%	5%	4%	4%	21%	0%	0%	2%	10%	0%	0%	0%	0%	0%	5%	210
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-4S	20%	7%	20%	3%	1%	0%	25%	7%	0%	1%	13%	0%	0%	0%	0%	0%	3%	560
Aerial - Mixture of PFAS	Onsite	Perched Zone	FTA-02	24%	12%	10%	2%	2%	3%	7%	3%	1%	4%	2%	1%	0%	0%	27%	1%	1%	90,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-18D	53%	4%	7%	0%	0%	0%	28%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1,500
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-04	6%	6%	10%	3%	1%	1%	2%	1%	25%	3%	2%	28%	0%	1%	8%	4%	1%	4,300,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-12	2%	4%	7%	3%	2%	1%	6%	1%	12%	4%	4%	20%	0%	10%	13%	7%	2%	5,400,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-03	20%	1%	5%	1%	0%	0%	33%	19%	0%	0%	3%	12%	0%	2%	0%	1%	3%	400,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	LTW-05	7%	65%	18%	6%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	1%	370,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	MW-14D	4%	71%	14%	3%	1%	0%	3%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	250,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	MW-24	2%	77%	14%	3%	1%	0%	1%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	940,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	MW-27	3%	68%	18%	5%	1%	0%	2%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	350,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	NAF-02	3%	62%	17%	5%	2%	1%	2%	1%	0%	0%	0%	5%	0%	1%	0%	0%	0%	4,700,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	PIW-9S	3%	69%	16%	4%	1%	0%	3%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	220,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PW-15R	2%	67%	13%	3%	0%	0%	7%	2%	1%	0%	0%	4%	0%	1%	0%	0%	0%	490,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	SMW-08B	2%	74%	13%	3%	1%	0%	2%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	350,000
Combined Process Water - Mixture of PFAS	Onsite	Surficial Aquifer	MW-15DRR	4%	38%	8%	1%	0%	0%	4%	1%	11%	1%	1%	26%	0%	0%	1%	0%	0%	81,000
Combined Process Water - Mixture of PFAS	Onsite	Black Creek Aquifer	PIW-10DR	17%	40%	17%	5%	1%	0%	8%	3%	0%	0%	1%	6%	0%	0%	0%	1%	1%	110,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	PZ-11	19%	27%	18%	3%	2%	3%	13%	4%	2%	1%	1%	5%	0%	1%	0%	0%	0%	26,000

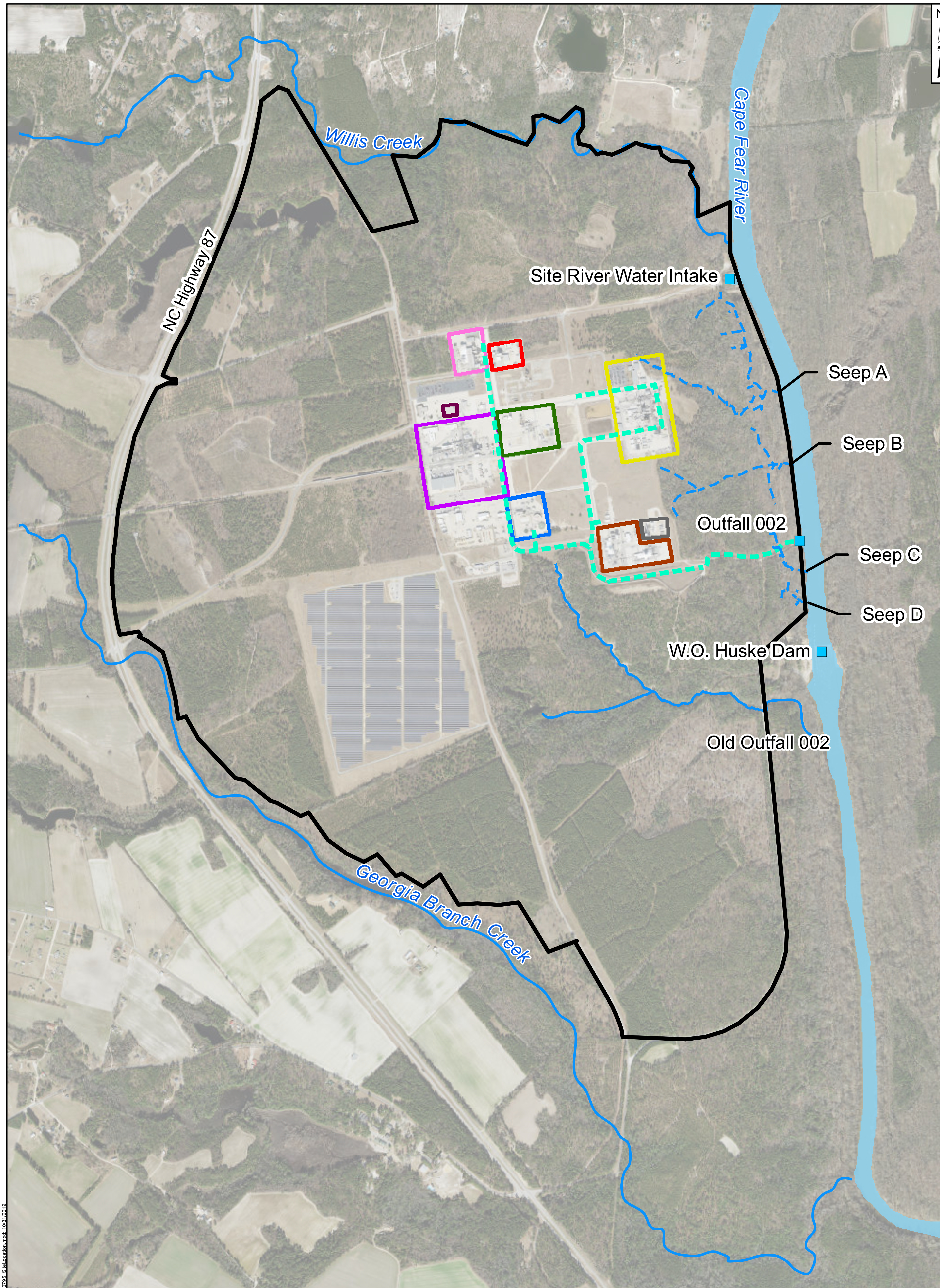
Notes:
ng/L - nanograms per liter
Table 3+ compounds reported as percentage of Total Table 3+ concentrations.
PES, PFECA B, and PFECA-G had no detections and are therefore omitted from this table.

TABLE 10-1
COMPARISON OF PROPOSED PFAS SIGNATURES TO SELECTED LOCATIONS
Chemours Fayetteville Works, North Carolina

Location ID	Sample Date	Proposed PFAS Signature	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PFESA-BP1	PFESA-BP2	Byproduct 4	Byproduct 5	Byproduct 6	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	Total Table 3+ (ng/L)
OLDOF-1	2/1/2019	Combined Process Water - Predominant PFMOAA	4%	72%	13%	4%	1%	1%	4%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	130,000
OLDOF-2	2/1/2019	Combined Process Water - Predominant PFMOAA	4%	66%	13%	4%	1%	1%	4%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	140,000
OLDOF-2L	2/2/2019	Combined Process Water - Predominant PFMOAA	4%	69%	14%	4%	1%	1%	4%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	150,000
OLDOF-3	2/2/2019	Combined Process Water - Predominant PFMOAA	4%	68%	14%	3%	1%	0%	4%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	160,000
OLDOF-4	2/2/2019	Combined Process Water - Predominant PFMOAA	3%	70%	13%	4%	1%	1%	4%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	200,000
OLDOF-5	2/2/2019	Combined Process Water - Predominant PFMOAA	3%	69%	13%	4%	2%	1%	3%	1%	1%	0%	0%	1%	0%	1%	0%	0%	0%	290,000
OLDOF-5K	2/2/2019	Combined Process Water - Predominant PFMOAA	16%	41%	14%	3%	3%	1%	12%	4%	0%	1%	1%	0%	0%	1%	0%	1%	1%	39,000
OLDOF-2J*	2/2/2019	Aerial - Mixture of PFAS	14%	6%	15%	3%	0%	0%	43%	15%	0%	1%	2%	0%	0%	0%	0%	0%	1%	8,700
SEEP-C-1	2/5/2019	Combined Process Water - Predominant PFMOAA	8%	58%	19%	6%	1%	0%	5%	2%	0%	0%	0%	1%	0%	1%	0%	1%	1%	340,000
SEEP-C-1-E2	2/5/2019	Combined Process Water - Predominant PFMOAA	7%	63%	15%	4%	1%	0%	5%	2%	0%	0%	0%	1%	0%	1%	0%	0%	0%	260,000
SEEP-D-1	5/30/2019	Combined Process Water - Predominant PFMOAA	11%	54%	17%	5%	1%	0%	5%	2%	0%	0%	1%	2%	0%	0%	0%	1%	1%	170,000
SEEP-A-1	2/7/2019	Combined Process Water - Mixture of PFAS	4%	37%	18%	6%	4%	2%	11%	4%	2%	1%	1%	10%	0%	0%	0%	1%	1%	230,000
SEEP-A-10	2/7/2019	Combined Process Water - Mixture of PFAS	12%	16%	12%	5%	4%	5%	10%	4%	9%	1%	1%	13%	0%	1%	5%	2%	1%	530,000
SEEP-A-11	2/7/2019	Combined Process Water - Mixture of PFAS	10%	17%	12%	5%	4%	4%	9%	4%	10%	1%	1%	14%	0%	1%	4%	2%	1%	540,000
SEEP-A-12	2/7/2019	Combined Process Water - Mixture of PFAS	17%	13%	25%	4%	4%	3%	18%	7%	0%	1%	2%	0%	0%	0%	0%	0%	1%	120,000
SEEP-A-2	2/7/2019	Combined Process Water - Mixture of PFAS	11%	34%	17%	6%	3%	2%	10%	4%	2%	1%	1%	10%	0%	0%	0%	1%	1%	240,000
SEEP-A-3	2/7/2019	Combined Process Water - Mixture of PFAS	6%	36%	17%	6%	4%	3%	10%	4%	2%	1%	1%	10%	0%	0%	0%	1%	1%	220,000
SEEP-A-4	2/7/2019	Combined Process Water - Mixture of PFAS	11%	31%	18%	5%	3%	3%	18%	8%	0%	1%	1%	4%	0%	0%	0%	1%	0%	160,000
SEEP-A-5	2/7/2019	Combined Process Water - Mixture of PFAS	10%	17%	16%	5%	4%	3%	23%	11%	1%	1%	1%	6%	0%	0%	0%	1%	1%	180,000
SEEP-A-6	2/7/2019	Combined Process Water - Mixture of PFAS	13%	12%	14%	4%	4%	3%	27%	13%	1%	1%	1%	5%	0%	0%	0%	1%	1%	140,000
SEEP-A-7	2/7/2019	Combined Process Water - Mixture of PFAS	13%	20%	16%	5%	4%	3%	21%	10%	1%	1%	1%	6%	0%	0%	0%	1%	1%	220,000
SEEP-A-8	2/7/2019	Combined Process Water - Mixture of PFAS	9%	12%	14%	5%	5%	4%	27%	14%	1%	1%	1%	4%	0%	0%	0%	1%	1%	140,000
SEEP-A-9	2/7/2019	Combined Process Water - Mixture of PFAS	11%	15%	12%	5%	4%	3%	10%	4%	8%	1%	2%	16%	0%	1%	4%	2%	1%	510,000
SEEP-B-1	2/5/2019	Combined Process Water - Mixture of PFAS	7%	42%	12%	3%	1%	0%	12%	5%	1%	0%	1%	11%	0%	1%	2%	1%	1%	350,000
SEEP-B-2	2/5/2019	Aerial - Mixture of PFAS	12%	3%	5%	1%	1%	0%	20%	10%	5%	1%	4%	25%	0%	2%	8%	2%	3%	310,000
SEEP-B-3	2/6/2019	Aerial - Mixture of PFAS	11%	1%	4%	1%	1%	0%	19%	10%	6%	1%	4%	26%	0%	2%	9%	2%	3%	380,000
SEEP-B-3-A1	2/6/2019	Aerial - Mixture of PFAS	13%	1%	4%	1%	1%	0%	17%	9%	7%	1%	3%	26%	0%	2%	10%	2%	3%	460,000
SEEP-B-3-E4	2/6/2019	Aerial - Mixture of PFAS	22%	4%	13%	2%	3%	1%	36%	14%	0%	1%	2%	0%	0%	0%	0%	0%	1%	45,000
SEEP-B-4	2/6/2019	Aerial - Mixture of PFAS	12%	1%	3%	1%	1%	0%	17%	9%	8%	1%	4%	26%	0%	2%	11%	2%	3%	670,000
SEEP-B-4-A3	2/6/2019	Aerial - Mixture of PFAS	7%	1%	4%	1%	1%	1%	17%	8%	9%	1%	4%	22%	0%	1%	15%	2%	4%	430,000
GBC-1	5/29/2019	Aerial - Mixture of PFAS	19%	0%	16%	3%	0%	0%	50%	12%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2,600
GBC-2	5/29/2019	Aerial - Mixture of PFAS	25%	0%	14%	3%	0%	0%	46%	11%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2,600
GBC-3	5/29/2019	Aerial - Mixture of PFAS	23%	0%	15%	2%	0%	0%	47%	10%	0%	1%	0%	0%	0%	0%	0%	0%	0%	3,000
GBC-5	5/29/2019	Aerial - Mixture of PFAS	28%	5%	17%	3%	0%	0%	35%	11%	0%	1%	0%	0%	0%	0%	0%	0%	0%	4,600
GBC-6	5/29/2019	Aerial - Mixture of PFAS	29%	0%	17%	3%	0%	0%	39%	11%	0%	1%	0%	0%	0%	0%	0%	0%	0%	4,900
GBC-7	5/29/2019	Aerial - Mixture of PFAS	29%	0%	19%	3%	0%	1%	38%	10%	0%	1%	0%	0%	0%	0%	0%	0%	0%	4,200
WC-1	5/30/2019	Combined Process Water - Mixture of PFAS	17%	29%	15%	3%	0%	1%	25%	5%	0%	0%	0%	5%	0%	0%	0%	0%	0%	4,800
CFR-MILE-76	6/7/2019	Aerial - Mixture of PFAS	10%	0%	6%	0%	0%	0%	25%	0%	0%	0%	11%	32%	0%	10%	0%	0%	6%	72
CFR-BLADEN	5/22/2019	Combined Process Water - Mixture of PFAS	10%	45%	14%	3%	1%	0%	11%	0%	0%	0%	3%	11%	0%	2%	0%	0%	1%	290
CFR-KINGS	5/23/2019	Combined Process Water - Mixture of PFAS	12%	6%	21%	5%	2%	0%	21%	0%	0%	0%	14%	5%	0%	4%	0%	0%	7%	140

Notes:
ng/L - nanograms per liter
Table 3+ compounds reported as percentage of Total Table 3+ concentrations.
PES, PFECA B, and PFECA-G had no detections and are therefore omitted from this table.
* - Sample was collected from seep water, not Old Outfall water.

FIGURES



Legend

- Site Features
- Site Boundary
- Nearby Tributary
- Observed Seep (Natural Drainage)
- Site Drainage Network

Areas at Site

- Chemours Monomers IXM
- Chemours Polymer Processing Aid Area
- DuPont Polyvinyl Fluoride Leased Area
- Former DuPont PMDF Area
- Kuraray SentryGlas® Leased Area
- Kuraray Trosifol® Leased Area
- Wastewater Treatment Plant
- Power - Filtered and Demineralized Water Production
- Kuraray Laboratory

Notes:
1. The outline of the Cape Fear River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
2. Basemap sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2,000 1,000 0 2,000 Feet

Site Location Map

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

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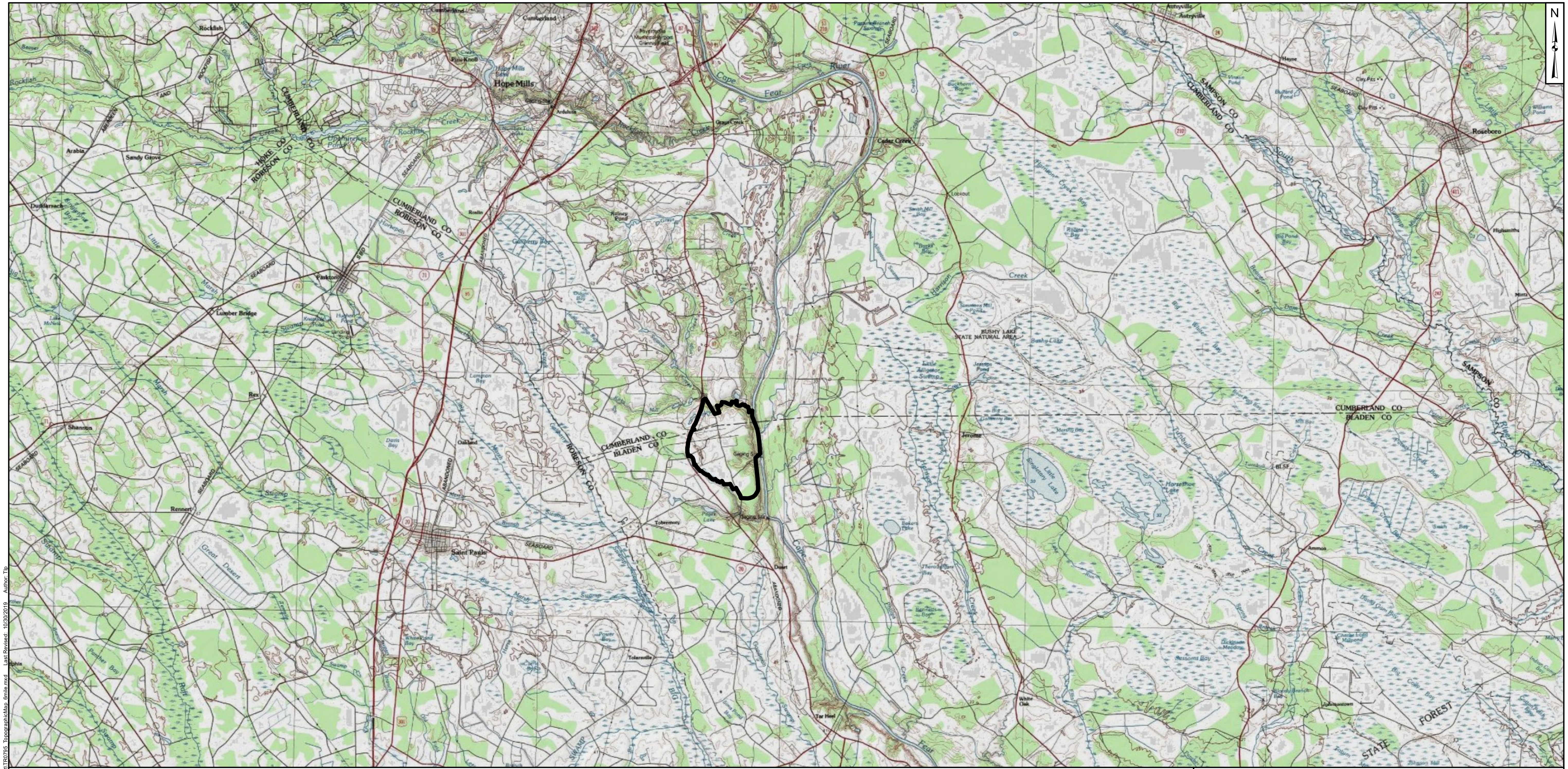
Figure 2-1

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_SiteLocation.mxd; 10/31/2019



Legend

Site Boundary

Notes:
1. For topographic map symbols, please refer to this document: https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf
2. Basemap source: © 2013 National Geographic Society, i-cubed

2 1 0 2 Miles

Regional Topographic Map

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Figure

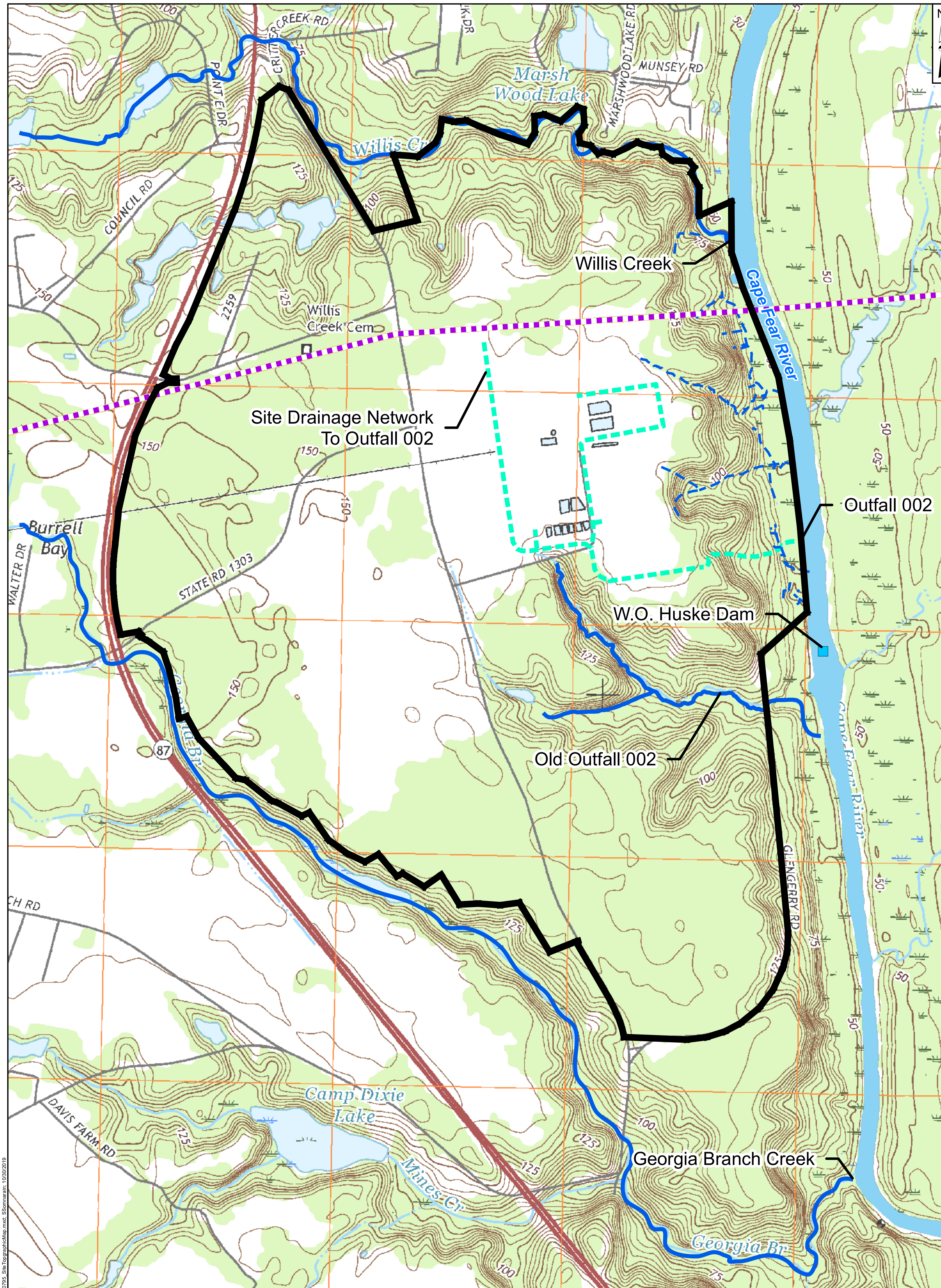
2-2

Raleigh

October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_TopographicMap_6mile.mxd Last Revised: 10/30/2019 Author: Tlp

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

- Site Features
- Site Boundary
- County Boundary
- Observed Seep (Natural Drainage)
- Nearby Tributary
- Site Drainage Network

2,000 1,000 0 2,000 Feet

Notes:
Basemap sources: Esri, Garmin, USGS, NPS (World Terrain Reference); Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community (World Hillshade)

Site Topographic Map

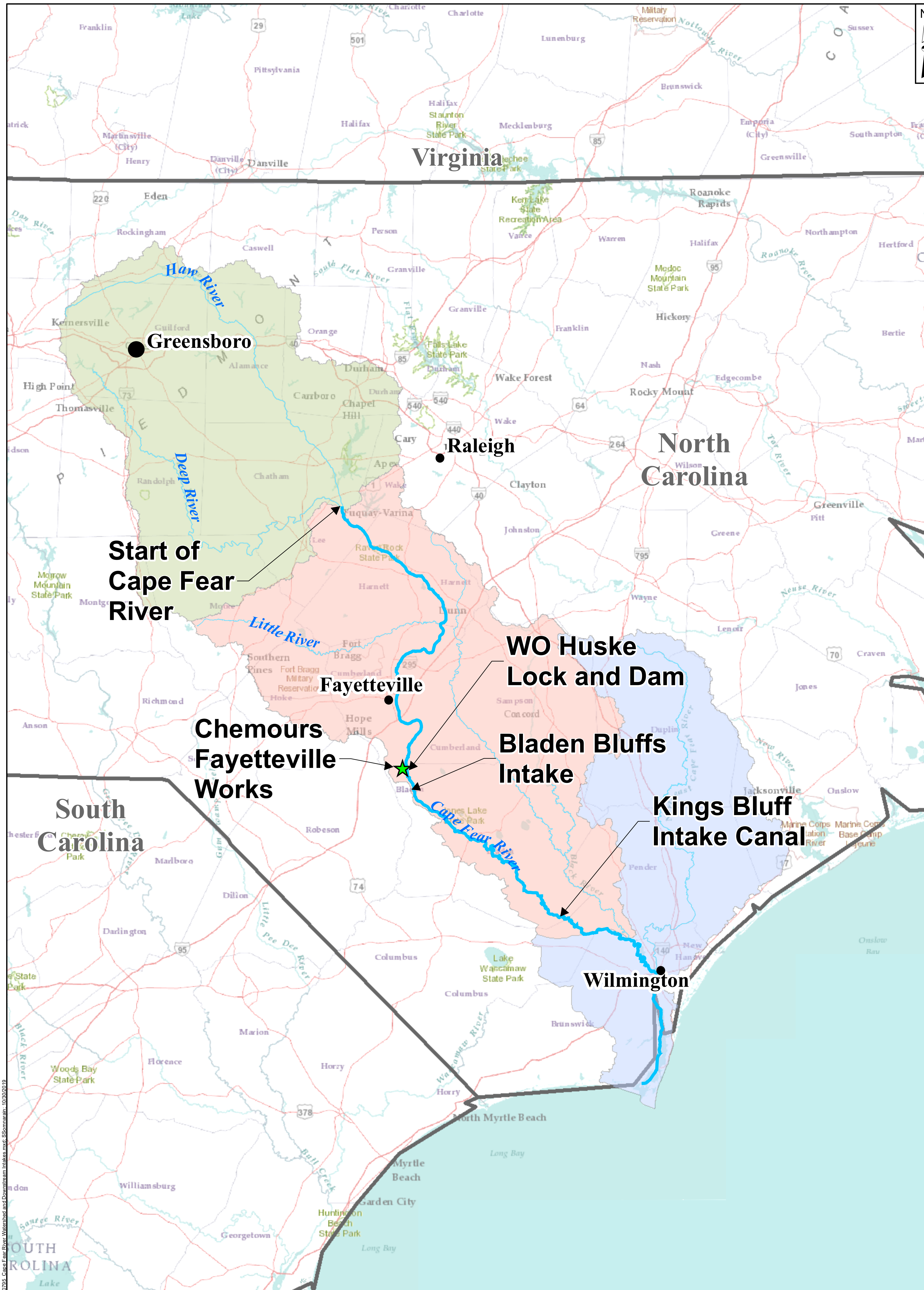
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 2-3



Legend

- ★ Chemours Fayetteville Works
- Upper Basin
- Middle Basin
- Lower Basin

Notes:
Basemap Source: Esri, Garmin, USGS, NPS

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

Cape Fear River Watershed and Downstream Drinking Water Intakes

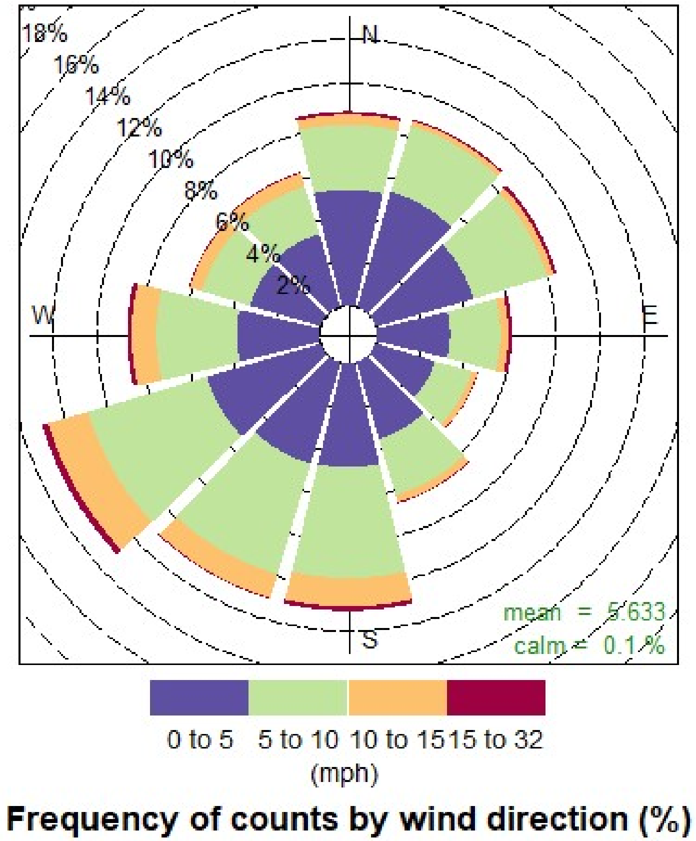
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

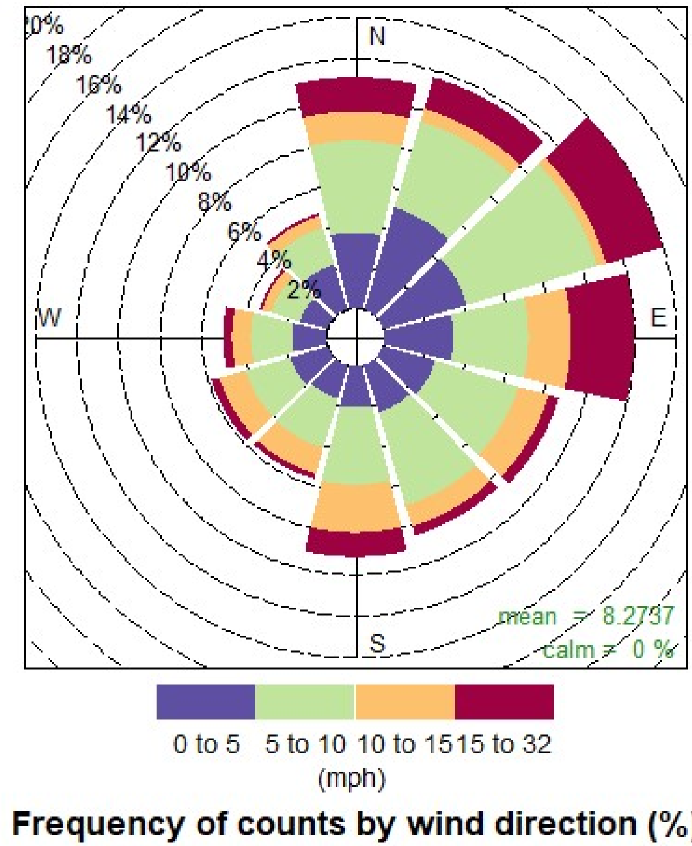
Geosyntec Consultants of NC, P.C.
NC License No.: C-3500 and C-295

Raleigh	October 2019	Figure 2-4

Wind Rose for Full Data Set



Wind Rose for Rain Events



Notes:

mph - miles per hour

1. Wind measurements collected at the Site for the period from 1 January 2018 to 15 May 2019.
2. Concentric circles indicate the relative proportion of winds from a given direction and speed.
3. Wedges represent the direction the winds are coming from.
4. Color indicates wind speed.
5. 575 total hours (5%) of rain and 10,738 total hours (95%) without rain at the Site for the period from1 January 2018 to 15 May 2019.

Wind Rose Measurements (January 2018- May 2019)

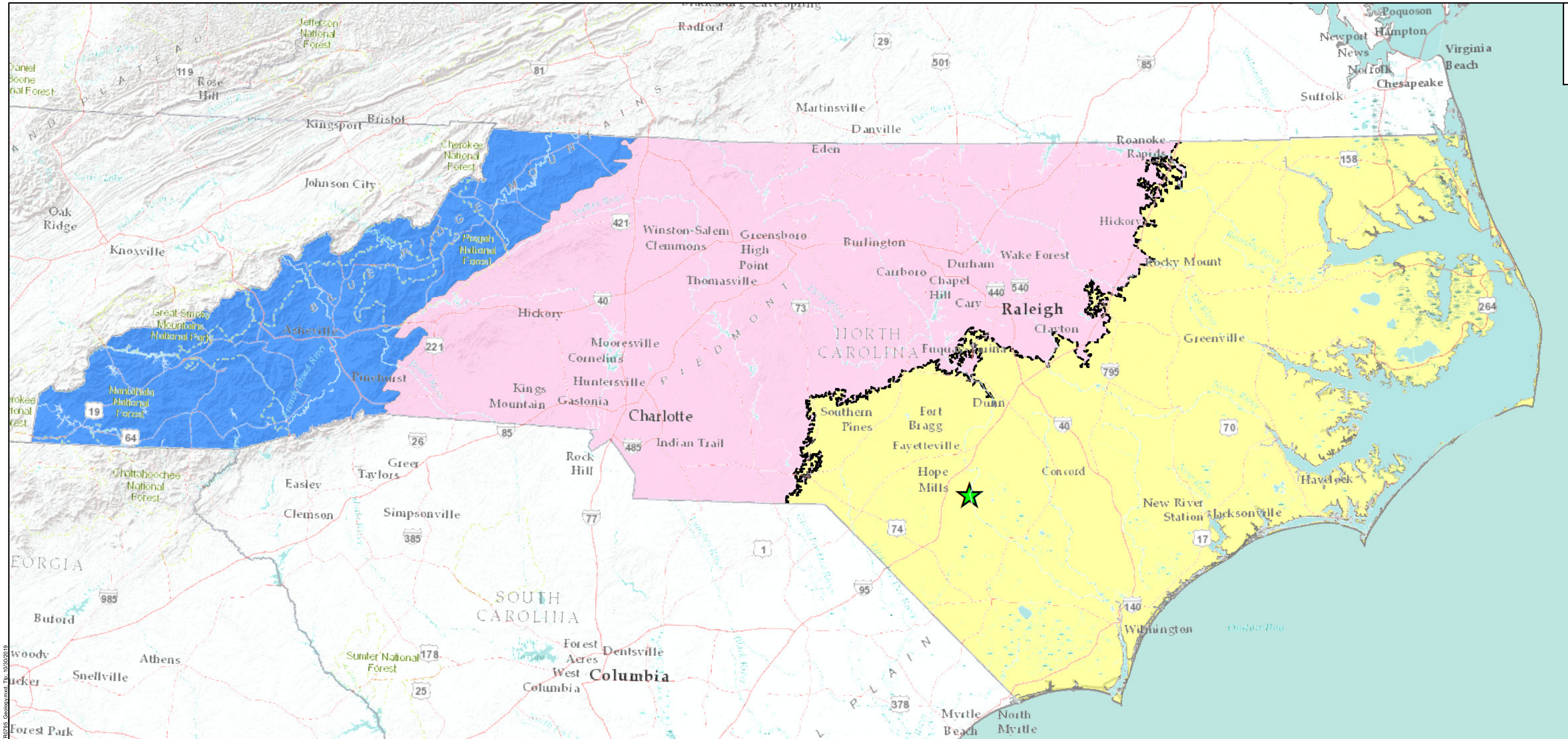
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Figure **2-5**

Raleigh | October 2019



Legend

- Chemours Fayetteville Works
- Blue Ridge
- Piedmont
- Coastal Plain
- Fall Line

Notes:
1. Physiography layer obtained fromNorth Carolina Geological Survey (NCGS).
2. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

40 20 0 40 Miles

Physiographic Provinces of North Carolina

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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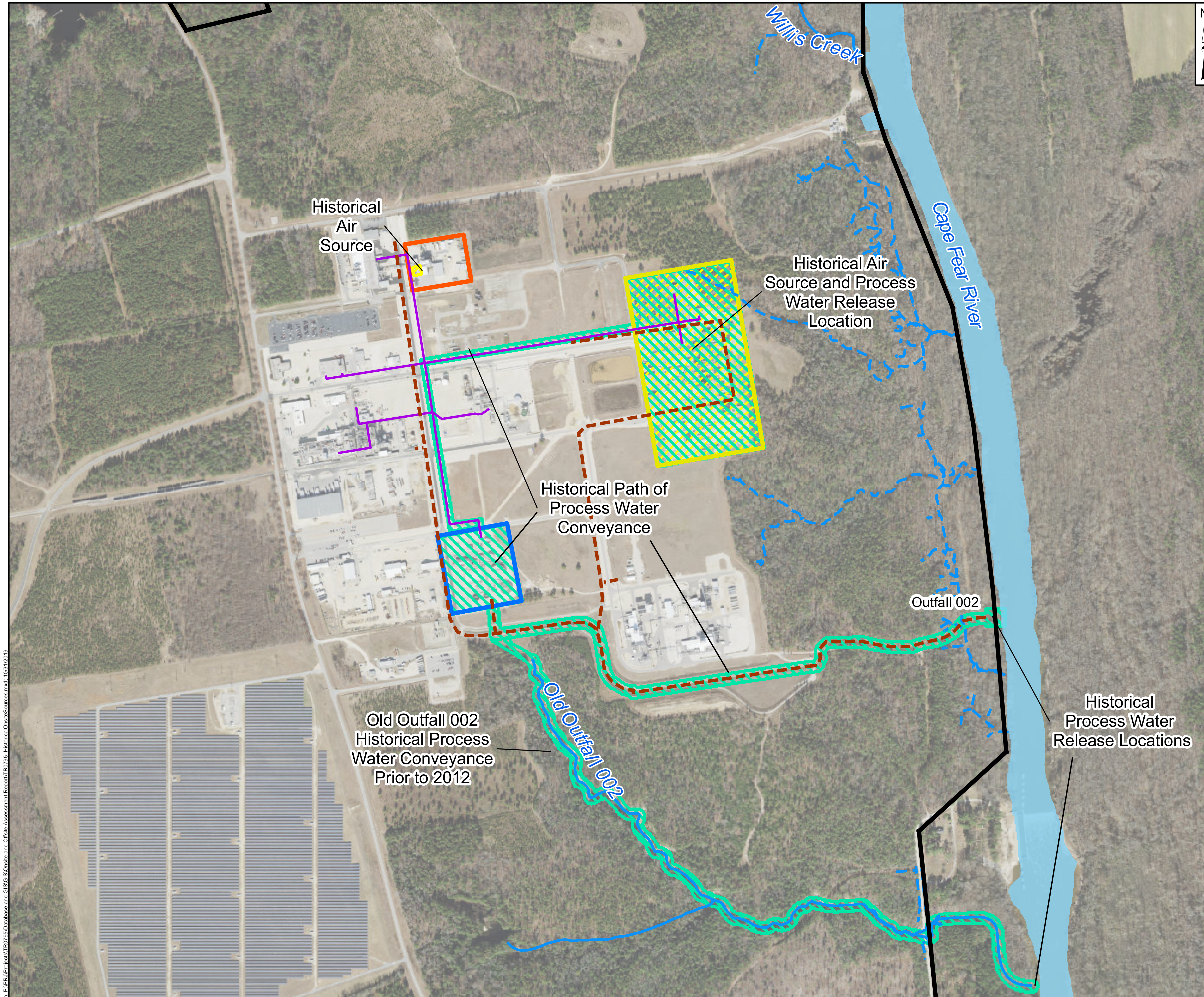
NC License No.: C 3500 and C 295

Figure 3-1

Raleigh | October 2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend
- Site Conveyance Network
- Site Boundary
- Nearby Tributary
- Observed Seep (Natural Drainage)
- Terracotta Pipe

Areas at Site
- Chemours Monomers IXM Area
- Chemours Polymer Processing Aid Area
- Wastewater Treatment Plant Area

Historical Onsite Sources
- Air
- Water

Notes:
1. Historical air sources are manufacturing areas where PFAS were emitted to air. The Site by December 31, 2019 will be operating a Thermal Oxidizer that in combination with other control technologies reduces facility wide air emissions of PFAS by 99%.
2. Historical water sources are areas where process water was released to soil and groundwater. Site infrastructure upgrades and offsite disposal of process water has mitigated these sources.

Basemap Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1,000 500 0 1,000 Feet

Historical Sources of PFAS

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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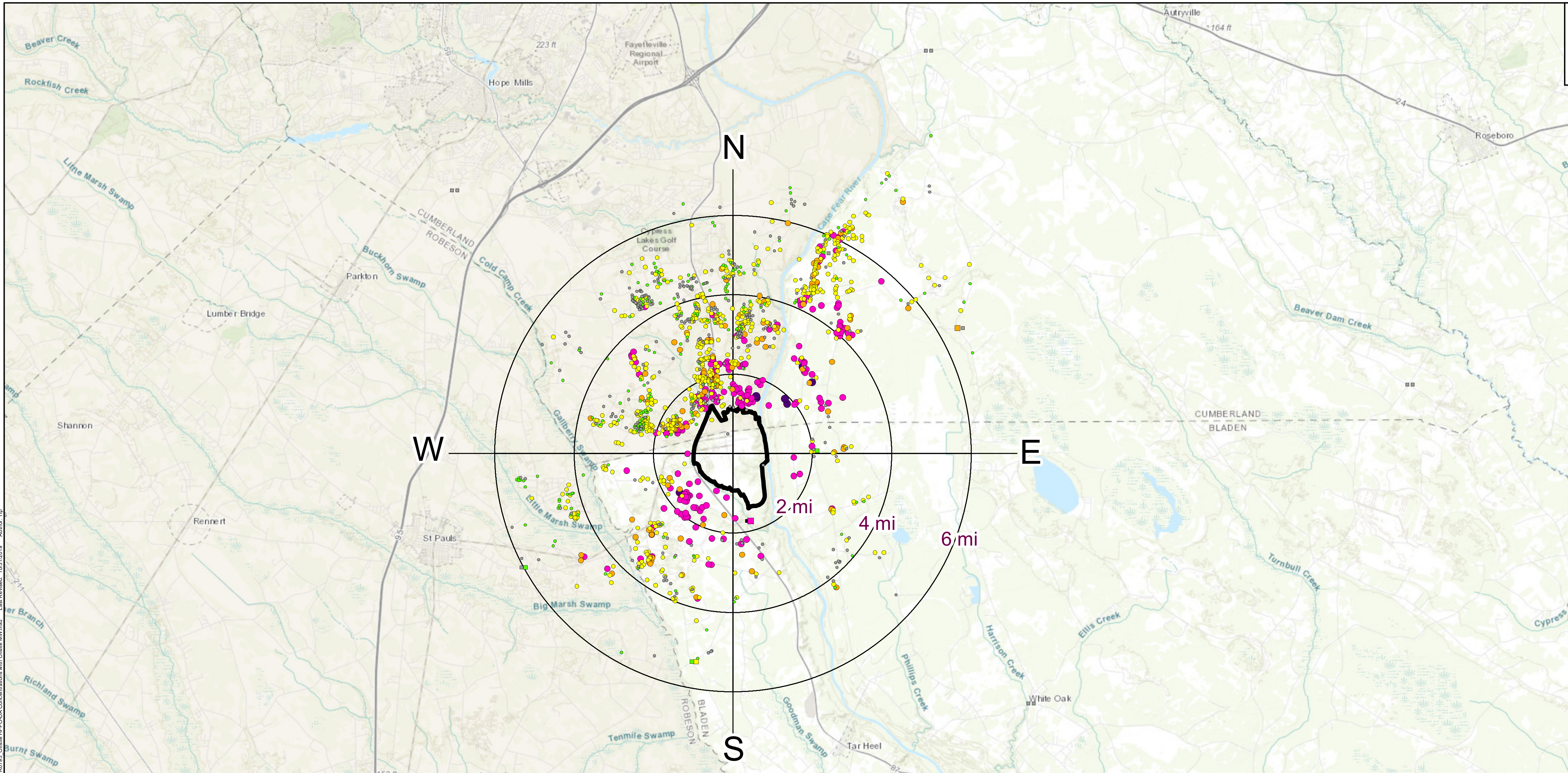
Raleigh | October 2019

Figure 4-1

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_HistoricalOnsiteSources.mxd; 10/31/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

HFPO-DA Concentrations (ng/L)

- Dry
- Non-detect
- < 10
- 10 - 70
- 70 - 140
- 140 - 1,400
- > 1,400

- Offsite Monitoring Well
- Offsite Private Well
- Site Boundary

Notes:
ng/L - nanograms per liter
1. Black lines represent cardinal directions (N, E, S, W)
2. Basemap sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

2 1 0 2 Miles

HFPO-DA Concentrations in Offsite Wells

Chemours Fayetteville Works, North Carolina

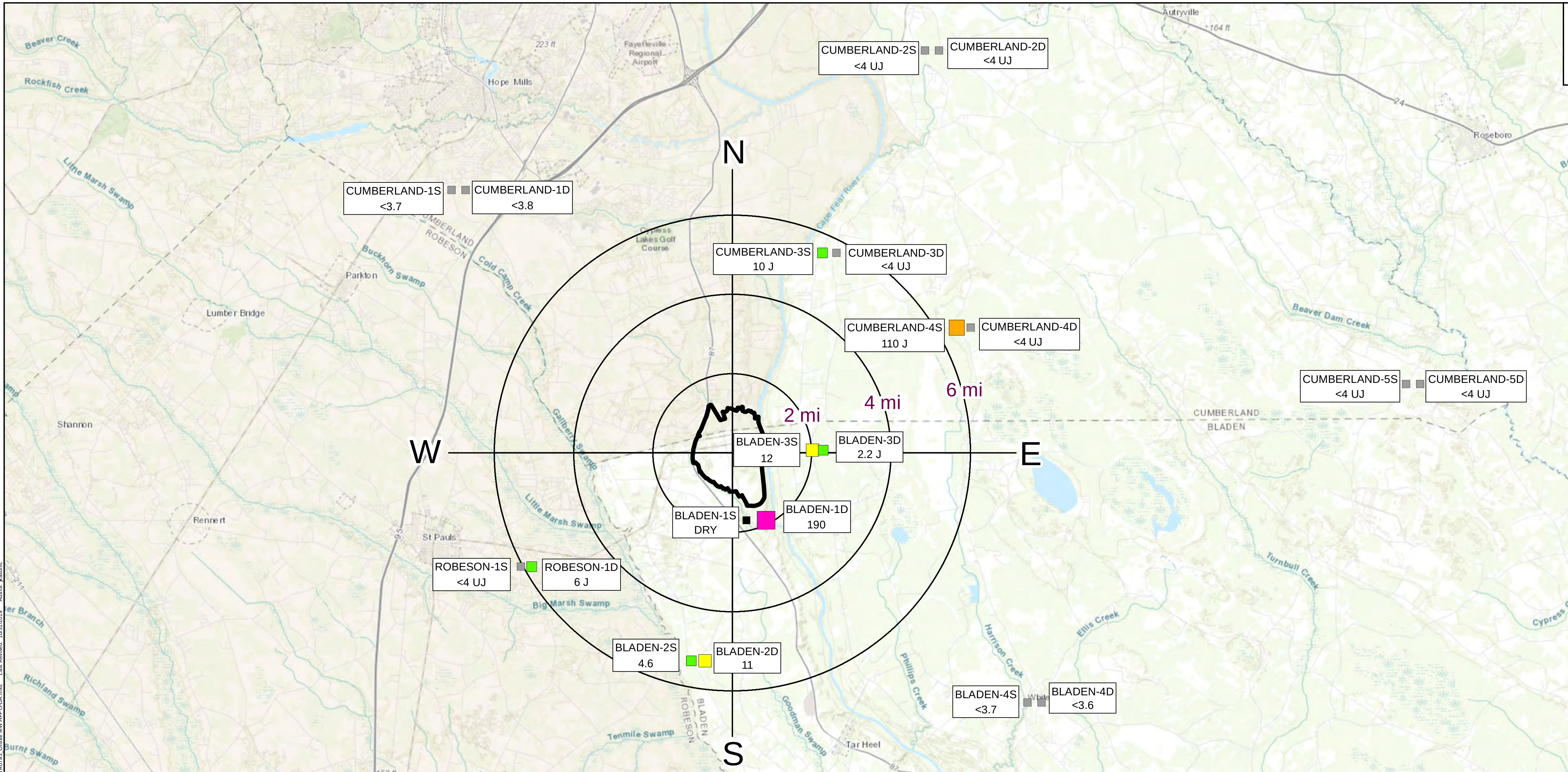
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 4-2A

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

HFPO-DA Concentrations (ng/L)

- Dry
- Non-detect
- < 10
- 10 - 70
- 70 - 140
- 140 - 1,400
- Site Boundary

Notes:

ng/L - nanograms per liter

< - Analyte not detected above associated reporting limit.

J - Analyte detected. Reported value may not be accurate or precise.

UJ - Analyte not detected. Reporting limit may not be accurate or precise.

1. Black lines represent cardinal directions (N, E, S, W)
2. The locations of Cumberland and Robeson well pairs are approximate.
3. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map do not reflect their true geographic coordinates.
4. Basemap sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

2 1 0 2 Miles

HFPO-DA Concentrations in Offsite Groundwater Monitoring Wells

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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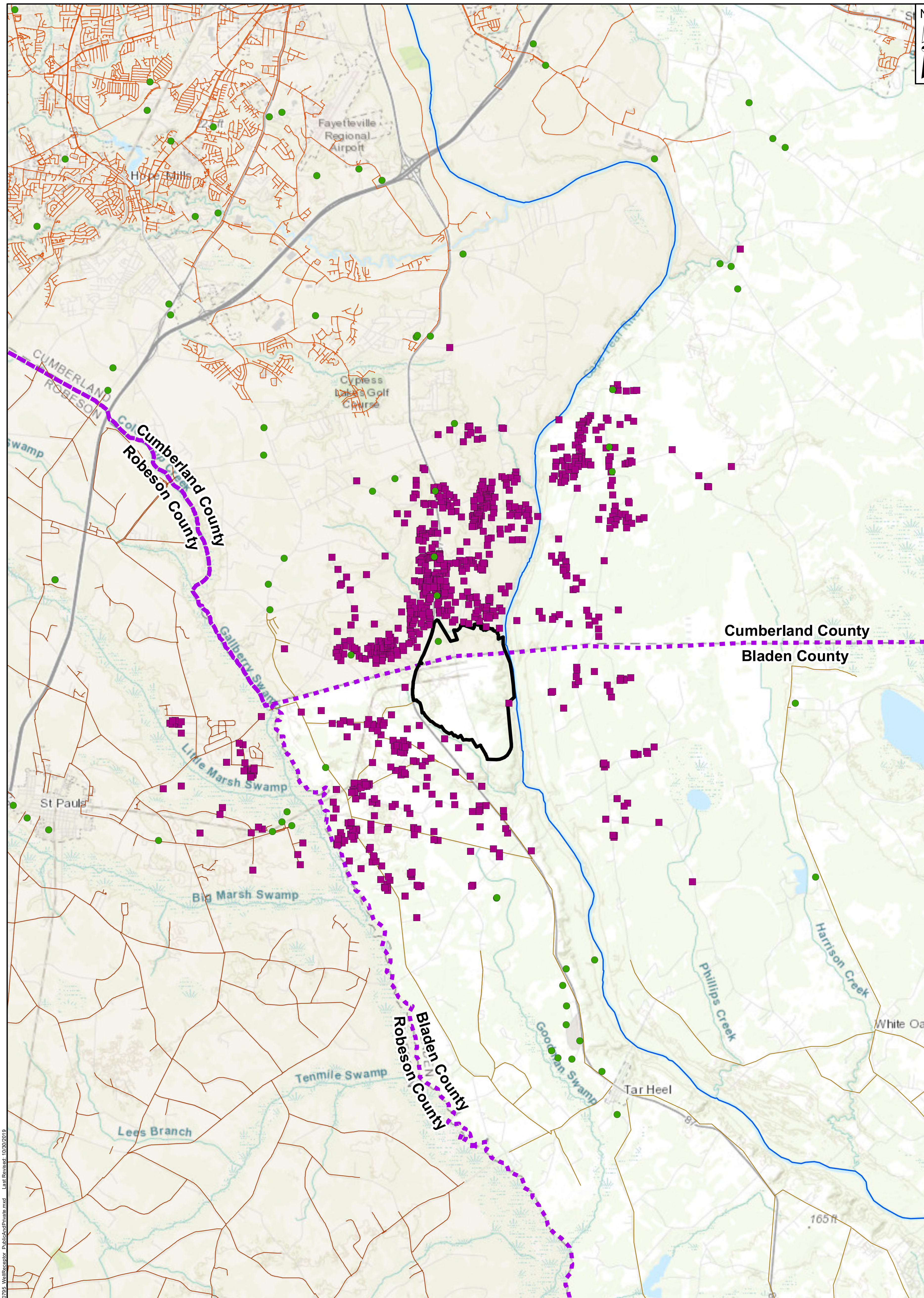
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 4-2B

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

- Presently Identified Private Well
- Public Community Well
- Cape Fear River
- Site Boundary
- County Boundary

Existing water lines

- Bladen County (2017 data)
- Robeson County (2018 data)
- Cumberland County (2018 data)

Notes:
1. Delineation of offsite private wells containing PFAS listed in Attachment C of the Consent Order is on-going. Additional private wells are expected to be identified.
2. Locations from public wells were sourced from the North Carolina Corporate Geographic Database. Earlier versions of this dataset may exist. Retrieved from NC OneMap on September 24, 2019.
3. Basemap Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community.

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_WellReceptor_PublicAndPrivate.mxd Last Revised: 10/30/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

Identified Well Receptor Locations

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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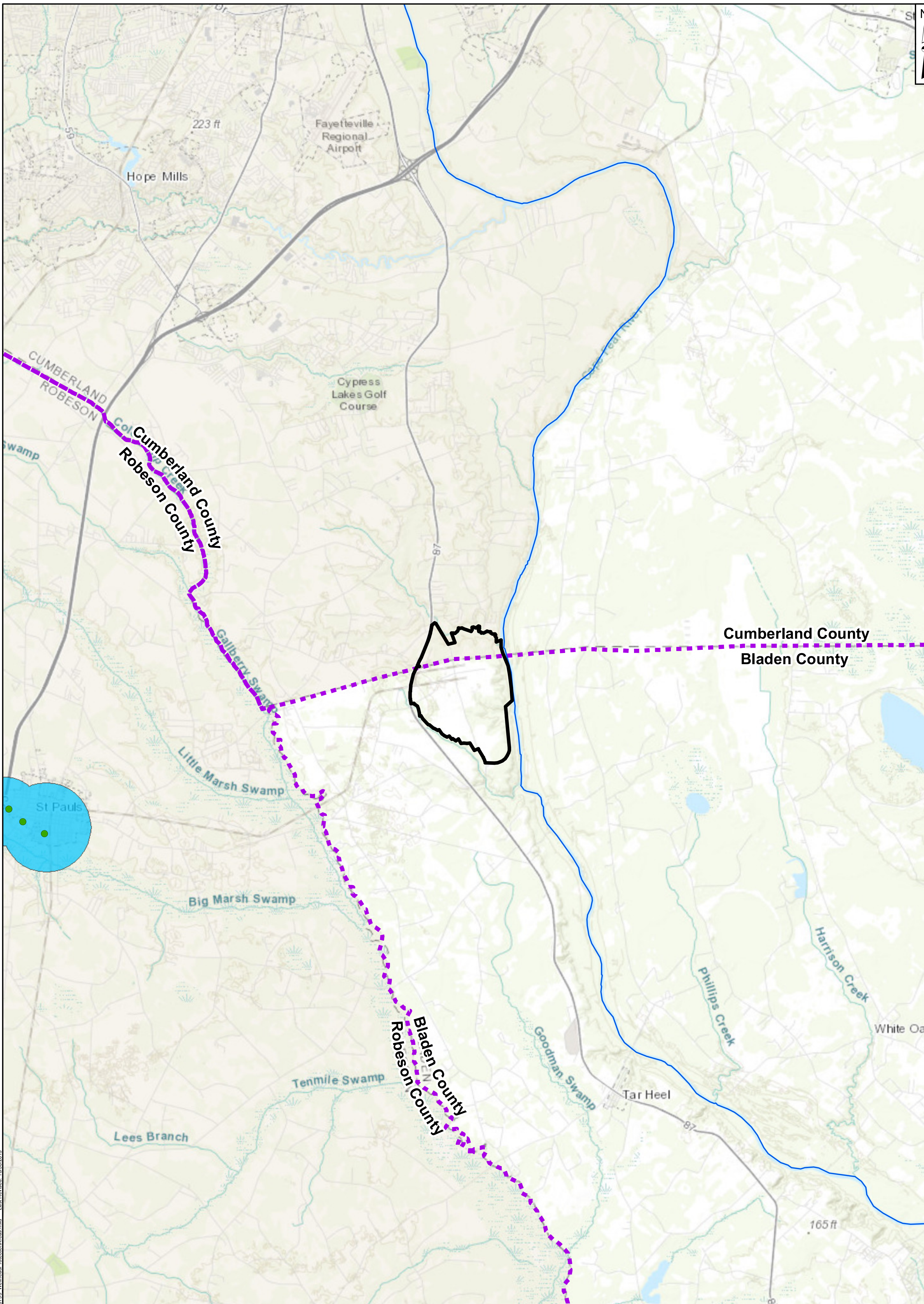
Figure 5-1



Legend

- Public Well within Wellhead Protection Area; PWS ID 0378030
- Wellhead Protection Area
- Cape Fear River
- Site Boundary
- County Boundary

Notes:
1. The source of the Public Well layer is the North Carolina Corporate Geographic Database. Earlier versions of this dataset may exist. Retrieved from NC OneMap on September 24, 2019.
2. Wellhead Protection Areas last updated on 10/27/2016. The data was downloaded from ArcGIS Online, and was provided by North Carolina Department of Environmental Quality.
3. Basemap Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community.

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_WellheadProtectionAreas.mxd Last Revised: 10/30/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

2 1 0 2 Miles

Wellhead Protection Areas

Chemours Fayetteville Works, North Carolina

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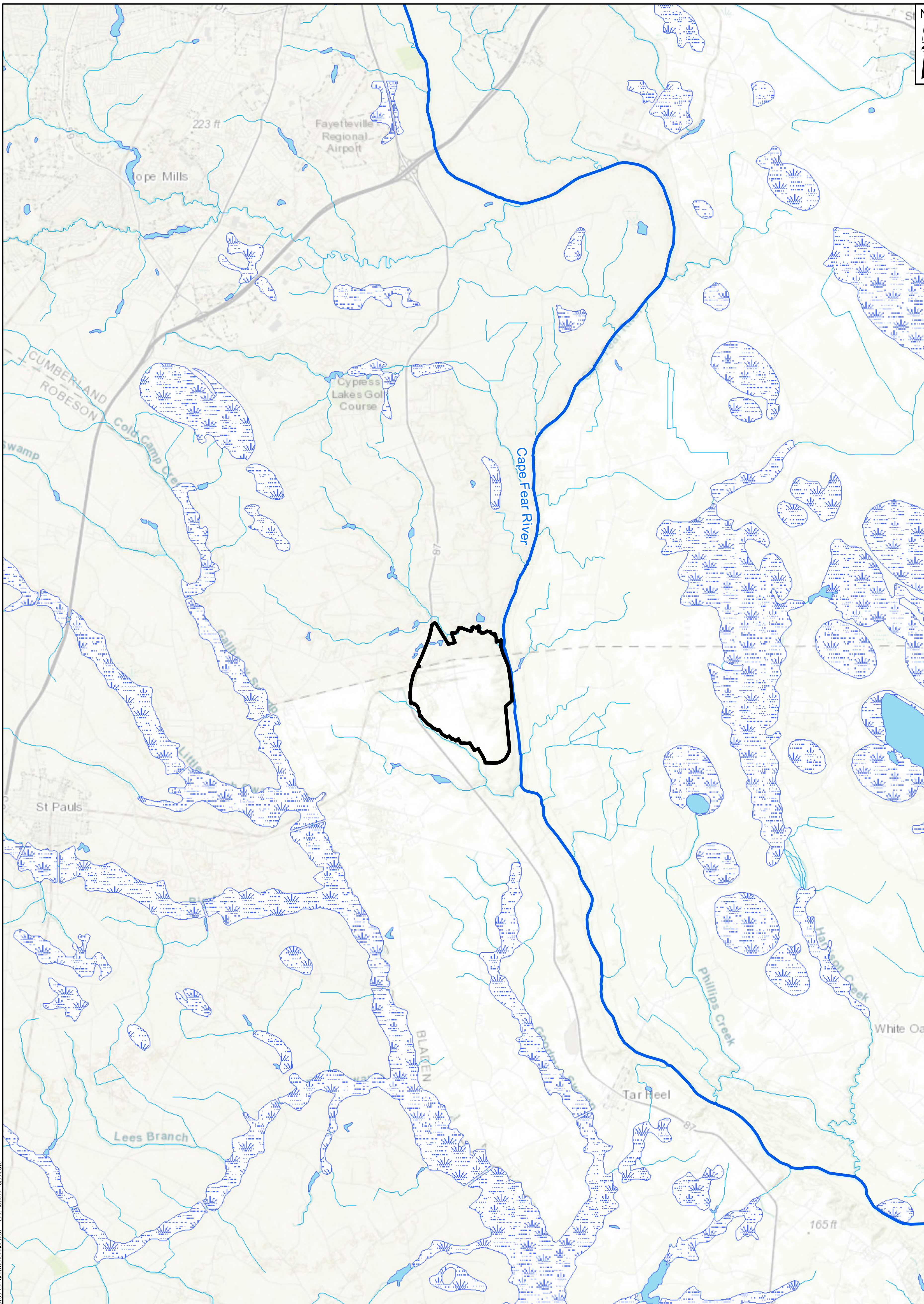
Figure
5-2



Legend

- Lake/Pond
- Wetland
- Stream/River
- Site Boundary

Notes:

1. Surface water layers obtained from National Hydrography Dataset - USGS (www.nhd.usgs.gov)
2. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

2 1 0 2 Miles

Surface Water Bodies in Region Around Site

Chemours Fayetteville Works, North Carolina

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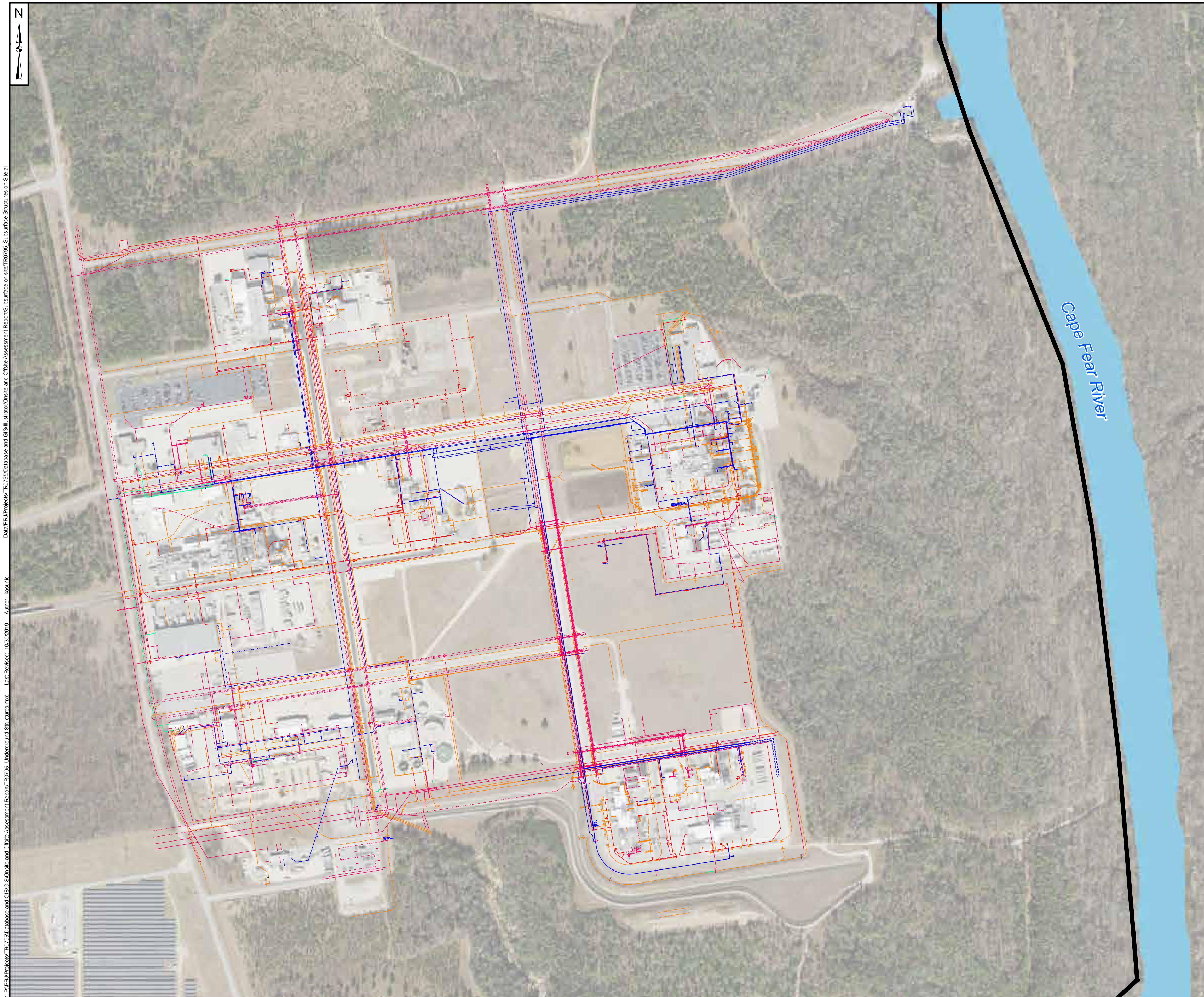
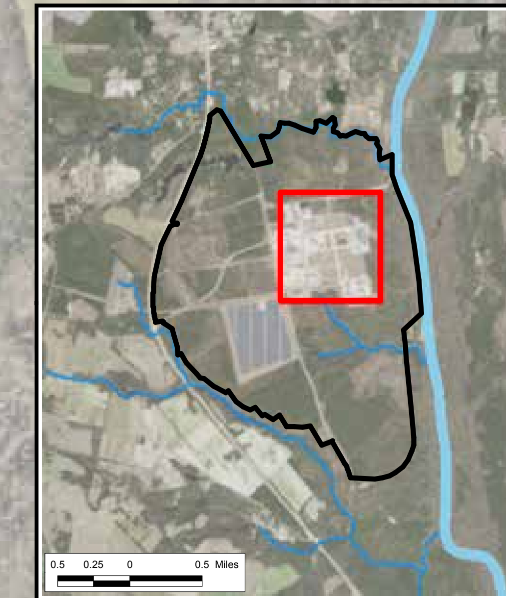
Figure 5-3

Raleigh | October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_SurfaceWaterBodies.mxd Last Revised: 10/30/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US





Legend

- Nearby Tributary
- Site Boundary
- Electric Lines
- Fiber Optic Lines
- Fire and Natural Gas Lines
- Sewers
- Water Lines

Notes:
1. Utilities map was last updated on September 24, 2019. Map is maintained by KBR Inc.
2. Additional underground tanks will be added to this map when identified. Other updates may also be added to this map as additional information is provided.
3. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
4. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

500 250 0 500 Feet

Identified Underground Structures

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Geosyntec consultants

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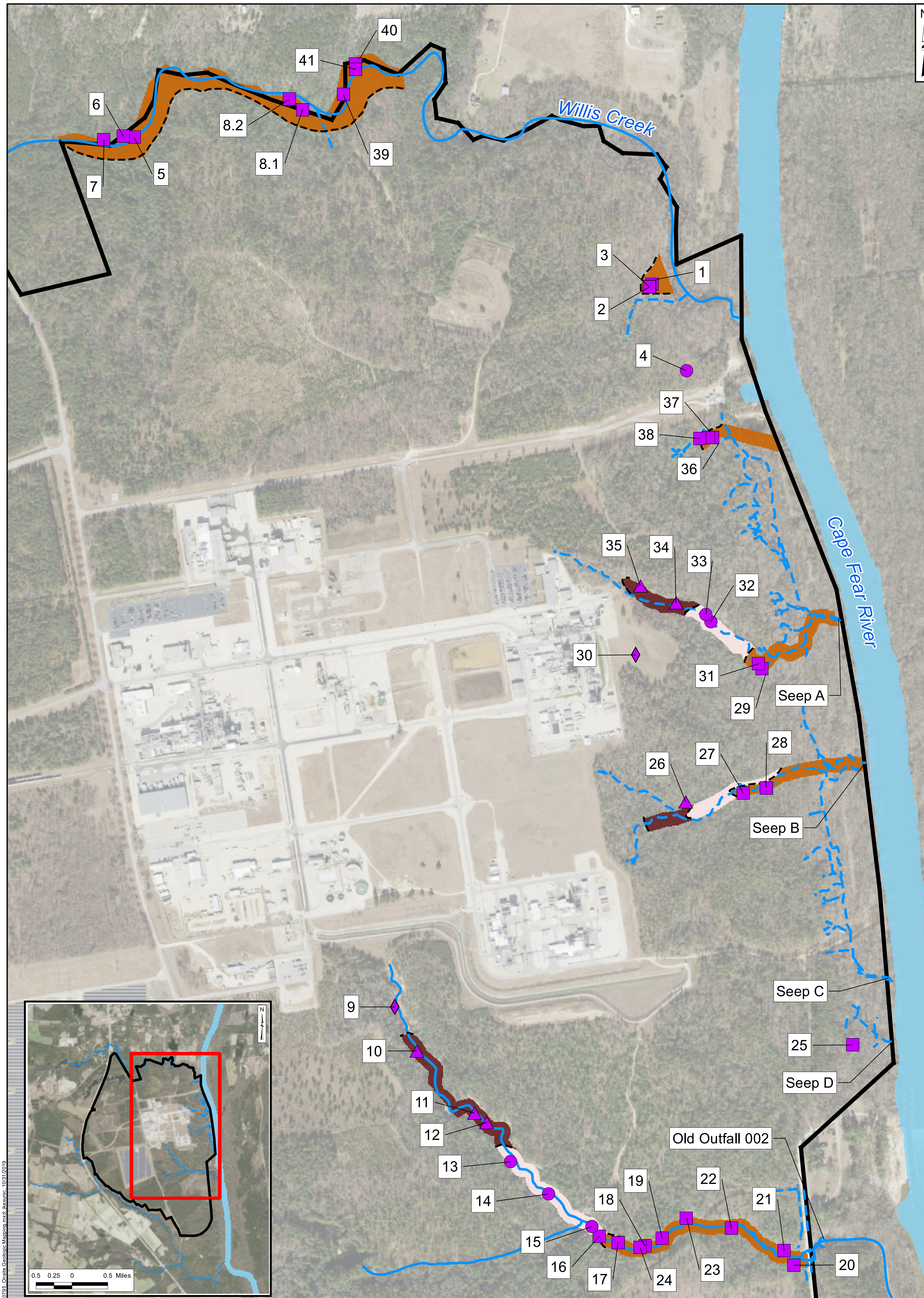
Figure

5-4

Raleigh | October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_Underground Structures.mxd Last Revised: 10/30/2019 Author: ikasunic Data/PRJ/Projects/TR0795/Database and GIS/Illustrator/Onsite and Offsite Assessment Report/Subsurface on site/TR0795_Subsurface Structures on Site.ai

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Station Locations

- Perched Zone
- Perched Clay
- Surficial
- Black Creek Confining Unit

- Inferred Lithologic Contacts
- Observed Seep
- Nearby Tributary
- Site Boundary

Observed Exposed Lithologies

- Black Creek Confining Unit
- Surficial
- Perched Zone

Notes:
1. Station Locations correspond to locations where outcrop exposures were visible and safely accessible. Additional information provided in Table 6-1.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_Onsite Geologic Mapping.mxd; jkasunic; 10/31/2019

1,000 500 0 1,000 Feet

Summary of Geologic Mapping Observations

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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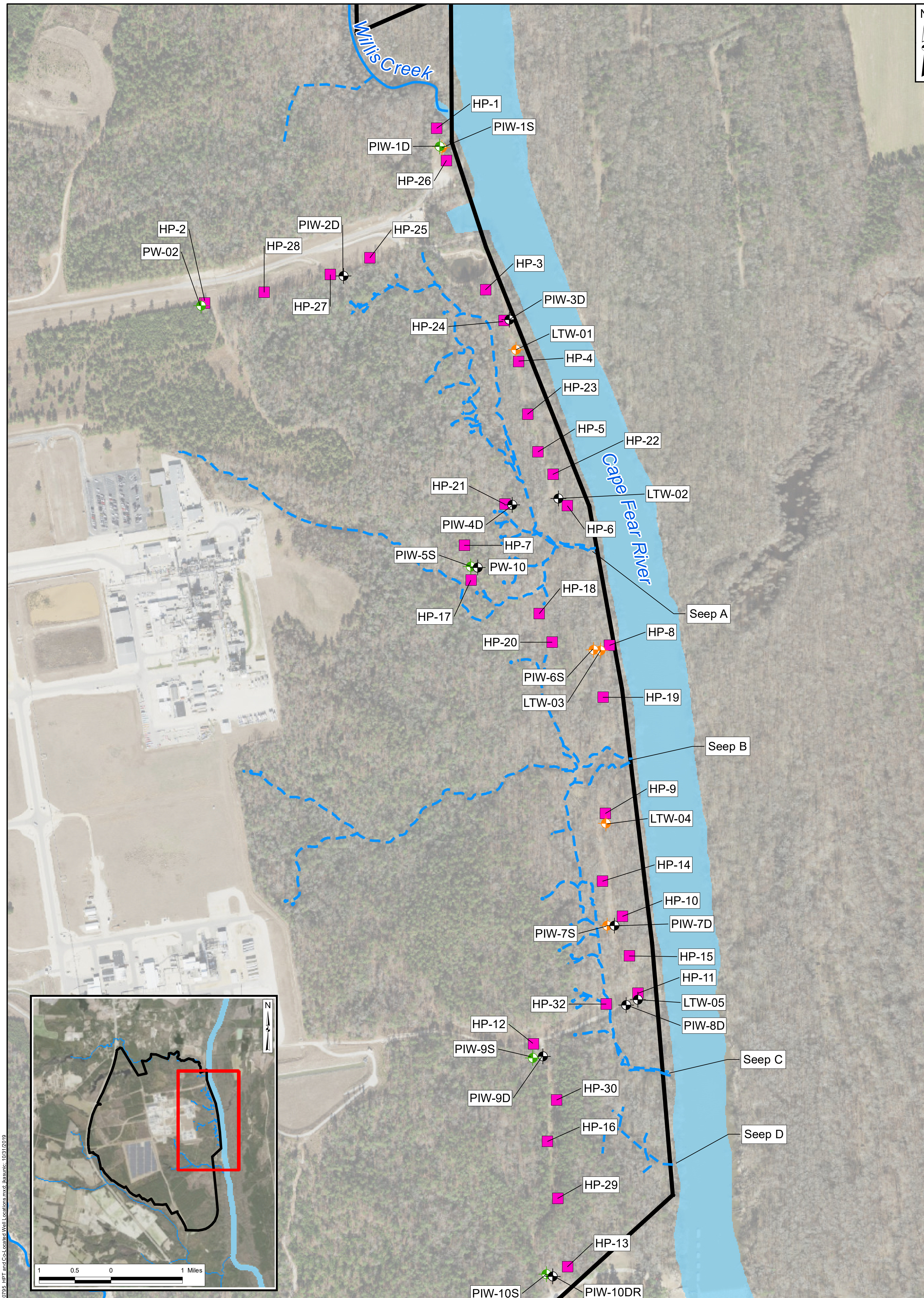
Raleigh | October 2019

Figure 6-1



Legend

Well Type

- Surficial Aquifer
- Floodplain Deposits
- Black Creek Aquifer
- HPT/EC Boring
- Observed Seep
- Nearby Tributary
- Site Boundary

Notes:

HPT - Hydraulic Profiling Tool

EC - Electrical Conductivity

1. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map may not exactly reflect their true geographic coordinates.
2. HP- locations were not surveyed and considered approximate.
3. PIW and PW-well locations were sureyed by a licensed North Carolina Surveyor.
4. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
5. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

500 250 0 500 Feet

HPT and Well Locations

Chemours Fayetteville Works, North Carolina

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Figure

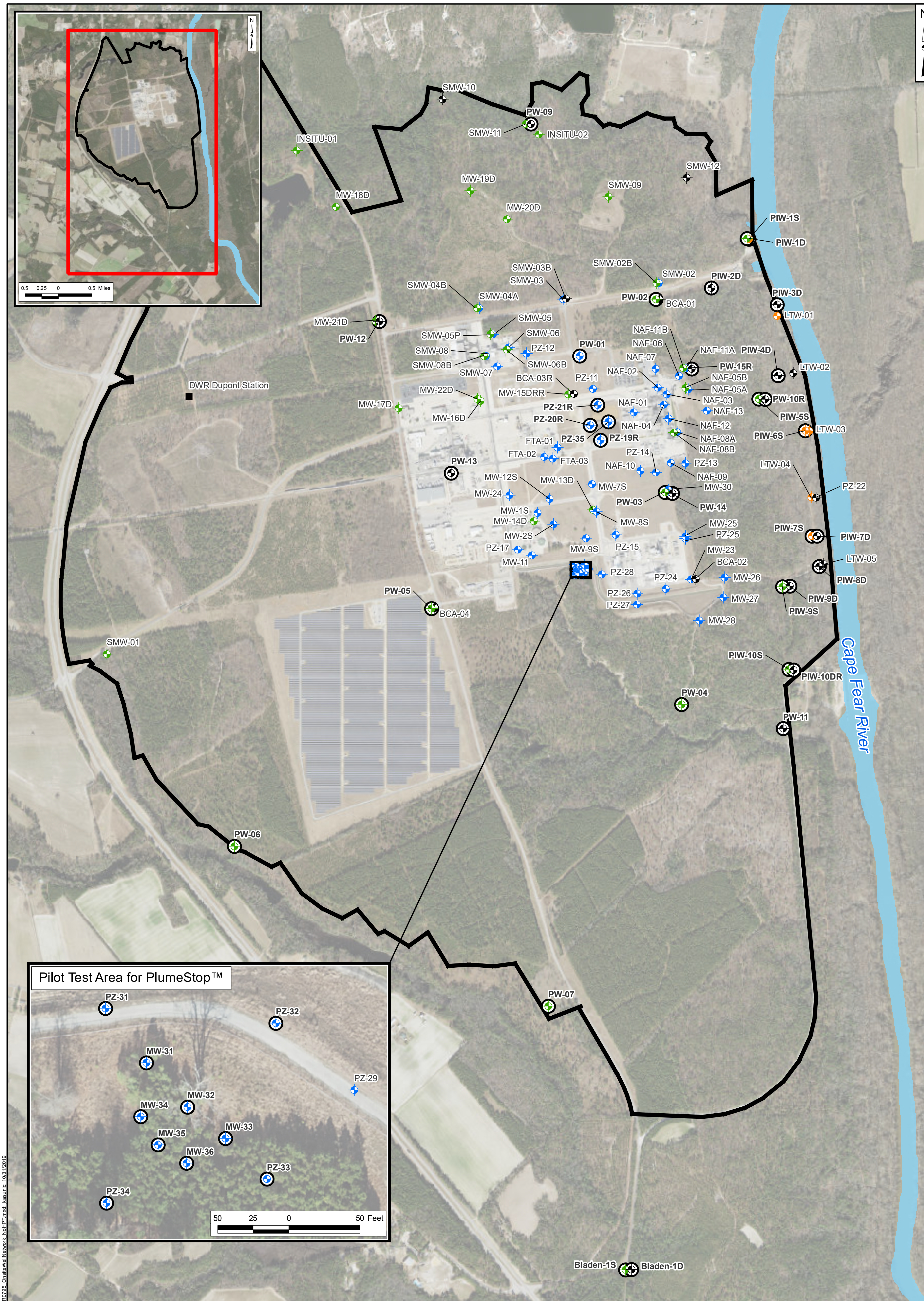
6-2

Raleigh

October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_HPT and Co-Located Well Locations.mxd; ikasunic; 10/31/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Perched Zone	DWR Dupont Station (V42V) Well Cluster
Surficial Aquifer	2019 Installed Wells
Floodplain Deposits	Site Boundary
Black Creek Aquifer	

1,000 500 0 1,000 Feet

Notes:
1. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map do not reflect their true geographic coordinates.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Onsite Monitoring Well Network

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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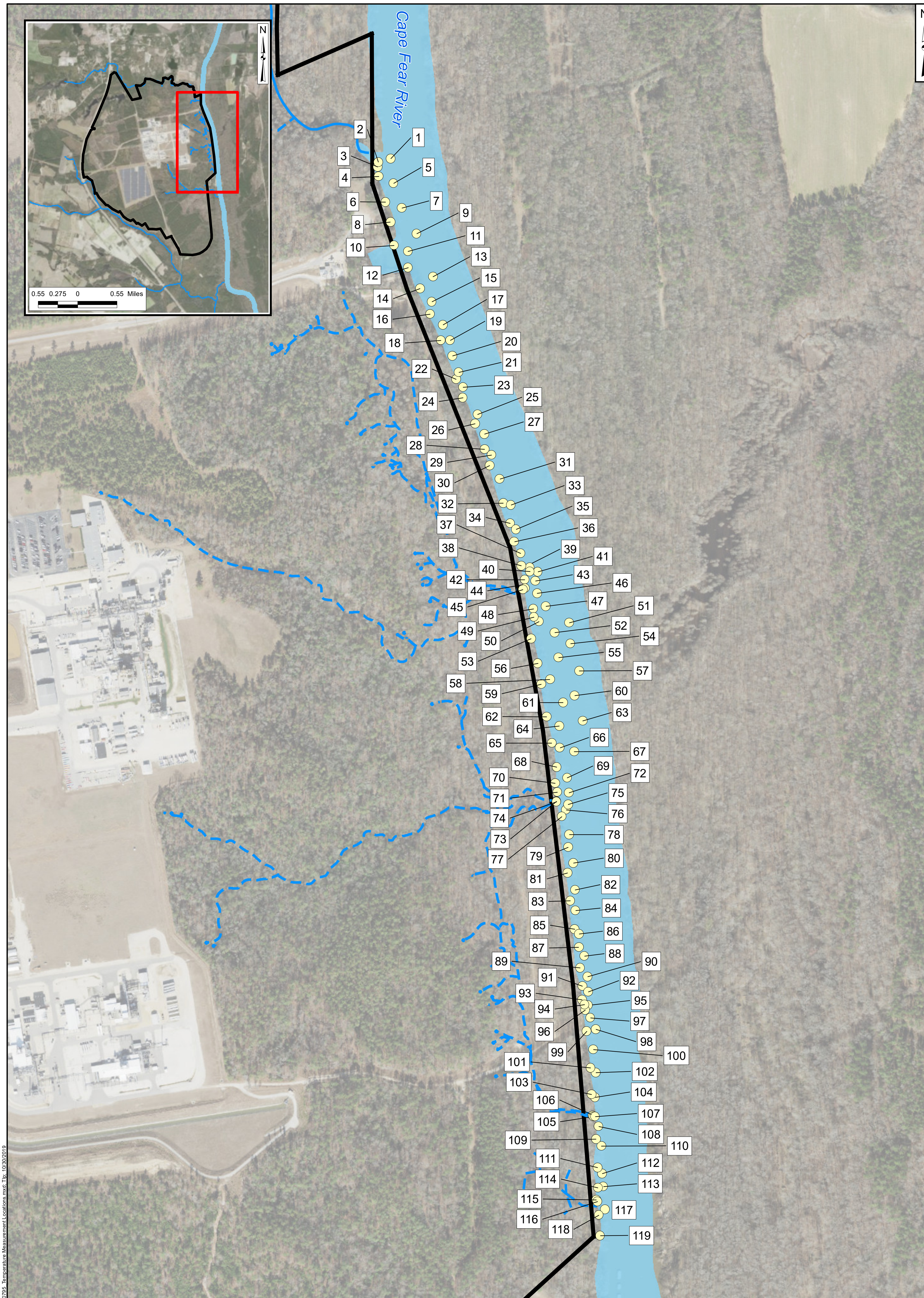
Figure 6-3

Raleigh | October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_OnsiteWellNetwork_NoHP.mxd; kasuric; 10/31/2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

109 Temperature Measurement Location

Observed Seep

Site Boundary

500 250 0 500 Feet

Cape Fear River Survey - Temperature Measurement Locations

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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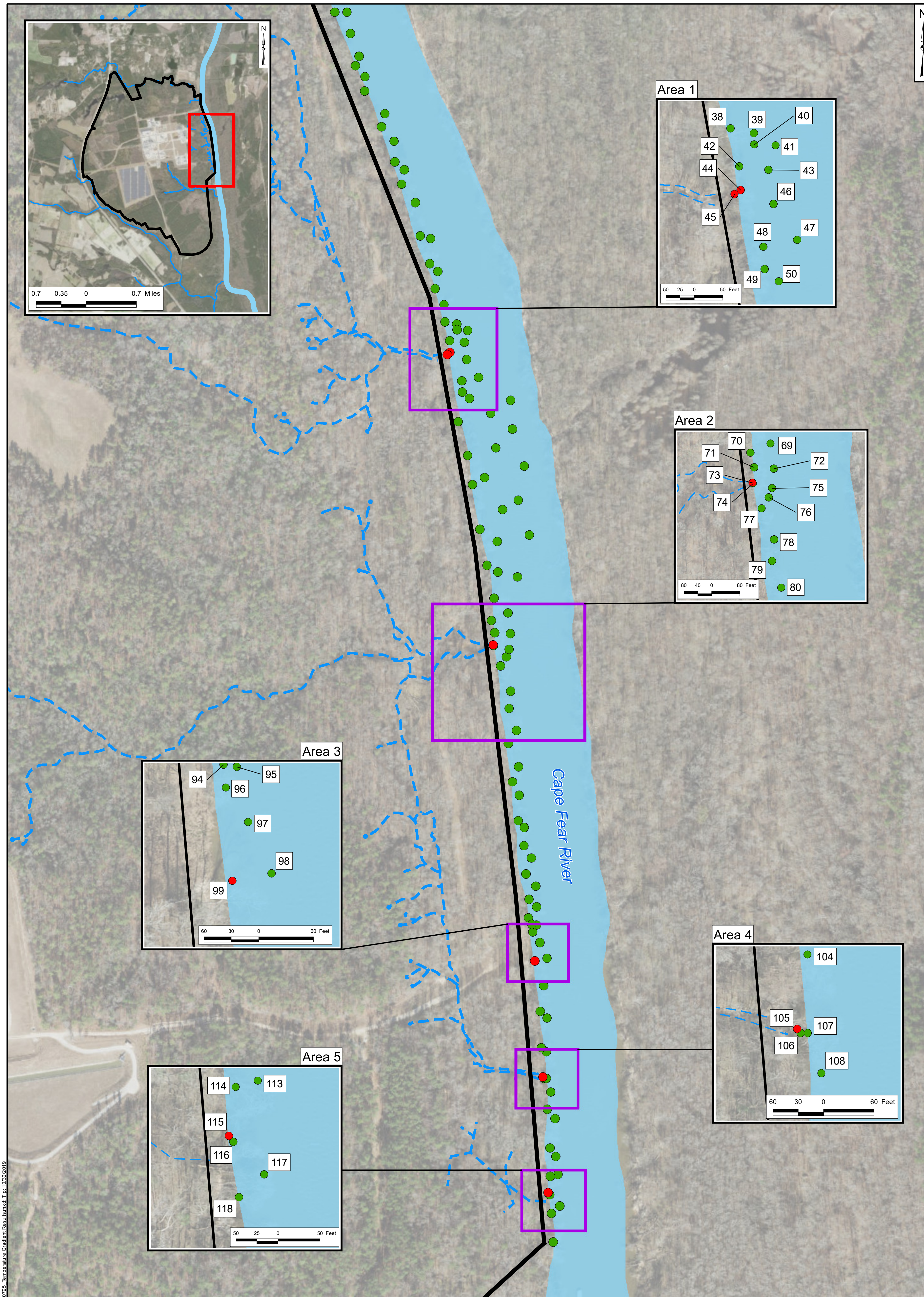
Figure 6-4

Raleigh | October 2019

Notes:
1. Temperature measurements were collected at locations west of the thalweg from August 5 to 9, 2019.
2. Location of thalweg was estimated in the field based on field measurements of maximum depth using a depth finder.
3. All samples were located in the Cape Fear River. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_Temperature Measurement Locations.mxd; Tlp; 10/30/2019



Legend

Temperature difference between porewater and 6 inches above sediment

- 0 - 0.5 °C
- 0.5 - 6.0 °C

- Observed Seep
- Nearby Tributary
- Site Boundary
- Area of Observed Temperature Differential > 0.5 °C

Notes:
1. Temperature measurements were collected at locations west of the thalweg from August 5 to 9, 2019.
2. Location of thalweg was estimated in the field based on field measurements of maximum depth using a depth finder.
3. All samples were located in the Cape Fear River. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

400 200 0 400 Feet

Temperature Gradient Results

Chemours Fayetteville Works, North Carolina

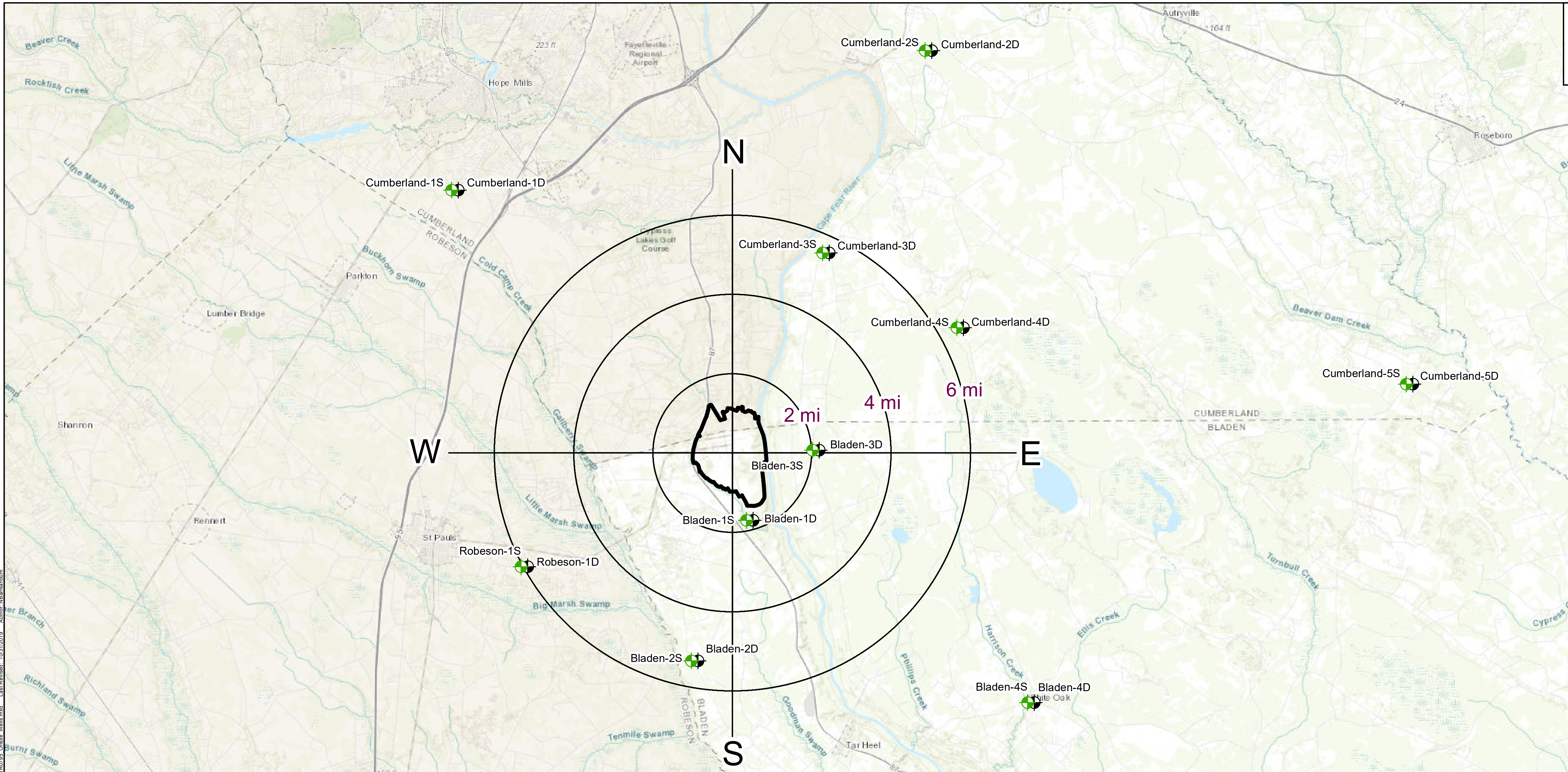
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh	October 2019

Figure 6-5

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_Temperature Gradient Results.mxd; Tlp; 10/30/2019



Legend

Well Type

Black Creek Aquifer

Surficial Aquifer

Site Boundary

Notes:

1. Black lines represent cardinal directions (N, E, S, W)
2. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map do not reflect their true geographic coordinates.
3. Basemap sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

2 1 0 2 Miles

Offsite Monitoring Wells

Chemours Fayetteville Works, North Carolina

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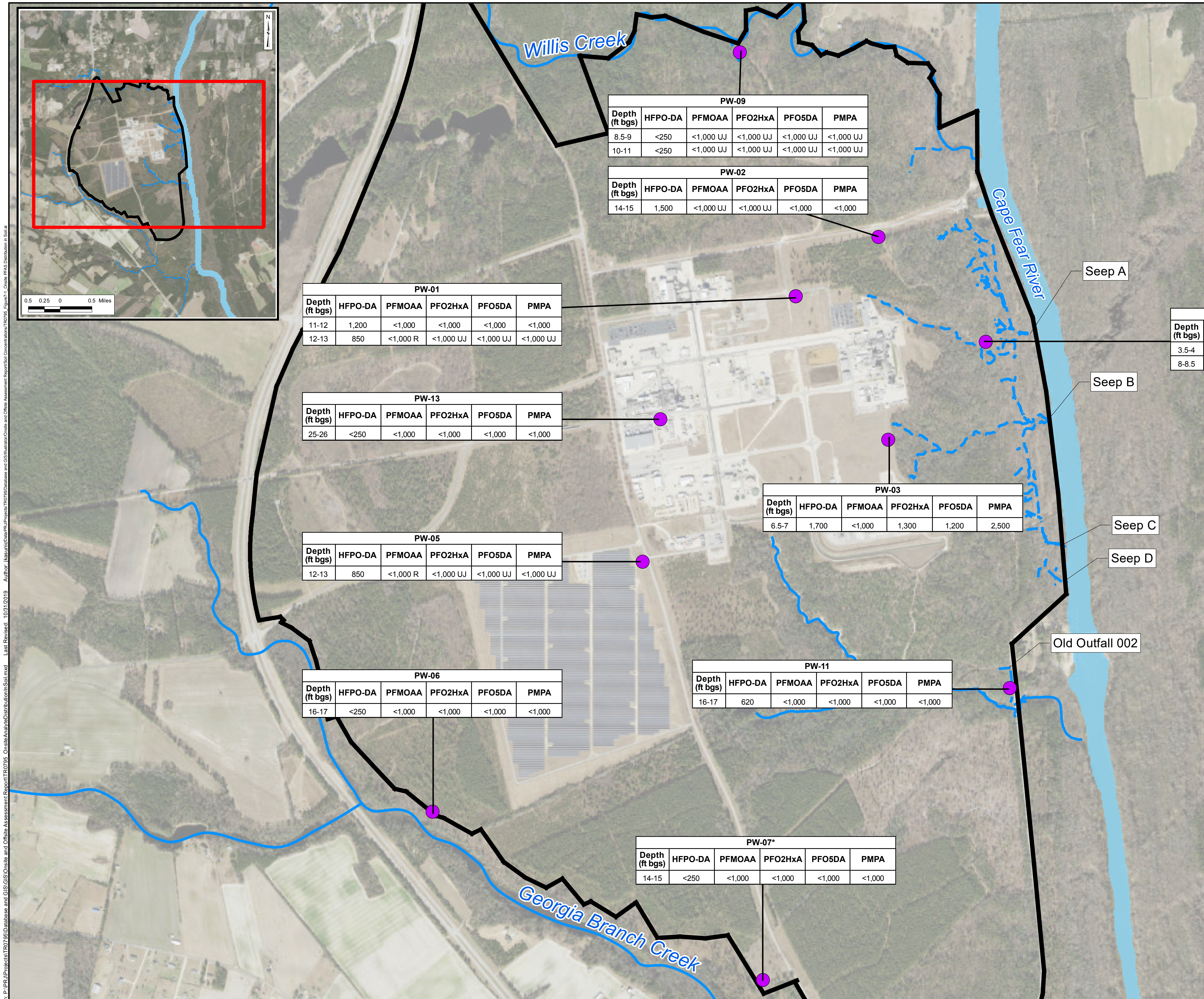
Figure

6-6

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



PW-09

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
8.5-9	<250	<1,000 UJ	<1,000 UJ	<1,000 UJ	<1,000 UJ
10-11	<250	<1,000 UJ	<1,000 UJ	<1,000 UJ	<1,000 UJ

PW-02

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
14-15	1,500	<1,000 UJ	<1,000 UJ	<1,000	<1,000

PW-01

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
11-12	1,200	<1,000	<1,000	<1,000	<1,000
12-13	850	<1,000 R	<1,000 UJ	<1,000 UJ	<1,000 UJ

PW-10**

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
3.5-4	570	<1,000	<1,000	1,260 U	<1,000
8-8.5	28,000	7,300	10,000 J	5,200	27,000 J

PW-13

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
25-26	<250	<1,000	<1,000	<1,000	<1,000

PW-03

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
6.5-7	1,700	<1,000	1,300	1,200	2,500

PW-05

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
12-13	850	<1,000 R	<1,000 UJ	<1,000 UJ	<1,000 UJ

PW-11

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
16-17	620	<1,000	<1,000	<1,000	<1,000

PW-06

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
16-17	<250	<1,000	<1,000	<1,000	<1,000

PW-07*

Depth (ft bgs)	HFPO-DA	PFMOAA	PFO2HxA	PFO5DA	PMPA
14-15	<250	<1,000	<1,000	<1,000	<1,000

Legend

- Soil Sample Location
- Observed Seep
- Nearby Tributary
- Site Boundary

Notes:
All measurements are in ng/kg (nanograms per kilogram).
< - Analyte not detected above associated reporting limit.
J - Analyte detected. Reported value may not be accurate or precise.
UJ - Analyte not detected. Reporting limit may not be accurate or precise.
* Results from the field duplicate sample are not shown but results are identical to the parent sample.
**Other analytes were detected, but not shown.
1. Only unsaturated soil samples shown.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,500 750 0 1,500 Feet

Selected PFAS Concentrations in Onsite Soil

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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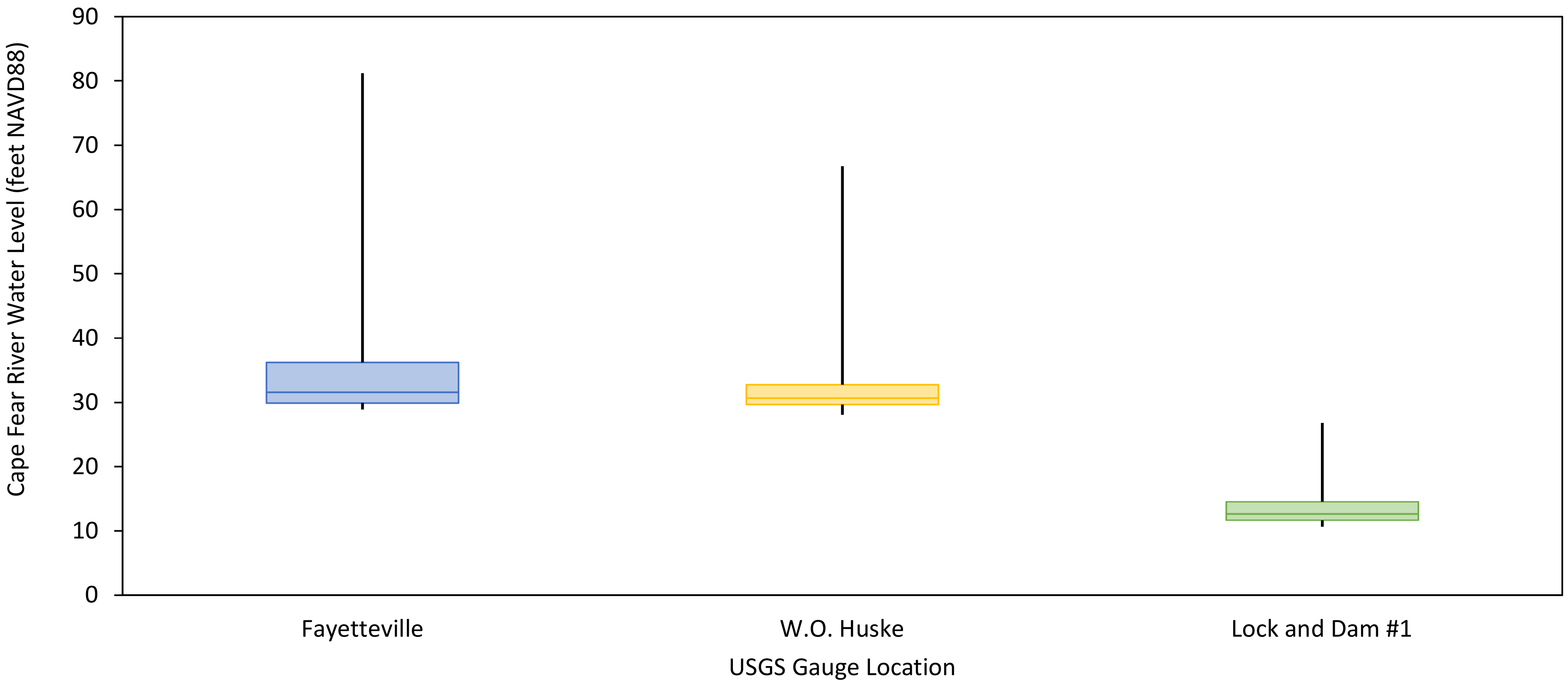
Raleigh | October 2019

Figure 7-1

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Notes

NGVD29 - National Geodetic Vertical Datum of 1929
NAVD88 – North American Vertical Datum of 1988
USGS - United States Geological Survey

1. Figure includes water level data from January 1, 2014 to September 10, 2019.
2. Water level data obtained for USGS gauges at Fayetteville (USGS 02104000), W.O.Huske (USGS 2105500) and Lock and Dam #1 (USGS 02105769) from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24)
3. Measured water level datum converted from feet NGVD29 to feet NAVD88 using National Oceanic and Atmospheric Administration’s VDatum tool available at vdatum.noaa.gov.
4. Line inside boxes represents the median water level.
5. Bottom and top of boxes represent the 25th and 75th percentile water levels, respectively.
6. Extent of whiskers represent range of observed water levels.

Cape Fear River Stage Variation
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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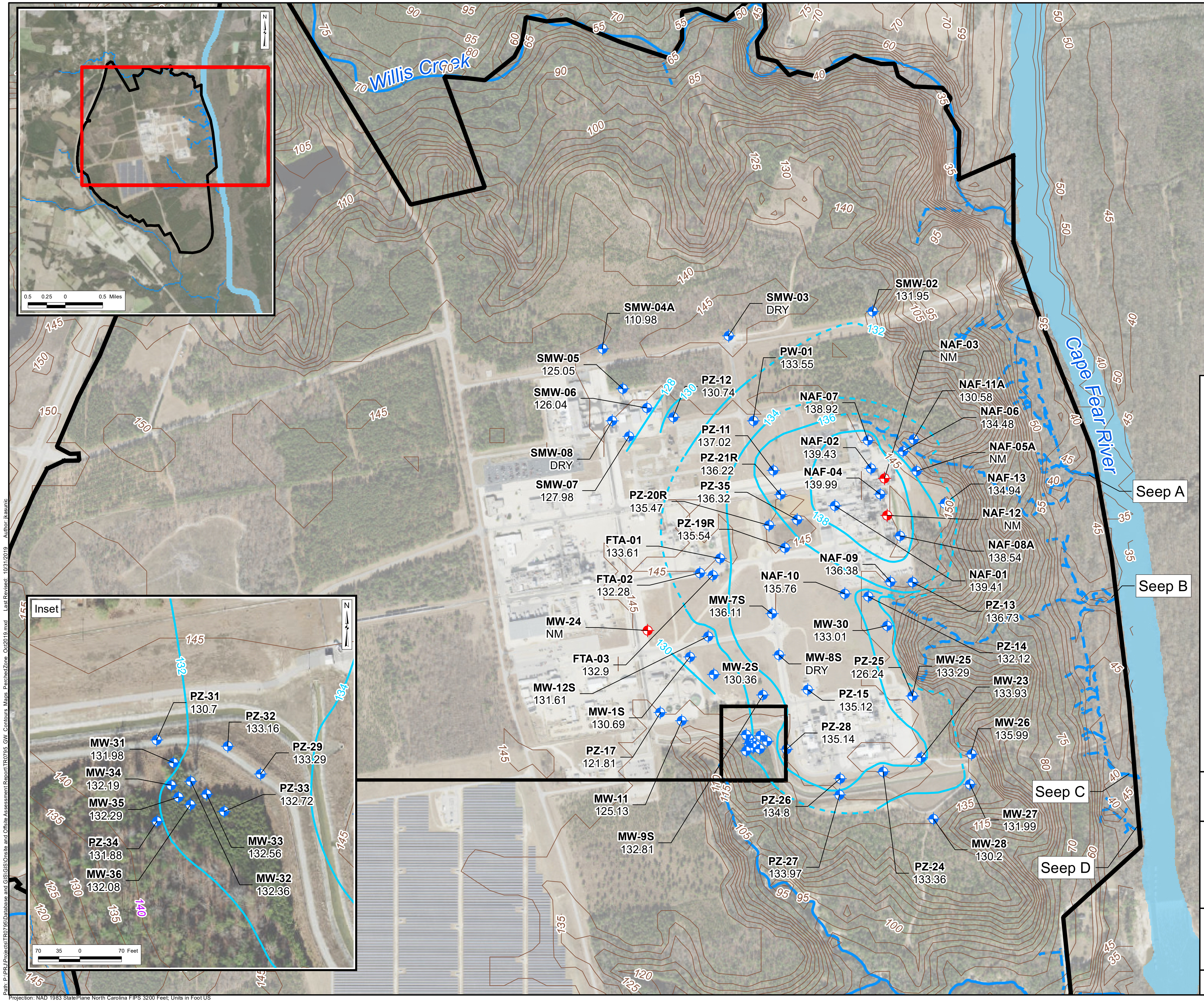
Raleigh | October 2019

Figure **8-1**



Legend

- Monitoring Well
- Monitoring Well Used for Groundwater Extraction
- Groundwater Contours (ft NAVD88) - 2 feet interval
- Potentiometric Surface Inferred
- Observed Seep
- Nearby Tributary
- Ground Surface Elevation Contour (ft NAVD88) - 5 ft interval
- Site Boundary

Notes:
NM - Not measured
ft NAVD88 - feet North American Vertical Datum 1988.
1. Depth to water measurements collected on October 15, 2019 used to generate contours.
2. Groundwater contours were visually interpolated using water level measurements collected 15 October 2019.
3. MW-26 and PZ-25 water levels not used in contouring.
4. Topographic contours from LiDAR Digital Elevation Model ground surface elevations collected by NC Dept. of Public Safety published 18 October 2015.
5. Seep locations identified visually as reported in Geosyntec, 2019. Seeps and Creeks Investigation Report. Chemours Fayetteville Works. 26 August 2019.
6. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
7. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Groundwater Elevation Map - Perched Zone October 2019

Chemours Fayetteville Works, North Carolina

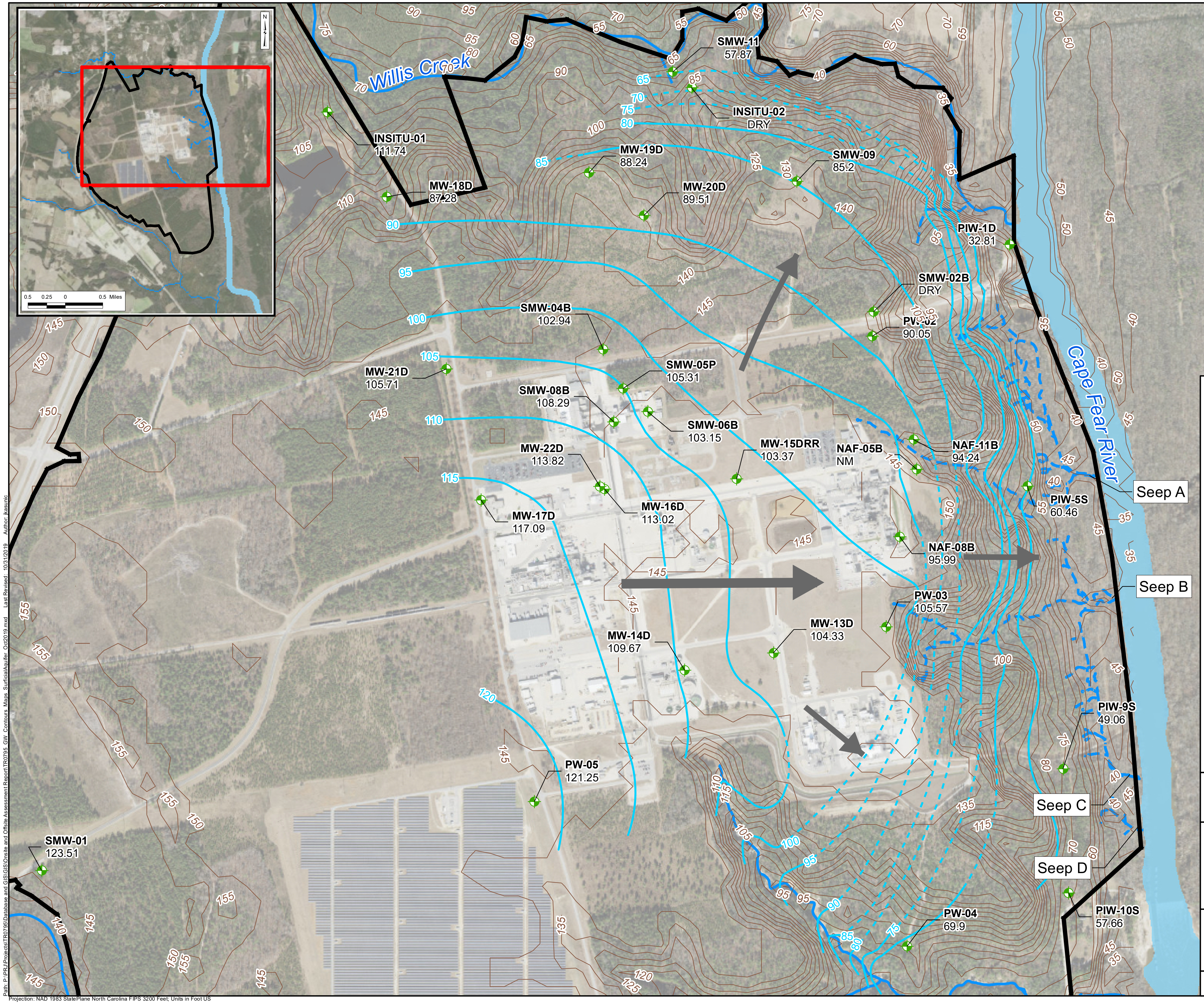
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh	October 2019	Figure 9-1

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

DRAFT; For Discussion Purposes Only.



Legend

- Monitoring Well
- Groundwater Contours (ft NAVD88) - 5 feet interval
- Potentiometric Surface Inferred
- Inferred Groundwater Flow Direction
- Observed Seep
- Nearby Tributary
- Ground Surface Elevation Contour (ft NAVD88) - 5 ft interval
- Site Boundary

Notes:
NM - Not measured
ft NAVD88 - feet North American Vertical Datum 1988.

1. Depth to water measurements collected on October 15, 2019 used to generate contours.
2. Groundwater contours were visually interpolated using water level measurements collected 15 October 2019.
3. Topographic contours from LiDAR Digital Elevation Model ground surface elevations collected by NC Dept. of Public Safety published 18 October 2015.
4. Seep locations identified visually as reported in Geosyntec, 2019. Seeps and Creeks Investigation Report. Chemours Fayetteville Works. 26 August 2019.
5. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
6. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Groundwater Elevation Map - Surficial Aquifer October 2019

Chemours Fayetteville Works, North Carolina

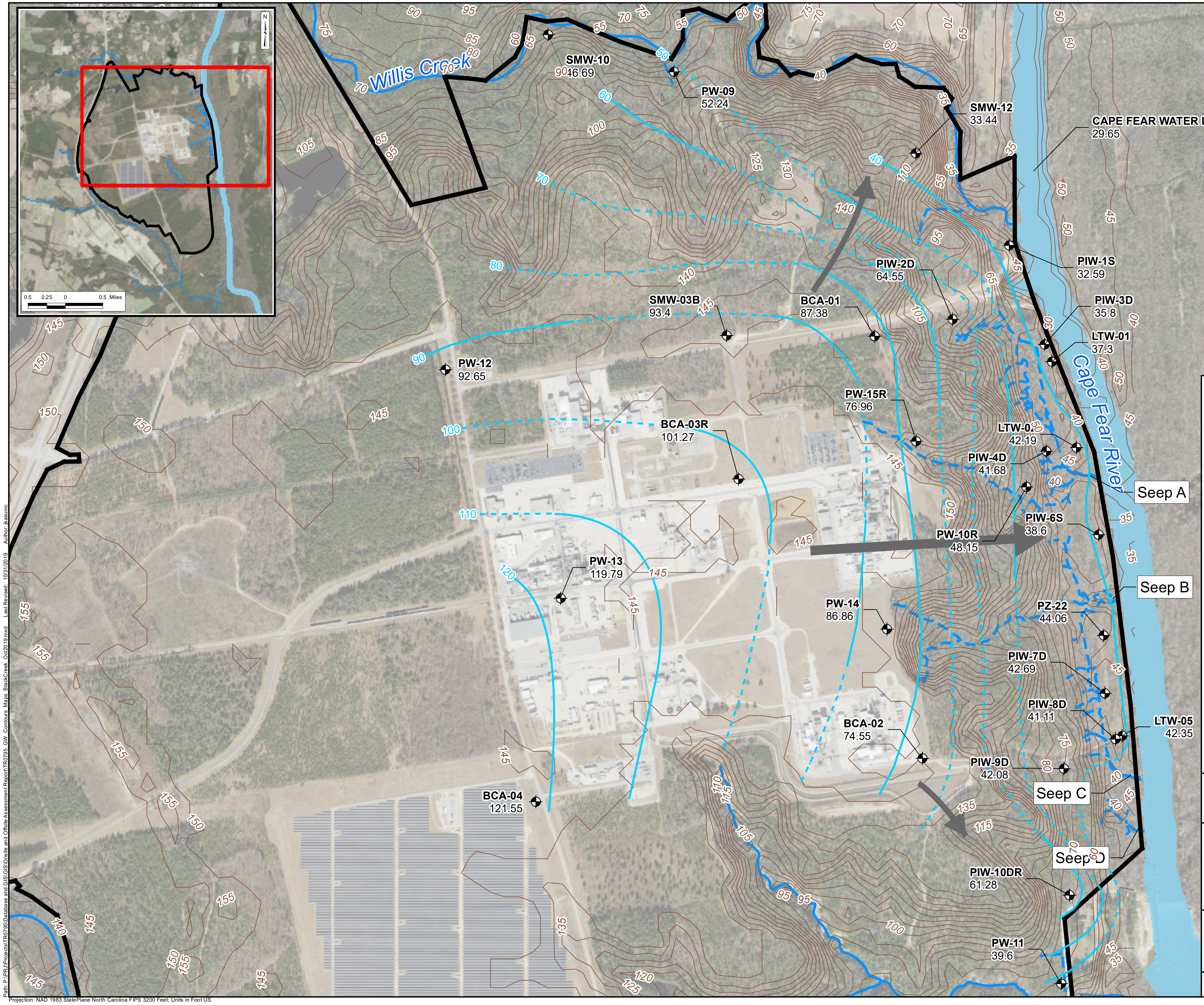
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 9-2

DRAFT; For Discussion Purposes Only.



Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

Legend

- Monitoring Well
- Groundwater Contours (ft NAVD88) - 10 feet interval
- Potentiometric Surface Inferred
- Inferred Groundwater Flow Direction
- Observed Seep
- Nearby Tributary
- Ground Surface Elevation Contour (ft NAVD88) - 5 ft interval
- Site Boundary

Notes:
ft NAVD88 - feet North American Vertical Datum 1988.
1. Depth to water measurements collected on October 15, 2019 used to generate contours.
2. Groundwater contours were visually interpolated using water level measurements collected 15 October 2019.
3. Cape Fear River water level indicated is median value for October 15, 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-10-23).
4. Topographic contours from LiDAR Digital Elevation Model ground surface elevations collected by NC Dept. of Public Safety published 18 October 2015.
5. Seep locations identified visually as reported in Geosyntec, 2019. Seeps and Creeks Investigation Report. Chemours Fayetteville Works. 26 August 2019.
6. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
6. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Groundwater Elevation Map - Black Creek Aquifer October 2019

Chemours Fayetteville Works, North Carolina

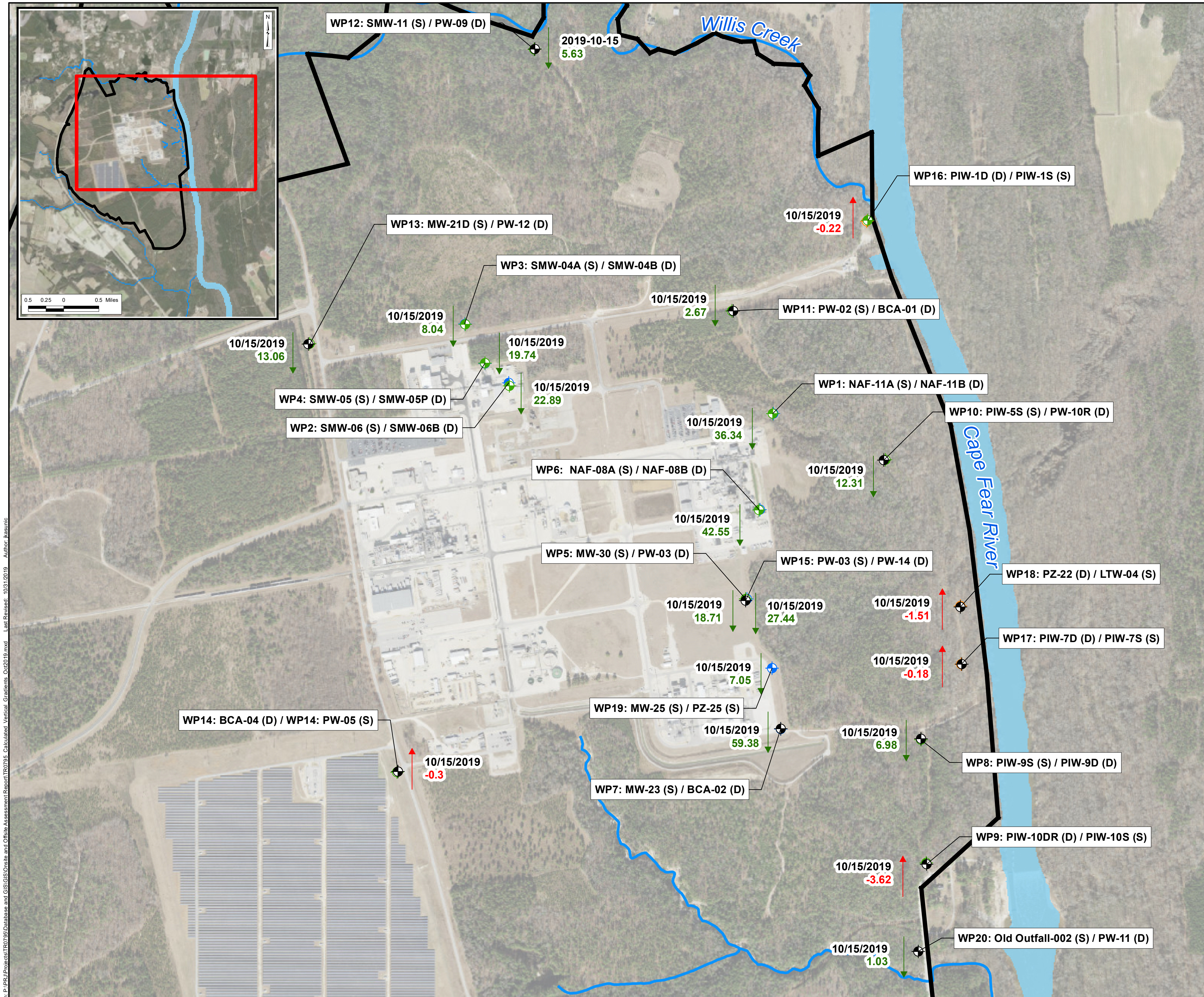
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Figure 9-3

Raleigh | October 2019

DRAFT; For Discussion Purposes Only.



Legend

- Black Creek Aquifer
- Floodplain Deposits
- Perched Aquifer; Perched Zone
- Surficial Aquifer
- Negative Vertical Gradients
- Positive Vertical Gradients
- Nearby Tributary
- Site Boundary

Notes:
1. Positive vertical gradients (i.e. potential for downward flow) are colored in green. Negative vertical gradients (i.e. potential for upward flow) are colored in red.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. WP corresponds to well pair ID listed in Table 9-2.
4. (s) and (d) refers to shallow and deep well of well pair.
5. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Calculated Vertical Gradients Between Selected Stratigraphic Units

Chemours Fayetteville Works, North Carolina

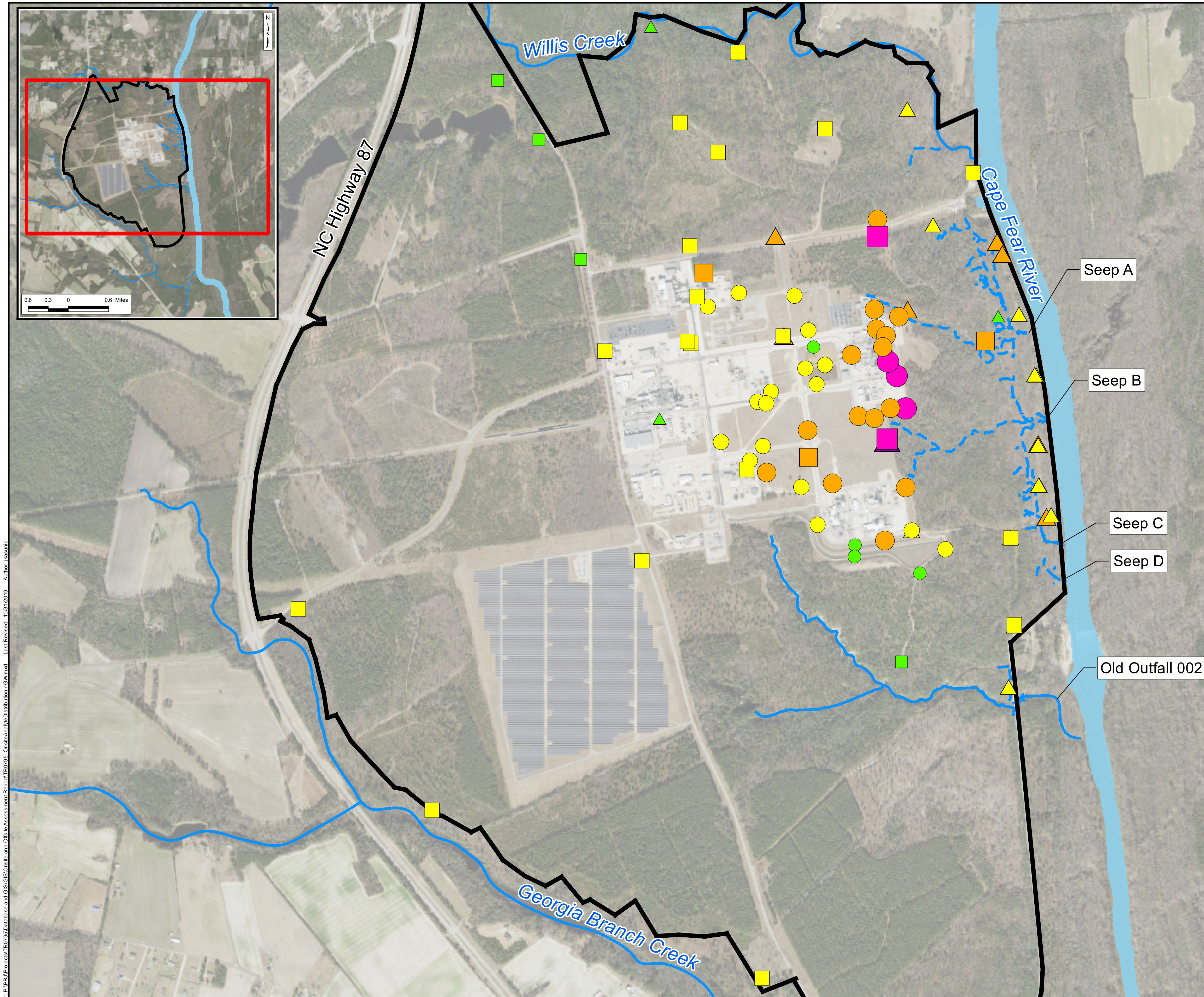
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 9-4

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Concentration (ng/L)	Well Type
< 10	Perched Zone
10 - 100	Surficial Aquifer
100 - 1,000	Black Creek Aquifer / Floodplain Deposits
1,000 - 10,000	Observed Seep
10,000 - 100,000	Nearby Tributary
100,000 - 1,000,000	Site Boundary
> 1,000,000	

Notes:
ng/L - nanograms per liter

1. Samples were collected between June and September 2019.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Onsite PMPA Concentrations in Groundwater

Chemours Fayetteville Works, North Carolina

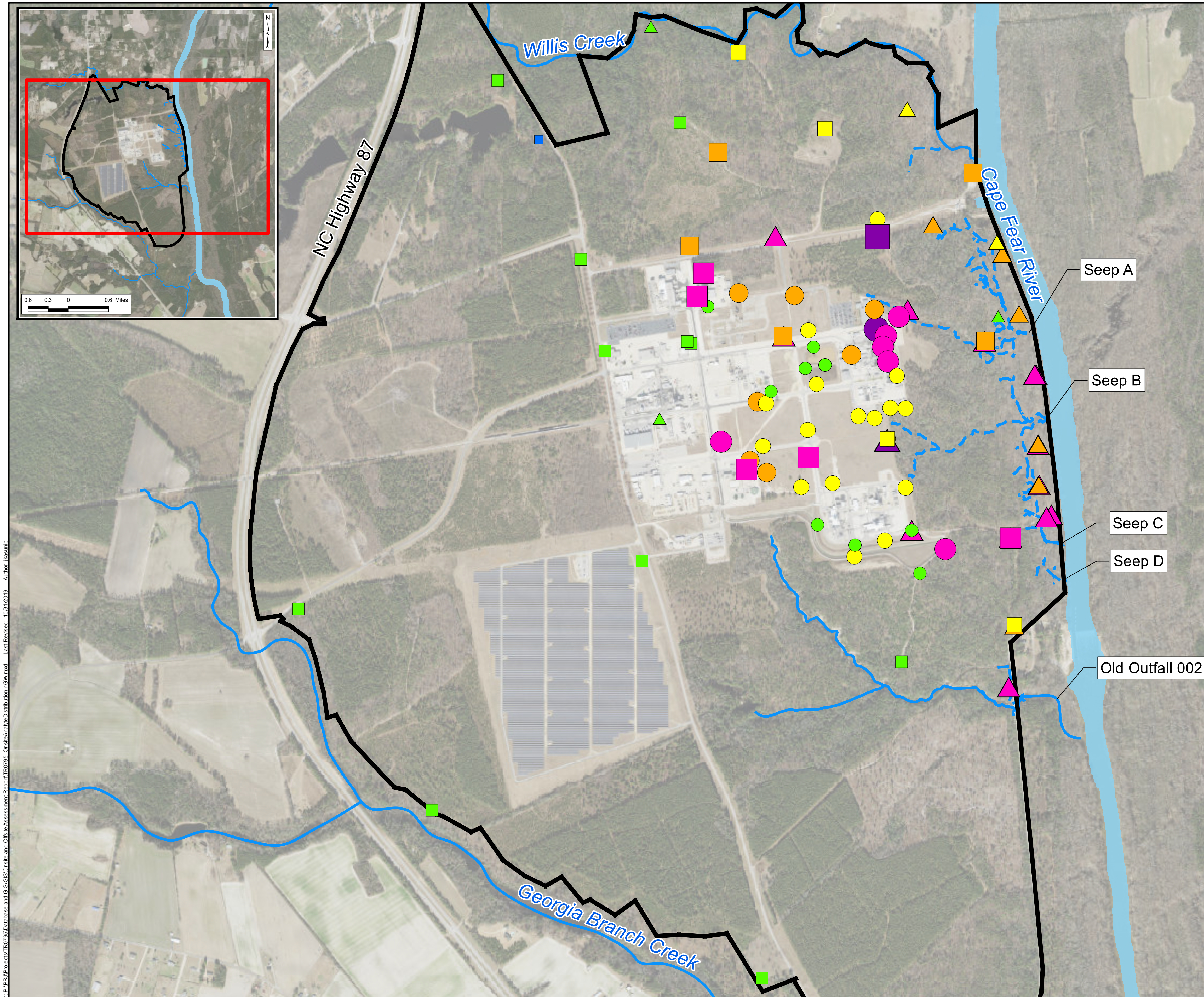
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Figure 9-5

Raleigh | October 2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Concentration (ng/L)
- < 10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- 100,000 - 1,000,000
- > 1,000,000

Well Type
- Perched Zone
- Surficial Aquifer
- Black Creek Aquifer / Floodplain Deposits
- Observed Seep
- Nearby Tributary
- Site Boundary

Notes:
ng/L - nanograms per liter

1. Samples were collected between June and September 2019.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Onsite PFMOAA Concentrations in Groundwater

Chemours Fayetteville Works, North Carolina

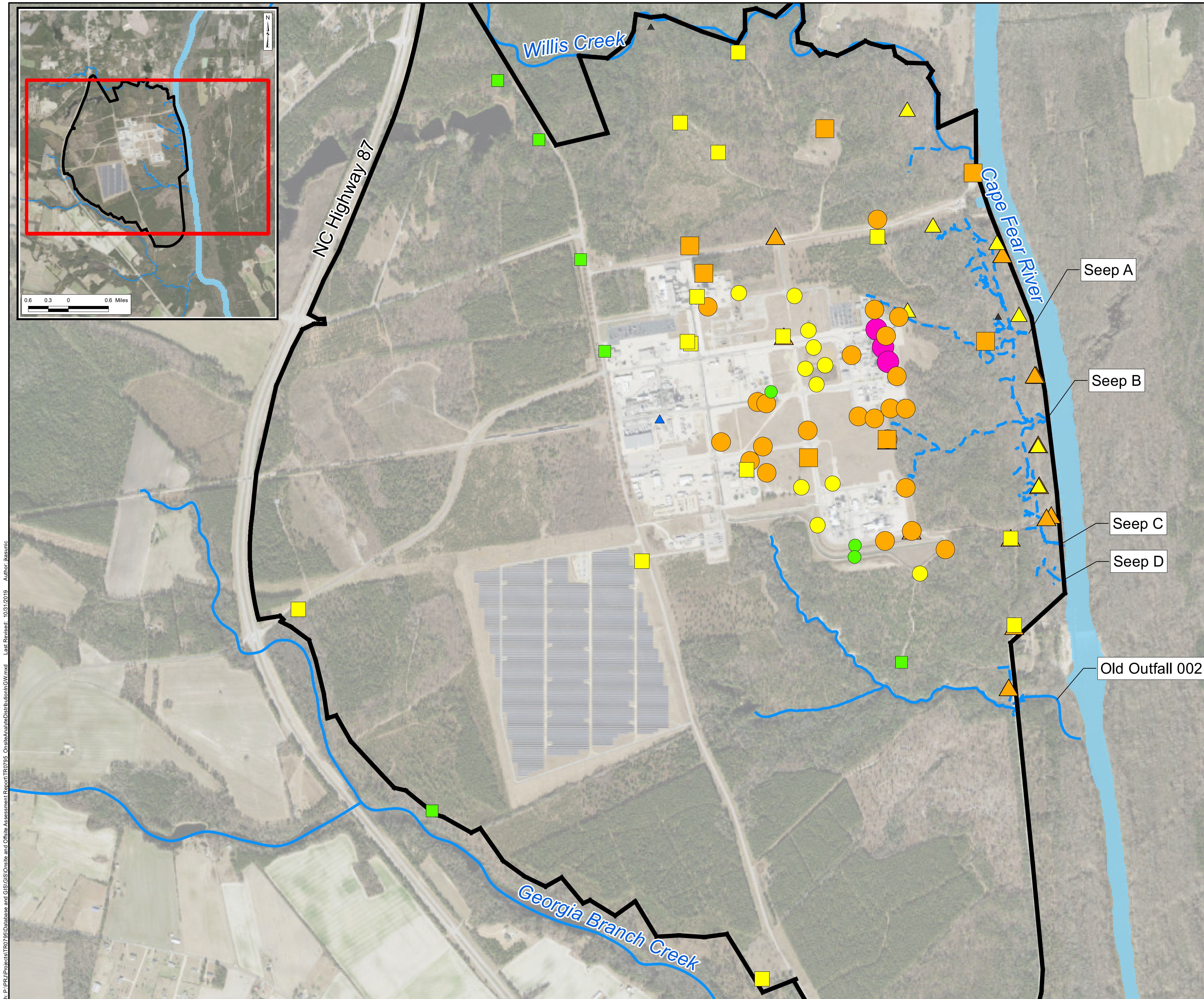
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Figure 9-6

Raleigh | October 2019

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Onsite HFPO-DA Concentrations in Groundwater

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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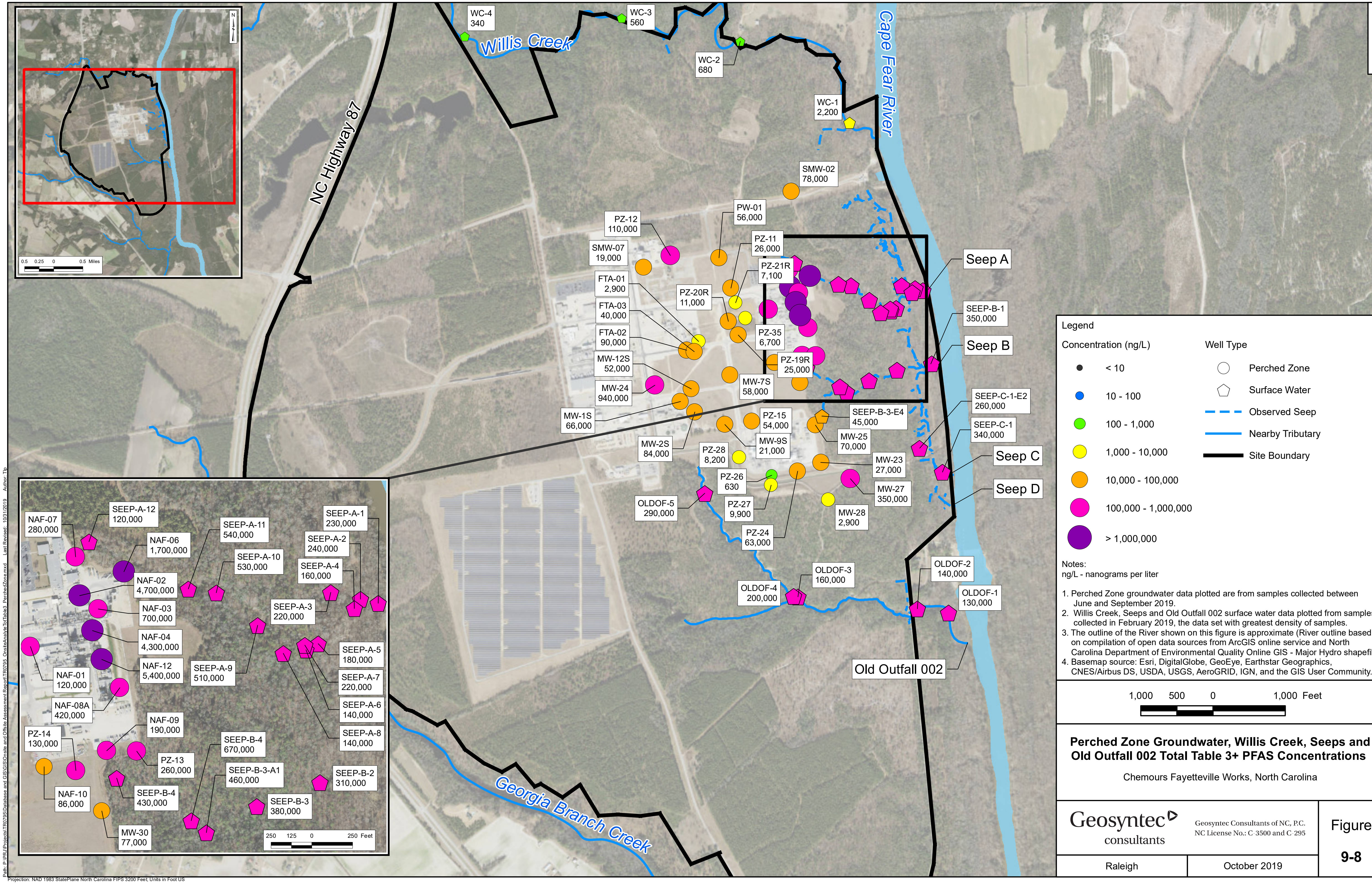
Raleigh | October 2019

Figure 9-7

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_OnsiteAnalyteDistributionInGW.mxd Last Revised: 10/31/2019 Author: jkasunic

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Perched Zone Groundwater, Willis Creek, Seeps and Old Outfall 002 Total Table 3+ PFAS Concentrations

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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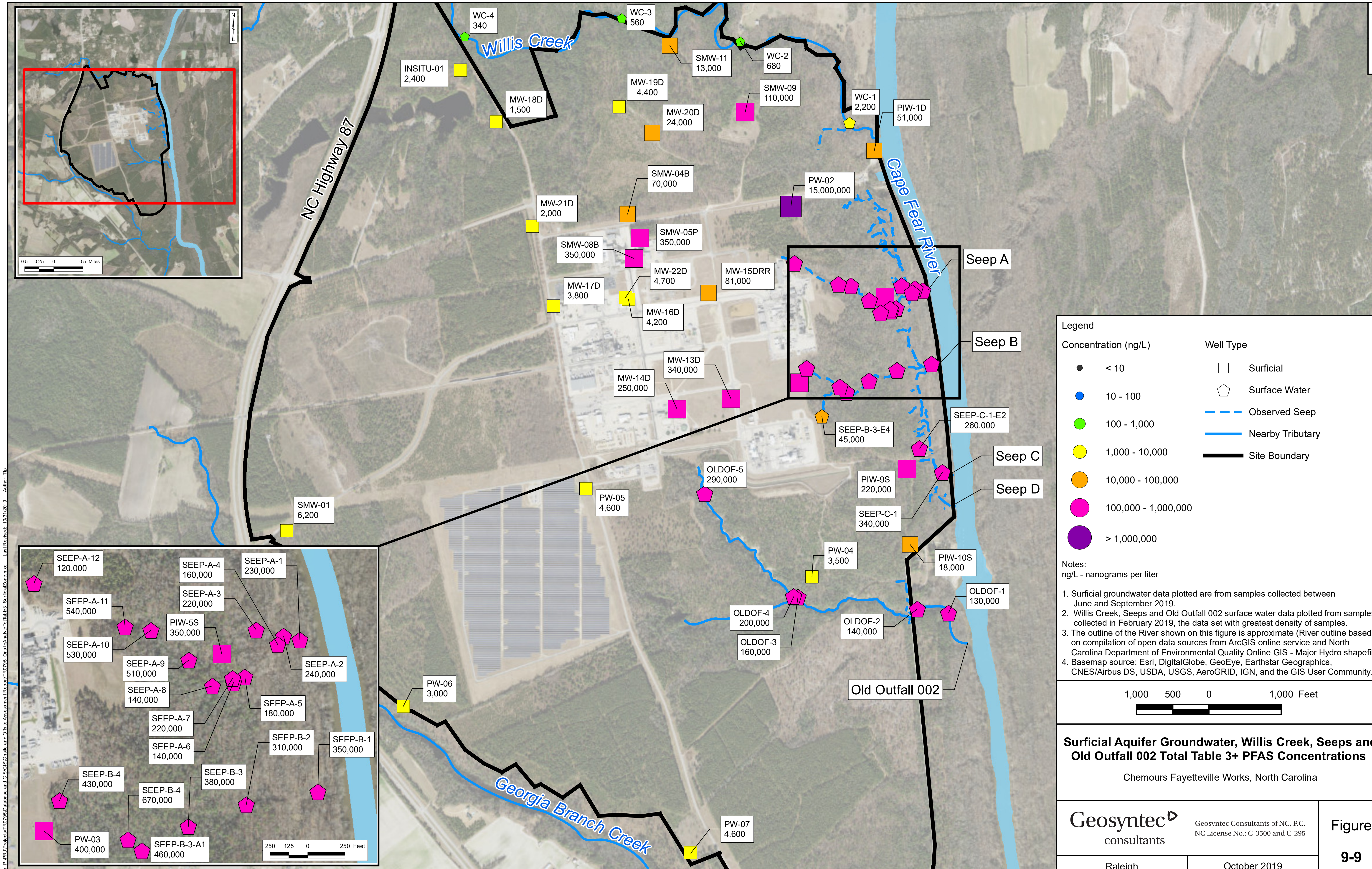
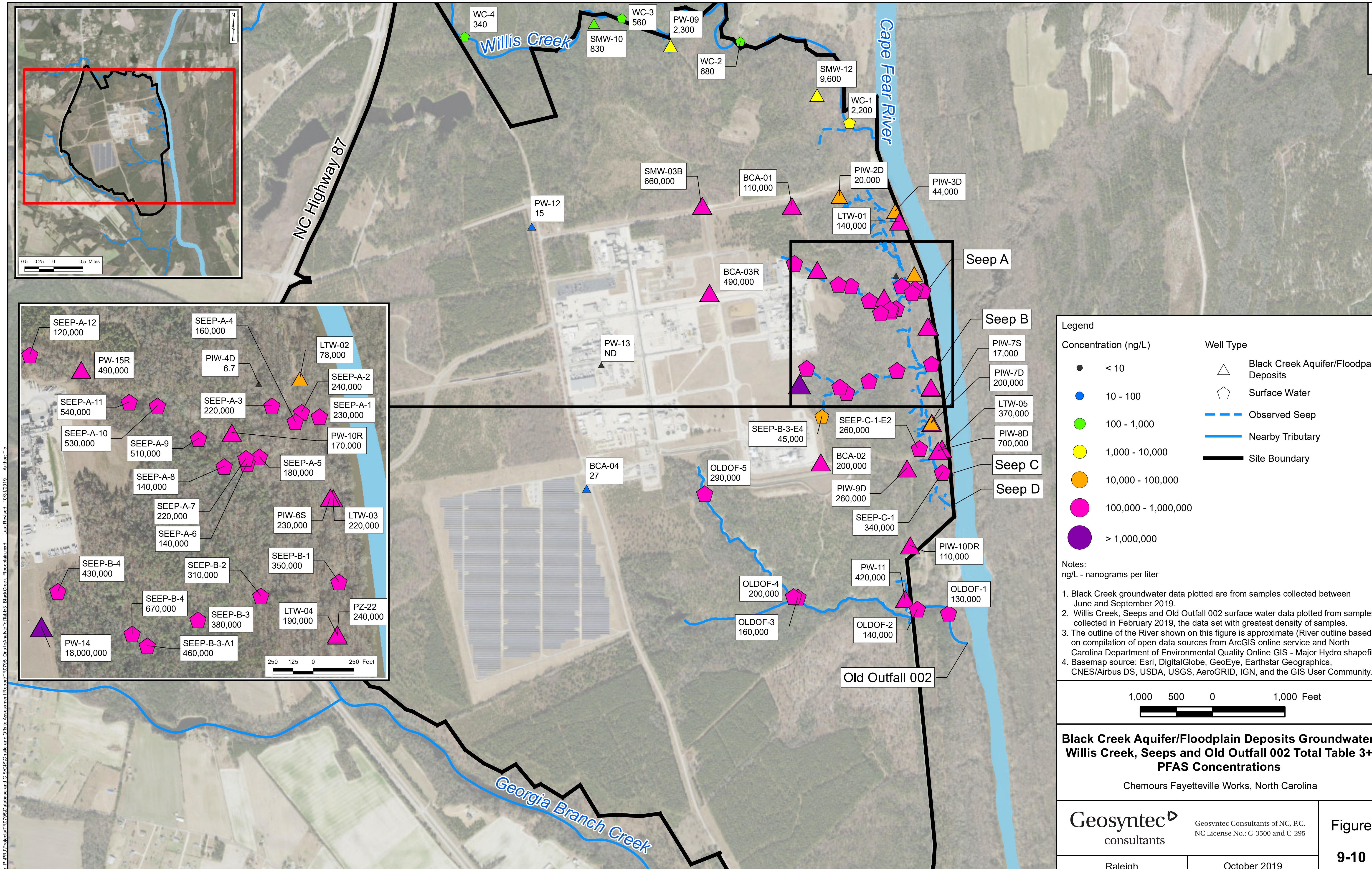
Raleigh | October 2019

Figure 9-8



Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Concentration (ng/L)
- < 10
- 10 - 100
- 100 - 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- 100,000 - 1,000,000
- > 1,000,000

Well Type
- Black Creek Aquifer/Floodplain Deposits
- Surface Water
- Observed Seep
- Nearby Tributary
- Site Boundary

Notes:
ng/L - nanograms per liter

1. Black Creek groundwater data plotted are from samples collected between June and September 2019.
2. Willis Creek, Seeps and Old Outfall 002 surface water data plotted from samples collected in February 2019, the data set with greatest density of samples.
3. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
4. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Black Creek Aquifer/Floodplain Deposits Groundwater, Willis Creek, Seeps and Old Outfall 002 Total Table 3+ PFAS Concentrations

Chemours Fayetteville Works, North Carolina

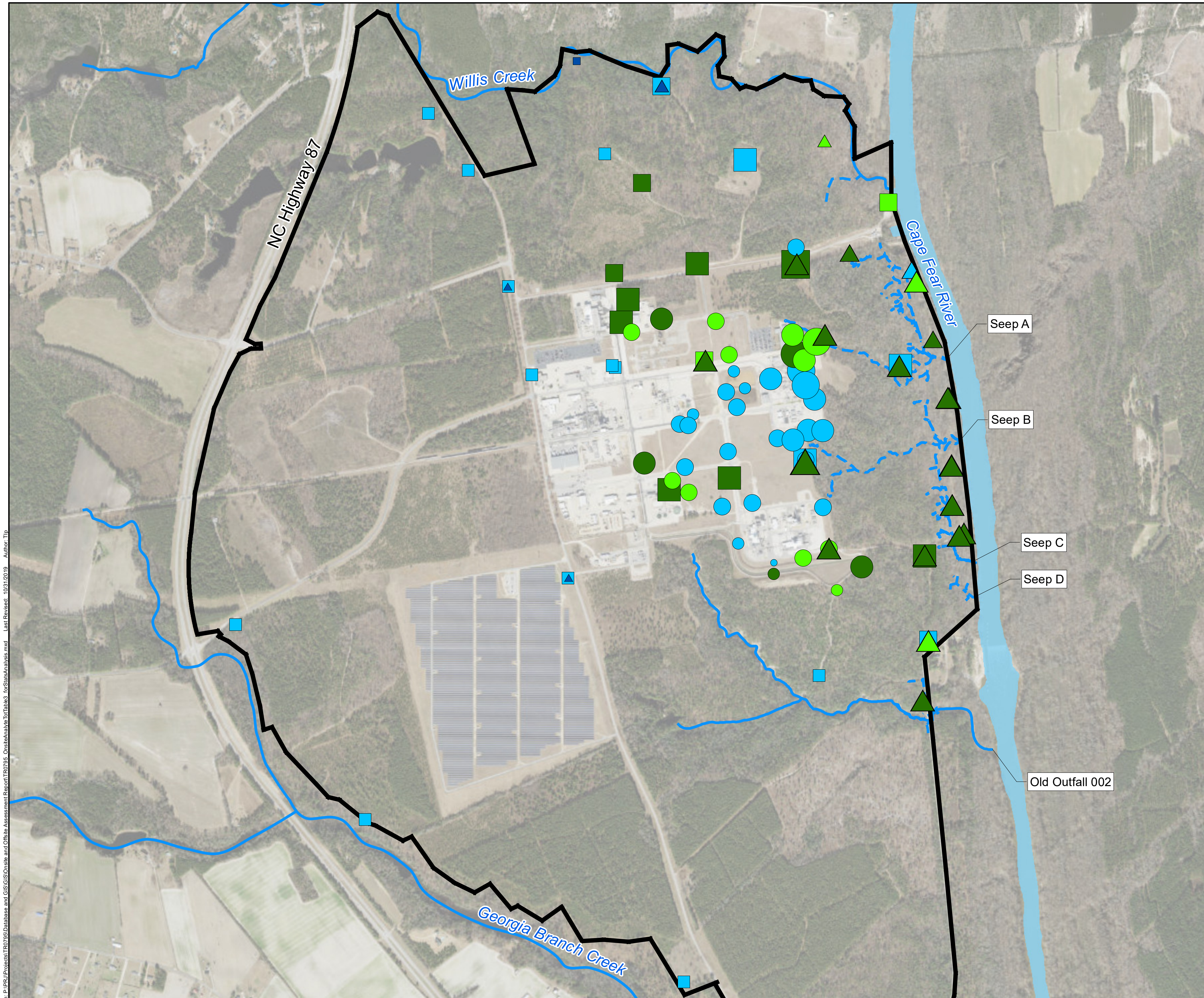
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 9-10

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Concentration (ng/L)

- < 1,000
- 1,000 - 10,000
- 10,000 - 100,000
- 100,000 - 1,000,000
- > 1,000,000

Well Type

- Black Creek/Floodplain Deposits
- Perched Zone
- Surficial

Proposed PFAS Signature

- Aerial - Predominant PMPA
- Aerial - Mixture of PFAS
- Combined Process Water - Predominant PFMOAA
- Combined Process Water - Mixture of PFAS
- Observed Seep
- Nearby Tributary
- Site Boundary

Notes:
ng/L - nanograms per liter

1. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
2. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

1,000 500 0 1,000 Feet

Onsite Spatial Distribution of Proposed PFAS Signatures

Chemours Fayetteville Works, North Carolina

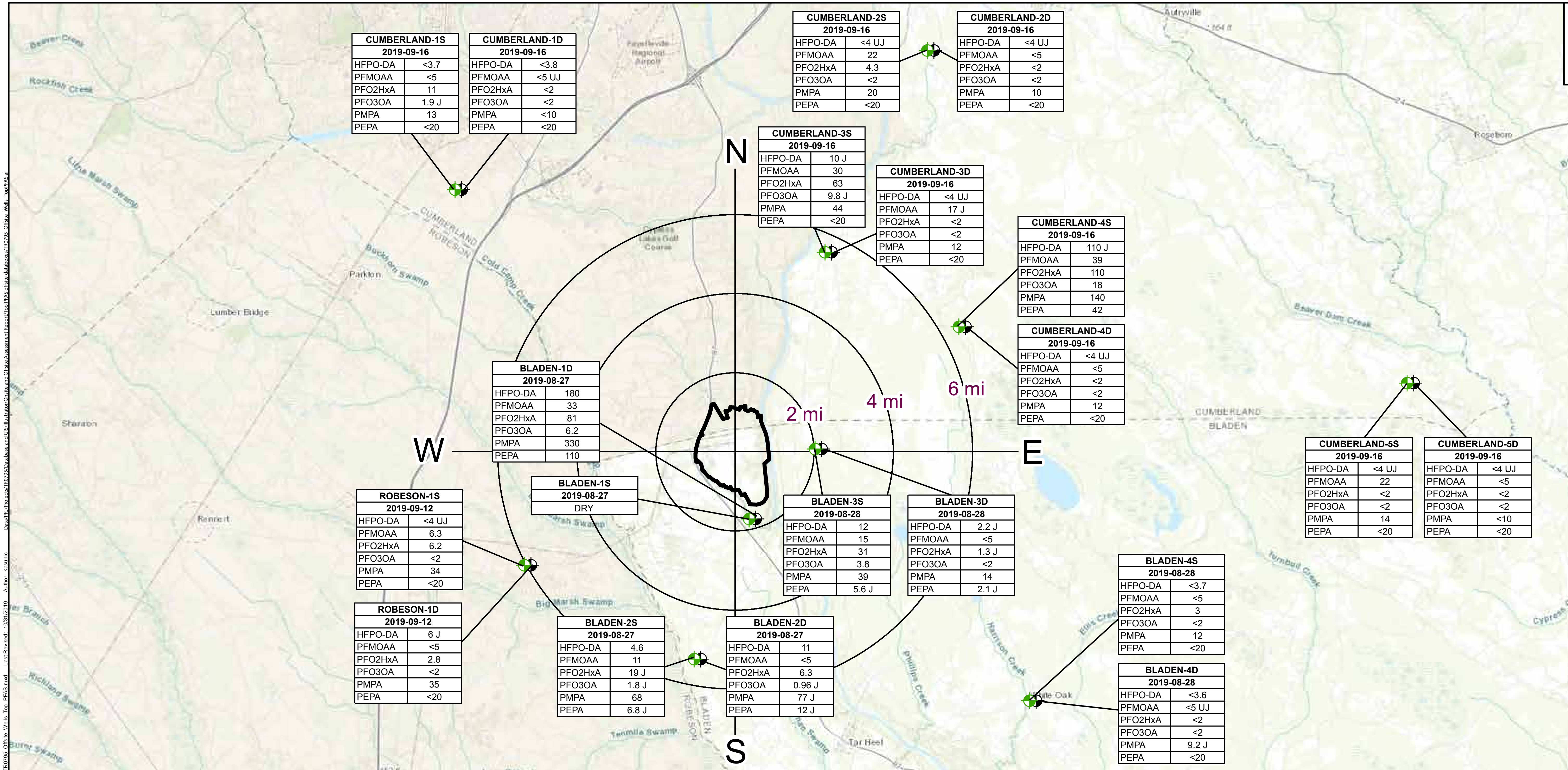
Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 9-11

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Well Type

Black Creek Aquifer

Surficial Aquifer

Site Boundary

Notes:
All measurements are in ng/L (nanograms per litre).
< - Analyte not detected above associated reporting limit.
J - Analyte detected. Reported value may not be accurate or precise.
UJ - Analyte not detected. Reporting limit may not be accurate or precise.
1. Black lines represent cardinal directions (N, E, S, W)
2. Only the six most frequently detected Table 3+ compounds in offsite wells are shown.
3. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map do not reflect their true geographic coordinates.
4. Date indicated is date of sample collection.
5. Table 3+ compounds abbreviations referenced in Table 2-1 of the report.
6. "DRY" indicates well was dry at the time of sampling.
7. Basemap sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

2 1 0 2 Miles

Selected PFAS Concentrations in Offsite Groundwater

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

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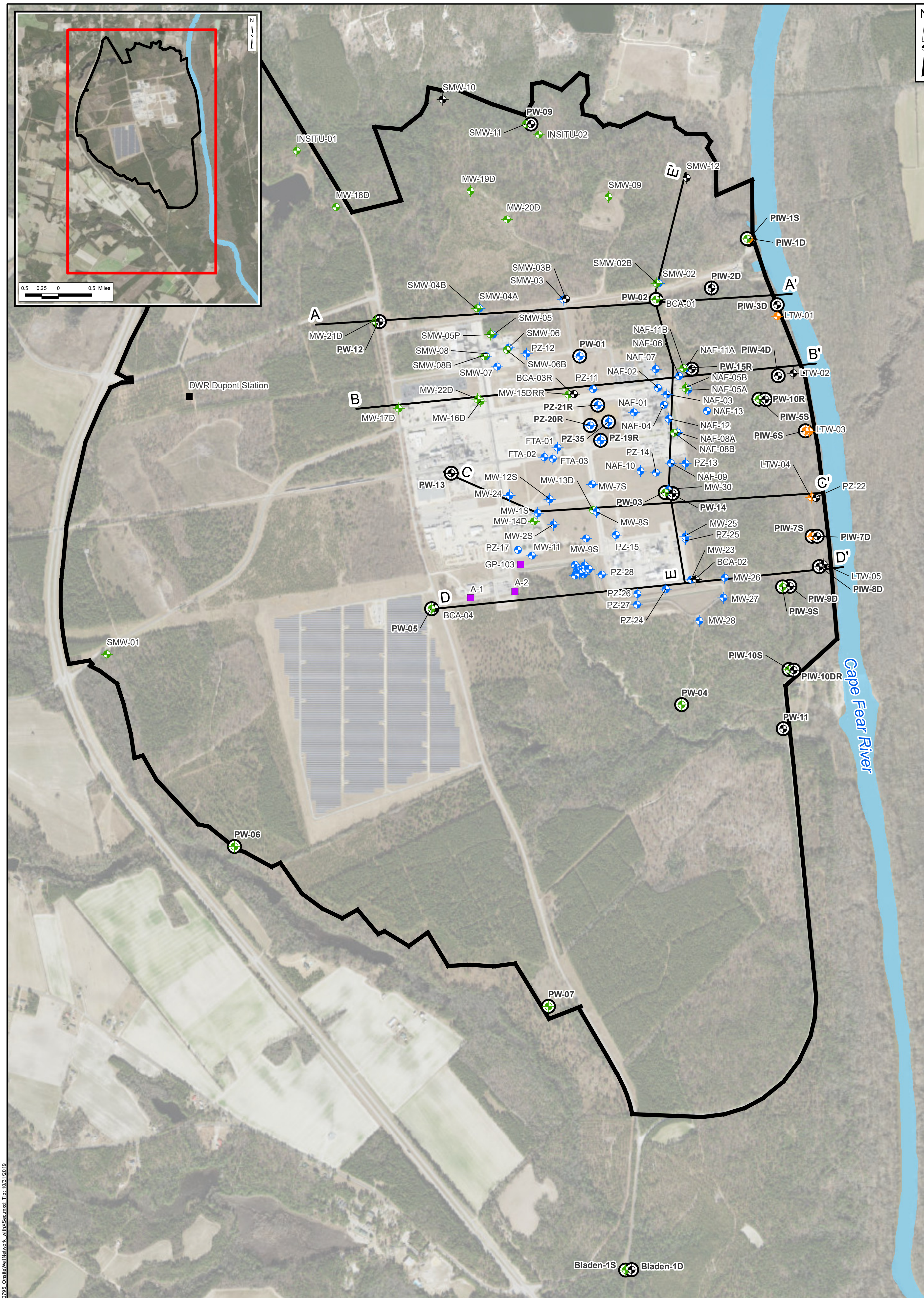
Raleigh | October 2019

Figure 9-12

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US



Legend

Perched Zone	DWR Dupont Station (V42V) Well Cluster
Surficial Aquifer	CPT/DPT Soil Boring
Floodplain Deposits	Site Boundary
Black Creek Aquifer	Cross-Section
2019 Installed Wells	

Notes:
1. Due to the scale of the map, pairs of wells that are in close proximity have been offset for visibility. Therefore, the placement of these wells on this map do not reflect their true geographic coordinates.
2. The outline of the River shown on this figure is approximate (River outline based on compilation of open data sources from ArcGIS online service and North Carolina Department of Environmental Quality Online GIS - Major Hydro shapefile).
3. Basemap source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community.

Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

1,000 500 0 1,000 Feet

Onsite Cross-Section Lines

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
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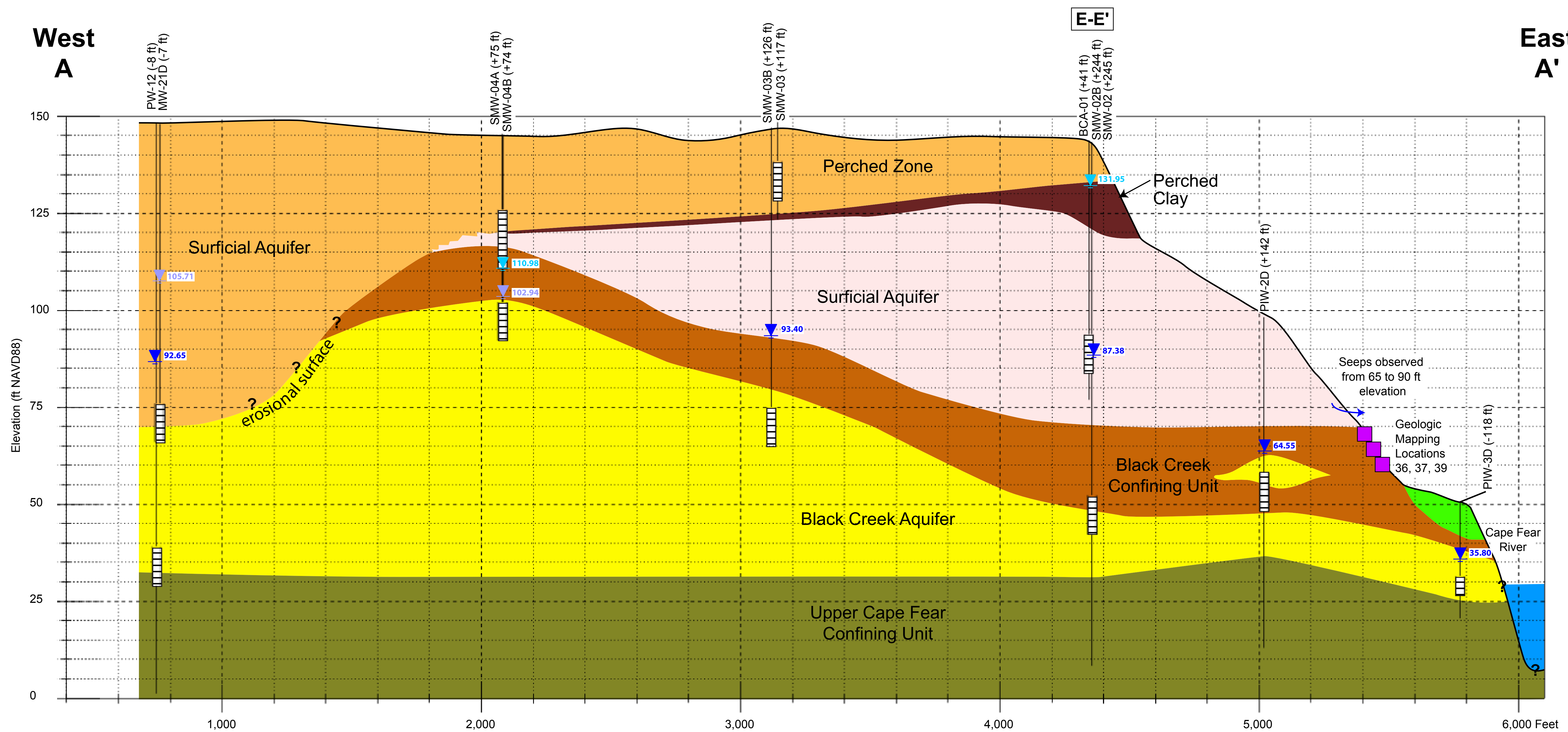
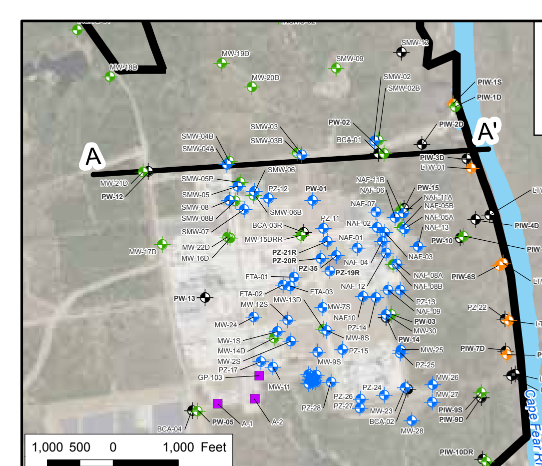
Figure 10-1

Raleigh | October 2019

Path: P:\PRJ\Projects\TR0795\Database and GIS\GIS\Onsite and Offsite Assessment Report\TR0795_OnsiteWellNetwork_withXSec.mxd; Tlp; 10/31/2019





Legend

- Clay
- Silty or Sandy Clay with Organics
- Micaceous Clay
- Predominantly Fine to Medium-grained Sand
- Floodplain Deposits
- Fine to Medium-grained Sand with Variable Silt Content
- Fine to Medium Sand

MW-17D (100 ft) — Offset Distance +/- north/south of line; Location Name

Well Screen

110.98 — Perched Zone Groundwater Elevation

102.94 — Surficial Aquifer Groundwater Elevation

64.55 — Black Creek Aquifer Groundwater Elevation

Geological Mapping Location

E-E' — Corresponds to Section

Notes

ft NAVD88 - feet in 1988 North American Vertical Datum
Vertical Exaggeration = 15x

1. Lithology between borings is interpolated and estimated.
2. Groundwater elevations calculated from measured depth to water on 15 October 2019.
3. Cape Fear River water level indicated is median value for 15 October 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24).
4. Geological Mapping Locations from Figure 6-1. Approximate mapping elevations listed in Table 6-1.
5. Seeps observed reported in Seeps and Creeks Investigation Report (Geosyntec, 2019)

Cross-Section A-A'

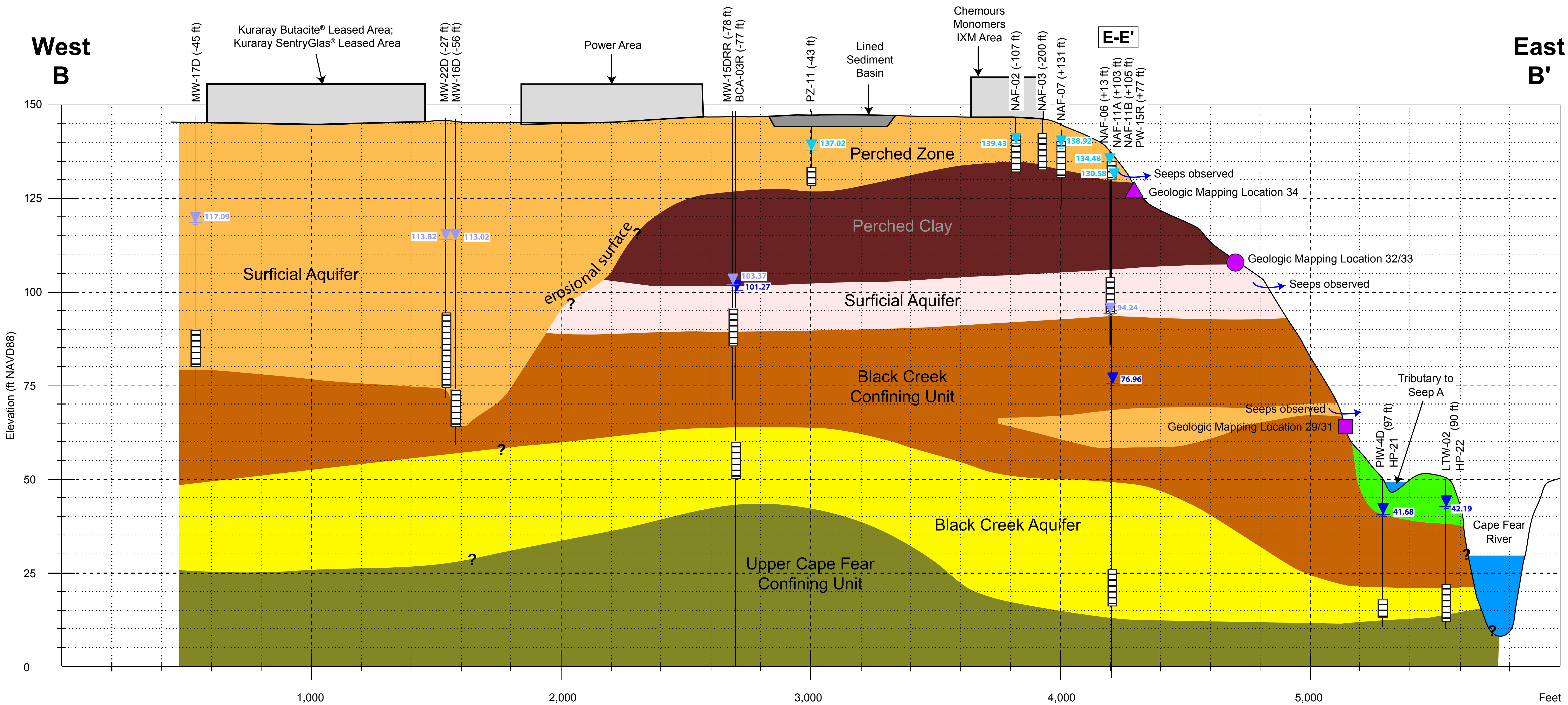
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 10-2



Legend

- Clay
- Silty or Sandy Clay with Organics
- Micaceous Clay
- Predominantly Fine to Medium-grained Sand
- Floodplain Deposits
- Fine to Medium-grained Sand with Variable Silt Content
- Fine to Medium Sand

MW-17D (100 ft) — Offset Distance +/- north/south of line; Location Name

Well Screen

110.98 Perched Zone Groundwater Elevation

102.94 Surficial Aquifer Groundwater Elevation

64.55 Black Creek Aquifer Groundwater Elevation

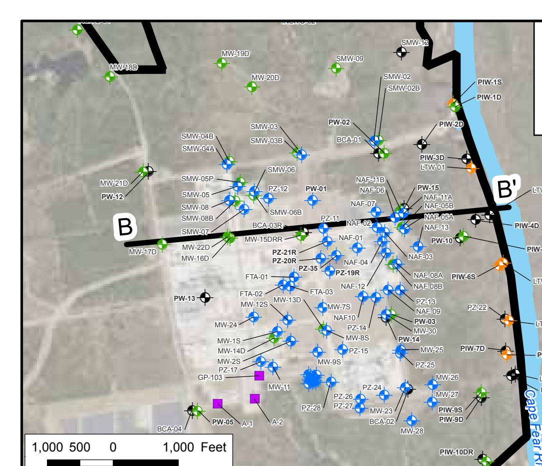
Geological Mapping Location

E-E' Corresponds to Section

Notes

ft NAVD88 - feet in 1988 North American Vertical Datum
Vertical Exaggeration = 15x

1. Lithology between borings is interpolated and estimated.
2. Groundwater elevations calculated from measured depth to water on 15 October 2019.
3. Cape Fear River water level indicated is median value for 15 October 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24).
4. Geological Mapping Locations from Figure 6-1. Approximate mapping elevations listed in Table 6-1.
5. Seeps observed reported in Seeps and Creeks Investigation Report (Geosyntec, 2019)



Cross-Section B-B'

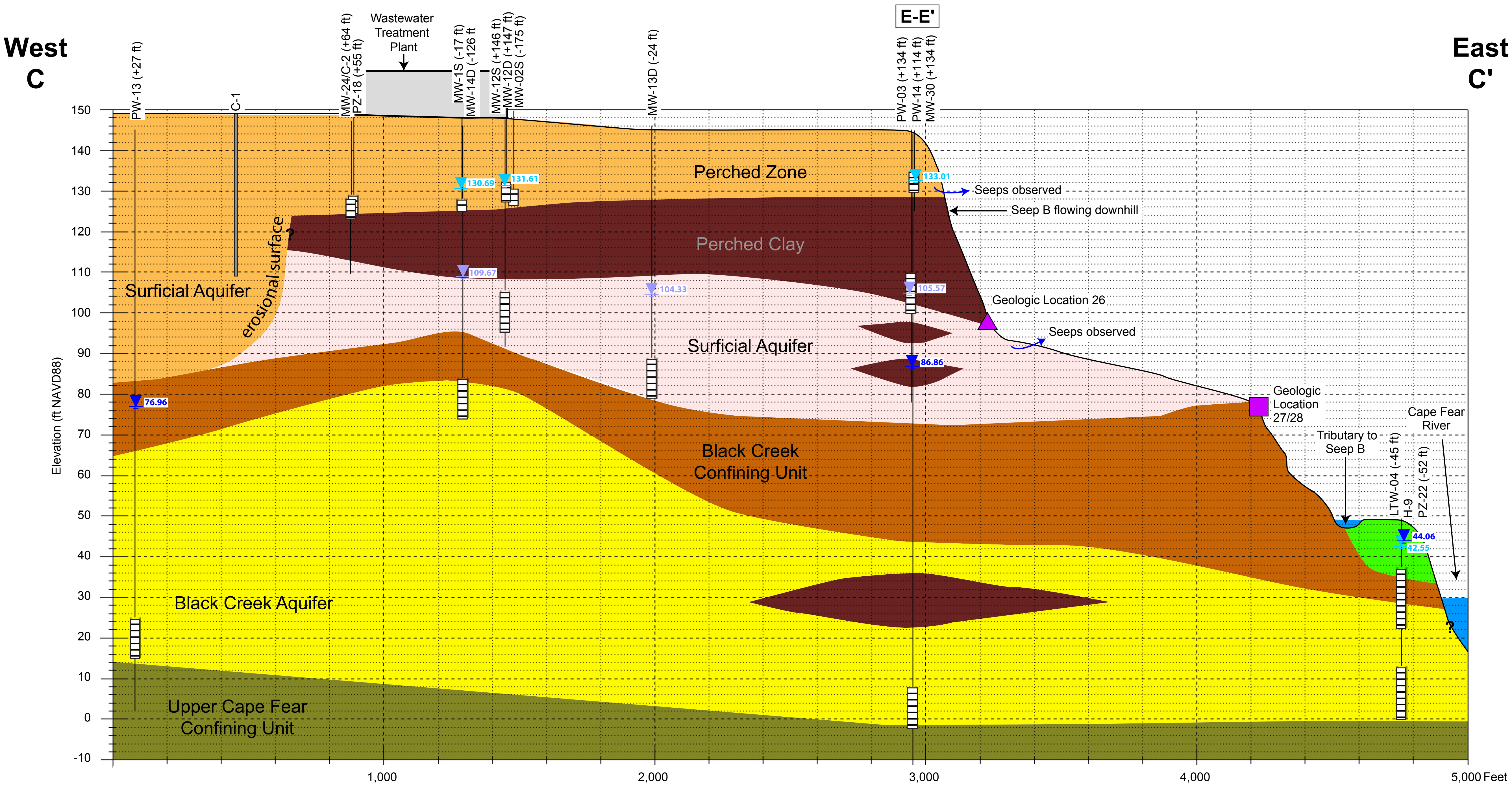
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 10-3



Legend

- Clay
- Silty or Sandy Clay with Organics
- Micaceous Clay
- Predominantly Fine to Medium-grained Sand with some Clay
- Floodplain Deposits
- Fine to Medium-grained Sand with Variable Silt Content
- Fine to Medium Sand

MW-17D (100 ft) — Offset Distance +/- north/south of line; Location Name

Well Screen

CPT Boring

110.98 Perched Zone Groundwater Elevation

102.94 Surficial Aquifer Groundwater Elevation

64.55 Black Creek Aquifer Groundwater Elevation

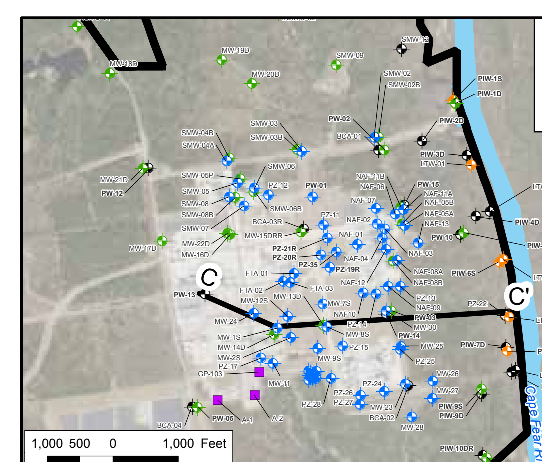
Geological Mapping Location

E-E' Corresponds to Section

Notes

ft NAVD88 - feet in 1988 North American Vertical Datum
Vertical Exaggeration = 15x

1. Lithology between borings is interpolated and estimated.
2. Groundwater elevations calculated from measured depth to water on 15 October 2019.
3. Cape Fear River water level indicated is median value for 15 October 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24).
4. Geological Mapping Locations from Figure 6-1. Approximate mapping elevations listed in Table 6-1.
5. Seeps observed reported in Seeps and Creeks Investigation Report (Geosyntec, 2019)



Cross-Section C-C'

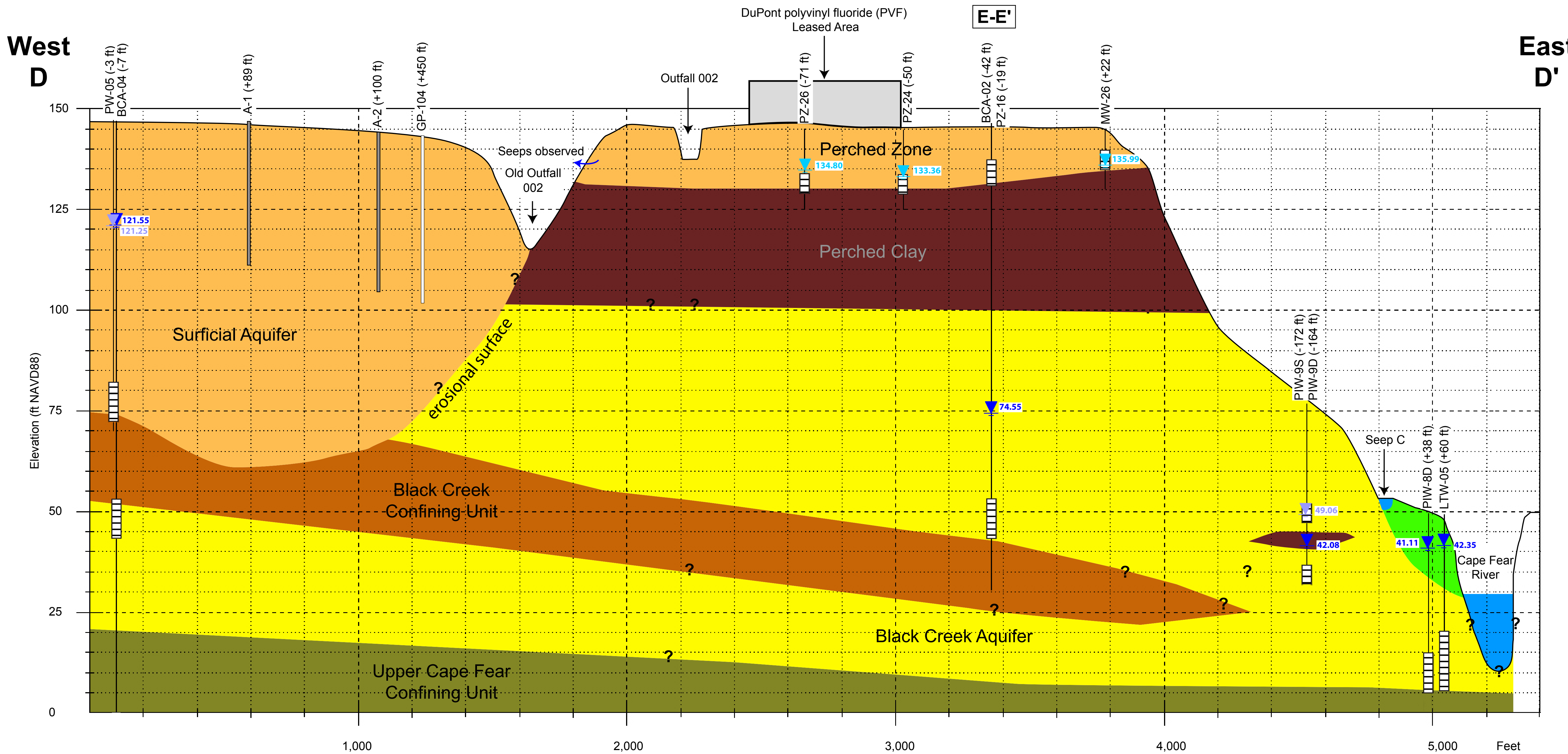
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 10-4



Legend

- Clay
- Silty or Sandy Clay with Organics
- Micaceous Clay
- Predominantly Fine to Medium-grained Sand with some Clay
- Floodplain Deposits
- Fine to Medium-grained Sand with Variable Silt Content
- Fine to Medium Sand

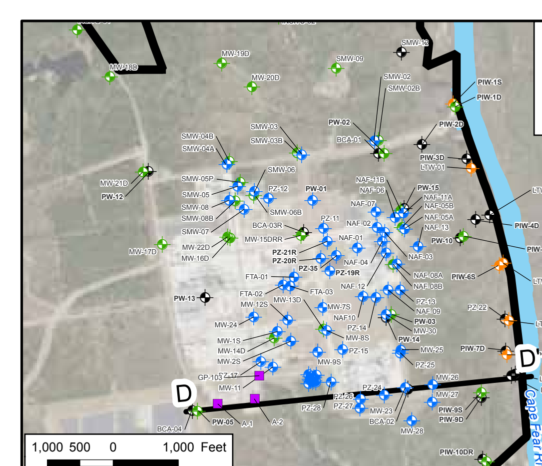
MW-17D (100 ft)

- Offset Distance +/- north/south of line
- Location Name
- Well Screen
- E-E' Corresponds to Section

- 110.98 Perched Zone Groundwater Elevation
- 102.94 Surficial Aquifer Groundwater Elevation
- 64.55 Black Creek Aquifer Groundwater Elevation
- CPT Boring
- Soil Boring

Notes

ft NAVD88 - feet in 1988 North American Vertical Datum
Vertical Exaggeration = 15x
1. Lithology between borings is interpolated and estimated.
2. Groundwater elevations calculated from measured depth to water on 15 October 2019.
3. Cape Fear River water level indicated is median value for 15 October 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24).
4. Geological Mapping Locations from Figure 6-1. Approximate mapping elevations listed in Table 6-1.
5. Seeps observed reported in Seeps and Creeks Investigation Report (Geosyntec, 2019)



Cross-Section D-D'

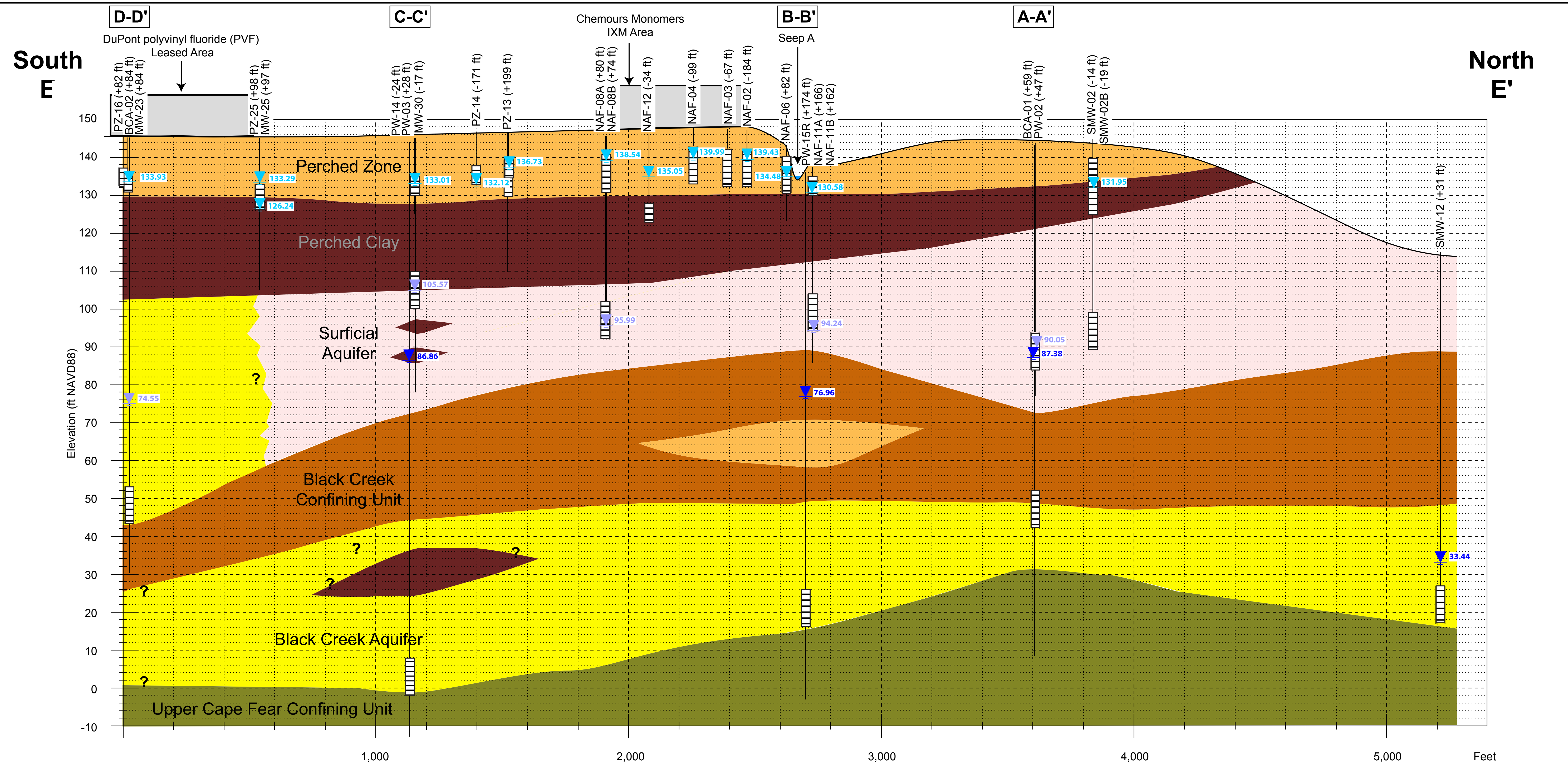
Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

Raleigh | October 2019

Figure 10-5



Legend

- Clay
- Silty or Sandy Clay with Organics
- Micaceous Clay
- Predominantly Fine to Medium-grained Sand with some Clay
- Floodplain Deposits
- Fine to Medium-grained Sand with Variable Silt Content
- Fine to Medium Sand

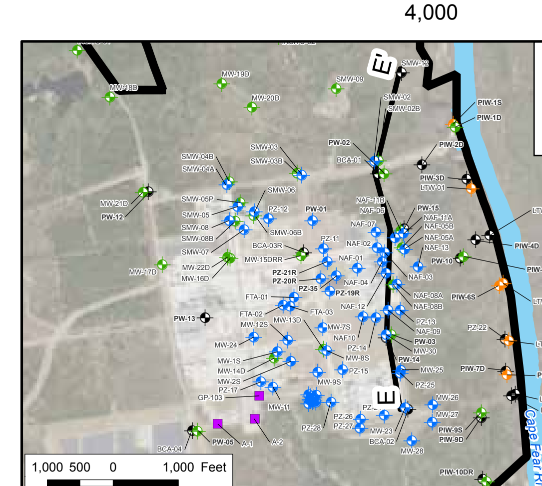
MW-17D (100 ft)

- Offset Distance +/- east/west of line
- Location Name
- Well Screen

- 110.98 Perched Zone Groundwater Elevation
- 102.94 Surficial Aquifer Groundwater Elevation
- 64.55 Black Creek Aquifer Groundwater Elevation
- A-A' Corresponds to Section

Notes

ft NAVD88 - feet in 1988 North American Vertical Datum
Vertical Exaggeration = 15x
Seep A bottom is approximate
1. Lithology between borings is interpolated and estimated.
2. Groundwater elevations calculated from measured depth to water on 15 October 2019.
3. Cape Fear River water level indicated is median value for 15 October 2019 measured at the W.O. Huske Dam (USGS 2105500). Data obtained from National Water Information System (URL: https://waterdata.usgs.gov/nwis/inventory/?site_no=02105769, date accessed: 2019-09-24).
4. Geological Mapping Locations from Figure 6-1. Approximate mapping elevations listed in Table 6-1.
5. Seeps observed reported in Seeps and Creeks Investigation Report (Geosyntec, 2019)



Cross-Section E-E'

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C 3500 and C 295

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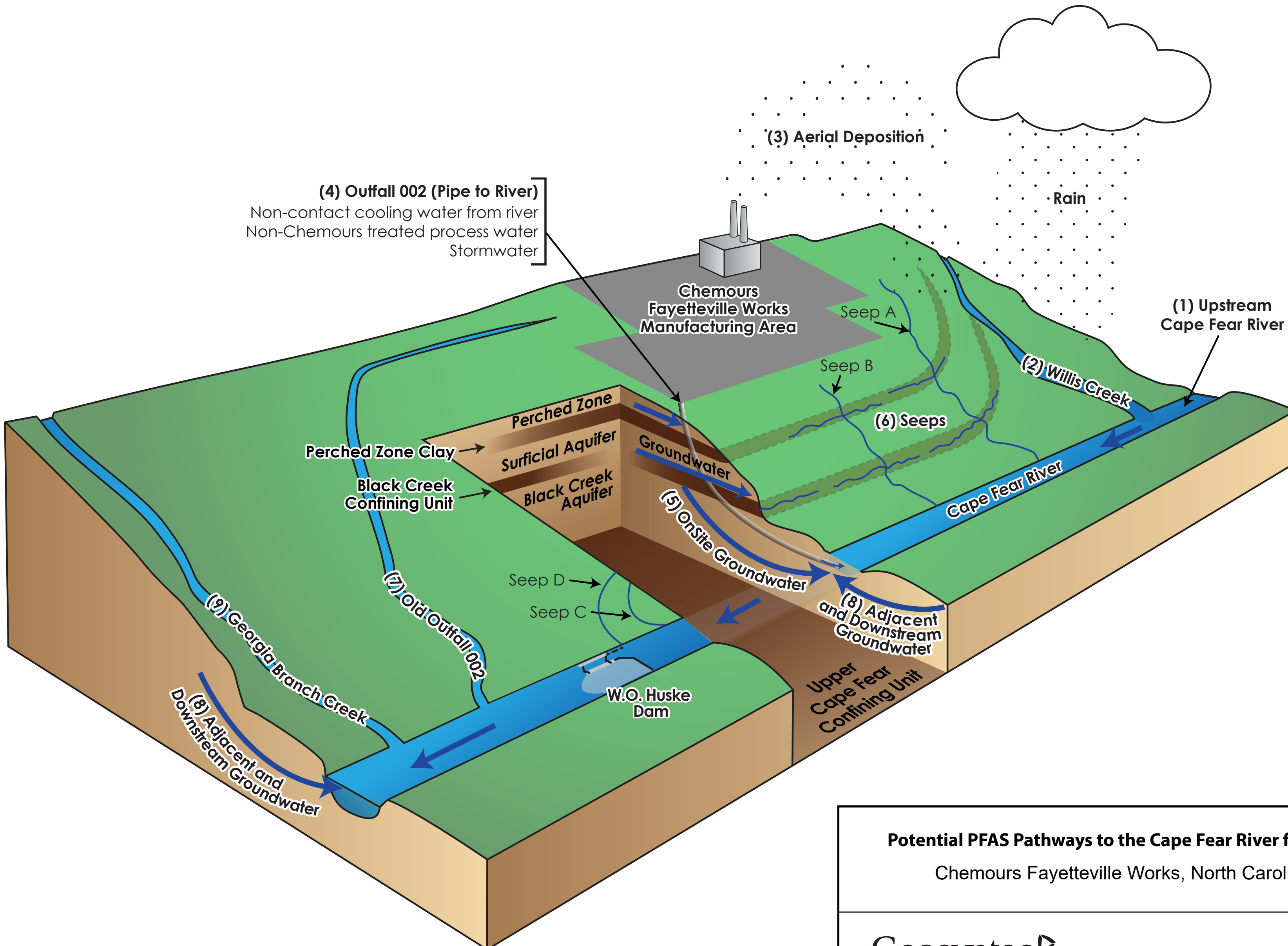
Figure 10-6

00 01 02 03 04 Data\PRJ\Projects\TR0795\Database and GIS\Illustrator\Onsite and Offsite Assessment Report\Numeric Modeling cross-sections\TR0795_CrossSectionE_E'.ai



Potential PFAS Pathways to the Cape Fear River from Site

Chemours Fayetteville Works, North Carolina

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C-3500 and C-295

Figure **10-7**

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APPENDIX A

Field Investigation Methods

APPENDIX A: FIELD METHODS

1. INTRODUCTION

This appendix provides details on the methodologies employed during field events associated with the On and Offsite Assessment report, including drilling, well installation, and soil and groundwater sample collection. The following methods are described herein:

- General Field Procedures
- Sonic and Direct Push Drilling
- Well Development
- Groundwater Sampling
- Investigative Derived Waste (IDW) Management

1.1 General Field Procedures

All equipment was inspected by the field program supervisor and calibrated daily prior to use in the field according to the manufacturer's recommendations.

1.1.1 Decontamination Methods

Sample containers were new and used only once for each sample. Disposable equipment (e.g., gloves, tubing, etc.) was not reused, therefore; these items did not require decontamination.

All non-dedicated or non-disposable sampling equipment was decontaminated immediately before sample collection in the following manner:

- De-ionized water rinse;
- Scrub with de-ionized water containing non-phosphate detergent (i.e., Alconox®); and
- De-ionized water rinse.

1.1.2 Sample Shipping, Chain of Custody, and Holding Times

Upon sample collection, each labeled, containerized sample was placed into a heavy plastic bag inside an insulated sample cooler with ice. Prior to shipment of the samples to the laboratory, a chain of custody (COC) form was completed by the field sample custodian. Sample locations, sample identification numbers, description of samples, number of samples collected, and specific laboratory analyses to be performed on the samples were recorded on the COC form. The COC was signed by the field personnel relinquishing the samples to the courier and was signed by the laboratory upon receipt of the cooler.

1.2 Drilling Methods

All boring locations were cleared for utilities using geophysical methods and then manually cleared to a depth of 5 feet (ft). Borings were advanced using either a direct push followed by hollow stem augers where necessary, or sonic drill rig depending on target drilling depth. A track mounted direct push drill rig was used to advance borings into shallow surface aquifers. Where borings were advanced to deeper aquifer units, a 7-inch override (outer) steel casing was advanced using a sonic drill rig to reduce the risk of potential cross-contamination from the surface to deeper hydrogeologic units. Borings into the deeper units were then advanced though the casing using a 6-inch core barrel.

Soil cores were retrieved in 5-foot sections for DPT or 10-foot sections for sonic, photographed, and logged for lithology. Lithology was logged using the Unified Soil Classification System (USCS, ASTM D-2487) with attention paid to lithologic contacts and soil moisture content. Contacts were determined as depths below ground surface, accounting for no or poor recovery, slough and heave, using professional judgement. Downhole equipment was decontaminated before drilling each well.

Soil samples were collected for PFAS and physical soil matrix properties. PFAS samples were collected from the unsaturated zones, where possible. Physical parameter samples (e.g., particle size distribution, fraction organic carbon, specific gravity etc.) were collected from representative hydrogeologic units encountered.

Monitoring wells were constructed at each location in accordance with the North Carolina Well Construction Standards for a monitoring well (15A NCAC 2C). Well and screen depths were determined based on field lithologic logs and professional judgement of field geologist, in consultation with the project manager. Wells were constructed with a minimum of 2-inch diameter, flush-threaded, schedule-40, poly-vinyl chloride (PVC) with 0.010-inch machine-slotted screens. A 5-foot screen was used for higher yielding units (e.g., Surficial and Black Creek Aquifers). The well screen was surrounded by a filter pack of washed silica sand size 20-30, which was installed by tremie from a minimum of 6 inches below the bottom of the well sump, extending to two foot above the well screen.

The top of the sand filter pack was sealed with bentonite pellets placed down the annular space and hydrated in place. Bentonite pellets were added to form a layer at least 2 ft thick above the sand pack. Bentonite was placed slowly to avoid bridging. The bentonite hydrated for a minimum of 1 hour as specified by the manufacturer. Depths to the top of the sand pack and the top of the bentonite seal were measured using a weighted tape. The remaining annular space was pressure-grouted by tremie pipe to ground surface according to requirements described in 15A NCAC 2C.0107 standards.

After allowing at least 24 hours for the grout to cure, the wells were sealed to the ground surface with concrete and a minimum 2-ft by 2-ft by 6-inch thick concrete surface pad that slopes away from the center of the pad and protective casing. Well completions include a stick-up or flush-mount cover, water tight well cap and lock. The well head was completed in accordance with 15A NCAC 2C.0108 standards which includes installation of well contractor information plate with the following information recorded:

(1) well contractor name and certification number;
(2) date well completed;
(3) total depth of well;

(4) a warning that the well is not for water supply and that the groundwater may contain hazardous materials;
(5) depths to the top and bottom of the screen; and
(6) the well identification number or name assigned by the well owner.

1.3 Well Development

The well contractor developed the installed wells to improve the connection to the aquifer and to remove materials potentially introduced into the formation during drilling which may include drilling fluids, mud, additives etc. Wells were developed by mechanically surging and pumping the water column using a submersible pump to remove fines and stimulate yield such that the formation water was free of visible sediment, contained less than 50 NTUs of turbidity, or following development for an extended period (e.g., turbidity readings that did not improve for an hour and 3 or more consecutive measurements that are within 10% of each other). Several newly installed onsite and offsite wells stabilized with elevated turbidity measurements (>50 NTUs; Table A-1, A-2). These wells will be redeveloped and resampled.

1.4 Groundwater Sampling

Groundwater samples were collected using low-flow sampling techniques. New dedicated high density polyethylene (HDPE) tubing and silicone tubing was used for the pump head at each well. Groundwater was pumped directly from submerged tubing through the pump head to a flow-through cell until turbidity measurements were below 20 NTU and all other field parameters (pH, temperature, specific conductivity, dissolved oxygen, oxidation-reduction potential) were stabilized within ±10 percent (%) over a five-minute interval. Once flow-through cell readings were stable, the flow-through cell was disconnected, the tubing was cut to provide a new clean end and grab samples were collected from the discharge of the peristaltic pump in new 250 milliliters (mL) laboratory-supplied HDPE bottles. Samples were shipped on ice to TestAmerica Sacramento and the Chemours Fluoroproducts Analytical Group. Table A-1 presents a summary of stabilized groundwater field parameters (pH, temperature, specific conductivity, dissolved oxygen, oxidation-reduction potential)

1.5 Investigative Derived Waste (IDW) Disposal

Investigative derived waste generated during drilling activities and well sampling was managed per plant specific IDW management plan. Solid and liquid waste generated during drilling activities were separated and contained within 55-gallon drums and temporarily stored within the laydown yard. All drums are inspected for integrity prior to use and are properly sealed and labeled when in use. Fluids were contained within closed top drums, while solids were stored in open top drums. IDW water free of solids is sent to Texas Molecular in Deerpark, Texas for disposal via deep well injection.

Purge water generated from well development and sampling was handled differently depending on the location of the well. Offsite well water was transported onsite and disposed of in the waste water treatment system. Purge water generated from onsite wells were contained in labeled closed top drums and staged for offsite shipment and disposal to an approved hazardous waste facility. Soils generated during drilling activities will be disposed of following their characterization.

TABLE A-1
ADDITIONAL MONITORING WELL DEVELOPMENT
Chemours Fayetteville Works, North Carolina

Area	Well ID	Northing (ft, NAD83)	Easting (ft, NAD83)	Installation Date	Casing Construction	Casing Diameter (in)	Well Casing Depth (ft)	Screened Interval (ft)	Filter Pack Interval (ft)	Bentonite Seal Interval (ft)	Grout Interval (ft)	Ground Elevation (ft NAVD88)	TOC Elevation (ft NAVD88)	Aquifer
Onsite	PIW-2D	399,922.75	2,051,317.64	8/15/2019	PVC	2	50	40 - 50	38 - 50	36 - 38	0 - 36	98.16	100.85	Black Creek Aquifer
Onsite	PIW-4D	398,817.36	2,052,102.82	7/1/2019	PVC	2	37.3	32.3 - 37.3	30 - 38	28 - 30	0 - 28	50.37	53.04	Black Creek Aquifer
Onsite	PW-02	399,779.06	2,050,649.47	7/30/2019	PVC	2	60	50 - 60	47.5 - 60	45.5 - 47.5	0 - 45.5	143.76	146.43	Surficial Aquifer
Onsite	PW-03	397,339.81	2,050,765.32	7/23/2019	PVC	2	45	35 - 45	33 - 45	31 - 33	0 - 31	144.97	147.97	Surficial Aquifer
Onsite	PW-04	394,659.55	2,050,940.66	7/24/2019	PVC	2	27	17 - 27	15 - 27	13 - 15	0 - 13	94.74	97.75	Surficial Aquifer
Onsite	PW-07	390,847.71	2,049,258.26	7/24/2019	PVC	2	38	28 - 38	26 - 38	23.5 - 26	0 - 23.5	144.90	148.16	Surficial Aquifer
Onsite	PW-09	401,997.39	2,048,980.54	8/12/2019	PVC	2	54	44 - 54	42 - 54	40 - 42	0 - 40	74.76	72.03	Black Creek Aquifer
Onsite	PW-10R	398,516.12	2,051,936.59	8/9/2019	PVC	2	67	57 - 67	55 - 67	52 - 55	0 - 52	73.28	75.90	Black Creek Aquifer
Onsite	PW-12	399,500.45	2,047,063.51	8/1/2019	PVC	2	119	109 - 119	106 - 119	103 - 106	0 - 103	148.05	150.61	Black Creek Aquifer
Onsite	PW-13	397,584.26	2,048,029.18	8/23/2019	PVC	2	130	120 - 130	118 - 130	115 - 118	0 - 115	146.52	149.36	Black Creek Aquifer
Onsite	PW-15R	398,900.88	2,051,011.75	8/14/2019	PVC	2	120	110 - 120	108 - 120	105 - 108	0 - 105	133.33	136.14	Black Creek Aquifer
Offsite	Robeson-1S	381,405.51	2,020,158.29	9/9/2019	PVC	2	27	17 - 27	15 - 27	13 - 15	0 - 13	161.51	161.22	Surficial Aquifer
Offsite	Robeson-1D	381,413.60	2,020,160.37	9/4/2019	PVC	2	53	42.75 - 52.75	41 - 53	39 - 41	0 - 39	161.23	160.93	Black Creek Aquifer
Offsite	Cumberland-2D	449,984.84	2,074,020.57	9/12/2019	PVC	2	57	47 - 57	43 - 57	43 - 45	0 - 43	134.06	133.79	Black Creek Aquifer
Offsite	Cumberland-4S	413,083.94	2,078,256.96	9/11/2019	PVC	2	20	10 - 20	8 - 20	6 - 8	0 - 6	124.15	123.93	Surficial Aquifer
Offsite	Cumberland-4D	413,093.08	2,078,251.38	9/10/2019	PVC	2	67	57 - 67	55 - 67	53 - 55	0 - 53	124.09	123.79	Black Creek Aquifer
Offsite	Cumberland-5S	405,623.27	2,138,233.37	9/11/2019	PVC	2	24	14 - 24	12 - 24	10 - 12	0 - 10	107.00	106.65	Surficial Aquifer

Notes:
1. Wells to be re-developed include those installed between June - September 2019 with high turbidity reported (> 50 NTUs) in groundwater sampling forms from June 2019 as reported in the On and Offsite Assessment (Geosyntec, 2019).
2. PW-9 and PW-15R wells indicated elevated pH (greater than 9) as reported in the On and Offsite Assessment (Geosyntec, 2019) and may benefit from further development.
3. Survey completed by Freeland-Clinkscales & Associates of NC.
4. Northing and Easting provided in feet, State Plane Coordinates for North Carolina (zone 3200) in North American Datum of 1983.
5. Ground surface and top of casing elevation reported in North American Vertical Datum of 1988.
6. Abbreviations:
ft NAD83 - feet, State Plane Coordinate System North American Datum 1983
ft NAVD88 - feet, North American Vertical Datum of 1988
in - inches
ft - feet
ft bgs - feet below ground surface
NA - not available
NM - not measured

TABLE A2
GROUNDWATER FIELD PARAMETERS
Chemours Fayetteville Works, North Carolina

Well ID	Sampling Date	pH stable	DO stable (mg/L)	Redox stable (mV)	Turbididty stable (NTU)	Spec. Cond. Stable (mS/cm)	Temp. stable (°C)	Notes
BCA-01	7/8/2019	5.79	NR	69	10.6	0.09	25.82	
BCA-02	7/9/2019	5.13	NR	73	18.2	0.23	20.6	
BCA-03R	9/12/2019	3.52	0.09	286.1	1.44	0.18	23.5	
BCA-04	7/9/2019	5.24	NR	16	16.1	0.05	20.11	
FTA-01	6/27/2019	5.57	4.82	234	NR	0.05	28.57	
FTA-02	6/27/2019	4.22	1.13	310	NR	0.07	28.75	
FTA-03	6/27/2019	4.5	1.65	308	NR	0.05	25.94	
INSITU-01	6/20/2019	3.72	0.23	211	5.7	0.05	34.5	
LTW-01	7/17/2019	3.79	2.44	318	NR	0.12	24.91	
LTW-02	7/17/2019	4.82	1.52	168	NR	0.08	25.58	
LTW-03	7/17/2019	5.18	NR	168	0.1	0.1	22.94	
LTW-04	7/17/2019	5.01	NR	241	10.3	0.09	22.93	
LTW-05	7/16/2019	5.02	3.9	173	2.4	0.14	21.3	
MW-1S	6/28/2019	5.75	0.23	47	10.5	0.06	24.13	
MW-2S	7/10/2019	5.6	NR	-52	0.4	0.14	23.43	
MW-7S	7/10/2019	4.28	1.8	340	4.44	0.08	27.51	
MW-9S	6/26/2019	4.57	7.58	370	NR	0.07	22.91	
MW-11S	7/11/2019	NR	NR	NR	NR	NR	NR	Well went dry during purging; no sample collected.
MW-12S	7/8/2019	5.24	3.93	218	10.8	0.06	23.55	
MW-13D	7/11/2019	3.56	NR	231	NR	0.11	22.24	
MW-14D	7/11/2019	3.8	0.36	321	NR	0.08	25.72	
MW-15DRR	9/12/2019	3.85	3.19	324.5	0.73	0.4	22.9	
MW-16D	7/15/2019	4.03	NR	389	NR	0.01	27.1	
MW-17D	7/15/2019	3.99	NR	239	2	0.08	33.2	
MW-18D	7/15/2019	4.11	NR	238	17.7	0.07	23.56	
MW-19D	7/9/2019	3.7	NR	321	NR	0.08	20.25	
MW-20D	7/9/2019	3.68	3.55	290	NR	0.08	20.55	
MW-21D	7/11/2019	3.73	NR	300	NR	0.08	21.86	
MW-22D	7/15/2019	4.11	NR	379	NR	0.1	25.6	
MW-23	6/25/2019	5.11	4	242	19.8	0.06	25.42	
MW-24	7/17/2019	NR	NR	NR	NR	NR	NR	Well is pumped daily and went dry the day prior. No parameters were recorded.
MW-25	6/25/2019	4.19	2.4	389	NR	0.07	25.2	
MW-26	7/3/2019	NR	NR	NR	NR	NR	NR	Well went dry during purging; no sample collected.
MW-27	6/25/2019	3.76	NR	348	14.4	0.06	30.94	
MW-28	6/26/2019	4.85	5.35	308	506	0.06	26.9	Well ran dry on 6/25/19. Parameters are from last reading before it went dry, and well was sampled on 6/26/19.
MW-30	7/2/2019	3.93	4.13	479	10.9	0.03	30.51	
MW-31	6/18/2019	5.35	2.74	127	0.6	0.1	21.05	
NAF-01	7/10/2019	4.29	0.85	329	NR	0.15	24.37	
NAF-02	6/27/2019	7.65	NR	-5	NR	0.55	25.13	
NAF-03	6/27/2019	5.56	3.77	199	NR	0.13	27.02	
NAF-04	7/15/2019	5.53	NR	37	3.5	0.28	25.27	
NAF-06	7/11/2019	5.23	NR	232	NR	0.28	27.67	
NAF-07	6/27/2019	4.59	NR	-45	NR	0.26	25.49	
NAF-08A	7/15/2019	5.07	0.03	67	6.5	0.05	31.58	
NAF-08B	7/15/2019	NR	NR	NR	NR	NR	NR	Insufficient water for parameters
NAF-09	7/2/2019	4.75	7.71	273	15.8	0.09	25.04	
NAF-10	7/3/2019	6.13	3.75	363	NR	0.14	26.55	
NAF-11B	Dry	NR	NR	NR	NR	NR	NR	Dry (7/15/19)
NAF-12	7/17/2019	NR	NR	NR	NR	NR	NR	Well is pumped daily and went dry the day prior. No parameters were recorded.
PIW-1D	7/19/2019	4.09	NR	420	9	0.21	20.77	
PIW-1S	Dry	NR	NR	NR	NR	NR	NR	Dry (7/19/19)
PIW-2D	9/12/2019	6.5	NR	6.9	NR	0.12	26.5	Well to be redeveloped
PIW-3D	7/18/2019	4.73	NR	44	0.3	0.1	19.55	
PIW-4D	9/11/2019	5.48	0.08	-40.5	285	0.06	18.7	Well to be redeveloped
PIW-5S	7/19/2019	4.54	0.94	369	NR	0.12	21.22	
PIW-6S	7/17/2019	5.73	NR	120	19.3	0.09	21.5	
PIW-7D	7/19/2019	4.38	0.15	2	NR	0.09	19.88	
PIW-7S	7/19/2019	5.94	NR	-109	3.5	0.14	21.59	
PIW-8D	7/19/2019	5.67	NR	181	8.4	0.21	20.2	

TABLE A2
GROUNDWATER FIELD PARAMETERS
Chemours Fayetteville Works, North Carolina

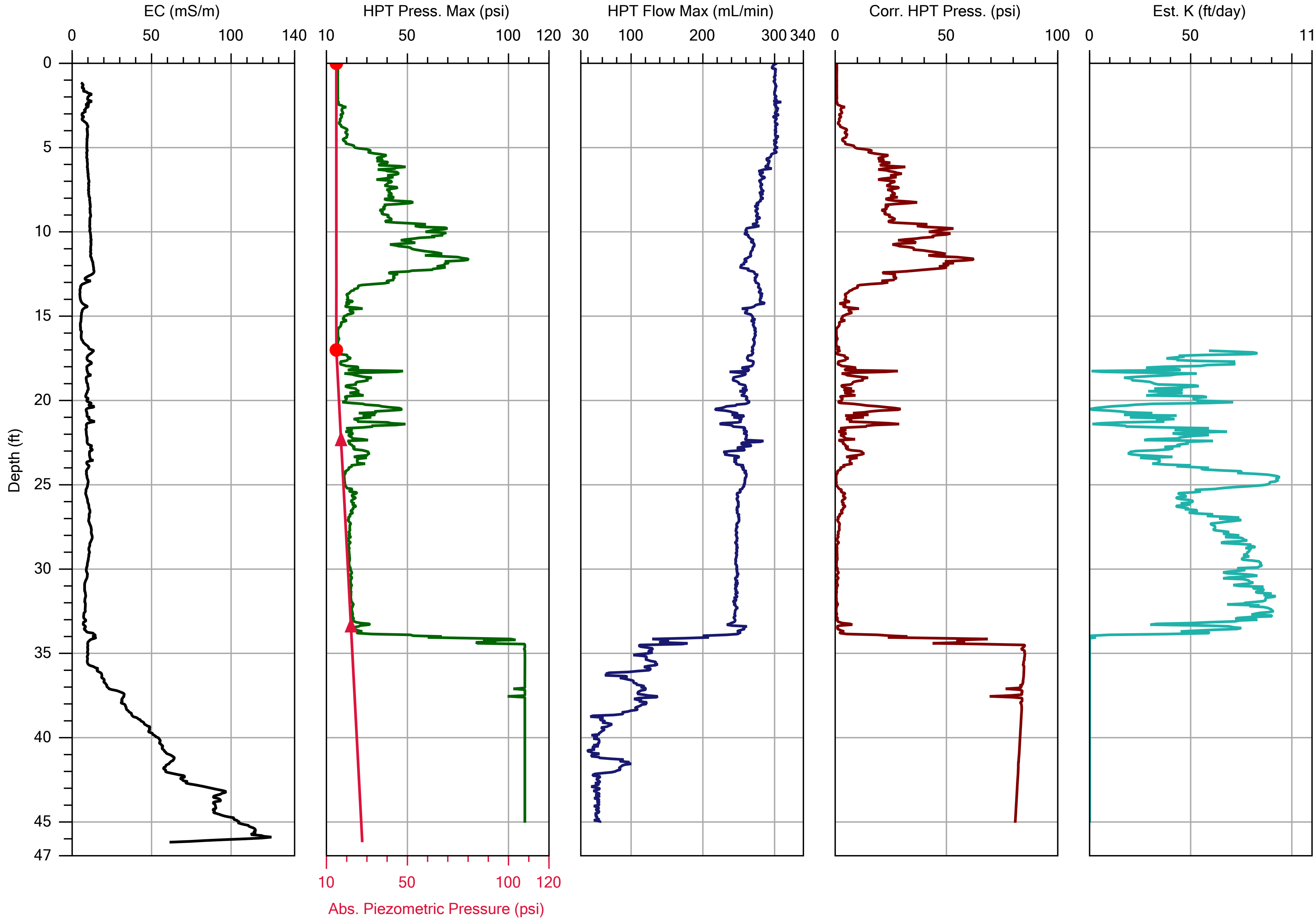
Well ID	Sampling Date	pH stable	DO stable (mg/L)	Redox stable (mV)	Turbididty stable (NTU)	Spec. Cond. Stable (mS/cm)	Temp. stable (°C)	Notes
PIW-9D	7/23/2019	5.64	0.25	54	NR	0.14	20.31	
PIW-9S	7/18/2019	4.66	0.73	131	9.5	0.07	30.81	
PIW-10DR	9/10/2019	5.84	0.16	-290	12.6	0.22	23.6	
PIW-10S	7/22/2019	4.83	2.8	360	NR	0.05	27.31	
PW-01	9/9/2019	4.68	6.42	169.7	1.87	0.05	23.06	
PW-02	9/11/2019	5.25	1.8	126.9	378	0.15	22.2	Well to be redeveloped
PW-03	9/11/2019	6.55	0.51	57	>1000	0.34	28.33	Well to be redeveloped
PW-04	9/11/2019	5.64	0	21.1	439*	0.32	30.02	Well to be redeveloped
PW-05	9/9/2019	6.58	3.17	48	1.49	0.1	23.08	
PW-06	9/10/2019	5.67	1.32	29	14.6	0.09	21.18	
PW-07	9/13/2019	3.03	4.86	406	307	0.04	27.07	Well ran dry on 9/12/19. Parameters are from last reading before it went dry, and well was sampled on 9/13/19. Well to be redeveloped
PW-09	9/11/2019	9.69	0.4	-70	52.9	0.2	19.18	Well to be redeveloped
PW-10R	9/19/2019	6.64	3.92	-315.9	228	0.13	18.6	Well to be redeveloped
PW-11	9/10/2019	5.42	0.08	-176.1	26.1	0.38	19.3	
PW-12	9/11/2019	5.56	0.07	-76.6	>1000	0.06	21.5	Well to be redeveloped
PW-13	9/10/2019	6.66	0.12	19.9	>1000	0.14	25.65	Well to be redeveloped
PW-14	9/11/2019	4.83	0.42	147.5	5.83	0.16	23.24	
PW-15R	9/19/2019	9.18	0.09	-500	18.3	0.32	21.9	Well to be redeveloped
PZ-11	7/16/2019	6.04	0.46	-43	6.6	0.11	26.56	
PZ-12	7/11/2019	4.18	5.41	321	NR	0.08	29.23	
PZ-13	6/25/2019	5.1	3.73	243	NR	0.05	24.96	
PZ-14	7/3/2019	NR	NR	NR	NR	NR	NR	Well was pumped dry on 7/2/19 and sampled the following day. Insufficient water for parameters.
PZ-15	6/25/2019	4.3	3.66	382	NR	0.04	26.56	
PZ-17	Dry	NR	NR	NR	NR	NR	NR	Dry (7/2/2019)
PZ-19R	7/1/2019	7.14	NR	-73	1.6	0.36	24.3	
PZ-20R	7/1/2019	7.12	NR	-80	NR	0.3	25.18	
PZ-21R	7/1/2019	5.58	NR	-33	NR	0.17	27.61	
PZ-22	7/23/2019	4.5	NR	88	NR	0.11	22.68	
PZ-24	6/25/2019	4.24	3.05	397	NR	0.12	30.64	
PZ-25	Dry	NR	NR	NR	NR	NR	NR	Dry (7/2/2019)
PZ-26	6/25/2019	5.49	2.83	206	NR	0.26	25.9	
PZ-27	6/25/2019	6.41	0.01	90	39.8	0.17	24.37	
PZ-28	6/25/2019	4.52	1.2	201	NR	0.14	24.49	
PZ-29	6/21/2019	5.96	NR	39	NR	0.16	23.03	
PZ-31	6/21/2019	4.49	3.34	276	NR	0.1	21.96	
PZ-32	6/21/2019	5.29	2.6	246	NR	0.11	22.54	
PZ-33	6/19/2019	5.07	0.11	243	NR	0.12	31.04	
PZ-34	6/19/2019	5.1	0.88	246	NR	0.13	31.34	
PZ-35	7/2/2019	5.67	NR	-66	NR	0.17	22.82	
SMW-01	6/25/2019	3.82	2.52	326	5.3	0.07	26.76	
SMW-02	7/17/2019	3.12	0.25	236	97.1	1.18	26.01	Well ran dry on 7/16/19. Parameters are from last reading before it went dry, and well was sampled on 7/17/19.
SMW-05	Dry	NR	NR	NR	NR	NR	NR	Dry (7/2/2019)
SMW-05P	7/25/2019	4.91	8.23	413	NR	0.13	25.71	
SMW-06	Dry	NR	NR	NR	NR	NR	NR	Dry (7/16/2019)
SMW-07	7/8/2019	3.75	4.87	445	NR	0.3	29.01	
SMW-08B	7/16/2019	4.31	NR	365	NR	0.16	26.48	
SMW-09	7/11/2019	4.65	NR	185	NR	0.29	24.27	
SMW-10	6/26/2019	6.26	0.25	101	NR	0.07	24.09	
SMW-11	6/26/2019	3.73	2.76	500	NR	0.05	20.56	
SMW-12	7/11/2019	3.54	NR	140	NR	0.2	22.35	
BLADEN-1S	Dry	NR	NR	NR	NR	NR	NR	
BLADEN-1D	8/27/2019	9.99	0.07	-335.6	11.5	206	19.9	
BLADEN-2S	8/27/2019	6.11	1.29	13	44.8	123	25.11	
BLADEN-2D	8/27/2019	11.12	1.34	-148.1	6.17	52.5	22.65	
BLADEN-3S	8/28/2019	5.84	1.93	-56.4	9.8	39	25.53	
BLADEN-3D	8/28/2019	5.8	0.05	-97.8	110	101	21.12	
BLADEN-4S	8/28/2019	5.38	0.27	-58.7	NR	65	27.41	Turbidity instrument lamp malfunction. Well to be resampled
BLADEN-4D	8/28/2019	6.35	0.08	-373.5	NR	411	23.69	Turbidity instrument lamp malfunction at 1530 prior to sampling. Last turbidity value recorded is 37 NTUs. Well to be resampled
ROBESON-1S	9/12/2019	5.54	4.39	-68.5	6.02	51.3	24.3	Well to be redeveloped

TABLE A2
GROUNDWATER FIELD PARAMETERS
Chemours Fayetteville Works, North Carolina

Well ID	Sampling Date	pH stable	DO stable (mg/L)	Redox stable (mV)	Turbididty stable (NTU)	Spec. Cond. Stable (mS/cm)	Temp. stable (°C)	Notes
ROBESON-1D	9/12/2019	6.64	0.05	-409	515.4	115	24.4	suspect turbidity instrument issue, purge water is clear. Well to be redeveloped and resampled
CUMBERLAND-1S	9/16/2019	5.92	0.51	32.3	2.22	137	23.66	
CUMBERLAND-1D	9/16/2019	6.65	0.06	-283	14.8	182.4	22	
CUMBERLAND-2S	9/16/2019	5.08	1.43	63.7	0.9	55.9	23.3	
CUMBERLAND-2D	9/16/2019	7.08	0.25	-212.3	211	121	22.23	Well to be re-developed and re-sampled
CUMBERLAND-3S	9/16/2019	6.73	0.08	-401.6	49.7	242.9	25.1	
CUMBERLAND-3D	9/16/2019	7.25	0.19	-180.1	6.85	366	23.25	
CUMBERLAND-4S	9/16/2019	4.49	0.37	149.1	4.38	59	28.14	Well to be redeveloped
CUMBERLAND-4D	9/16/2019	5.91	0.1	-345.3	36.2	100.8	22.9	Well to be redeveloped
CUMBERLAND-5S	9/16/2019	6.48	0.37	-173.4	12.6	305	24.31	Well to be redeveloped
CUMBERLAND-5D	9/16/2019	6.35	0.08	-431	35.1	183.6	22.5	

Notes:
° C - celsius
mg/L - milligram per liter
mS/cm - millisiemens per centimeter
mV - millivolt
NTU - nephelometric turbidity units
NR - not recorded

APPENDIX B
HPT Raw Data



CASCADE
DRILLING | TECHNICAL SERVICES

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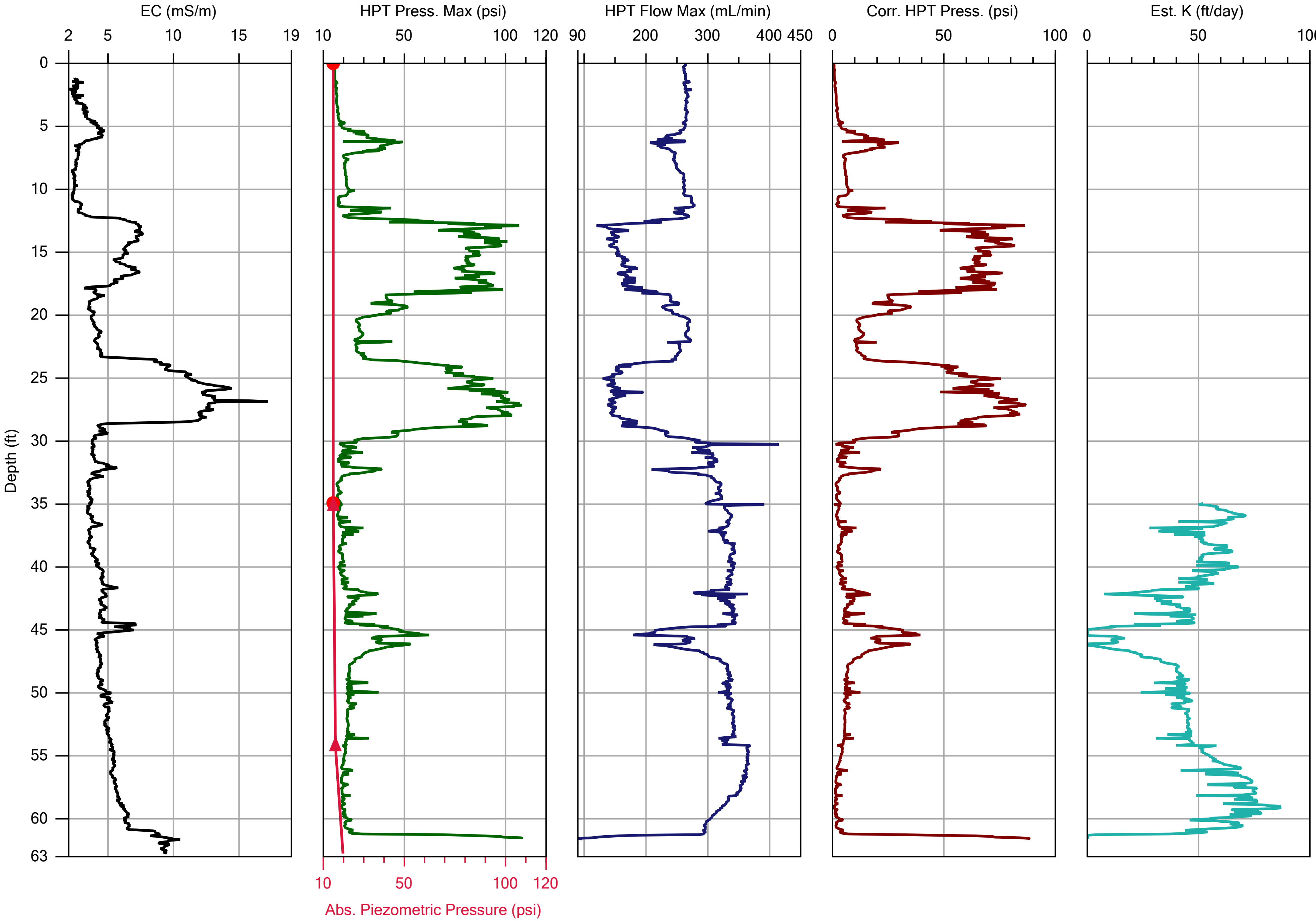
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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DRILLING | TECHNICAL SERVICES

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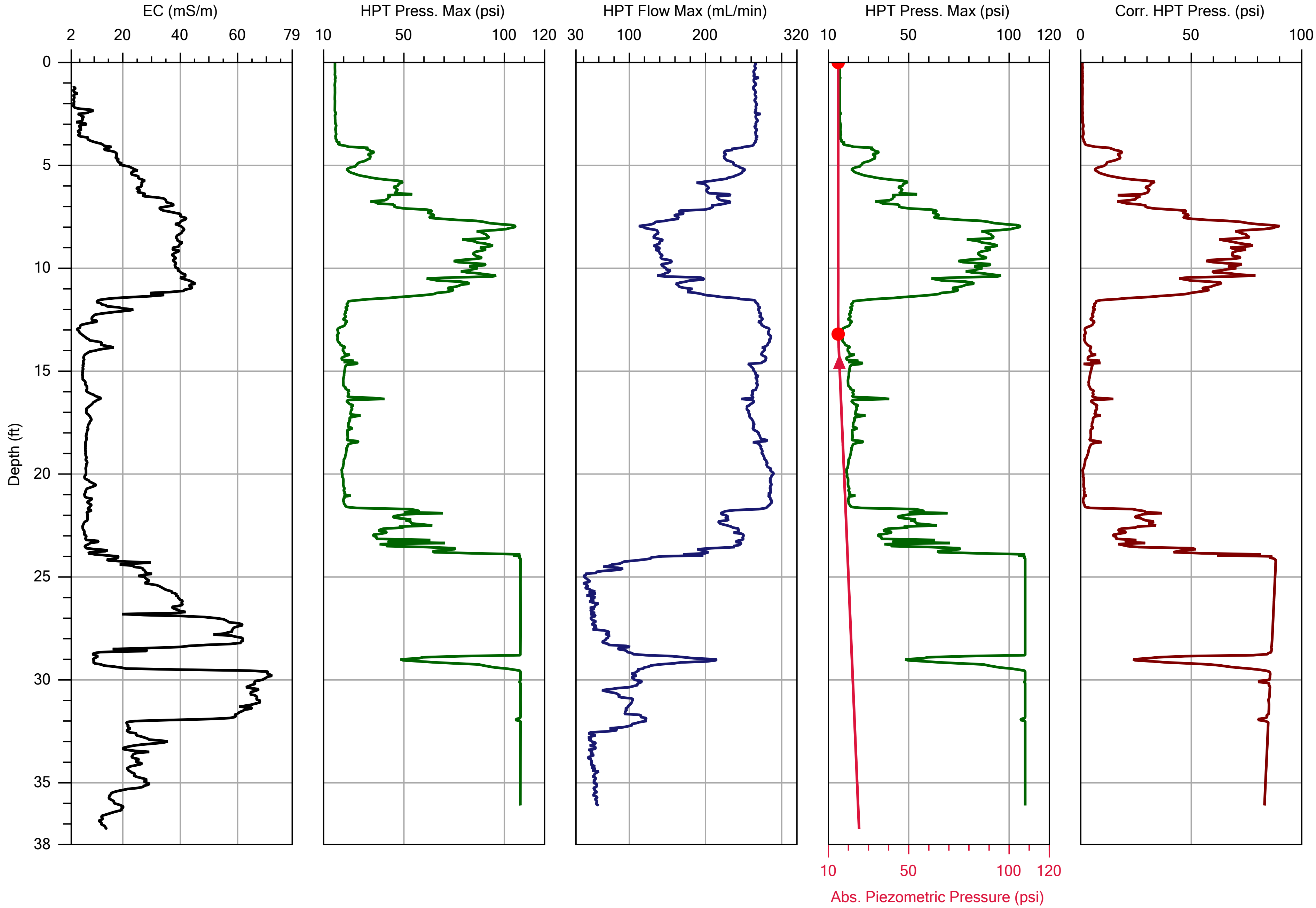
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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DRILLING | TECHNICAL SERVICES

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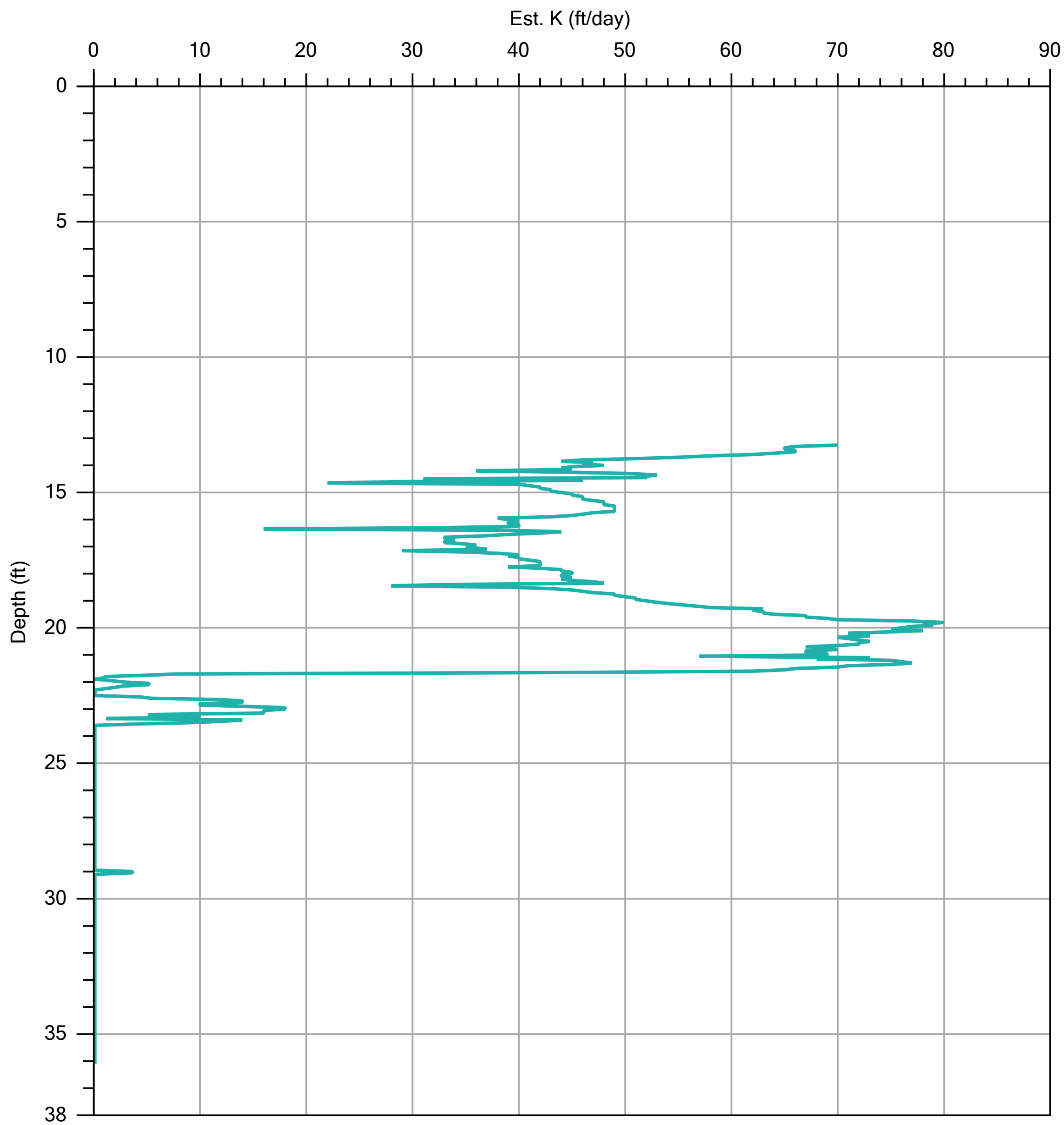
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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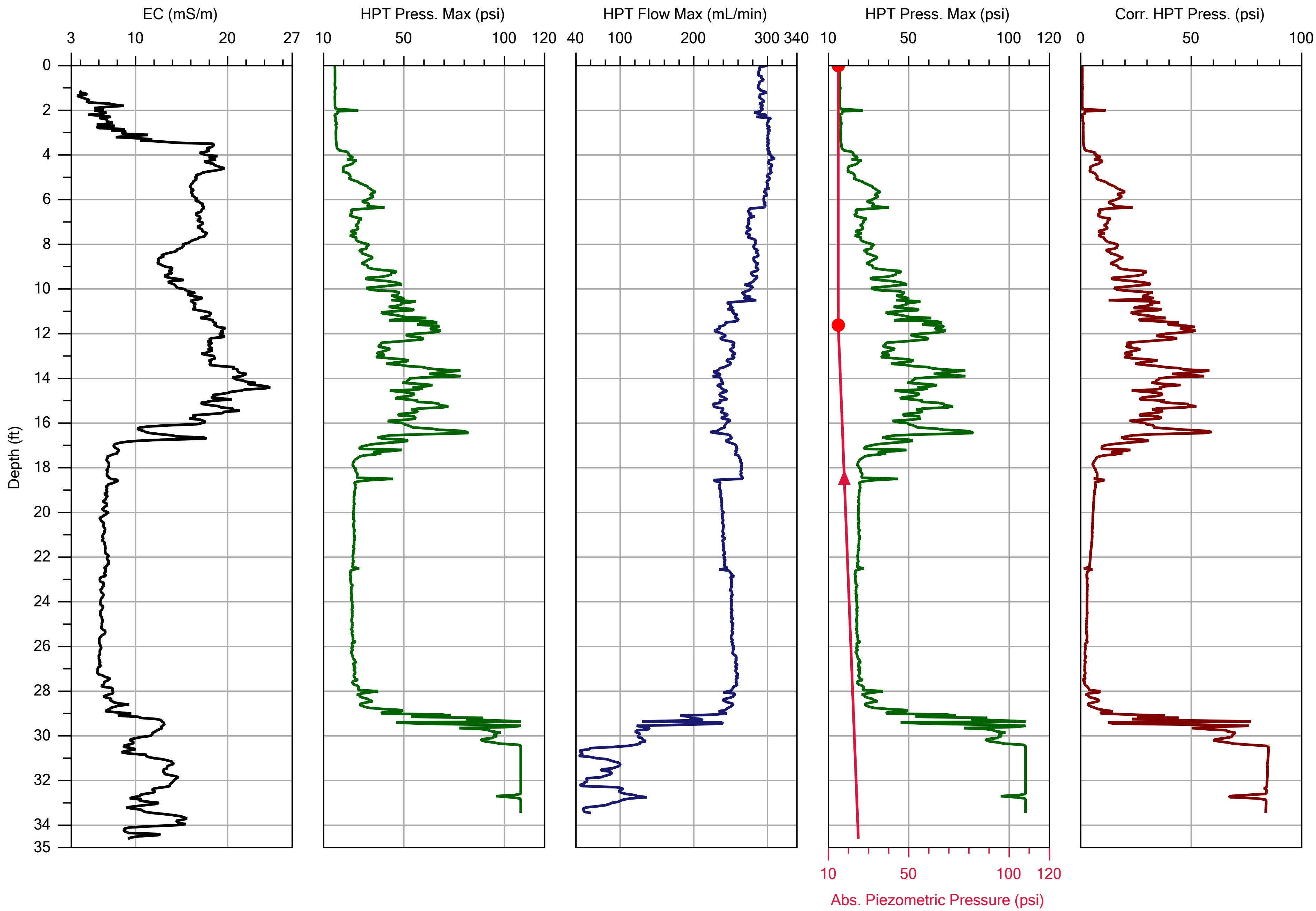

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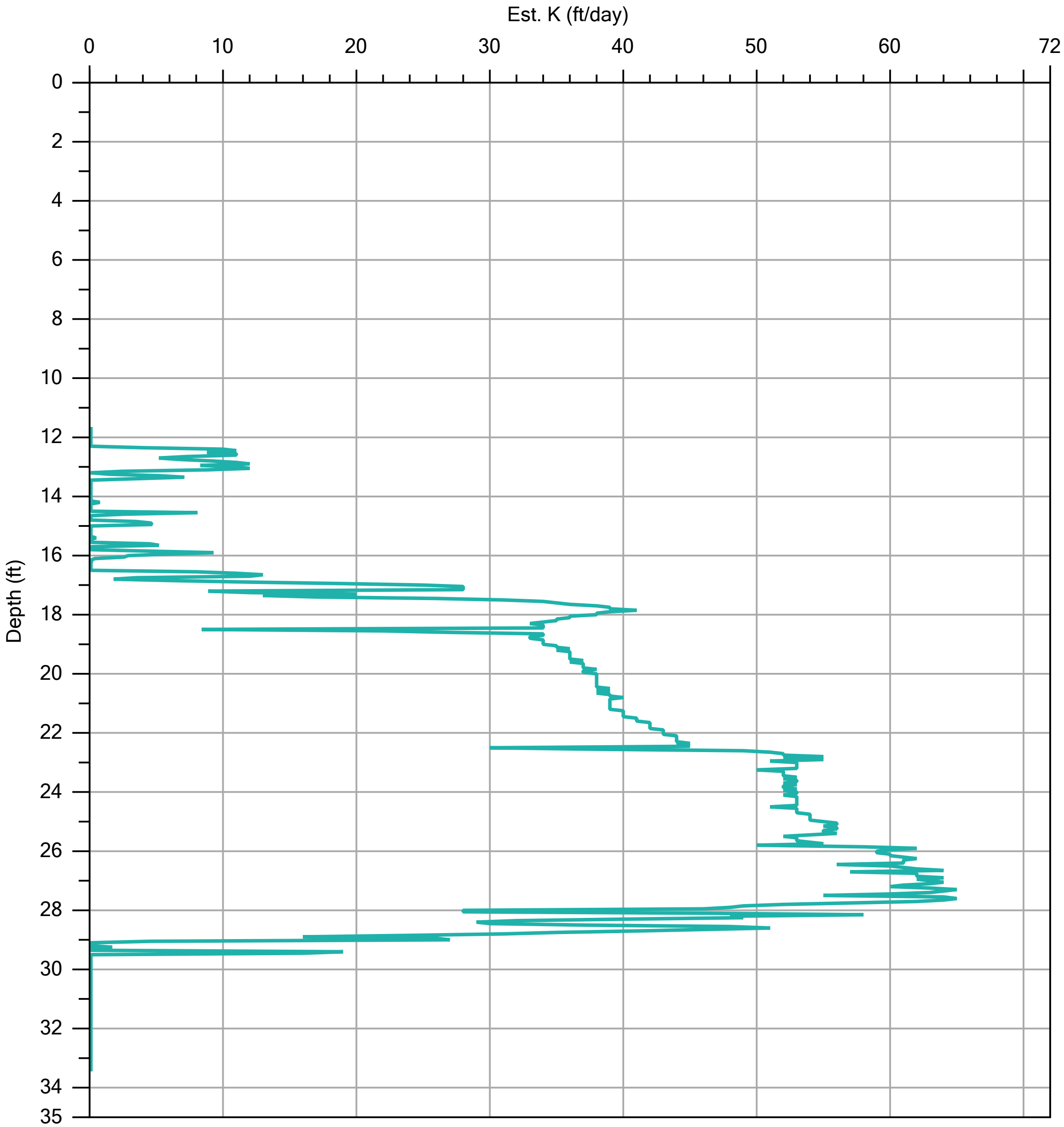

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DRILLING | TECHNICAL SERVICES

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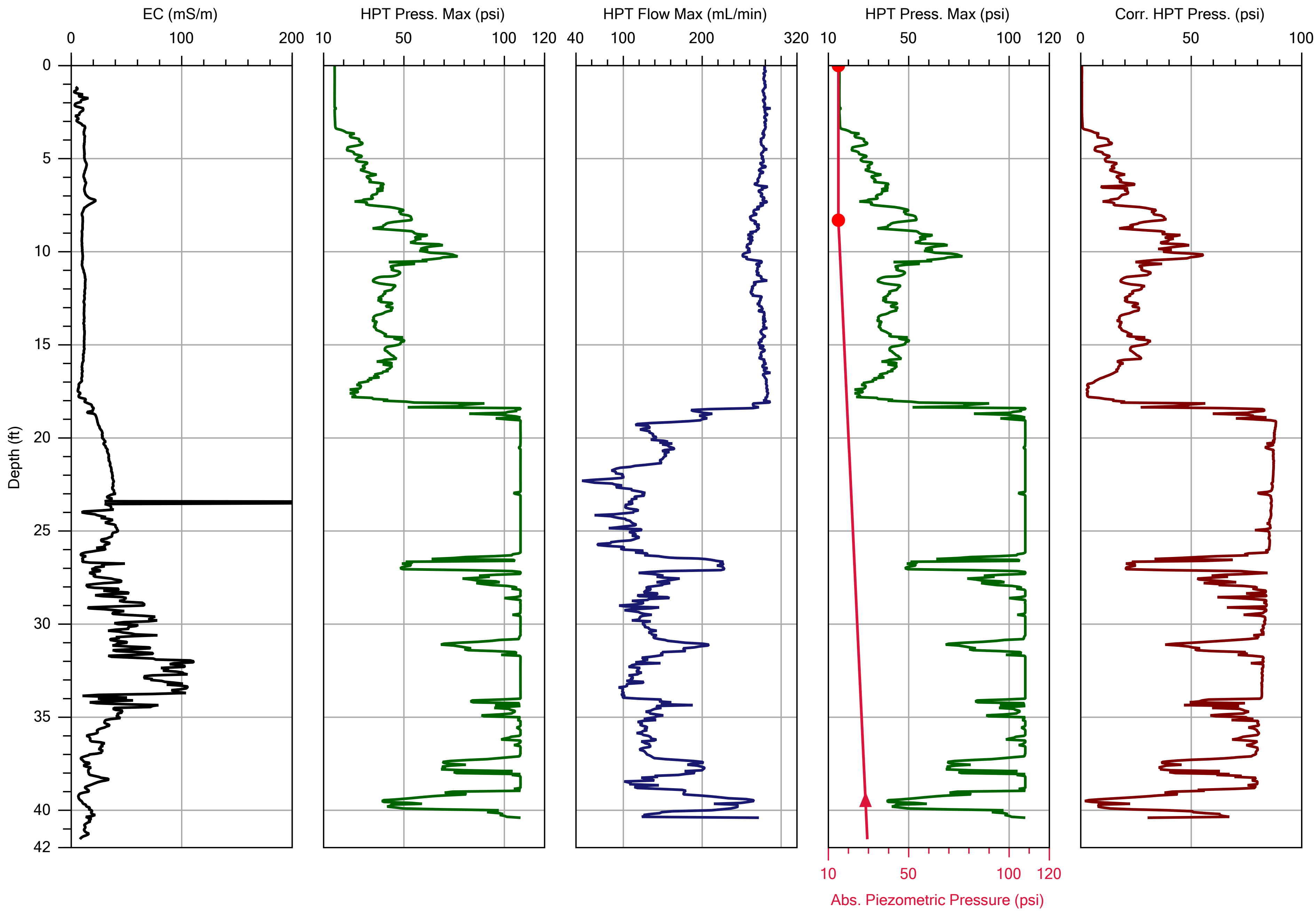
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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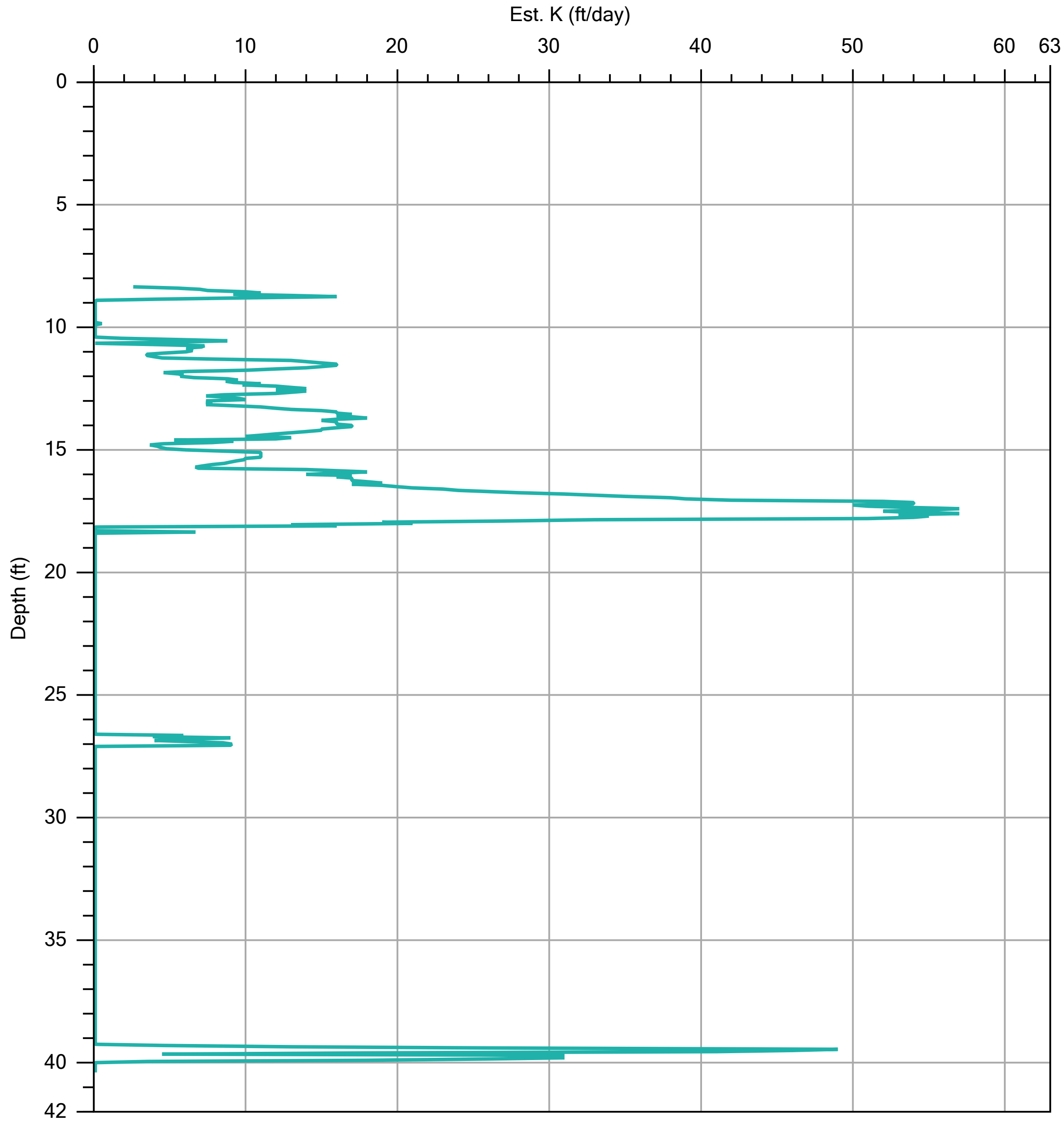

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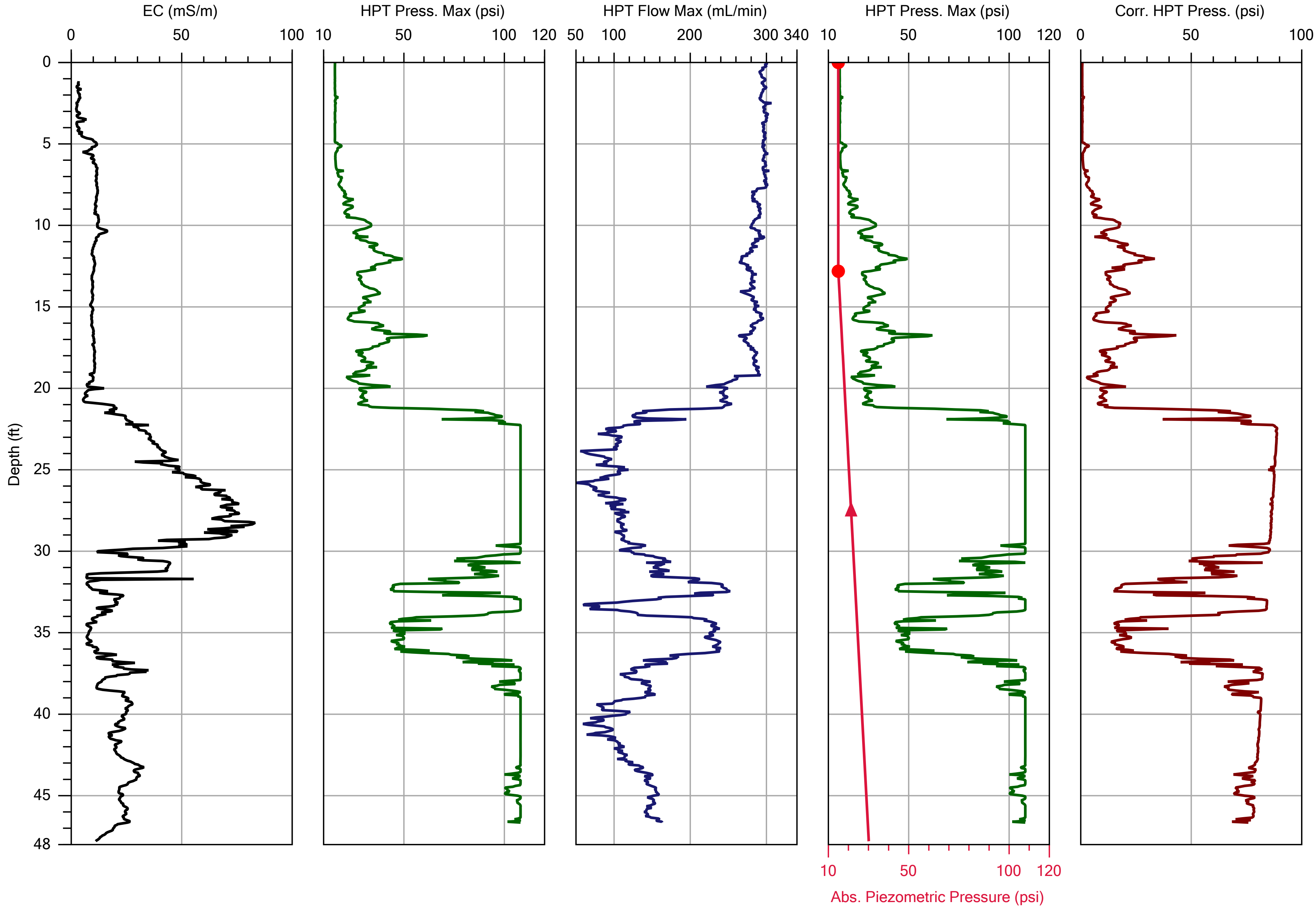

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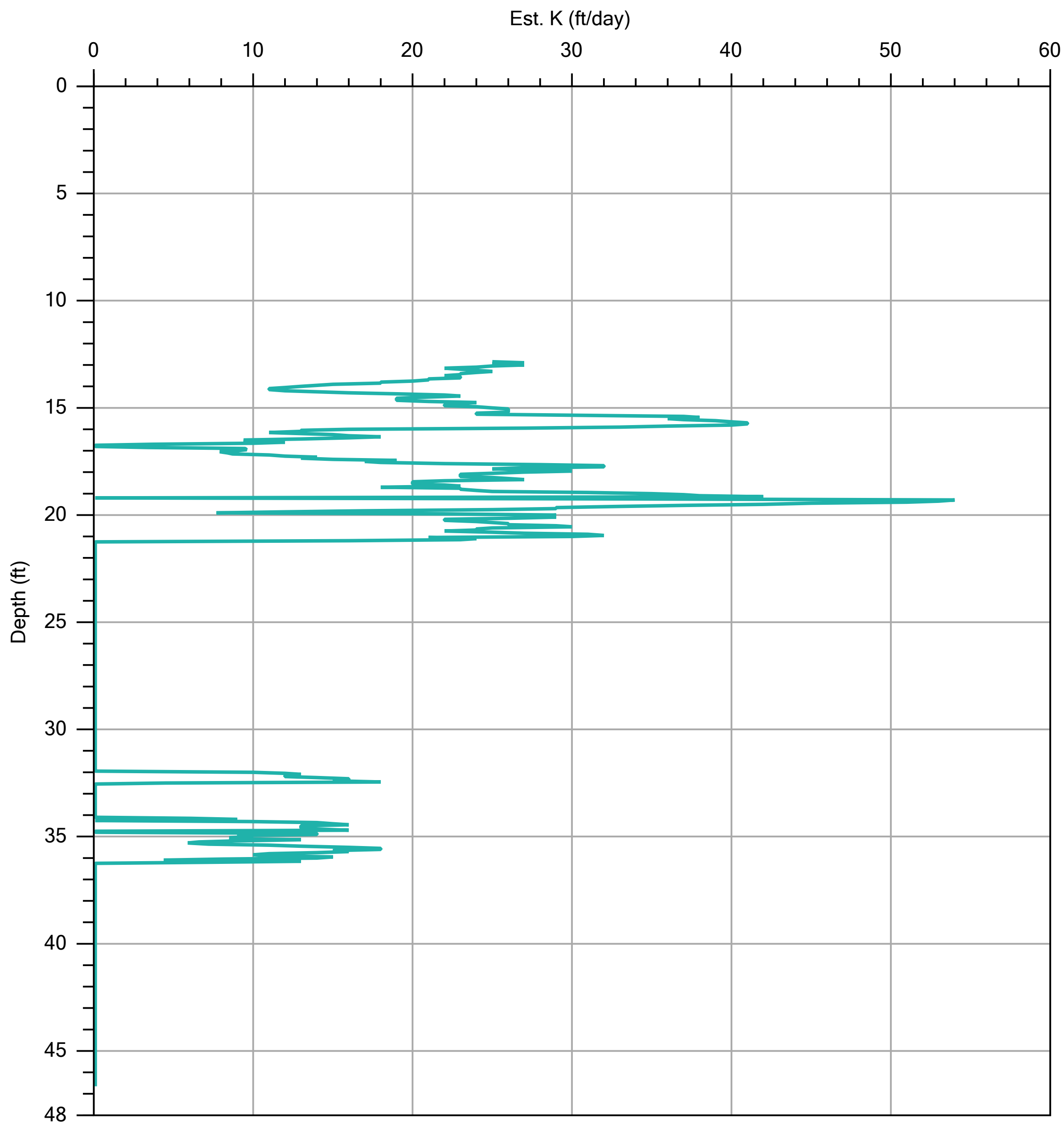

CASCADE
DRILLING | TECHNICAL SERVICES

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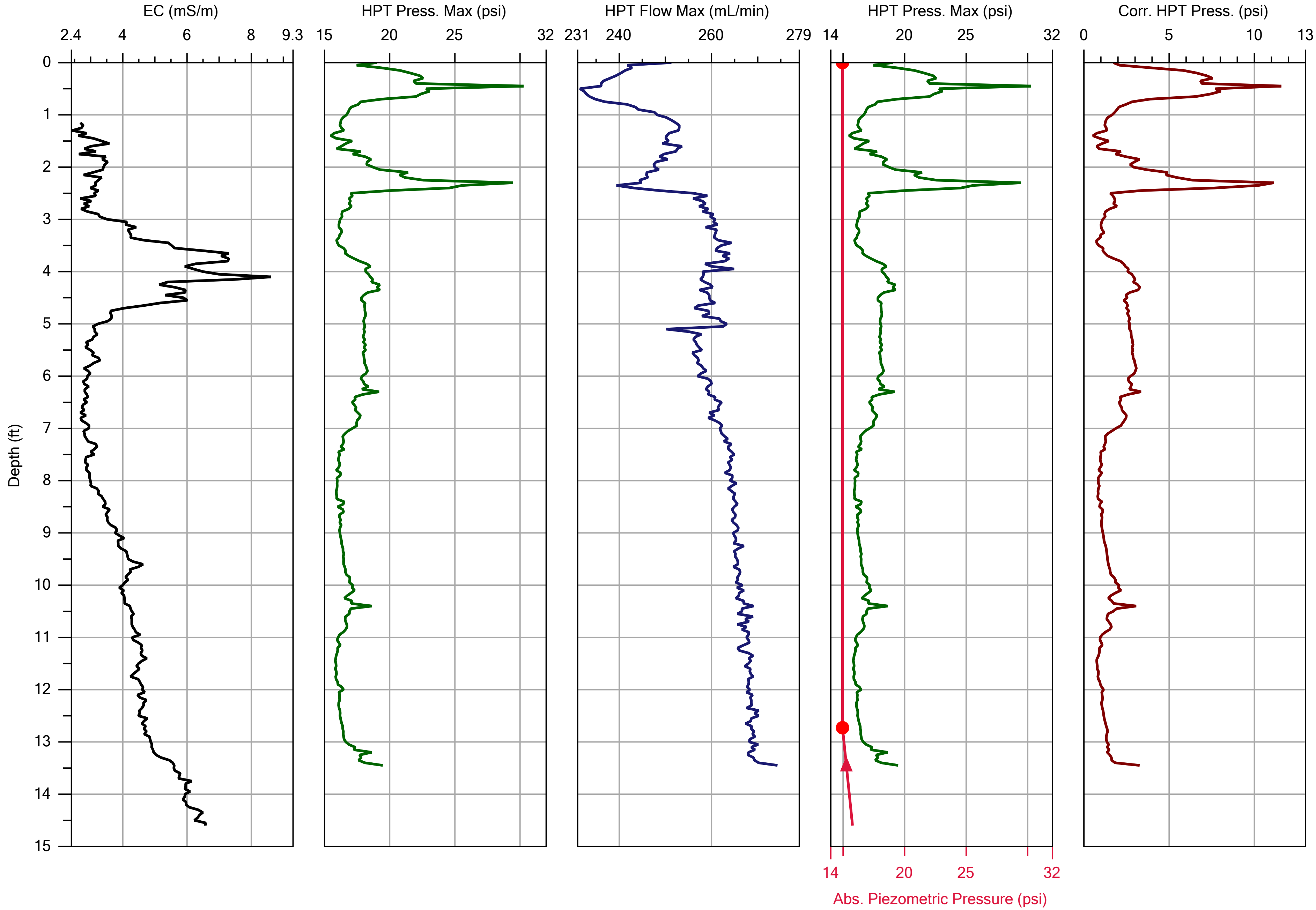

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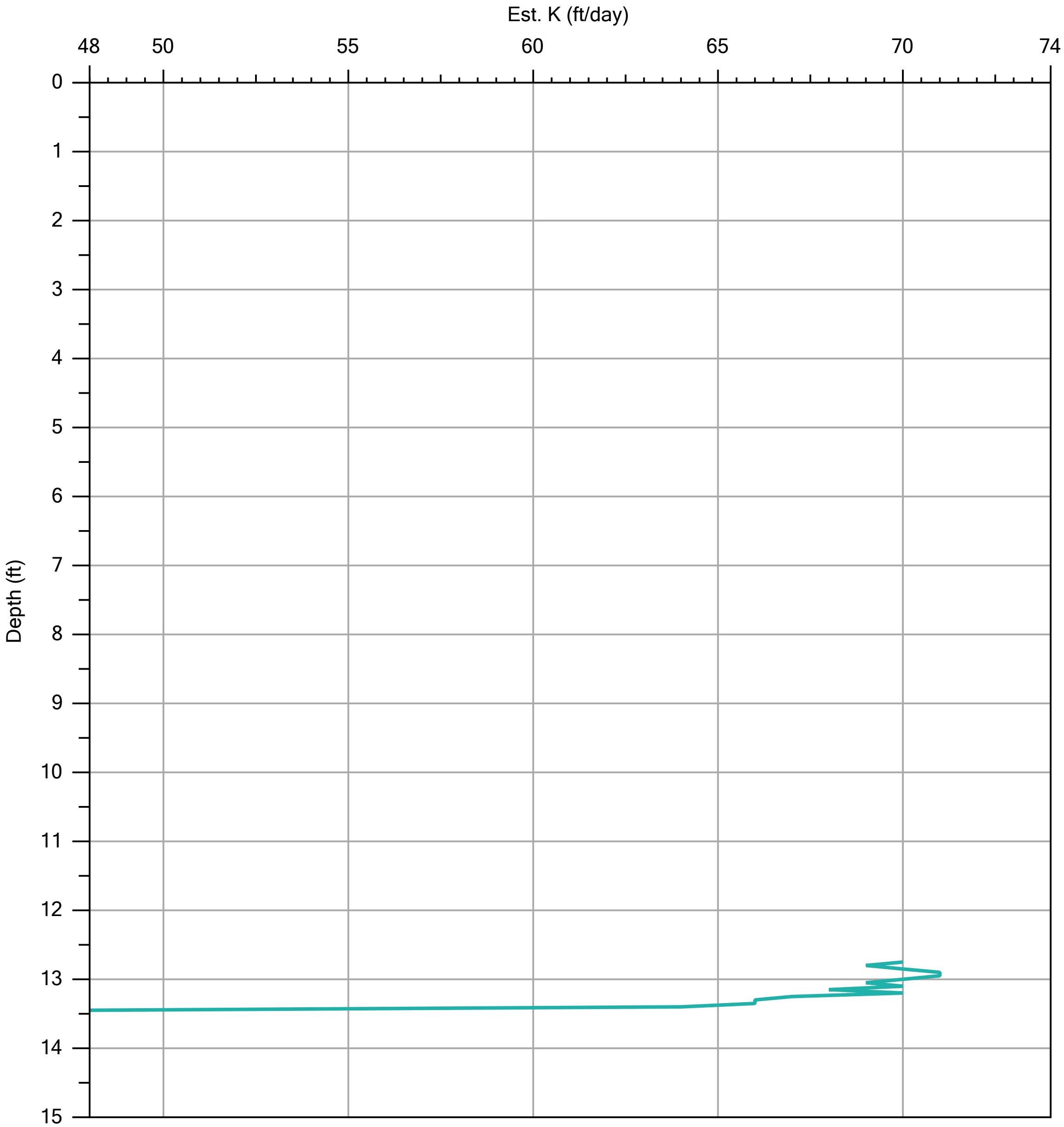

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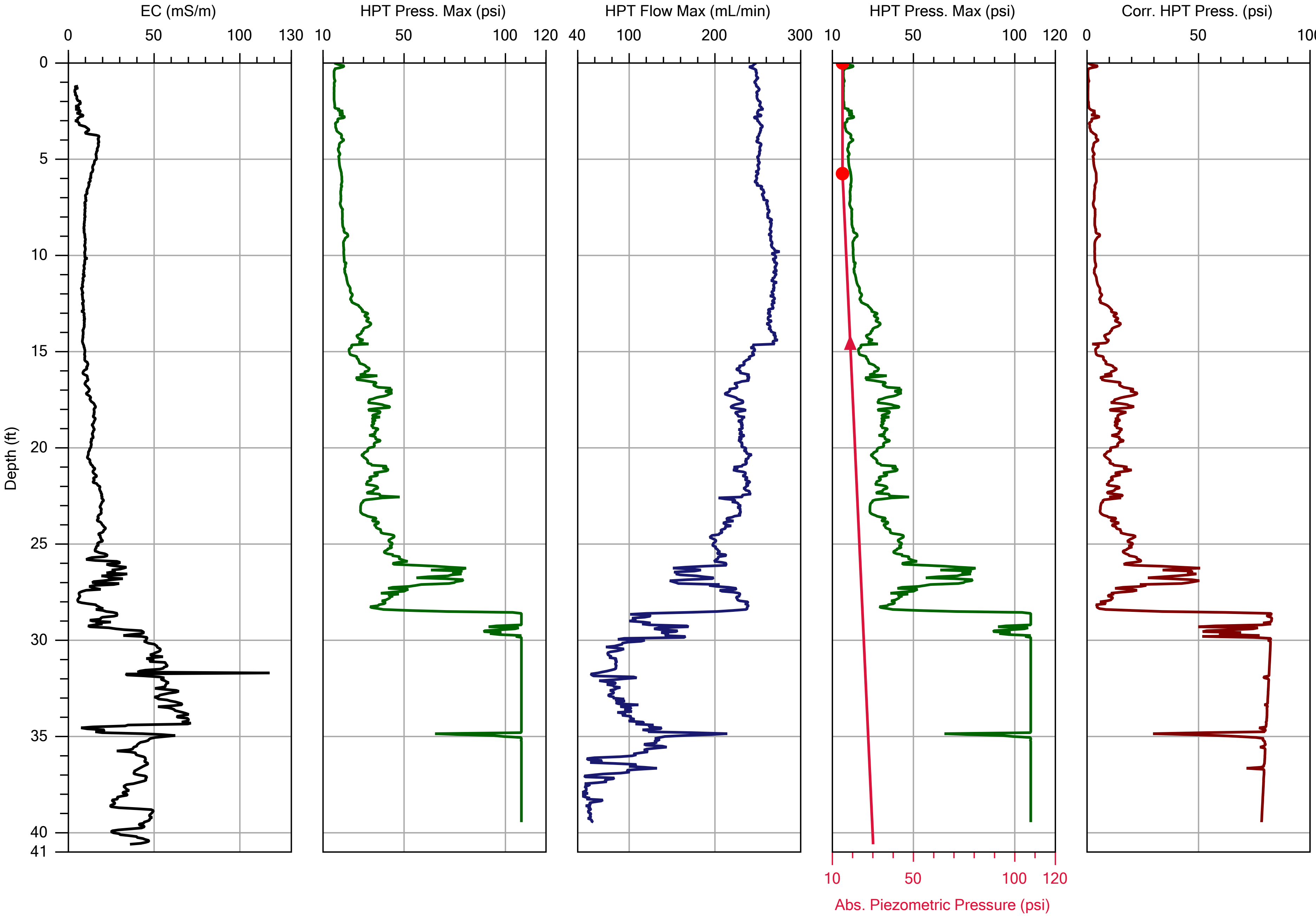

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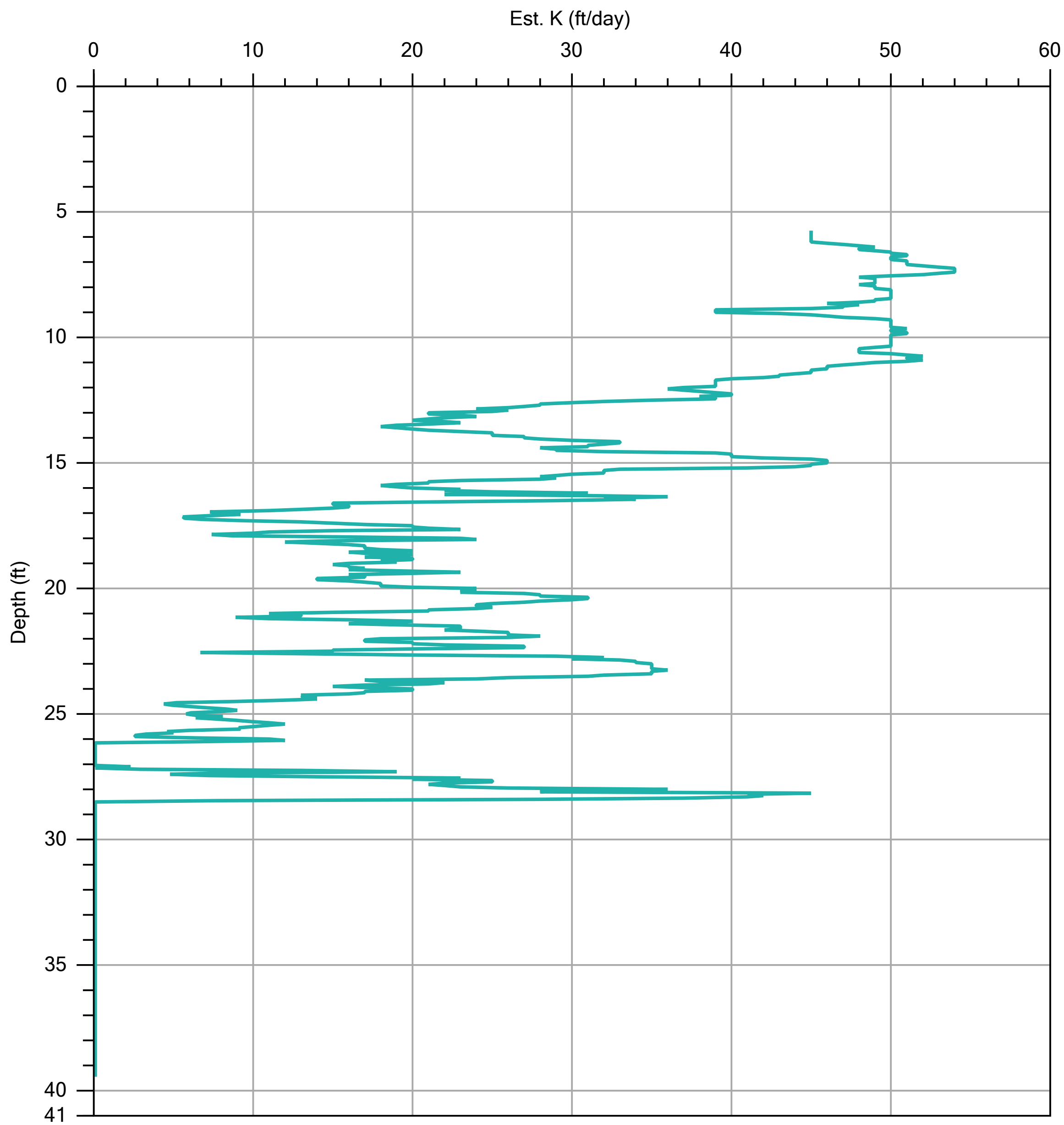

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DRILLING | TECHNICAL SERVICES

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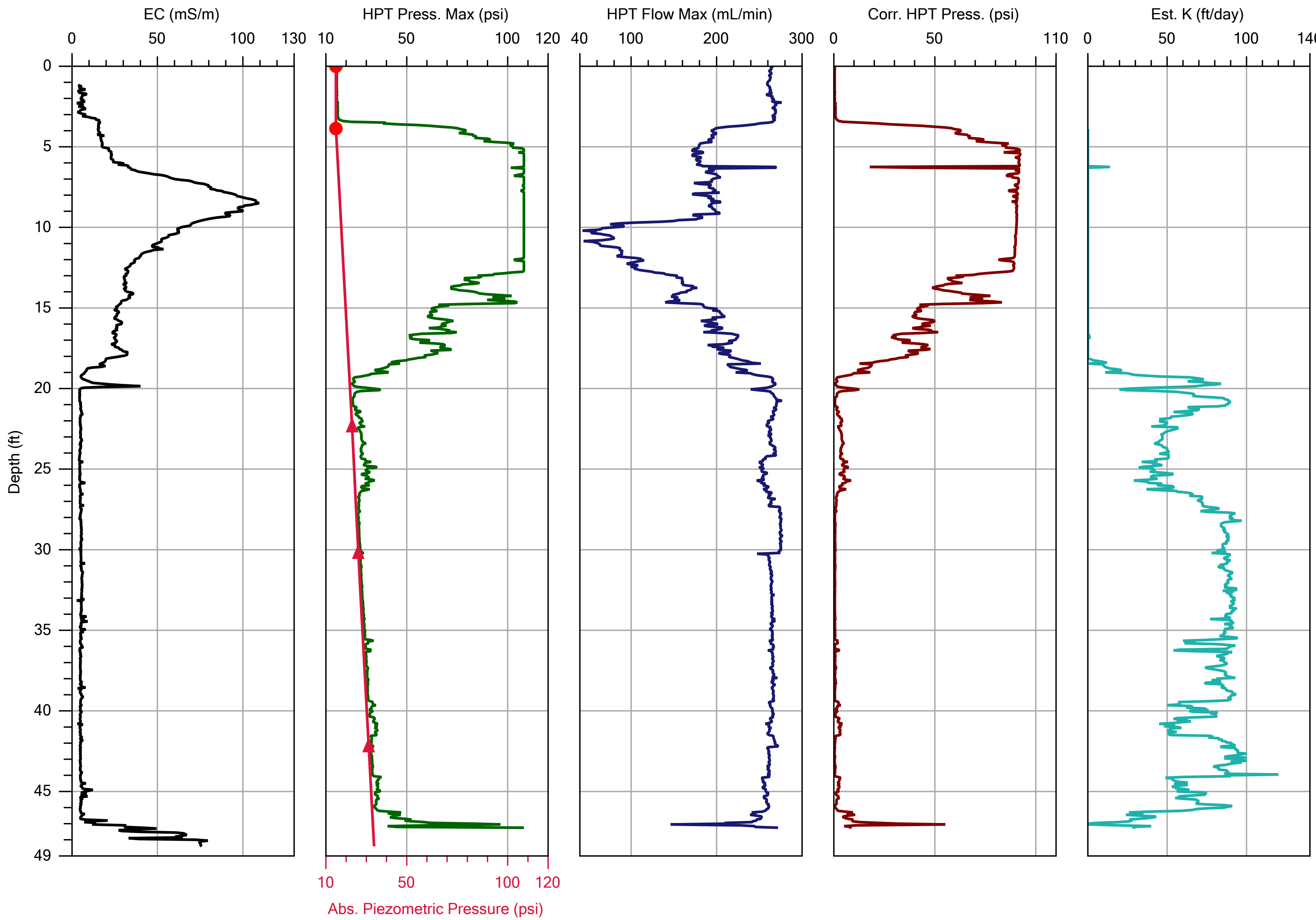

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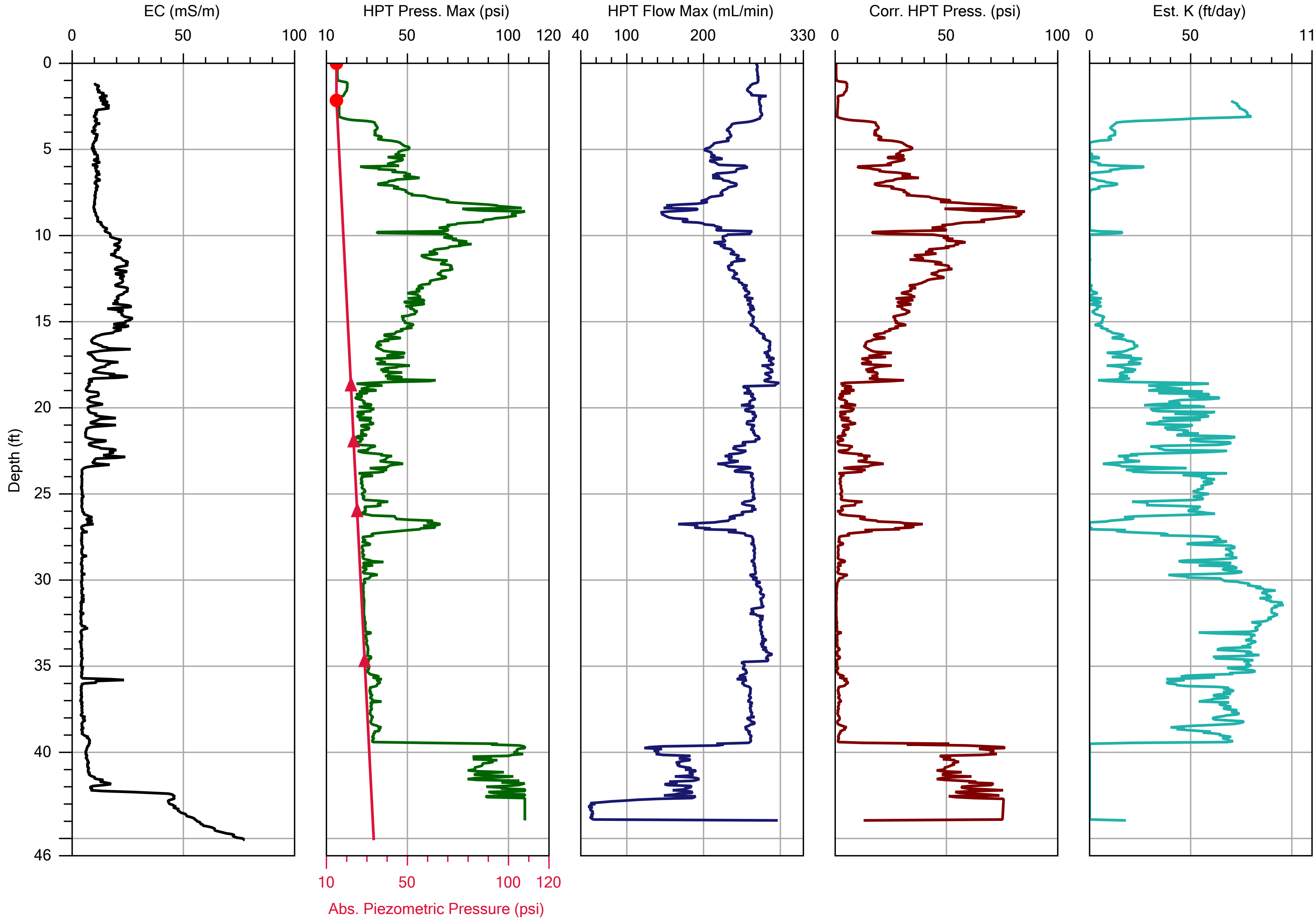

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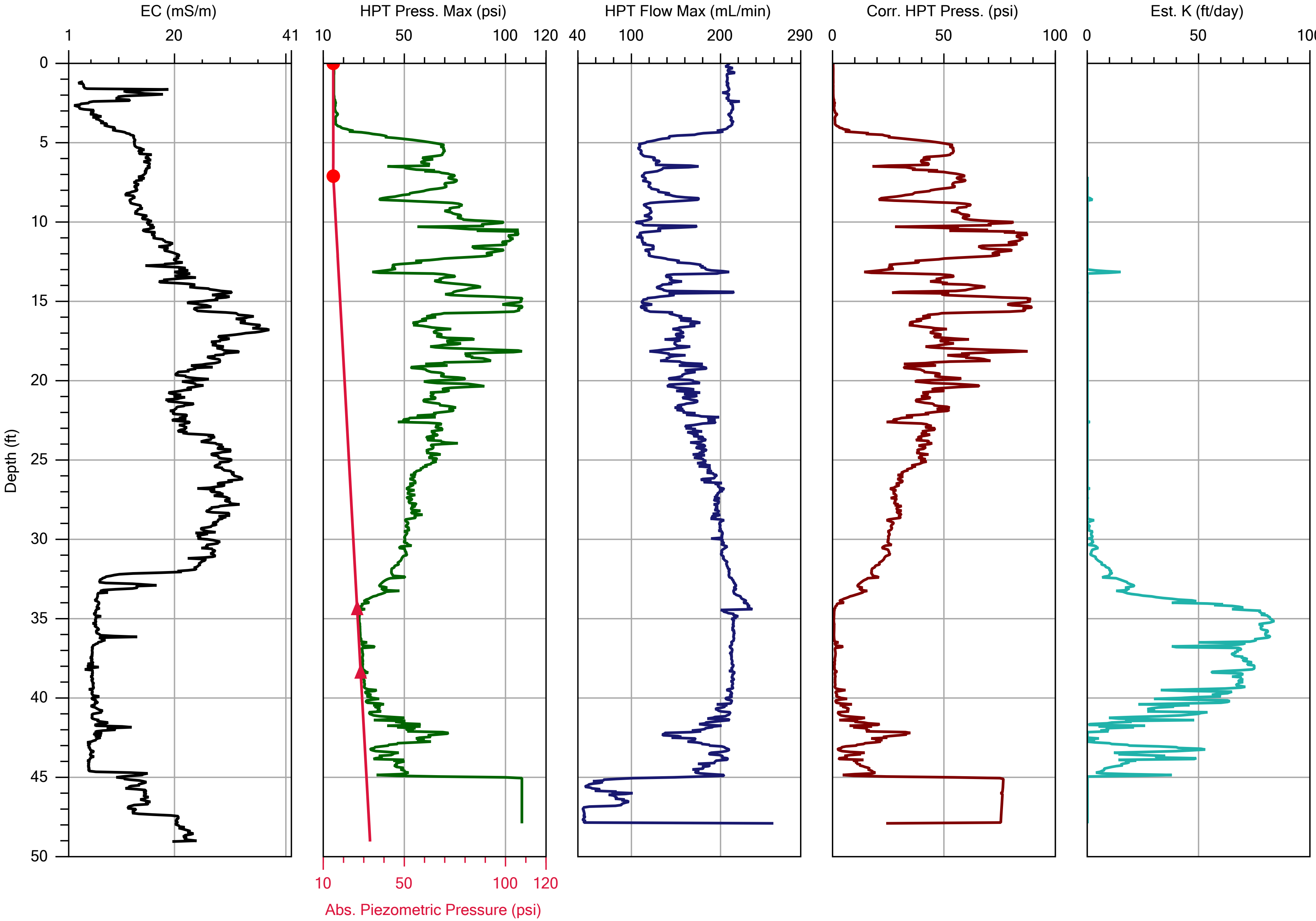

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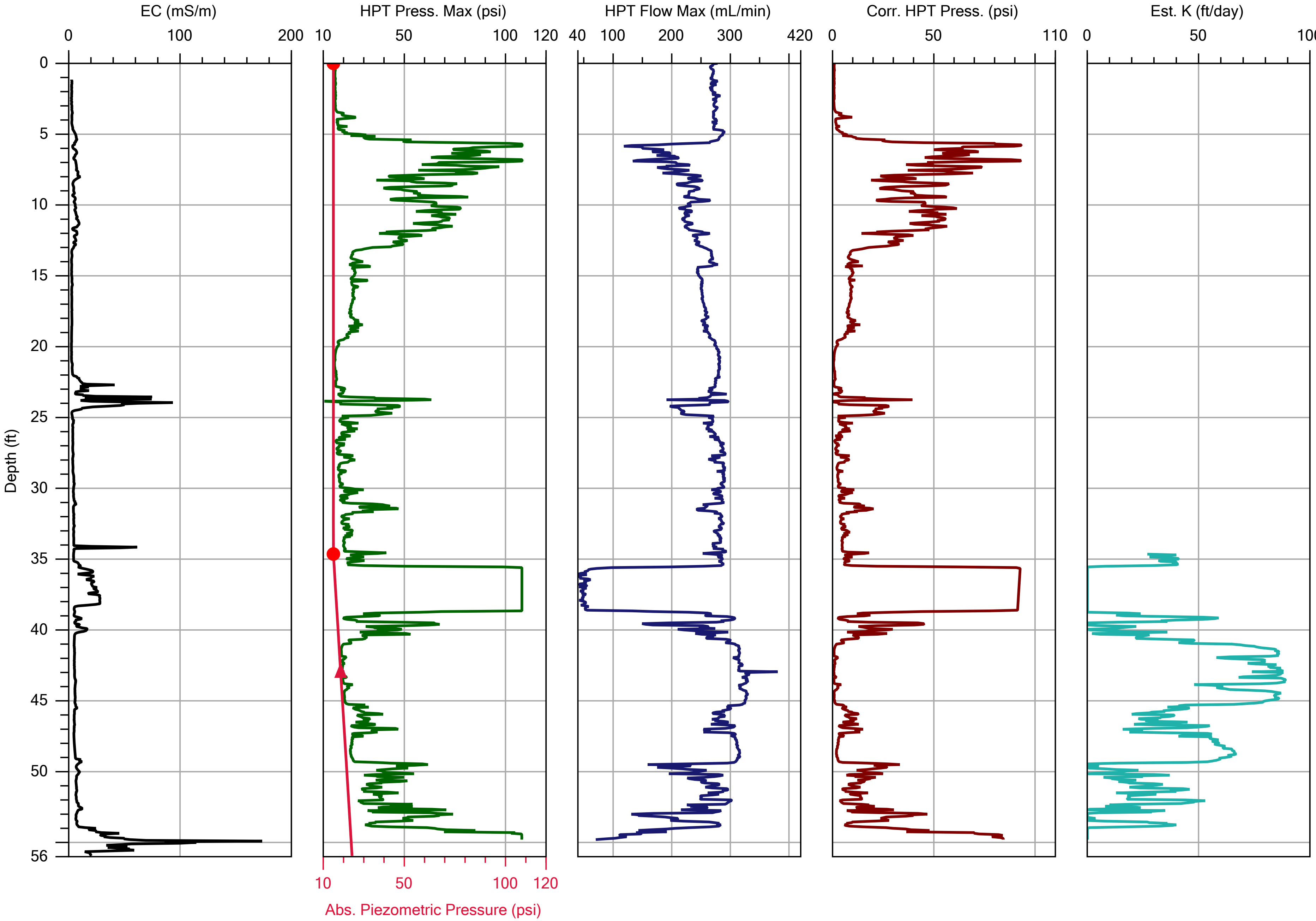

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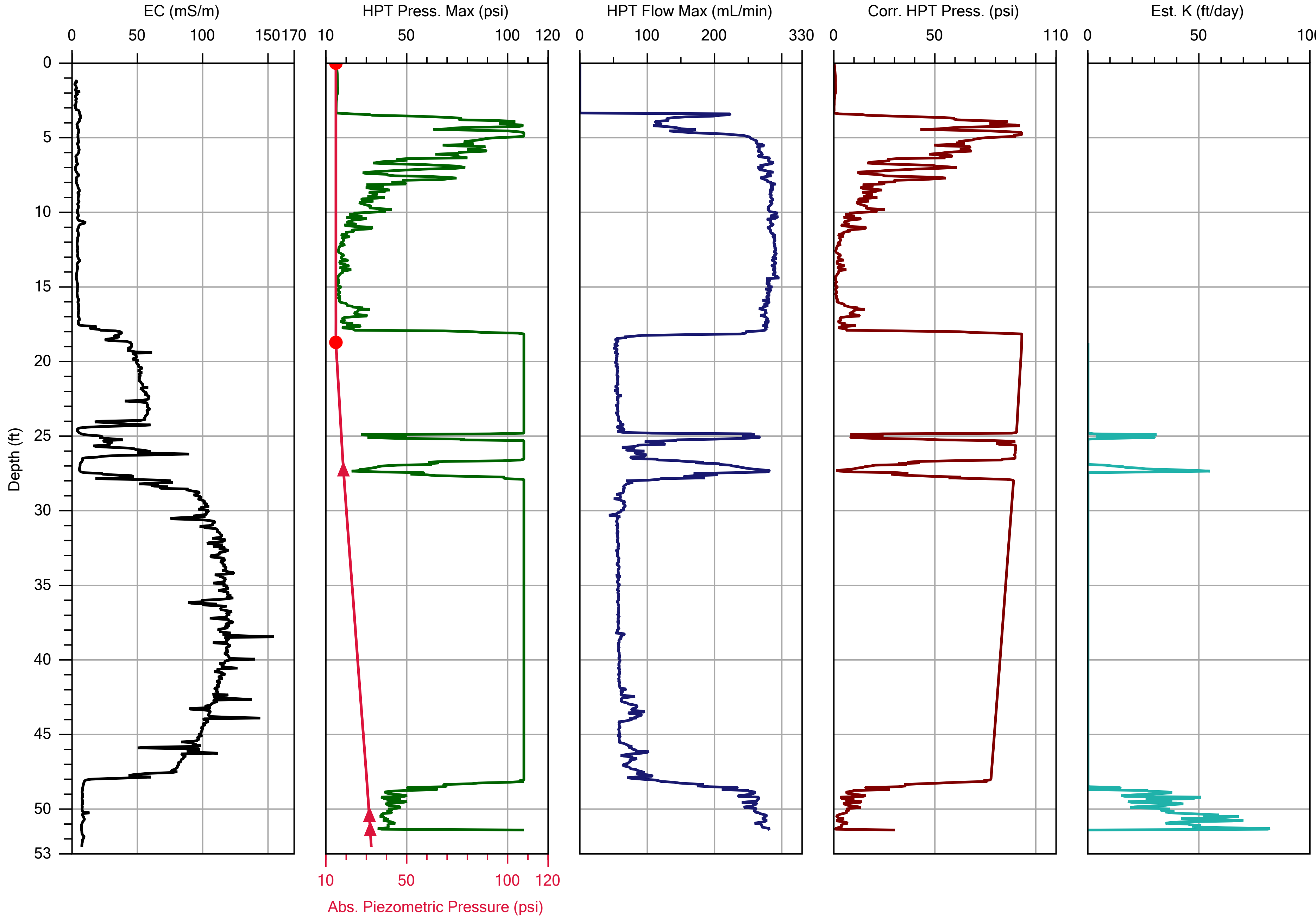

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DRILLING | TECHNICAL SERVICES

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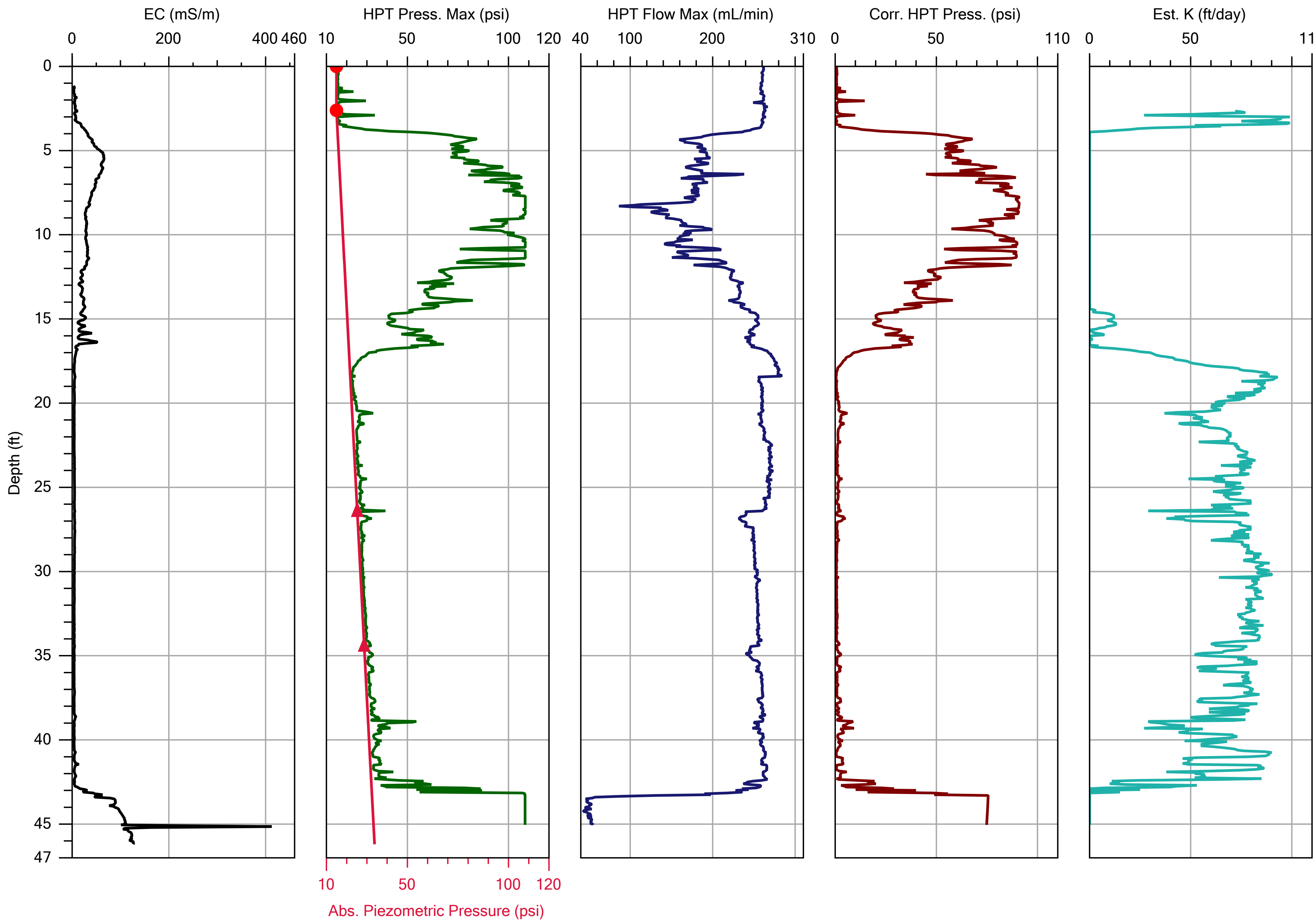

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DRILLING | TECHNICAL SERVICES

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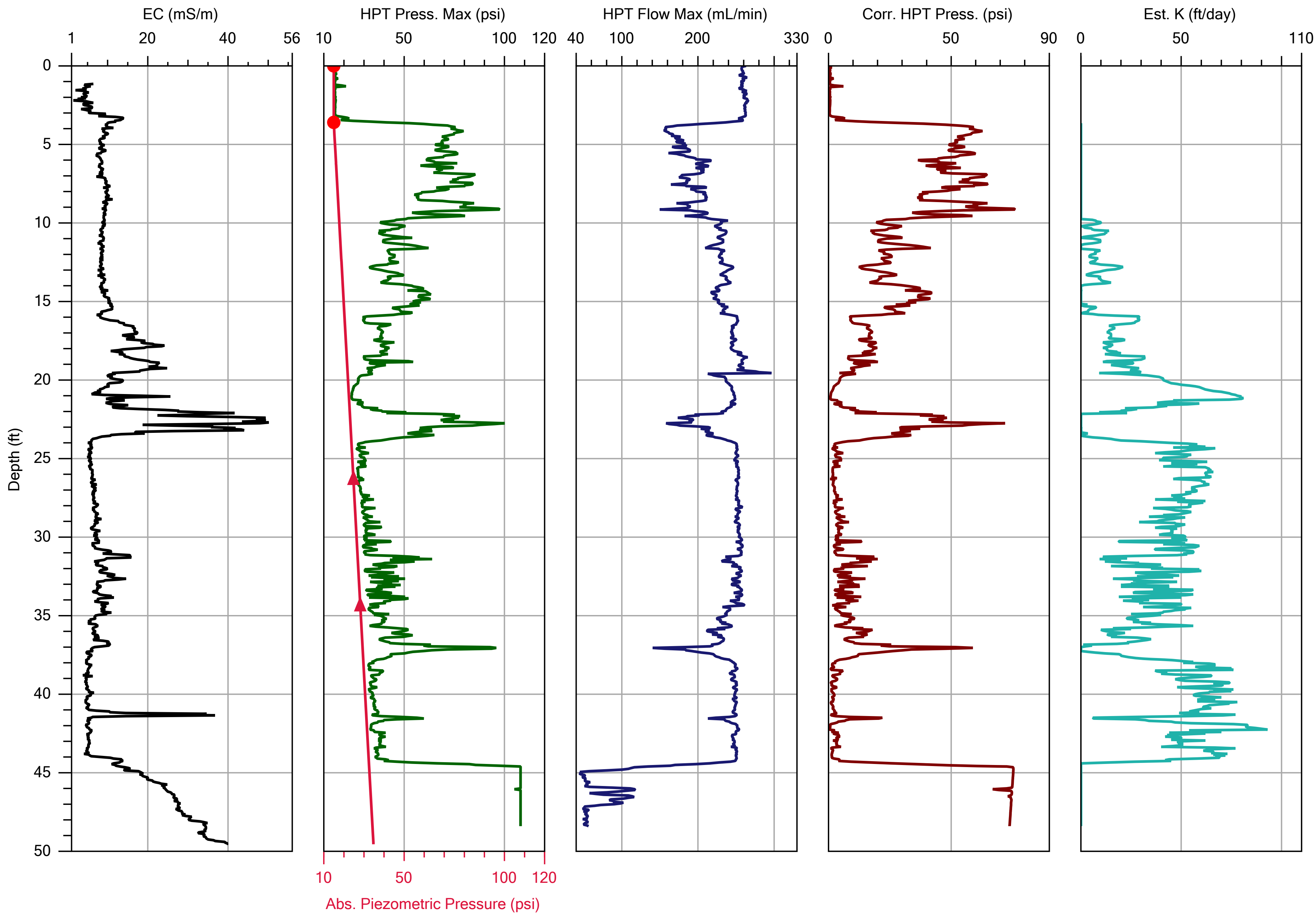

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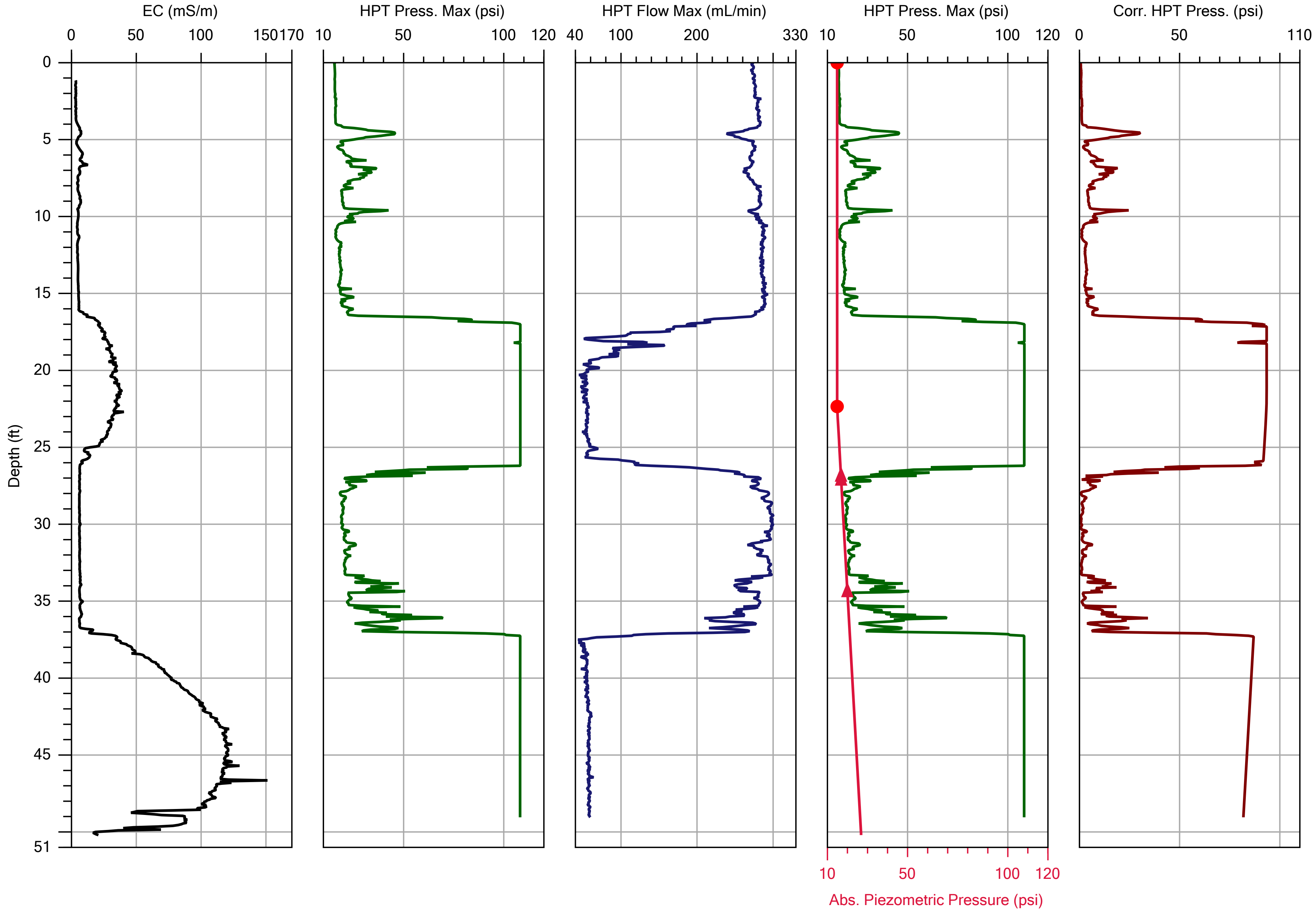

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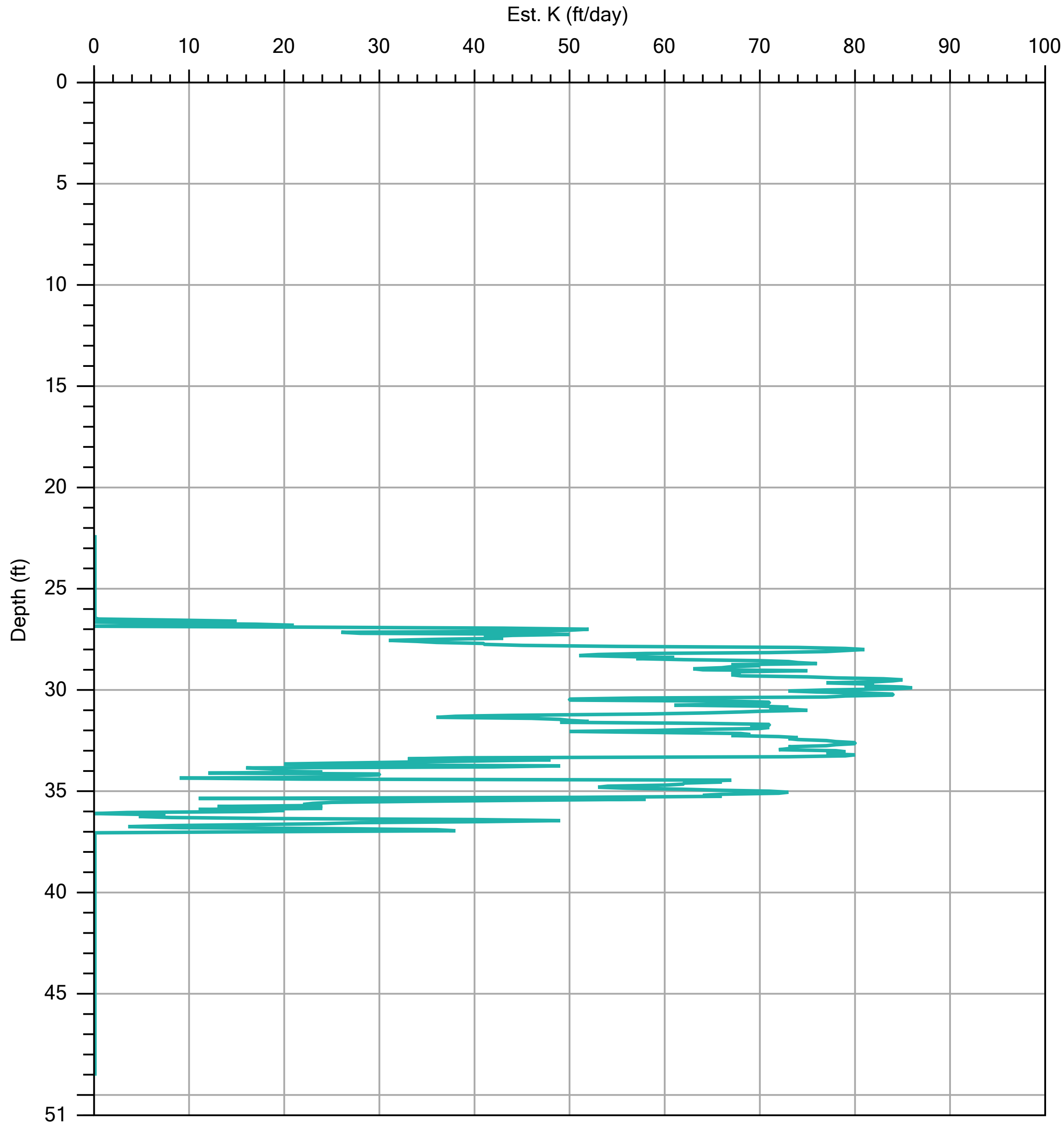

CASCADE DRILLING | TECHNICAL SERVICES

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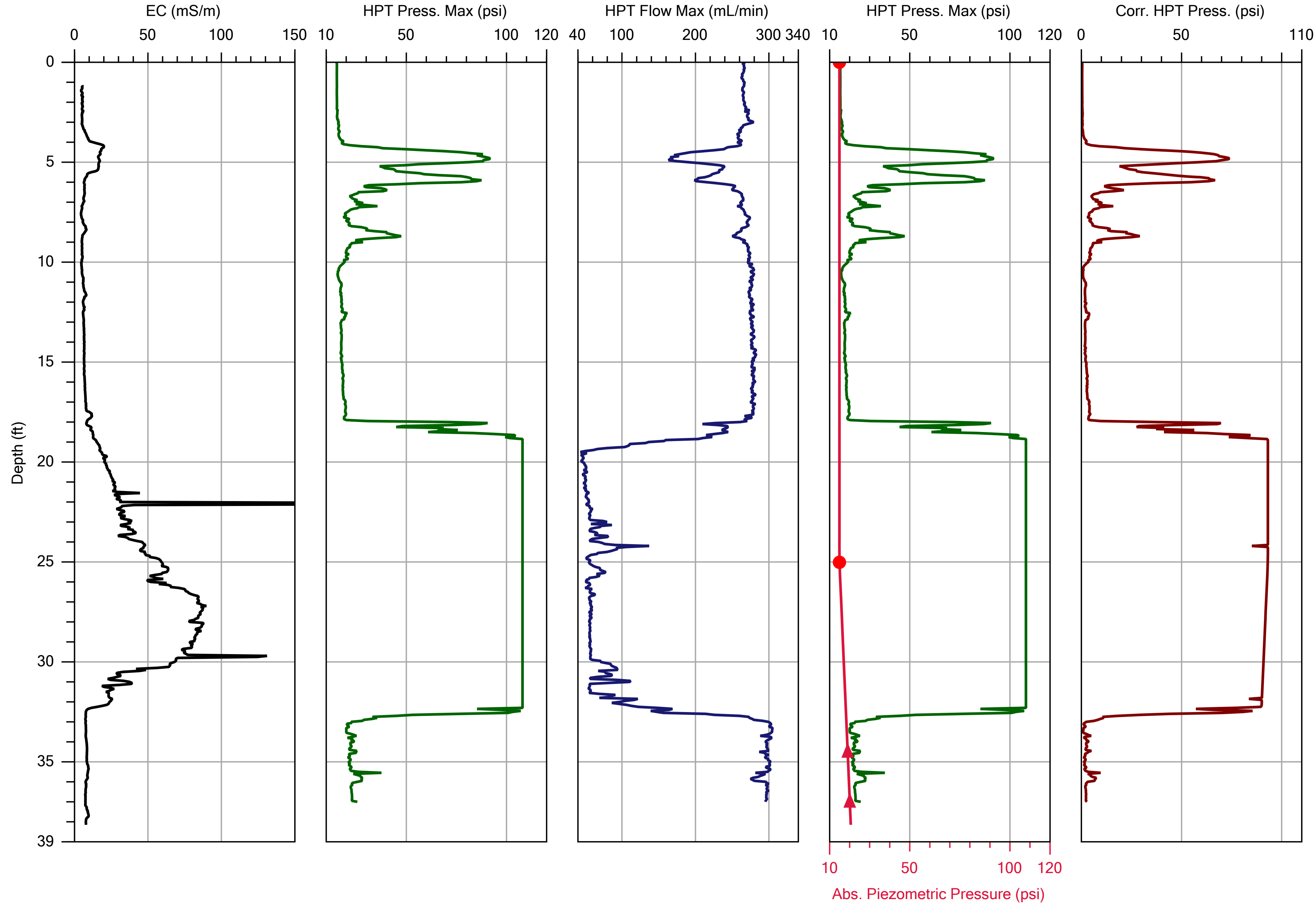

CASCADE
DRILLING | TECHNICAL SERVICES

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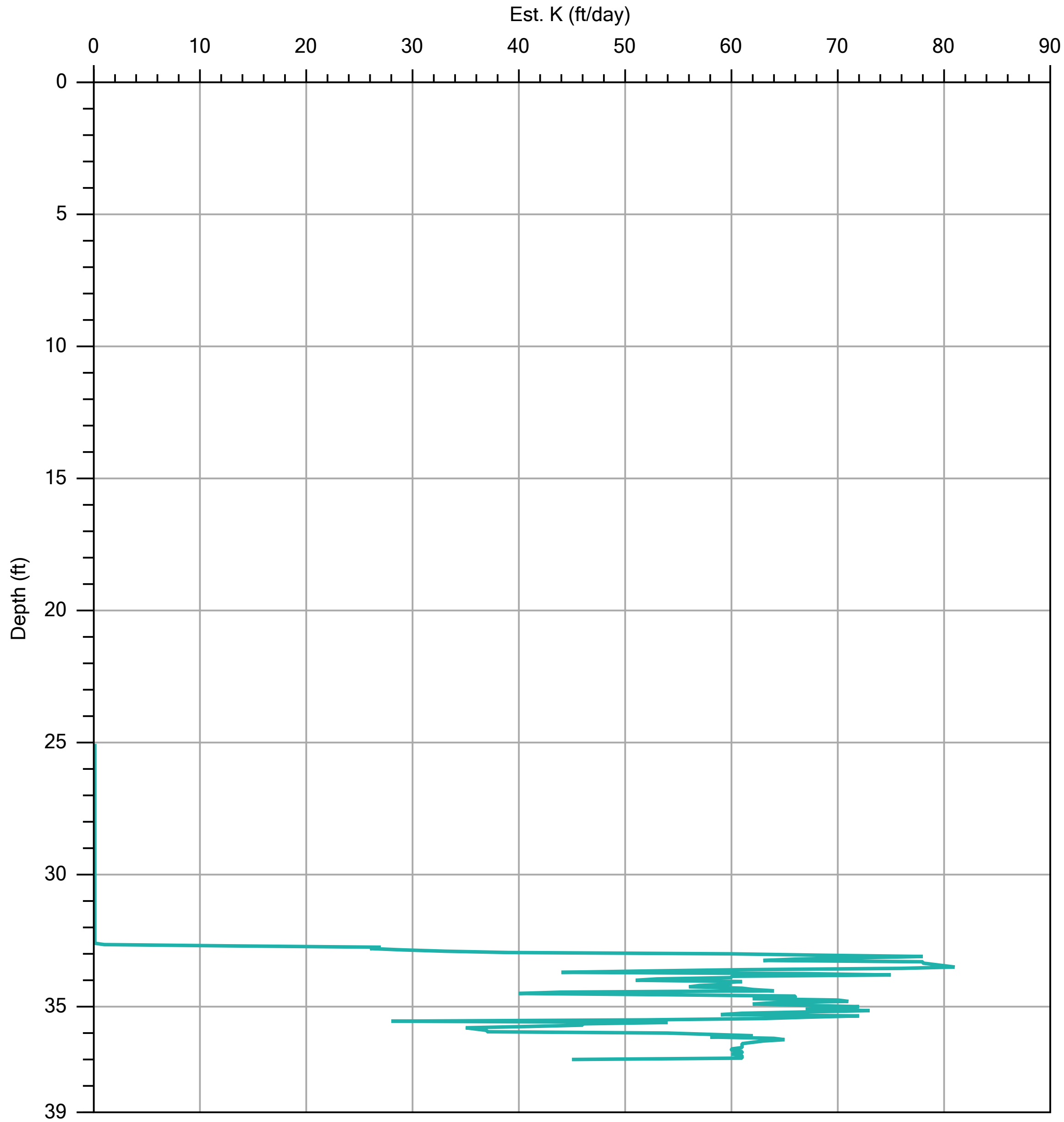
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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DRILLING | TECHNICAL SERVICES

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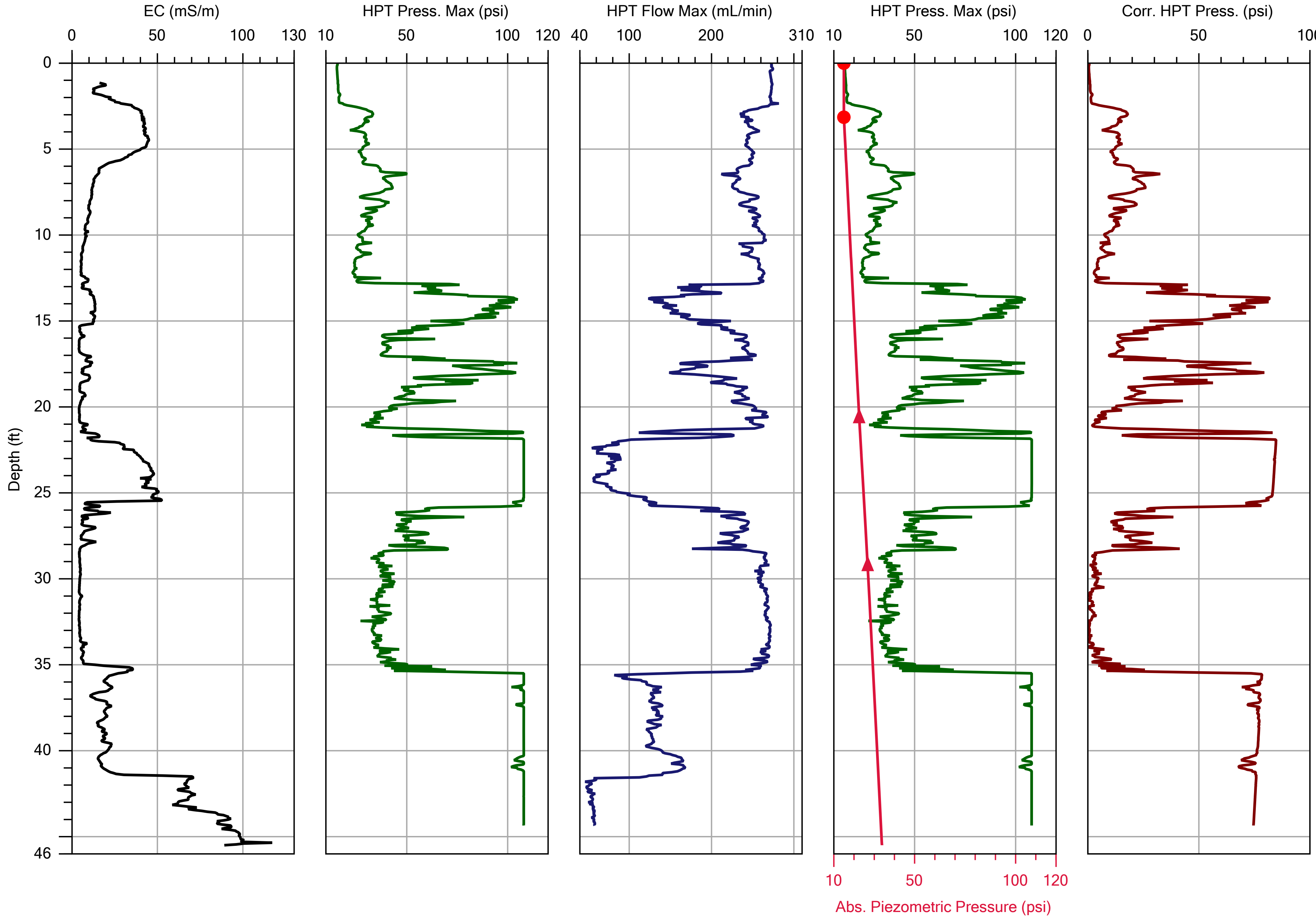
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



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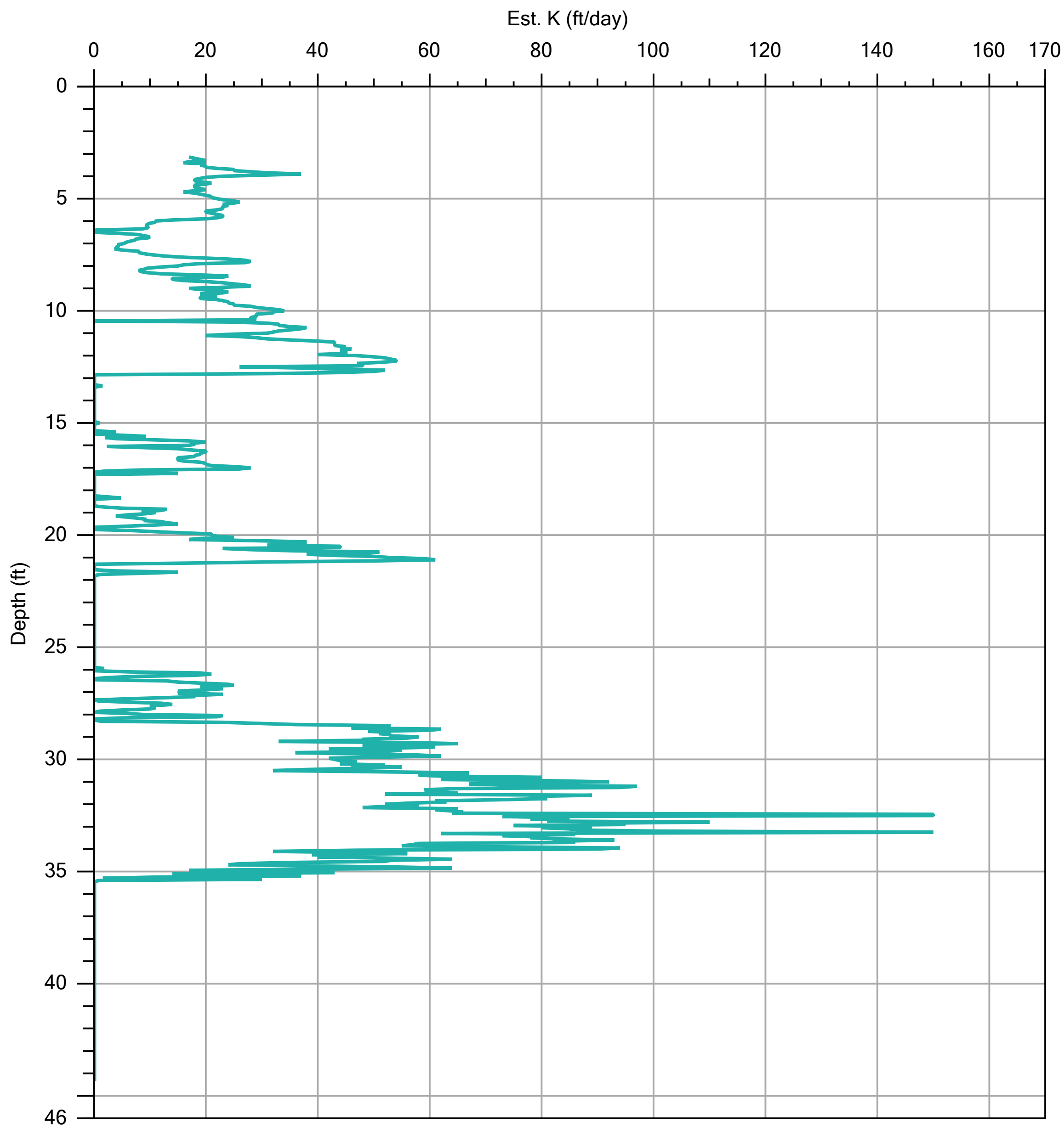
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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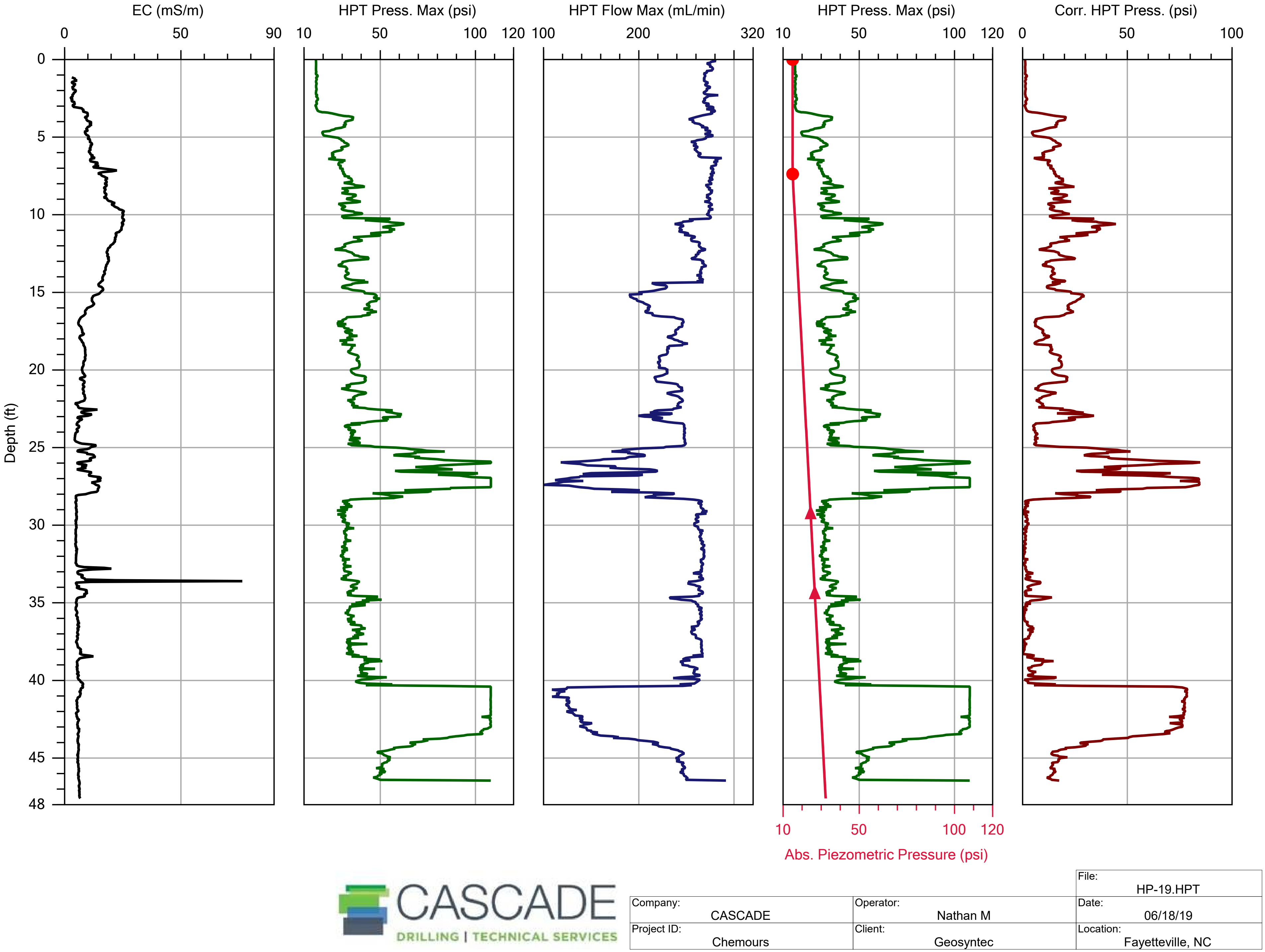
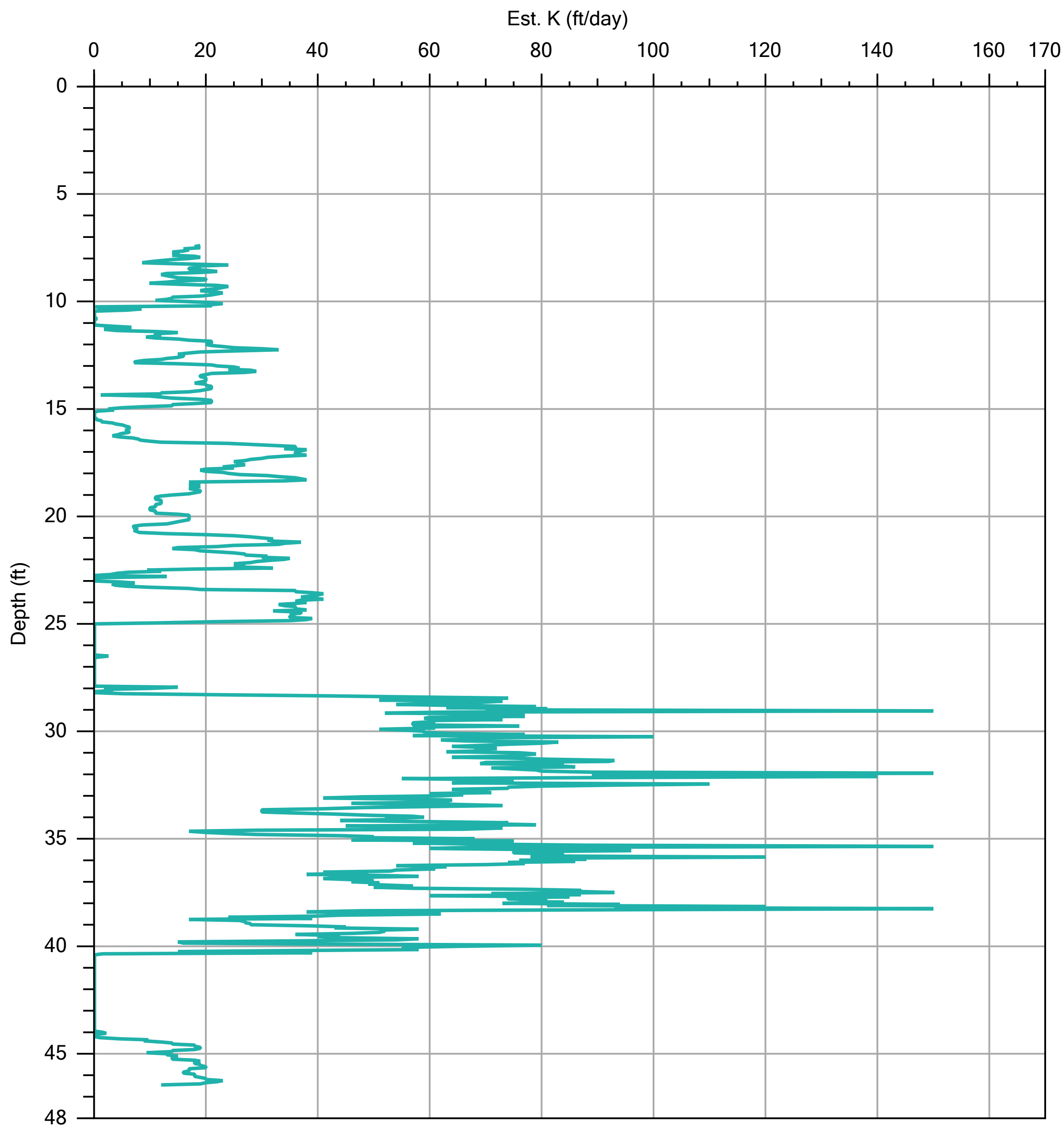
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC


EC (mS/m)
HPT Press. Max (psi)
HPT Flow Max (mL/min)
HPT Press. Max (psi)
Corr. HPT Press. (psi)
Depth (ft)
Abs. Piezometric Pressure (psi)
CASCADE
DRILLING | TECHNICAL SERVICES
Company: CASCADE
Operator: Nathan M
File: HP-19.HPT
Date: 06/18/19
Project ID: Chemours
Client: Geosyntec
Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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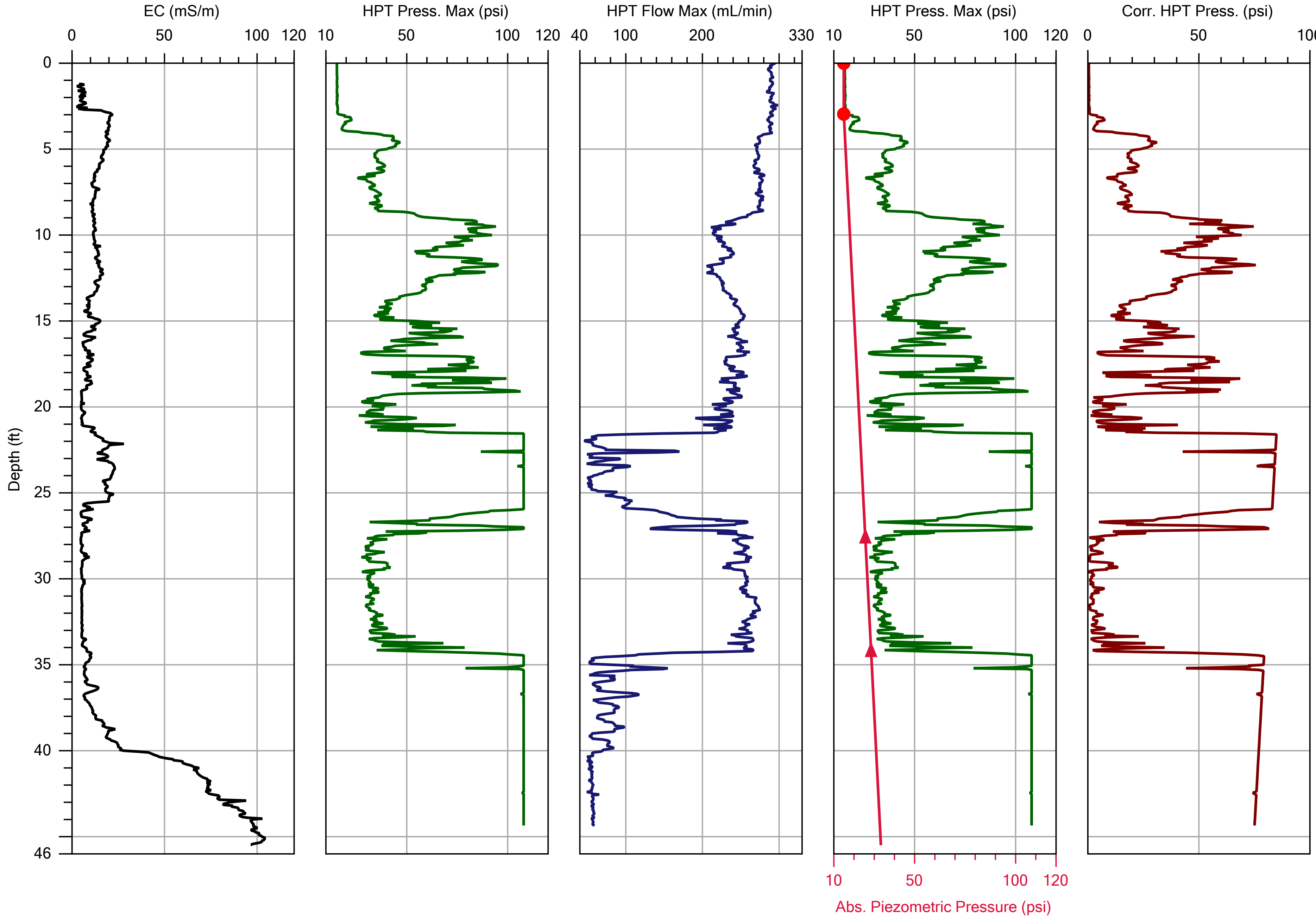

CASCADE
DRILLING | TECHNICAL SERVICES

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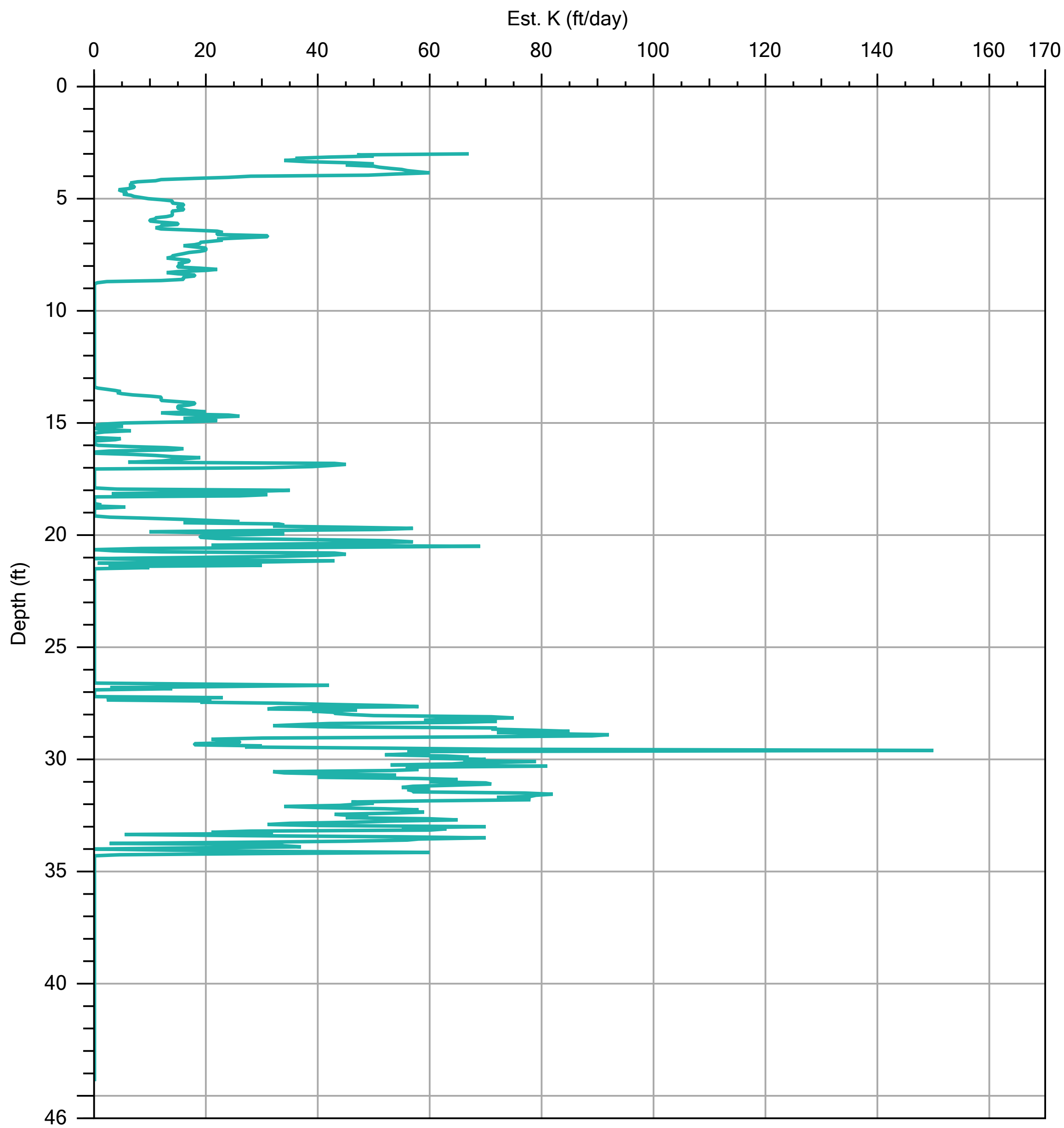

CASCADE DRILLING | TECHNICAL SERVICES

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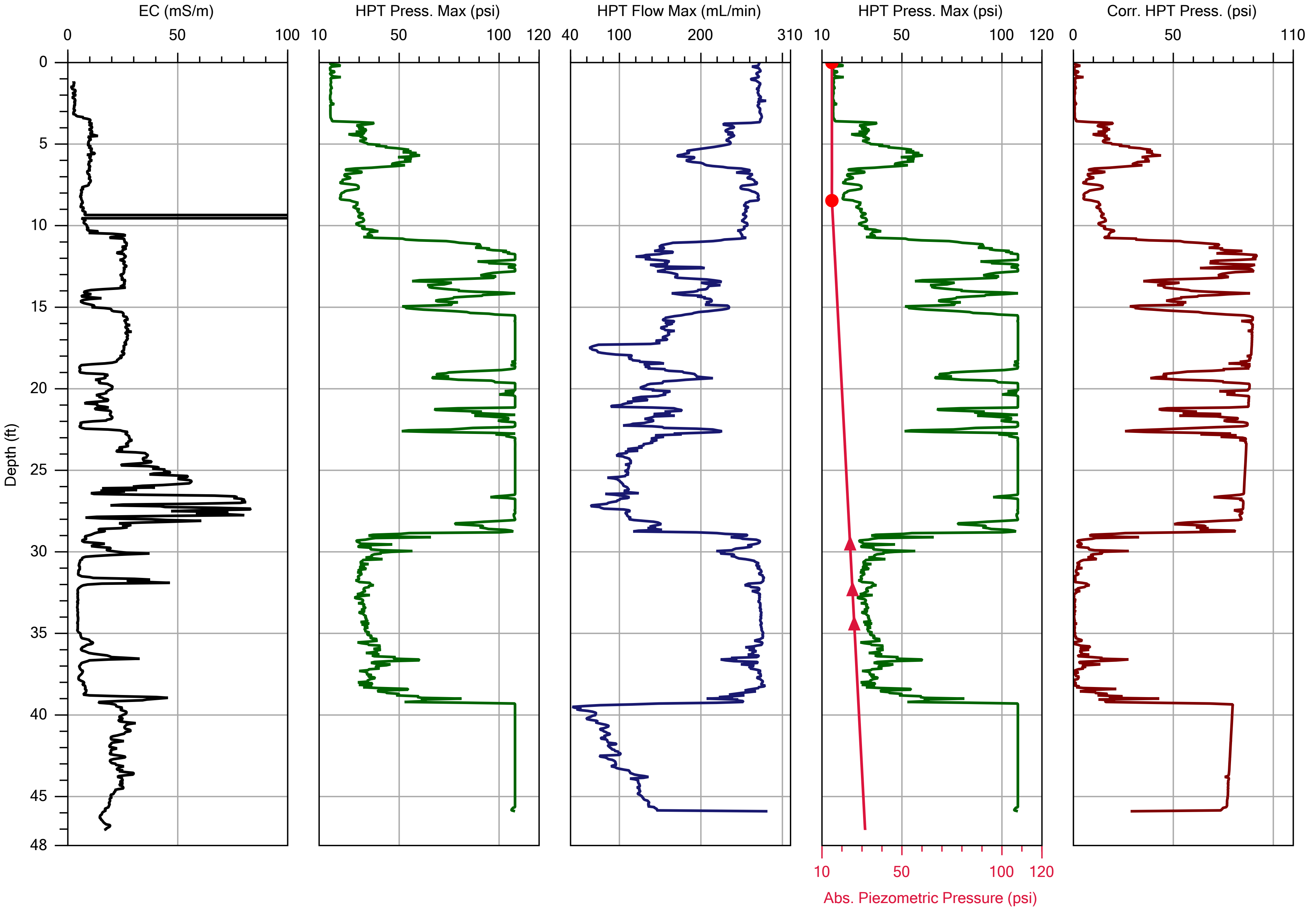

CASCADE
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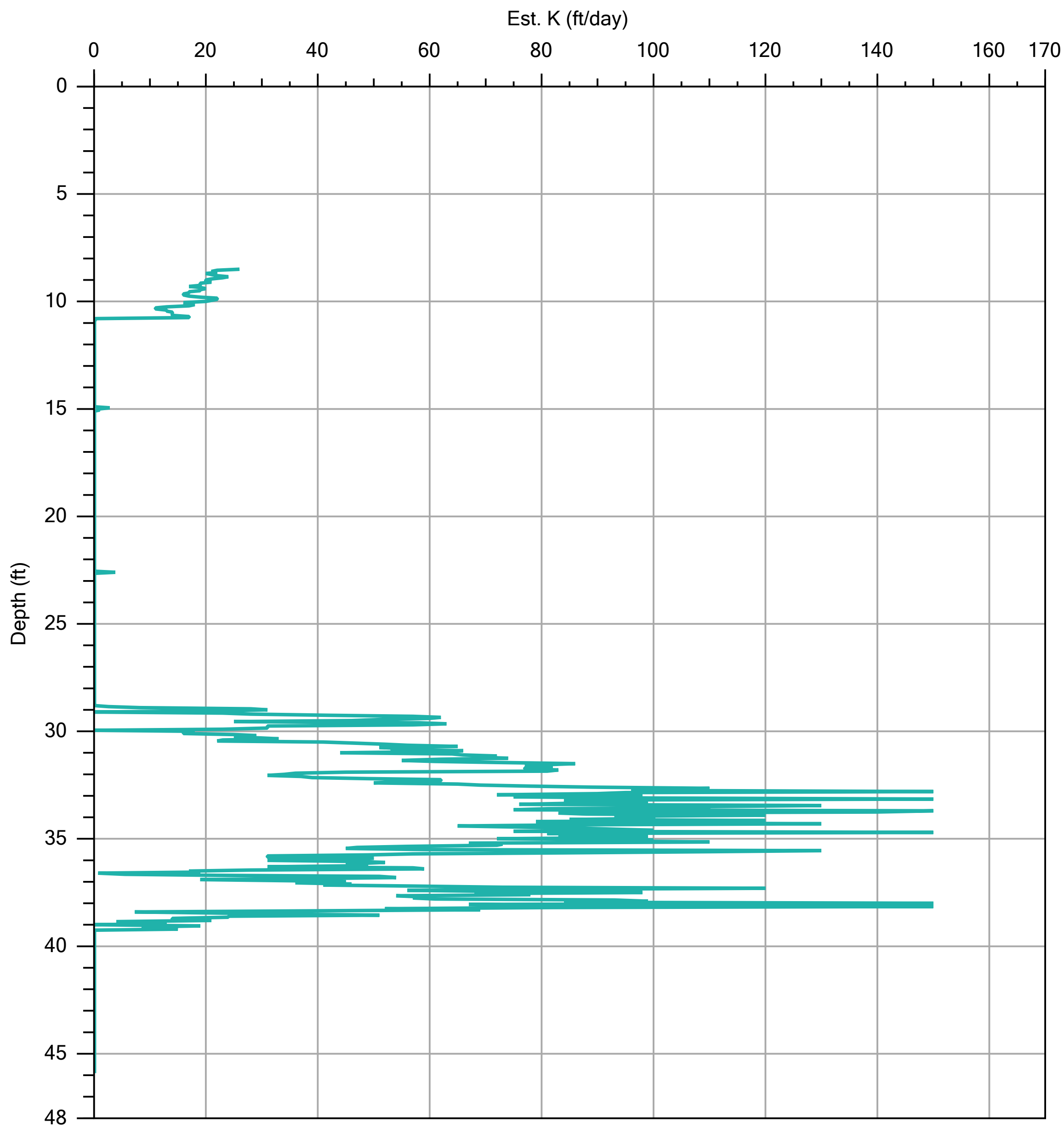

CASCADE
DRILLING | TECHNICAL SERVICES

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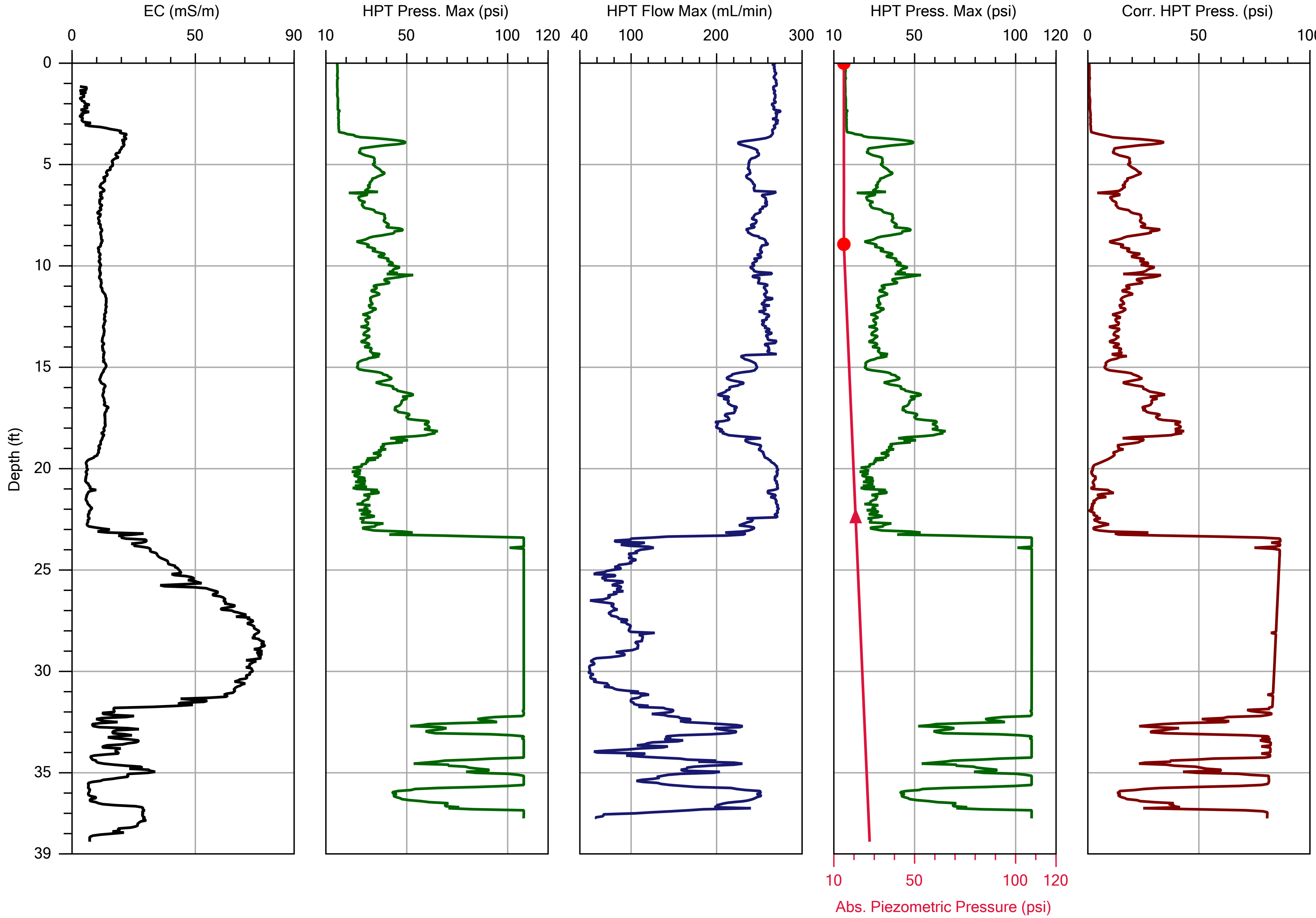

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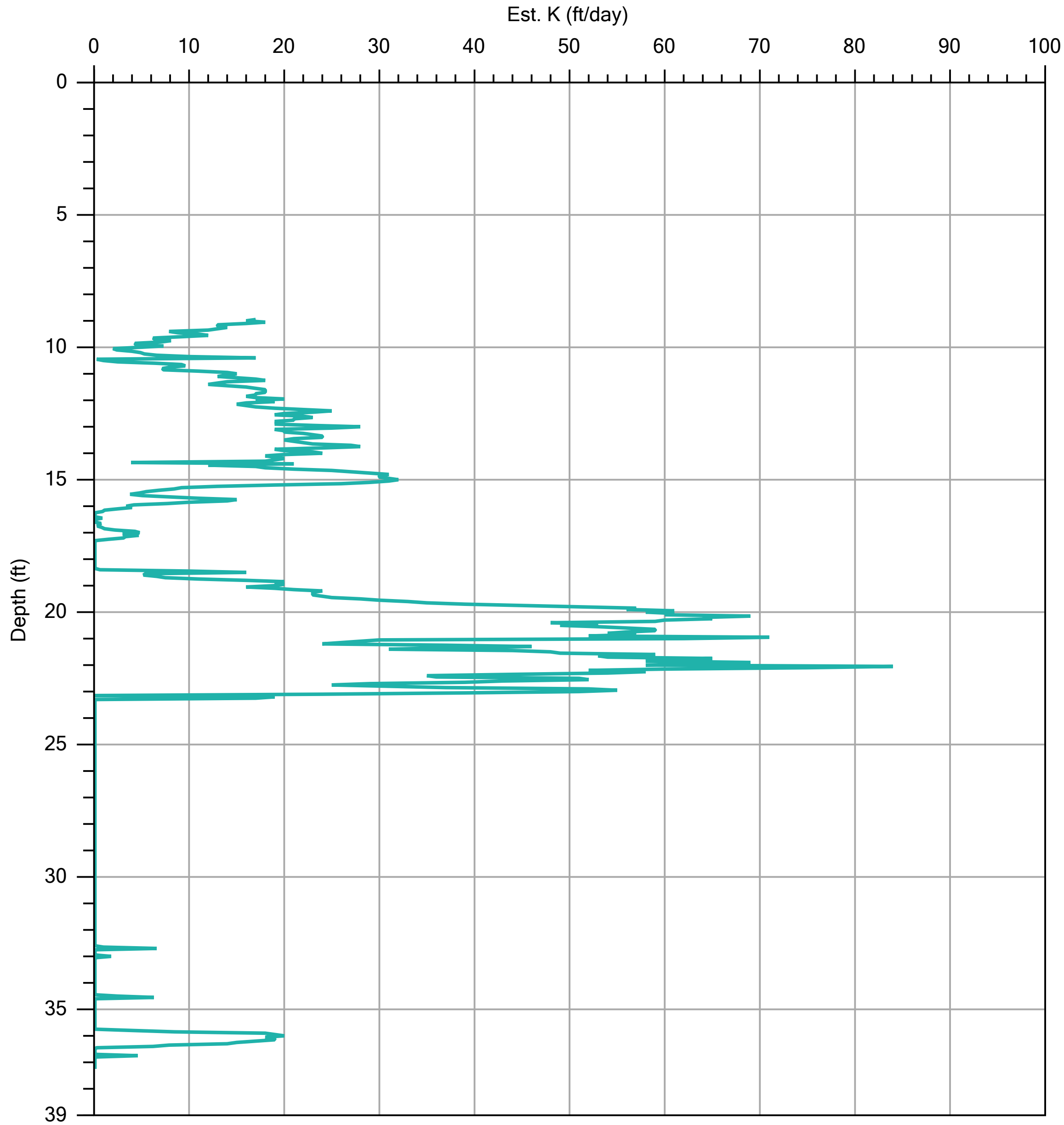

CASCADE
DRILLING | TECHNICAL SERVICES

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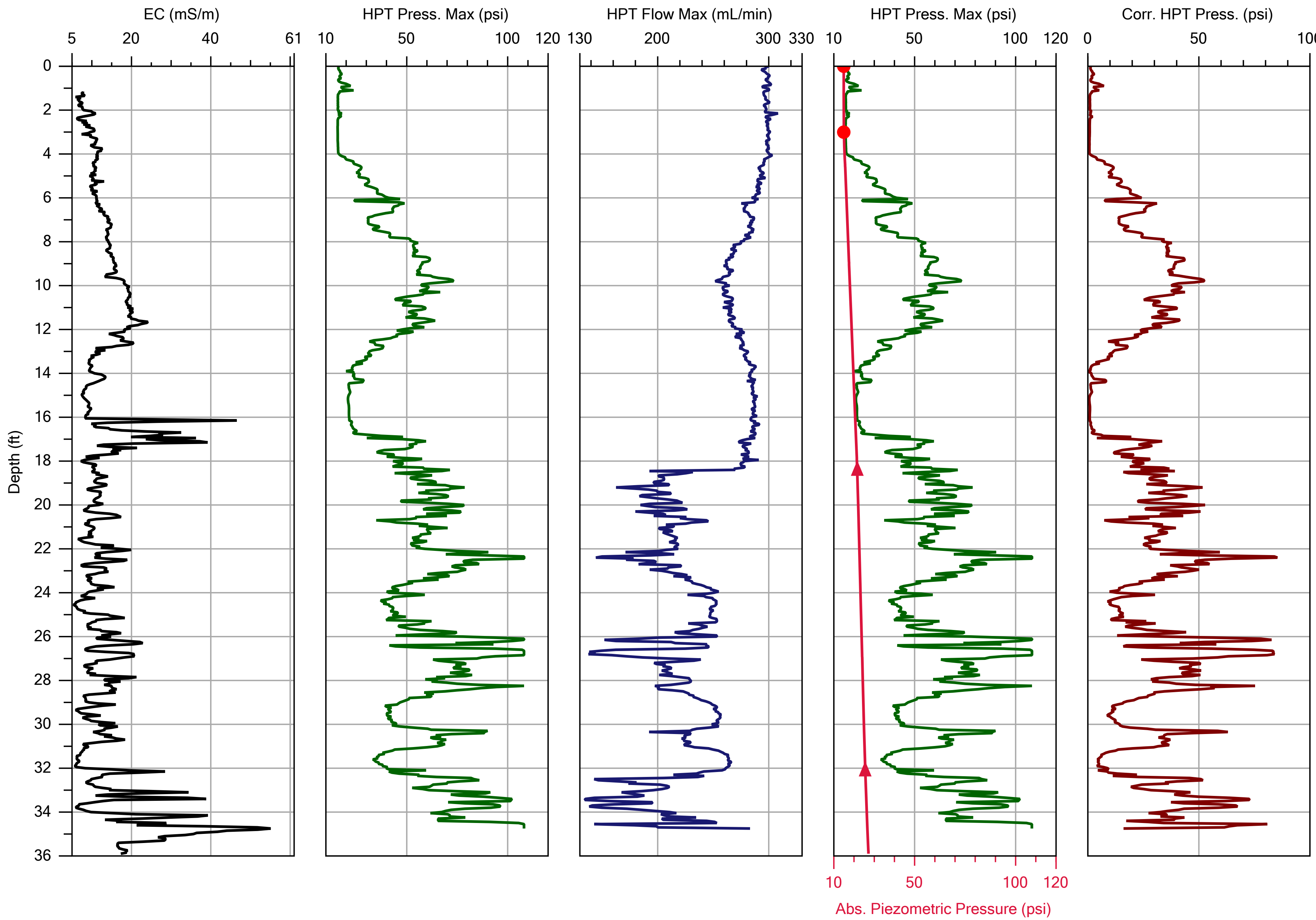

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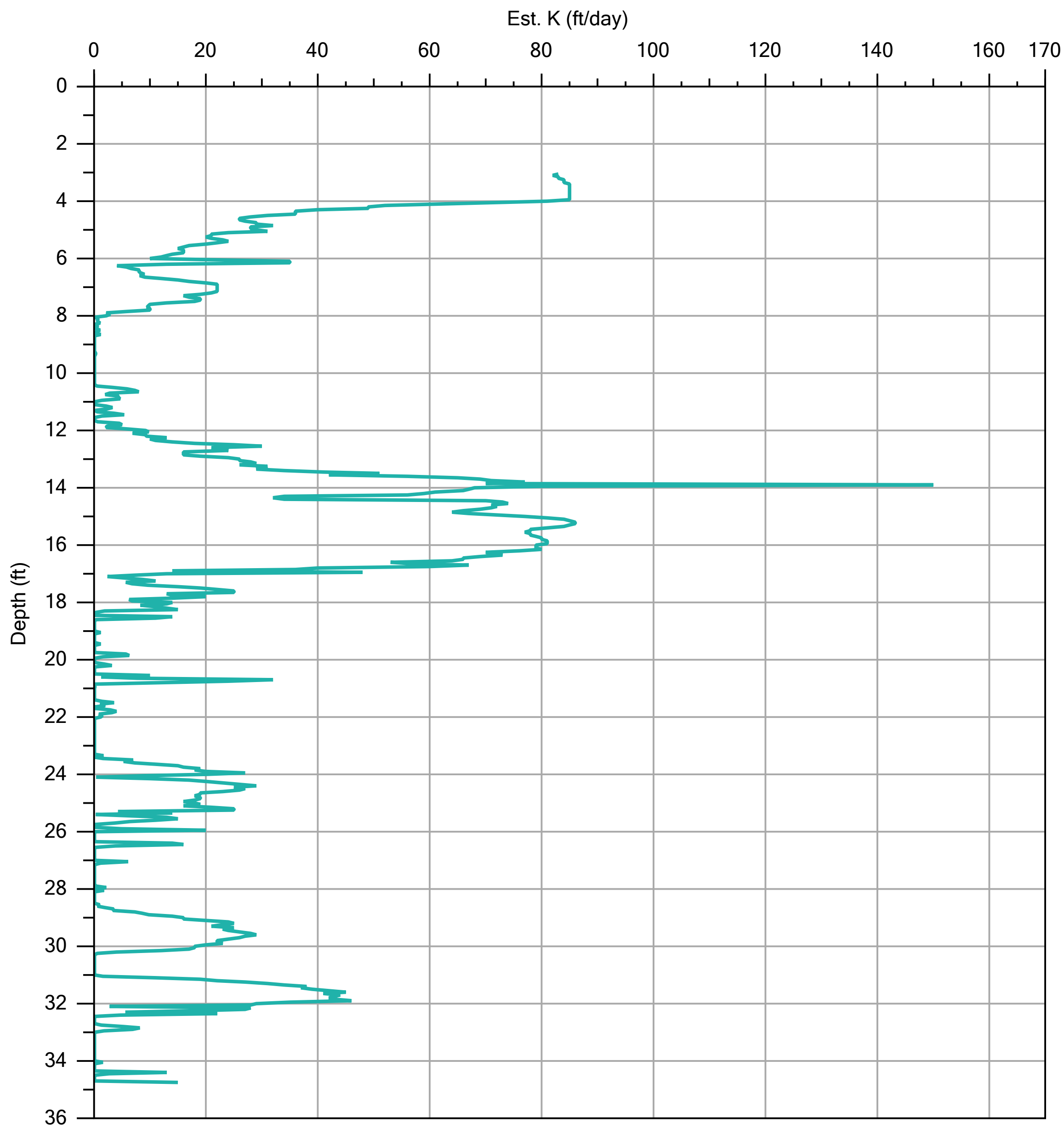

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DRILLING | TECHNICAL SERVICES

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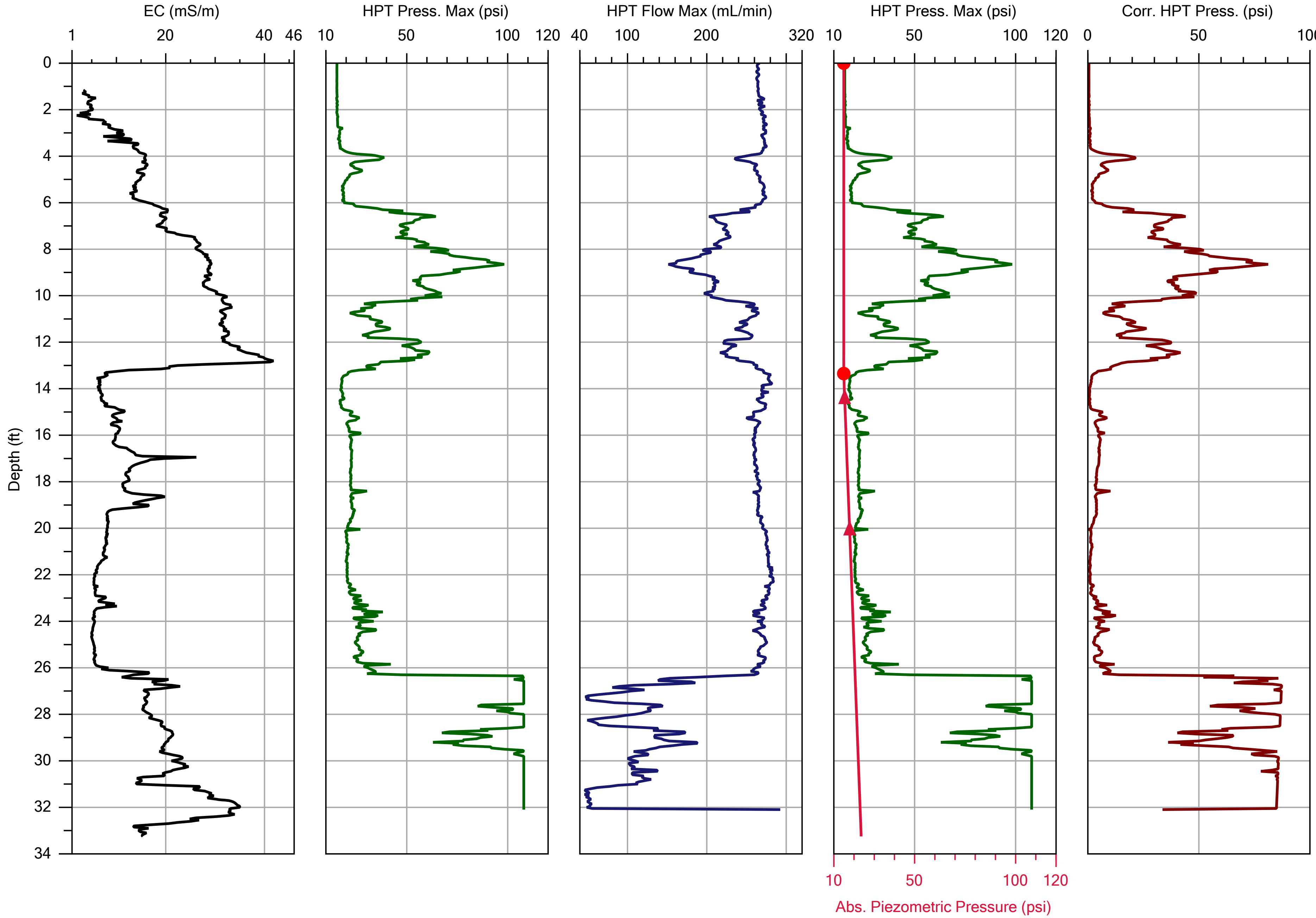

CASCADE
DRILLING | TECHNICAL SERVICES

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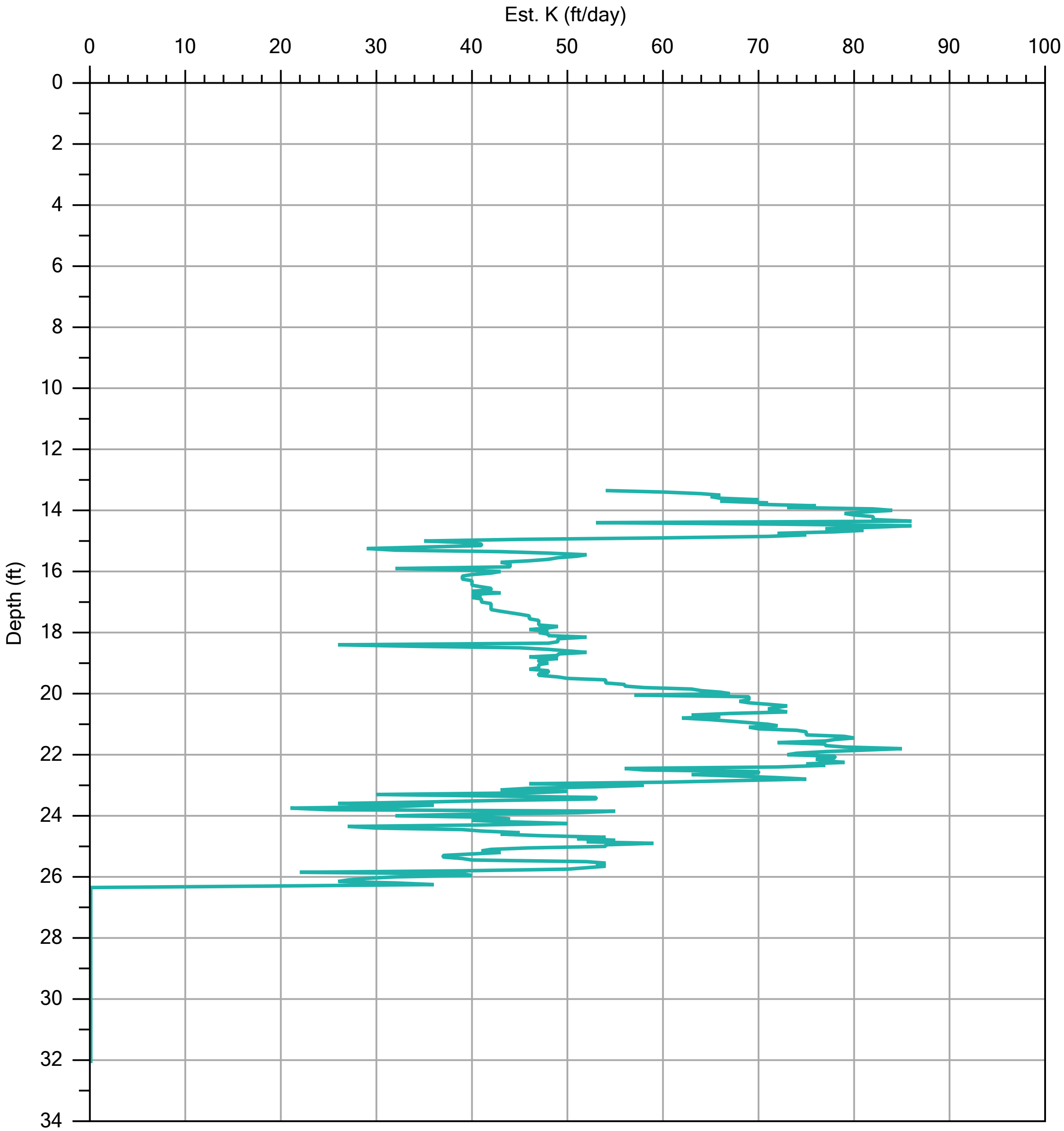

CASCADE
DRILLING | TECHNICAL SERVICES

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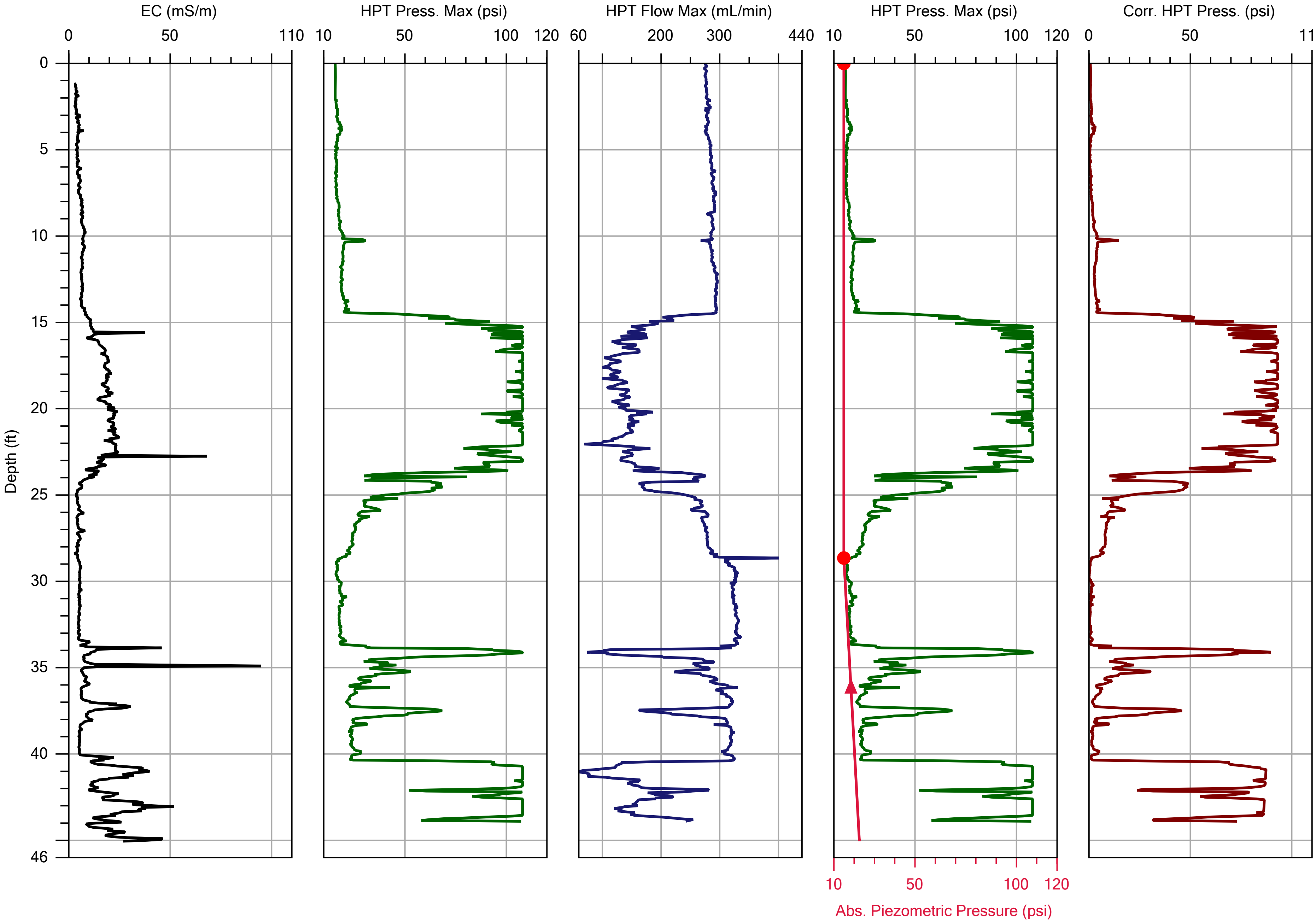

CASCADE
DRILLING | TECHNICAL SERVICES

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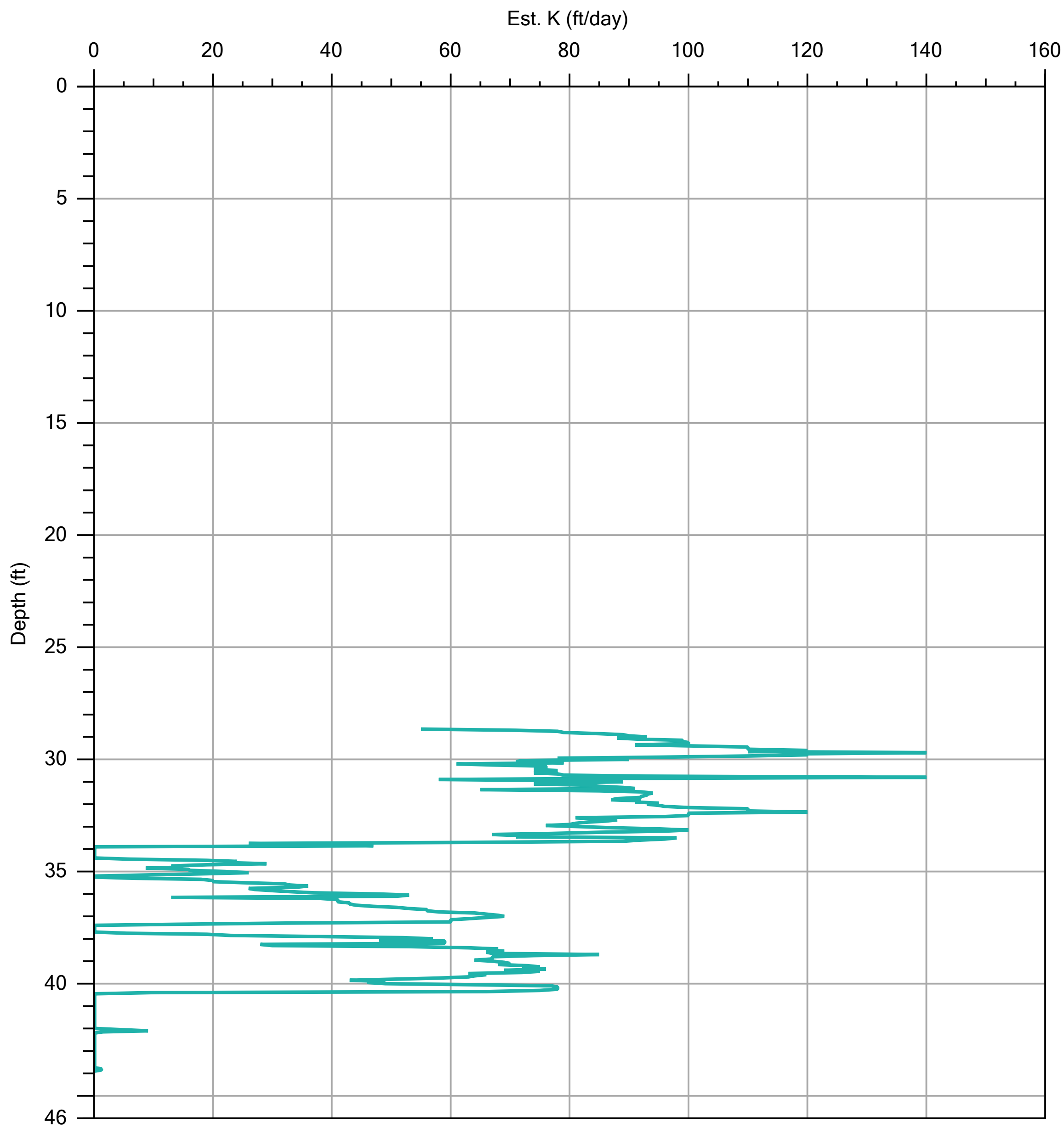
Company: CASCADE	Operator: Nathan M	Date: 06/19/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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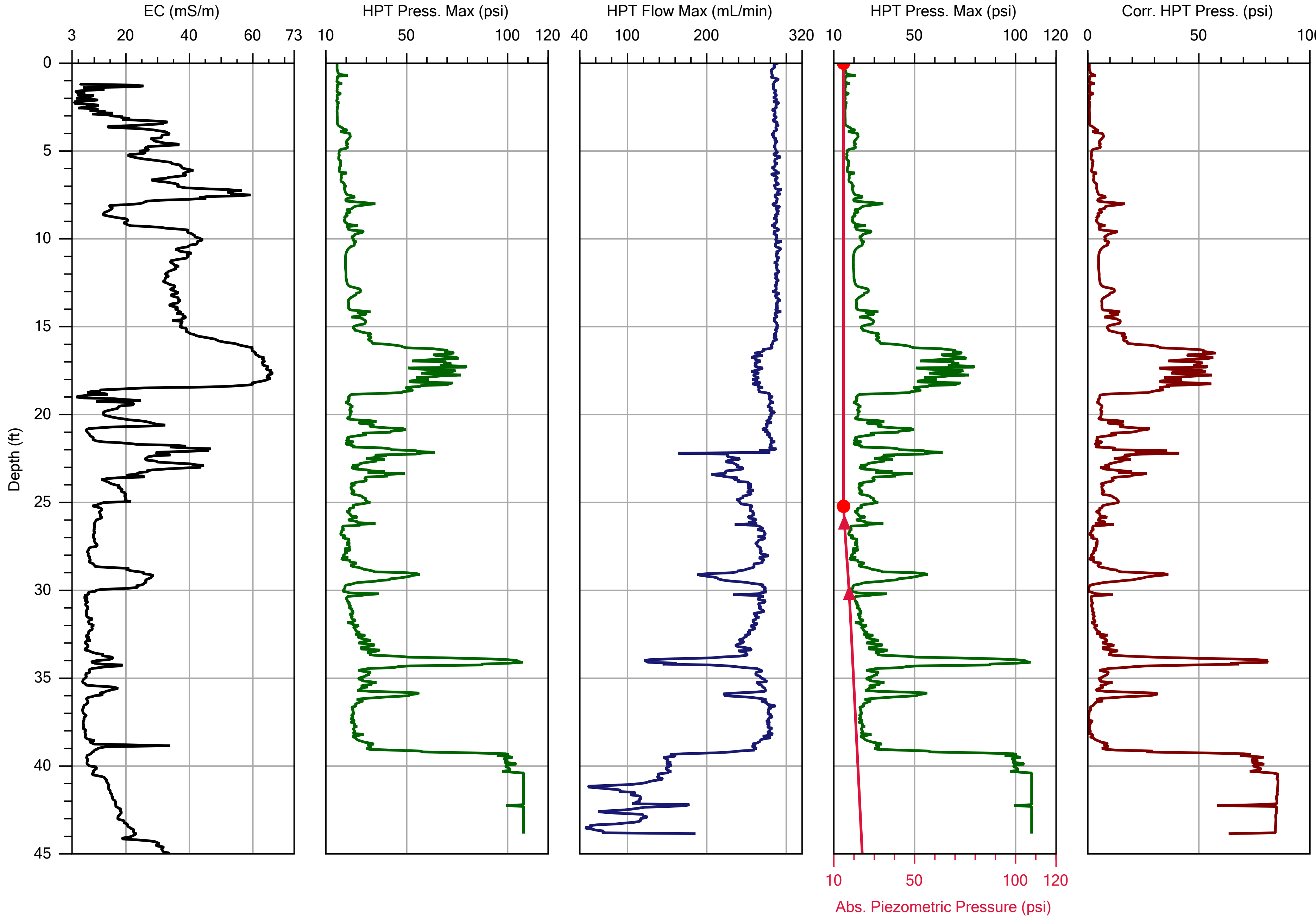
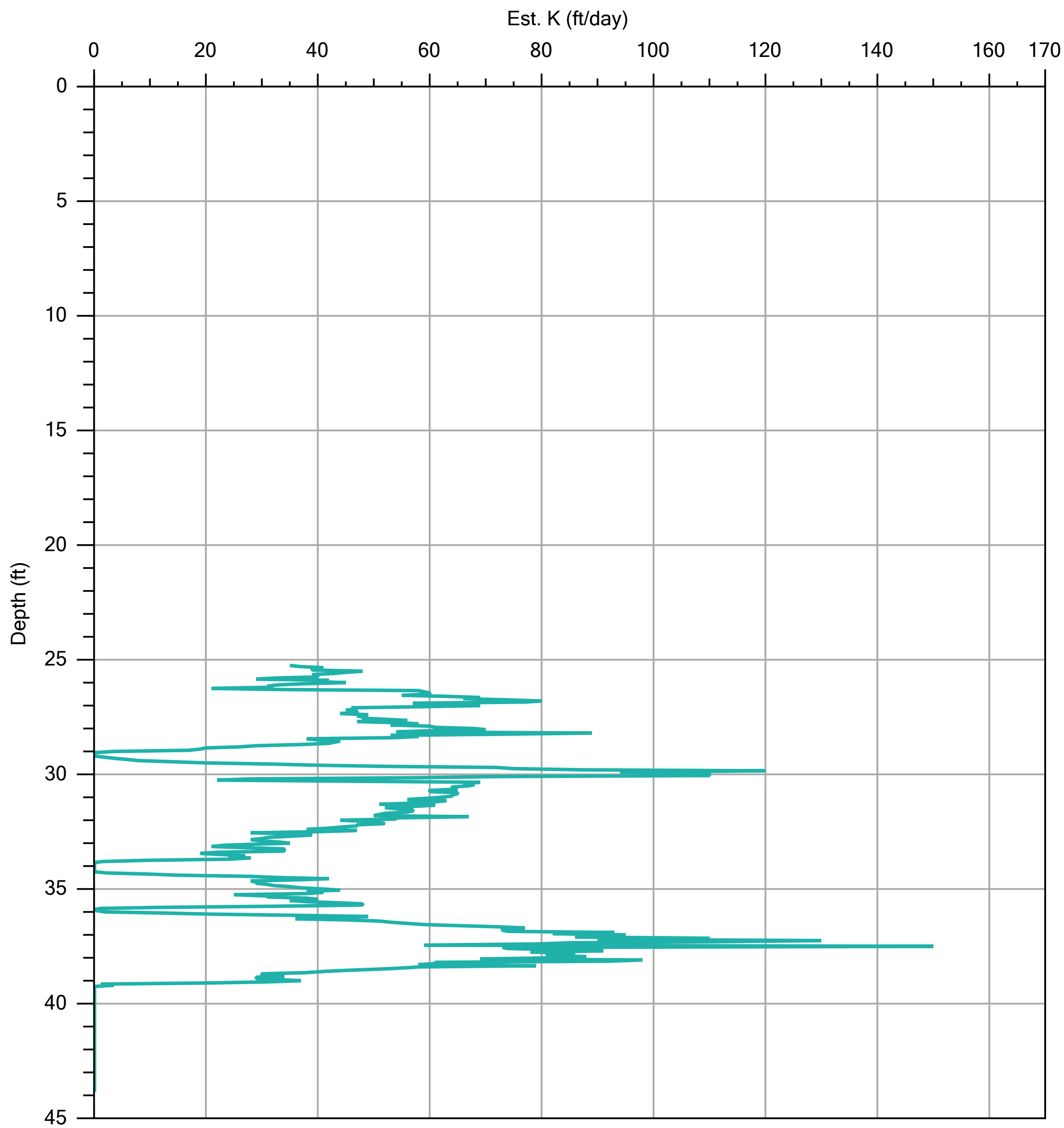
Company: CASCADE	Operator: Nathan M	Date: 06/19/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-26.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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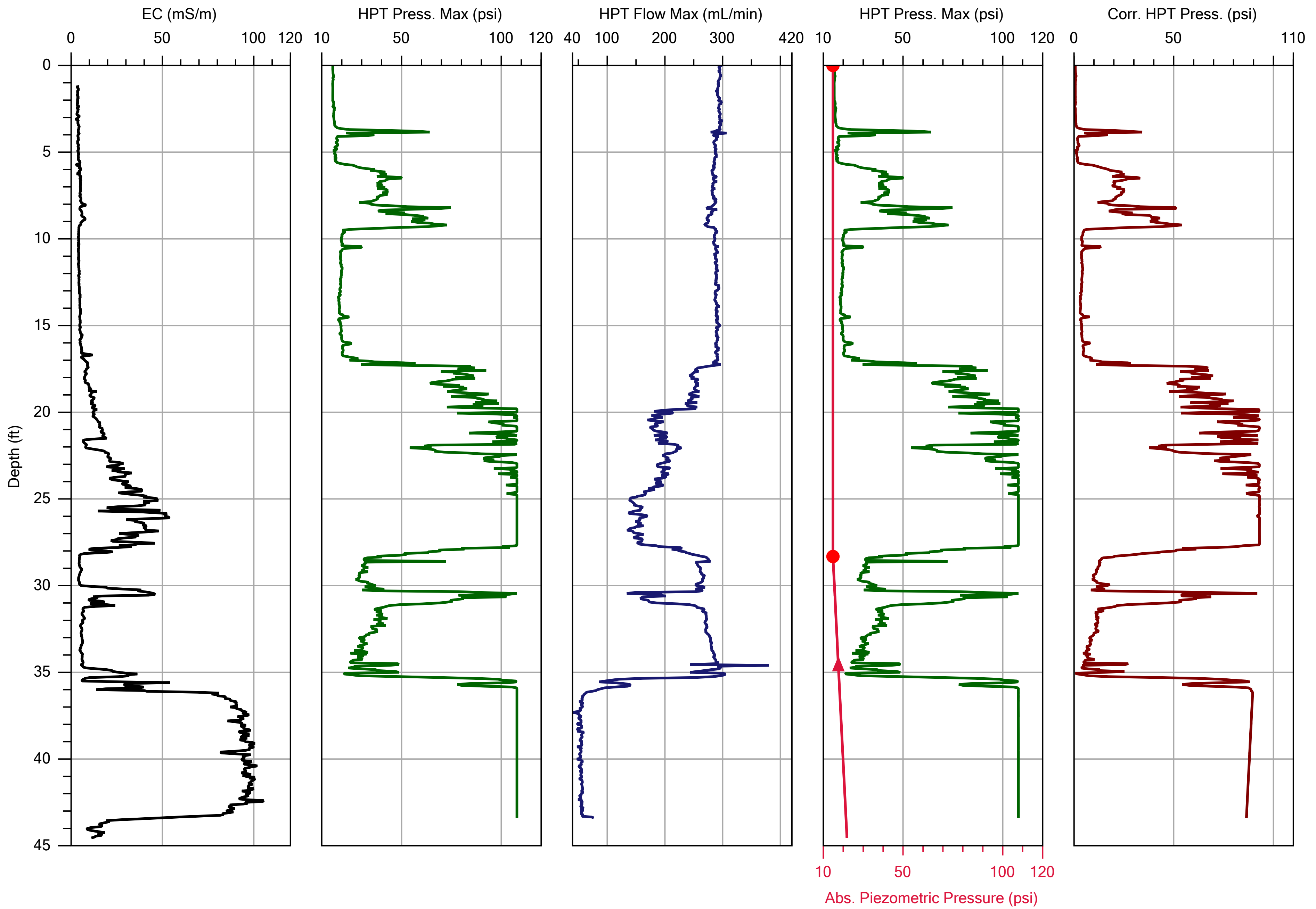
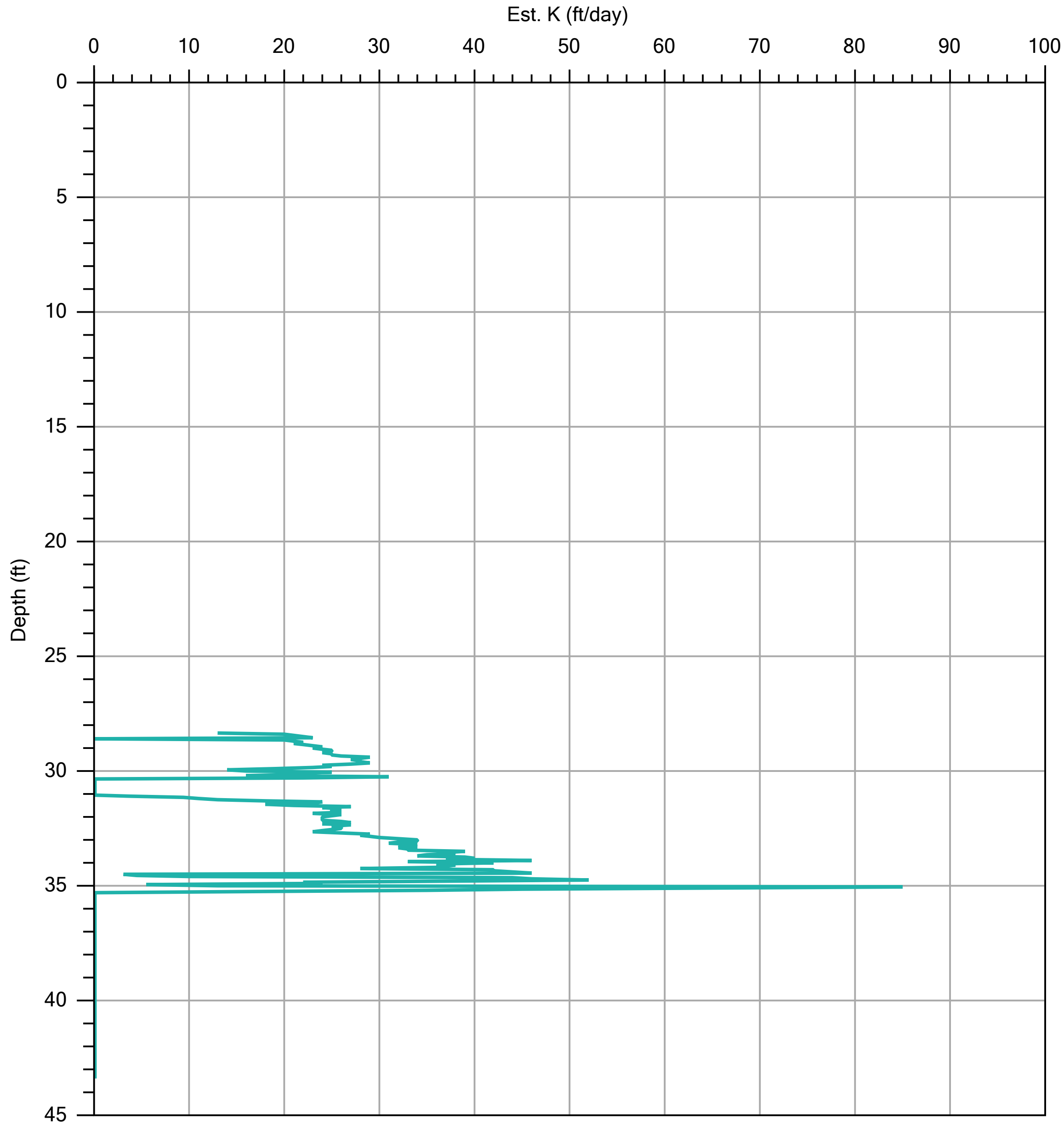
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC

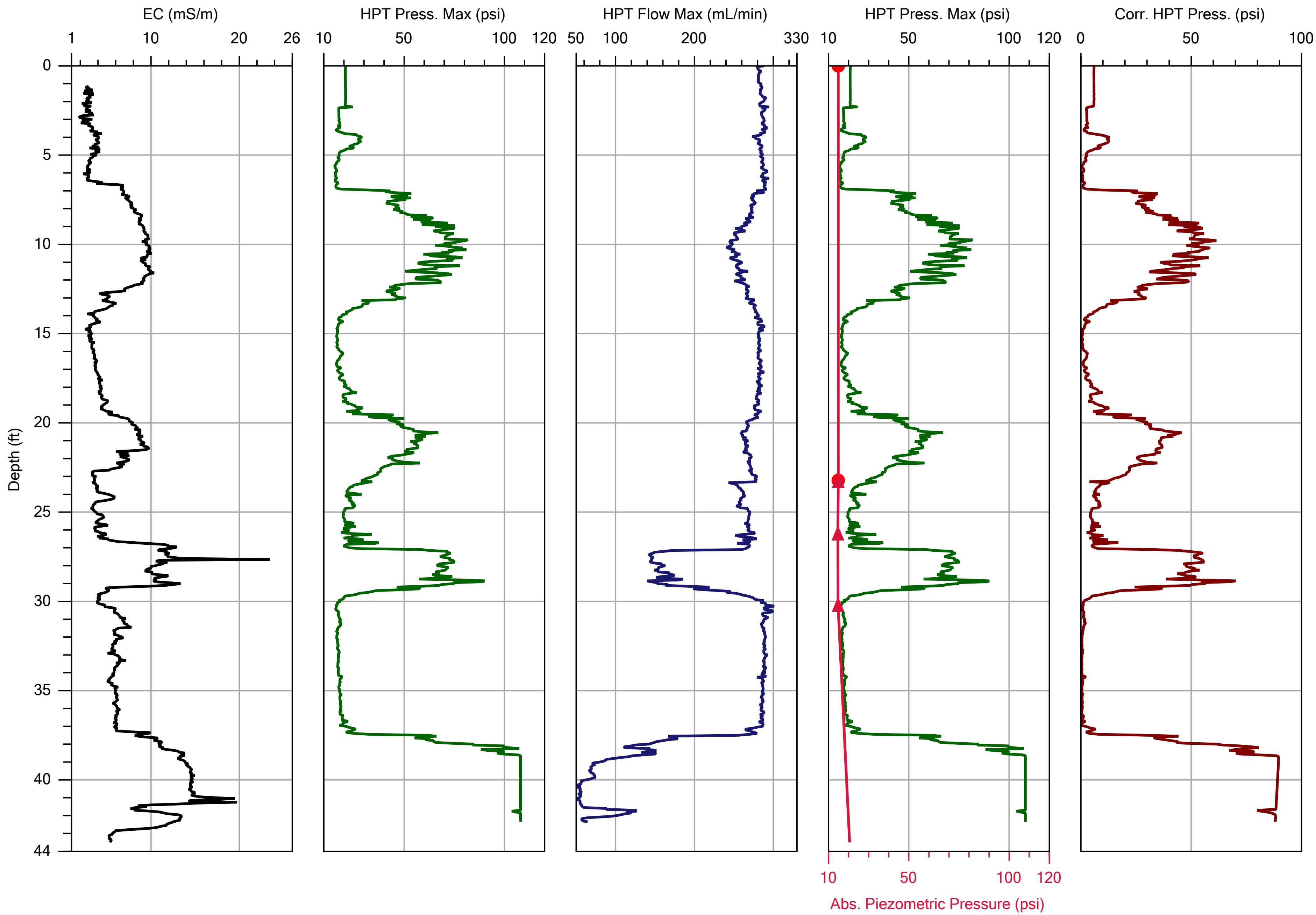


		File: HP-27.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/19/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



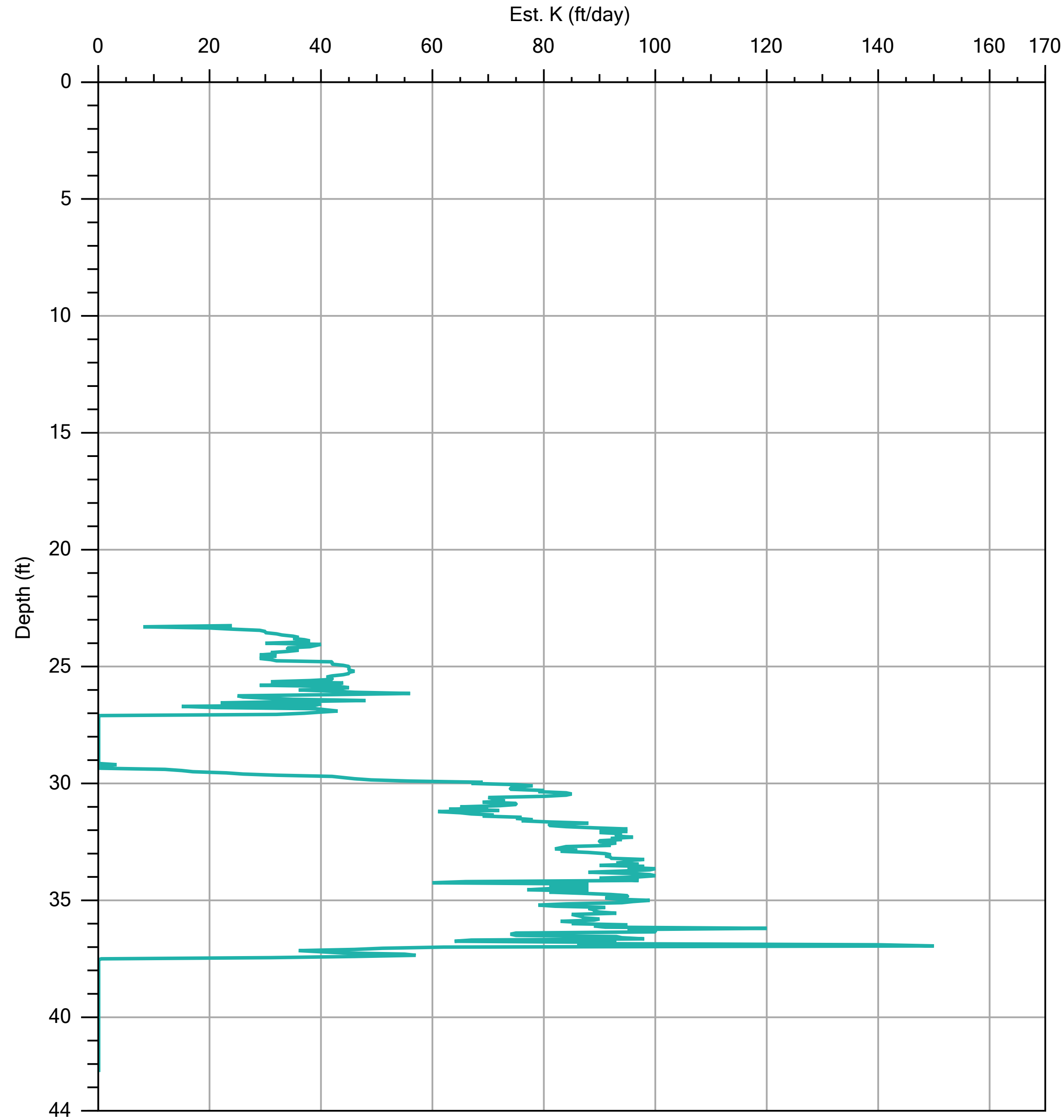
CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-27.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/19/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC

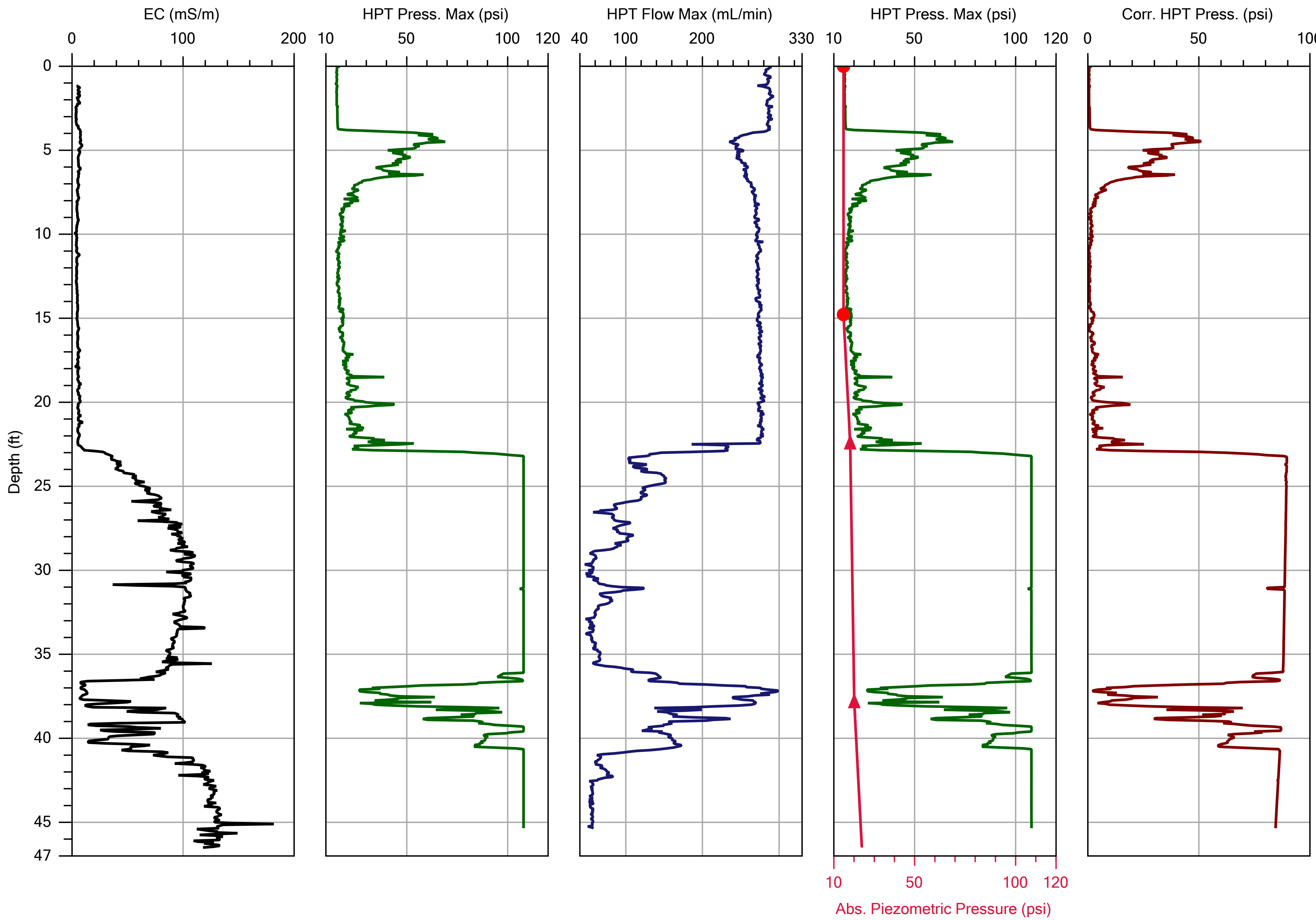


CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-28.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



Company: CASCADE	Operator: Nathan M	File: HP-28.HPT
		Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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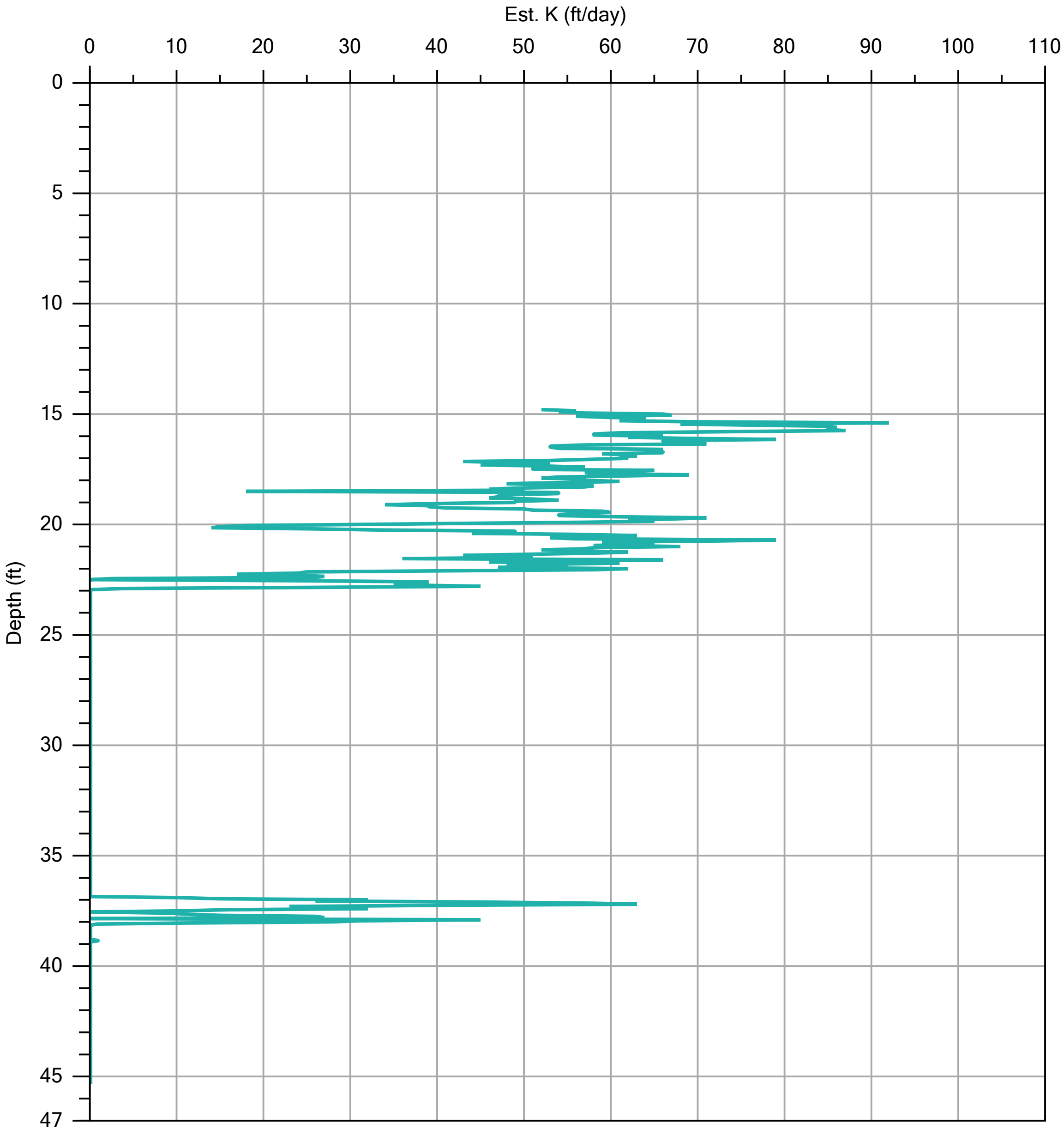
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

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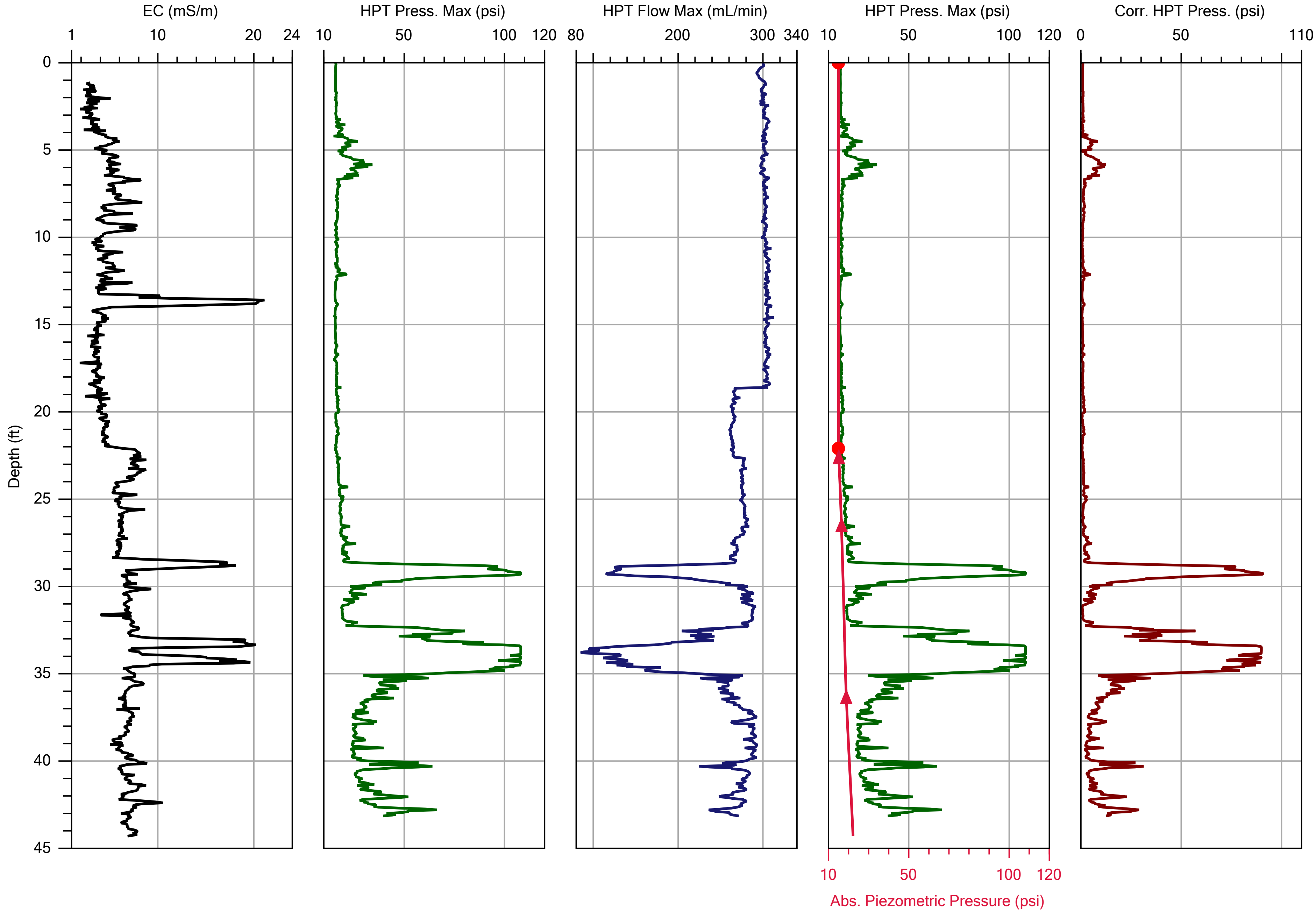
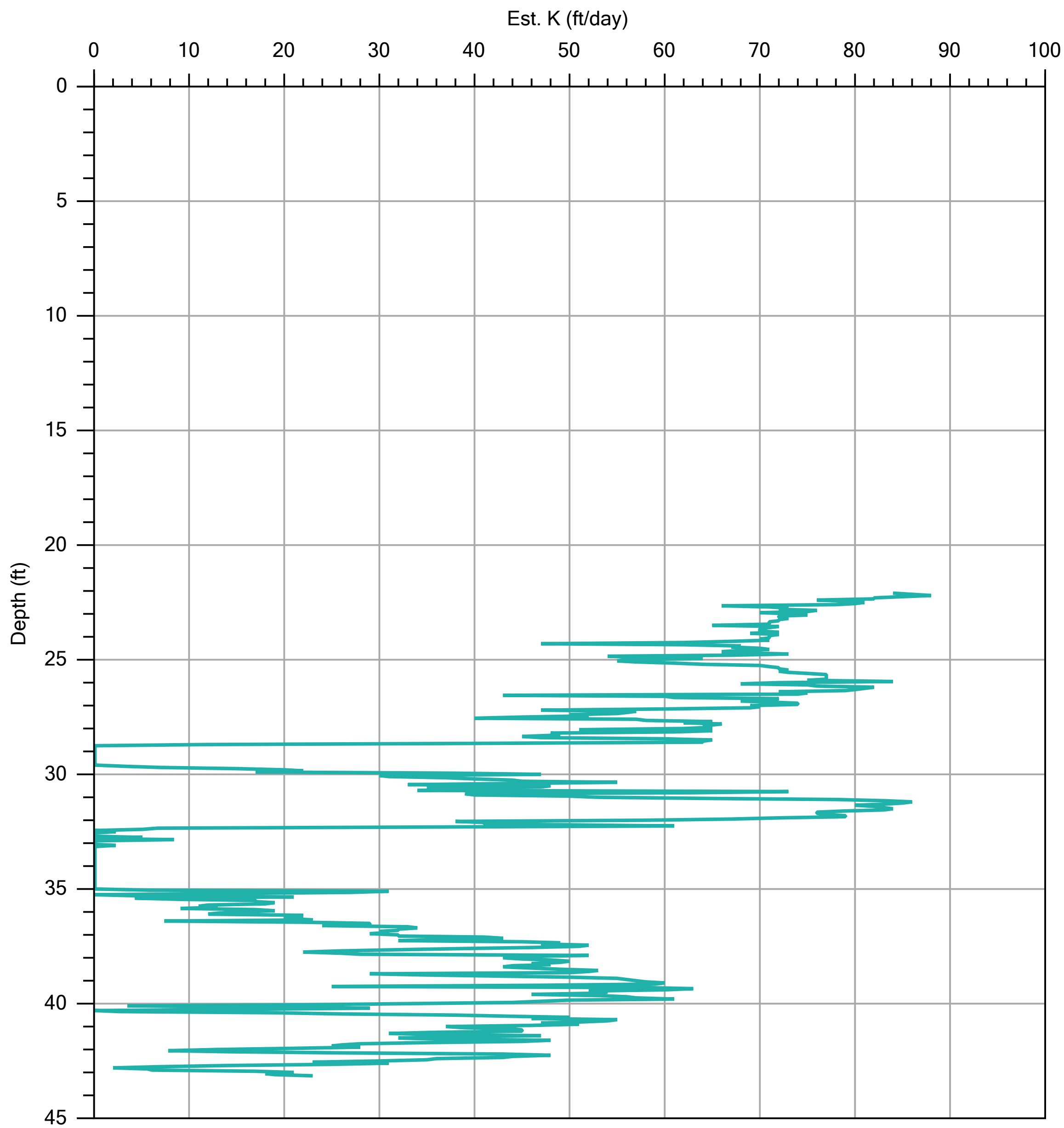
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



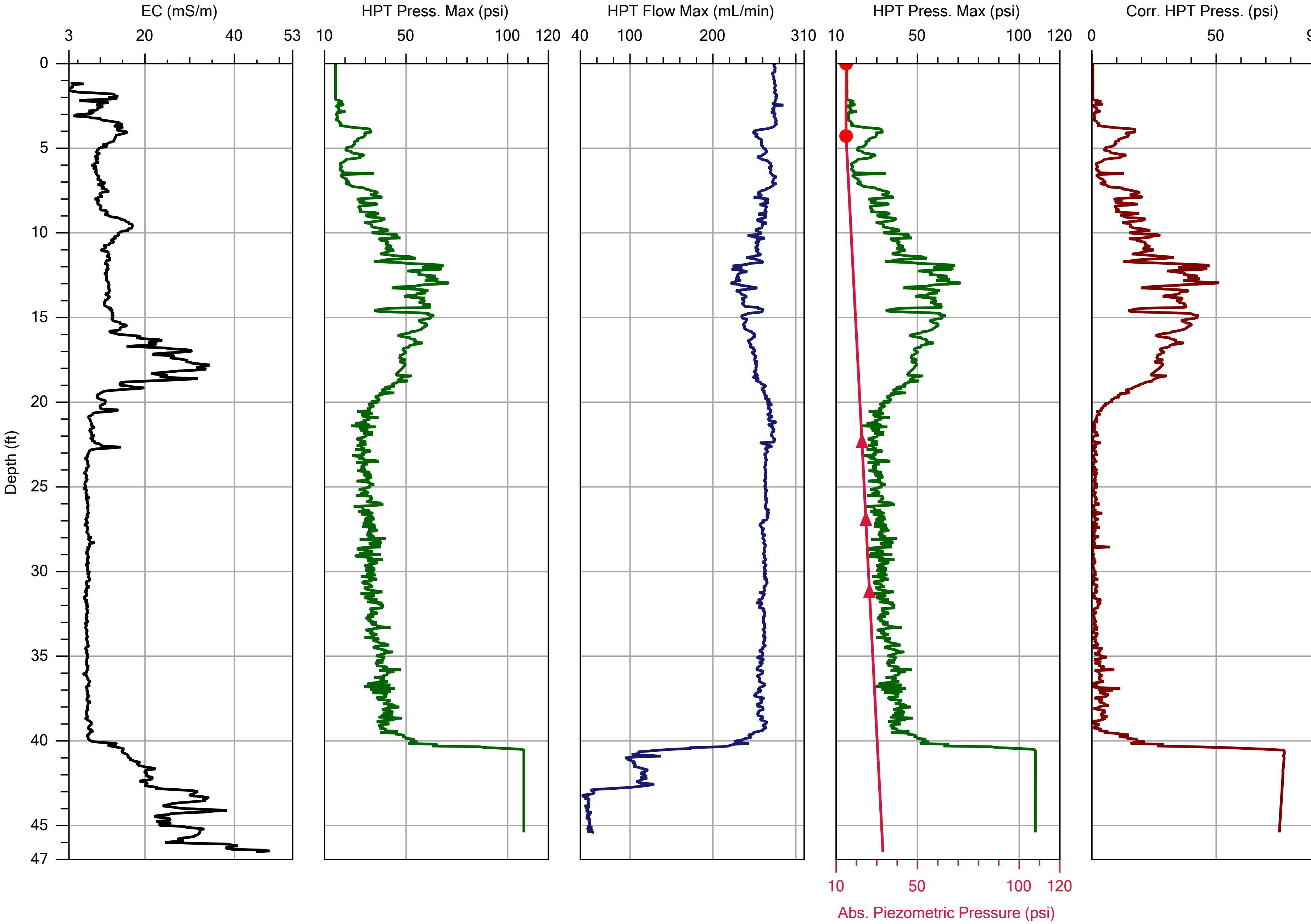
CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-30.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/21/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



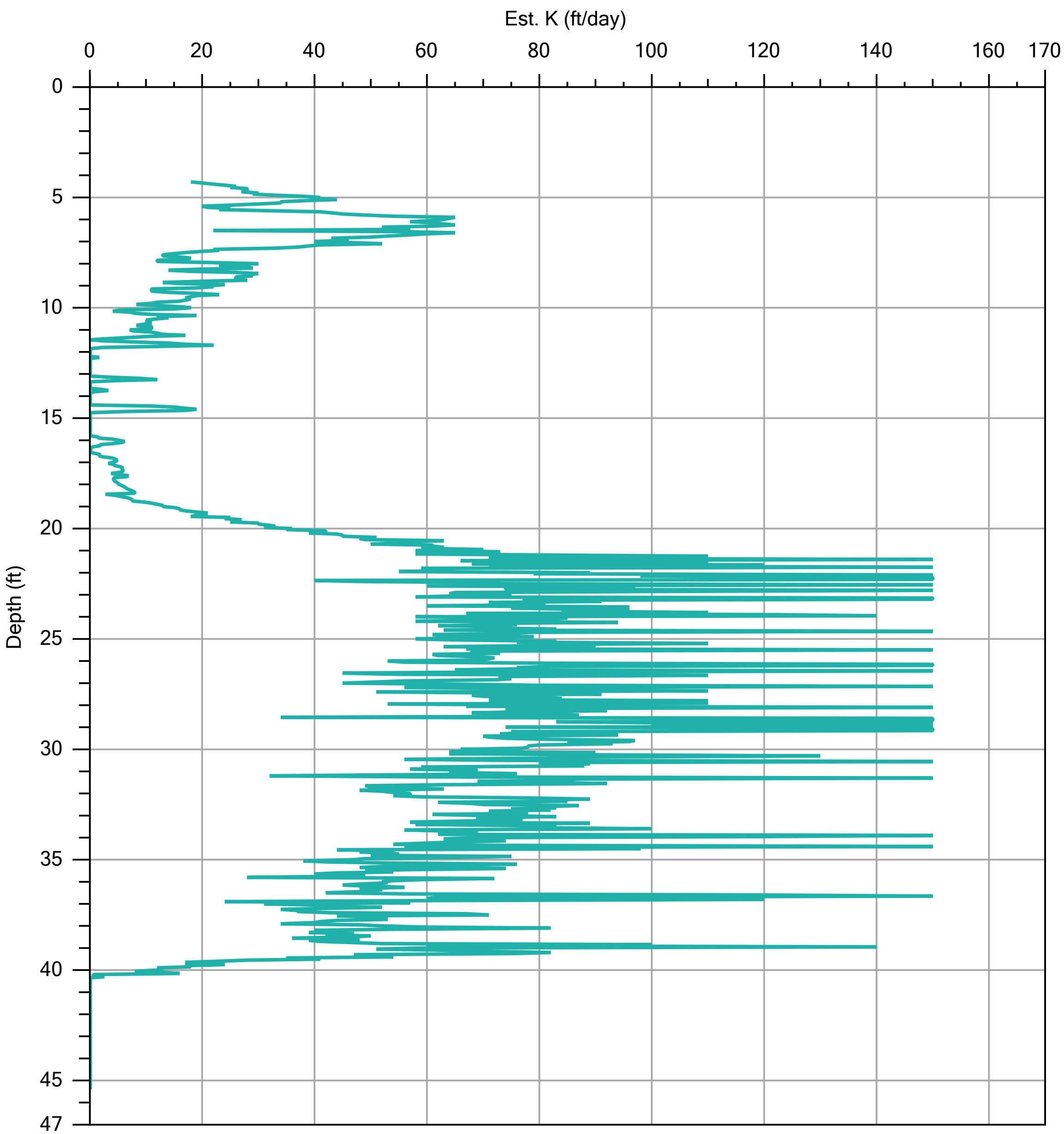
CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-30.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/21/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



CASCADE
DRILLING | TECHNICAL SERVICES

		File: HP-32.HPT
Company: CASCADE	Operator: Nathan M	Date: 06/20/19
Project ID: Chemours	Client: Geosyntec	Location: Fayetteville, NC



Company: CASCADE	Operator: Nathan M	File: HP-32.HPT
Project ID: Chemours	Client: Geosyntec	Date: 06/20/19
		Location: Fayetteville, NC

APPENDIX C
Interpreted HPT Logs

Geosyntec Consultants of NC, PC
NC License No.: C-3500

Geosyntec Consultants of NC, PC
2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

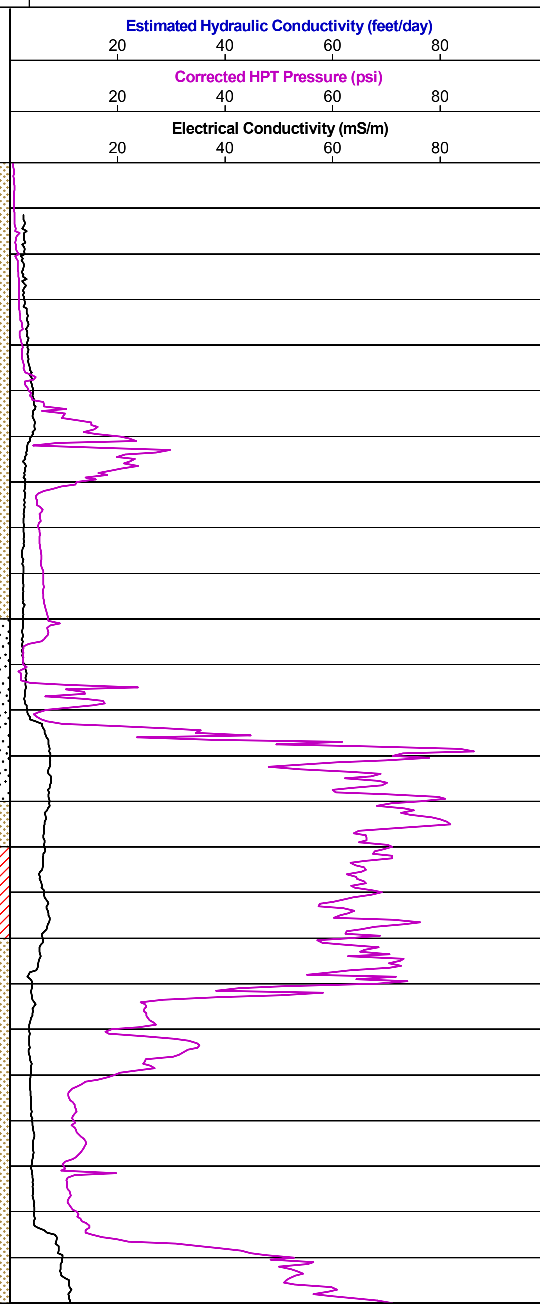
BORING LOG

BOREHOLE ID: *BCA-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *11/19/2017 to 11/20/2017*
GEOLOGIST: *Karen Teague (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Chris Ruffer*
DRILLING METHOD: *Sonic*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399780.058*
EASTING: *2050662.219*
GROUND ELEVATION: *143.263 (feet NAVD88)*
TOC ELEVATION: *146.297 (feet NAVD88)*
TOTAL WELL DEPTH: *10 ft*
TOTAL BORING DEPTH: *135 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
		Fine grained SAND (SP); light gray; loose; damp	Lithologic descriptions from historical log by Karen Teague (Parsons) logged November, 2017. Corresponds to HP-02.
140	-5		
135	-10	Fine grained Silty SAND (SM); light brown; loose; damp	
130		Fine grained SAND (SP); yellowish brown; loose; damp	
	-15	CLAY with mica (CL); gray; firm	Drilling rods used as isolation casing at 16' and at 75'
		Fine grained SAND (SP); light gray and light brown; damp	
125	-20		
120			



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All depths referenced to ground surface.

Total Depth: 135 ft bgs
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NC License No.: C-3500

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

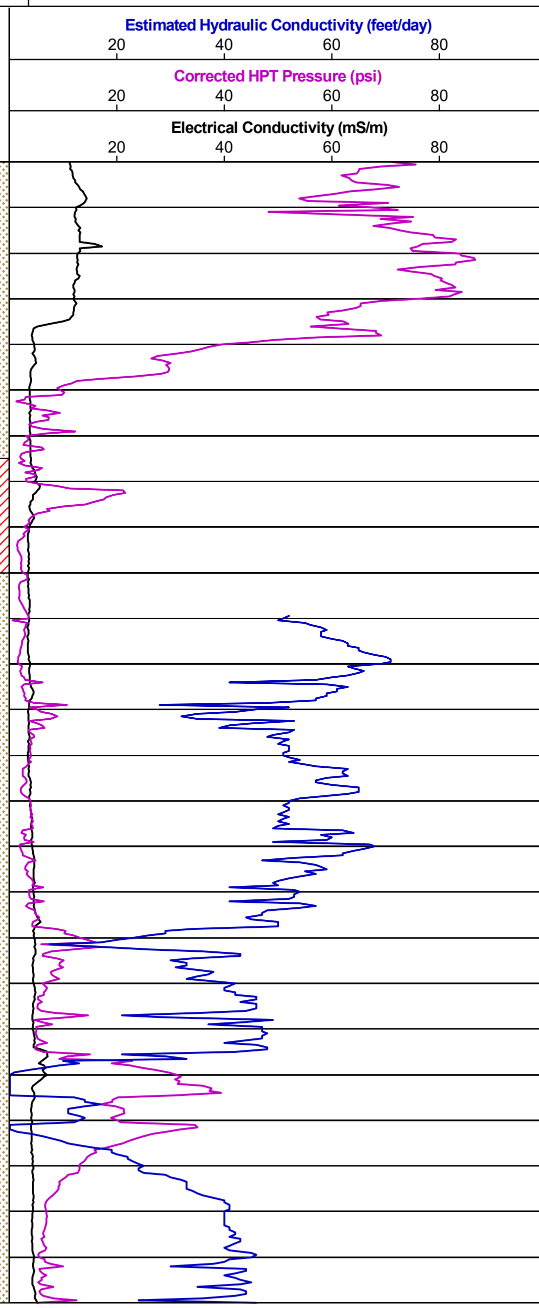
BORING LOG

BOREHOLE ID: *BCA-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *11/19/2017 to 11/20/2017*
GEOLOGIST: *Karen Teague (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Chris Ruffer*
DRILLING METHOD: *Sonic*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399780.058*
EASTING: *2050662.219*
GROUND ELEVATION: *143.263 (feet NAVD88)*
TOC ELEVATION: *146.297 (feet NAVD88)*
TOTAL WELL DEPTH: *10 ft*
TOTAL BORING DEPTH: *135 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		Fine grained SAND (SP); light gray and light brown; damp *(continued)*		
115				
	-30			
		CLAY (CL); black; stiff		
110				
		Fine grained SAND (SP); purple and light gray; damp; layers of light brown		
	-35	Medium grained SAND (SP); purple and light gray; loose; moist		
105				
	-40			
100				
	-45			
95				



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Raleigh NC, 27607
Telephone: 919-870-0576

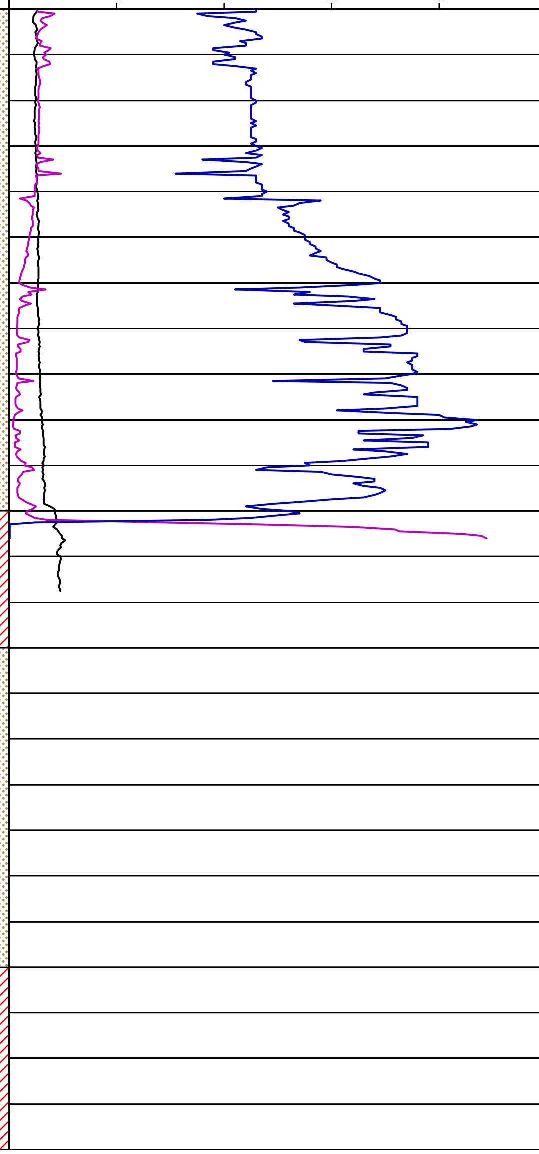
BORING LOG

BOREHOLE ID: *BCA-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *11/19/2017 to 11/20/2017*
GEOLOGIST: *Karen Teague (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Chris Ruffer*
DRILLING METHOD: *Sonic*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399780.058*
EASTING: *2050662.219*
GROUND ELEVATION: *143.263 (feet NAVD88)*
TOC ELEVATION: *146.297 (feet NAVD88)*
TOTAL WELL DEPTH: *10 ft*
TOTAL BORING DEPTH: *135 ft*

Estimated Hydraulic Conductivity (feet/day): 20 40 60 80
Corrected HPT Pressure (psi): 20 40 60 80
Electrical Conductivity (mS/m): 20 40 60 80



Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		Medium grained SAND (SP); purple and light gray; loose; moist *(continued)*		
		Fine grained SAND (SP); white; loose; damp		
90				
	-55	Medium grained SAND (SP); light gray and light brown; loose; wet		
85				
	-60			
		CLAY (CL); dark gray; stiff		HPT/EC boring terminated at 62.75' depth bgs due to refusal.
80				
		Medium grained SAND (SP); medium gray; loose; wet		
	-65			
75				
	-70	Medium grained SAND (SP); light brown; loose; wet		
		CLAY (CL); dark gray; stiff; with thin fine grained sand partings and mica		
70				

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Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *BCA-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *11/19/2017 to 11/20/2017*
GEOLOGIST: *Karen Teague (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Chris Ruffer*
DRILLING METHOD: *Sonic*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399780.058*
EASTING: *2050662.219*
GROUND ELEVATION: *143.263 (feet NAVD88)*
TOC ELEVATION: *146.297 (feet NAVD88)*
TOTAL WELL DEPTH: *10 ft*
TOTAL BORING DEPTH: *135 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
		CLAY (CL); dark gray; stiff; with thin fine grained sand partings and mica *(continued)*			
65					
	-80				
60					
	-85				
55					
	-90	Fine to medium grained SAND (SP); gray; wet			
		CLAY (CL); dark gray; stiff			
50					
	-95	Medium grained CLAY and clayey sand (CL); dark gray; hard; wet			
45					

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Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *BCA-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *11/19/2017 to 11/20/2017*
GEOLOGIST: *Karen Teague (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Chris Ruffer*
DRILLING METHOD: *Sonic*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399780.058*
EASTING: *2050662.219*
GROUND ELEVATION: *143.263 (feet NAVD88)*
TOC ELEVATION: *146.297 (feet NAVD88)*
TOTAL WELL DEPTH: *10 ft*
TOTAL BORING DEPTH: *135 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
		Medium grained CLAY and clayey sand (CL); dark gray; hard; wet *(continued)*			
		CLAY (CL); dark gray; hard			
40					
	-105				
35					
	-110				
30					
	-115	CLAY (CL); light gray; very hard			
25					
	-120				
20					

(Continued Next Page)

Geosyntec Consultants of NC, PC NC License No.: C-3500	Geosyntec Consultants of NC, PC 2501 Blue Ridge Rd. Suite 430 Raleigh NC, 27607 Telephone: 919-870-0576	**BORING LOG** **BOREHOLE ID:** *BCA-1*

PROJECT NAME: Additional Onsite Well Installation	**RIG TYPE:** *N/A*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *6"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *399780.058*
BORING DATE: *11/19/2017 to 11/20/2017*	**EASTING:** *2050662.219*
GEOLOGIST: *Karen Teague (Parsons)*	**GROUND ELEVATION:** *143.263 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *146.297 (feet NAVD88)*
DRILLER NAME: *Chris Ruffer*	**TOTAL WELL DEPTH:** *10 ft*
DRILLING METHOD: *Sonic*	**TOTAL BORING DEPTH:** *135 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
15 10	-130 -135	CLAY (CL); light gray; very hard *(continued)*			

End of Boring at 135.0 feet bgs.

BORING LOG

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BOREHOLE ID: *LTW-01*

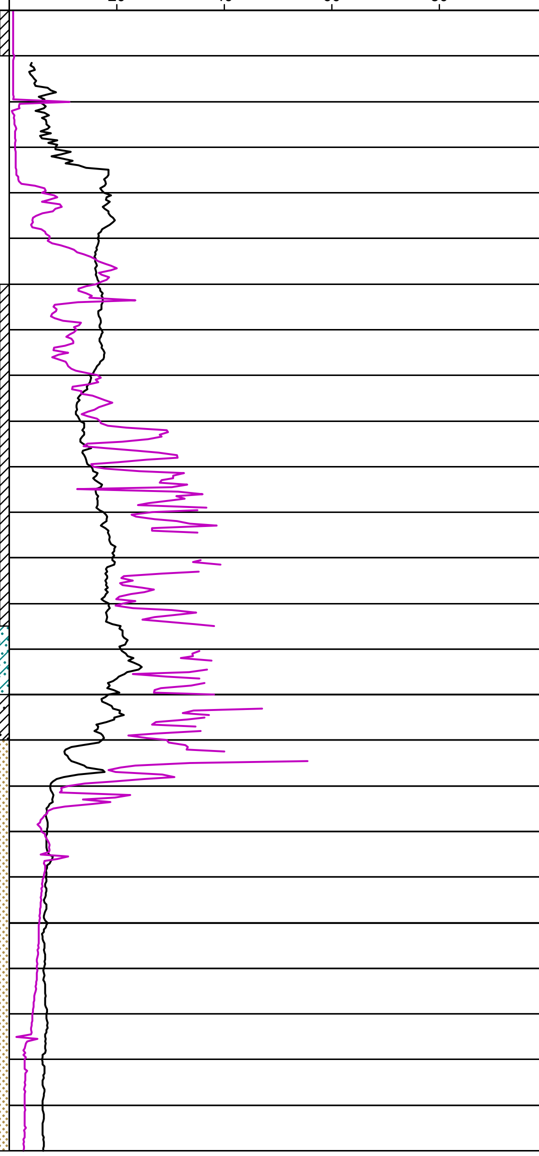
PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/21/2005 to 1/16/2006*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399565.75*
EASTING: *2052148.31*
GROUND ELEVATION: *51.22 (feet NAVD88)*
TOC ELEVATION: *53.83 (feet NAVD88)*
TOTAL WELL DEPTH: *26 ft*
TOTAL BORING DEPTH: *28 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
		Silty CLAY (CL-ML); dark brown; soft	Lithologic descriptions from historical log by Tracey Ovbey (Parsons) logged December, 2005. Corresponds to HP-04.
50		SILT with trace clay (ML); brown; dry	
	-5		
45		Silty CLAY (CL-ML); brown; stiff; dry	
		Silty CLAY (CL-ML); brown; soft; moist	
		Silty CLAY (CL-ML); orangeish brown; soft; moist	
	-10		
40		Silty CLAY (CL-ML); light brown; medium stiff; dry	
		Silty CLAY (CL-ML); light brown; medium stiff	
		Clayey SAND (SC); light orangeish brown; medium soft; moist	
	-15	Sandy CLAY (CLS); grayish orange; medium soft	
35		Medium grained SAND (SP); light gray	
		SAND (SP); grayish orange; medium soft; with stripes of dark orange and yellow	
		Medium grained SAND (SP); orange; damp; with stripes of dark orange and yellow	
		Fine to medium grained SAND (SP); light grayish white; wet	
		Fine to medium grained SAND (SP); tan; wet; spots of orange	
	-20		
30		Fine to medium grained SAND (SP); light orangeish tan; wet; spots of brighter orange	
		SAND (SP); orange; with water	

Pattern

Estimated Hydraulic Conductivity (feet/day): 20 40 60 80
Corrected HPT Pressure (psi): 20 40 60 80
Electrical Conductivity (mS/m): 20 40 60 80



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All depths referenced to ground surface.

Total Depth: 34.6 ft bgs

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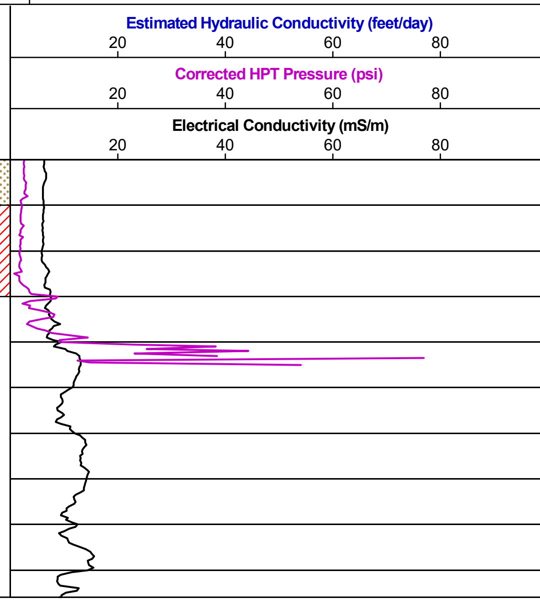
Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *LTW-01*

PROJECT NAME: Additional Onsite Well Installation	**RIG TYPE:** *N/A*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *6"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *399565.75*
BORING DATE: *12/21/2005 to 1/16/2006*	**EASTING:** *2052148.31*
GEOLOGIST: *Tracy Ovbey*	**GROUND ELEVATION:** *51.22 (feet NAVD88)*
DRILLING CONTRACTOR: *Gregg Drilling*	**TOC ELEVATION:** *53.83 (feet NAVD88)*
DRILLER NAME: *Anthony Frye*	**TOTAL WELL DEPTH:** *26 ft*
DRILLING METHOD: *N/A*	**TOTAL BORING DEPTH:** *28 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		Fine to medium grained SAND (SP); gray; wet; layers of black, crumbly organic material *(continued)*			
25		CLAY (CL); light gray; stiff			
		LTW-01 soil boring terminated at 26.0 feet. Lithologic descriptions not available beyond this depth.			
	-30				
20					
					HPT/EC boring terminated at 34.6' depth bgs.



End of Boring at 34.6 feet bgs.

All depths referenced to ground surface.

Total Depth: 34.6 ft bgs

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

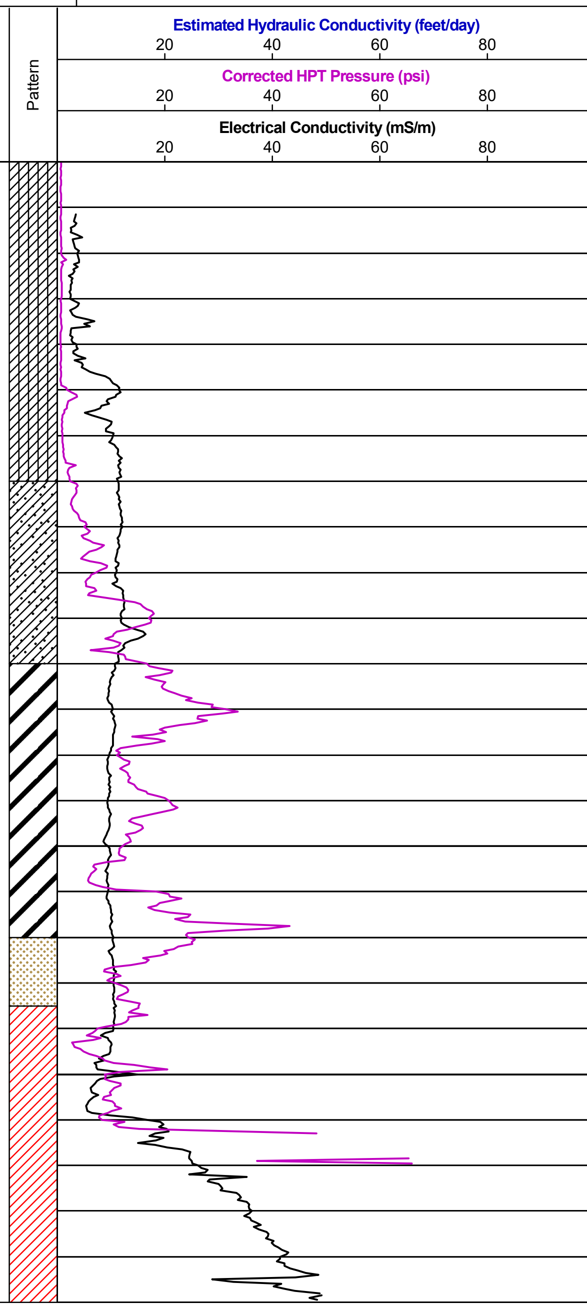
BORING LOG

BOREHOLE ID: *LTW-02*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/20/2005 to 1/16/2006*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398848.97*
EASTING: *2052352.87*
GROUND ELEVATION: *50.03 (feet NAVD88)*
TOC ELEVATION: *52.48 (feet NAVD88)*
TOTAL WELL DEPTH: *38 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
		Silty CLAY (CL-ML); brown; soft; slightly less moist and more crumbly at 4 ft	Lithologic descriptions from historical log by Tracey Ovbey (Parsons) logged December, 2005. Corresponds to HP-06.
45	-5	Silty CLAY (CL-ML); brown; stiff; dry; crumbly	
		Sandy CLAY (CLS); orangeish brown; soft; damp	
		Sandy CLAY (CLS); orangeish brown; soft; damp	
40	-10		
		CLAY (CH); orangeish brown; medium soft; with spots of light gray	
		CLAY (CH); orangeish brown; medium soft; with spots of light gray	
35	-15		
		Coarse grained SAND (SP); orange; wet	
		CLAY some sand (CL); dark gray	
30	-20		
		CLAY (CL); dark gray; stiff to stiff	
		CLAY (CL); dark gray; stiff	



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All depths referenced to ground surface.

Total Depth: 47.8 ft bgs
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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

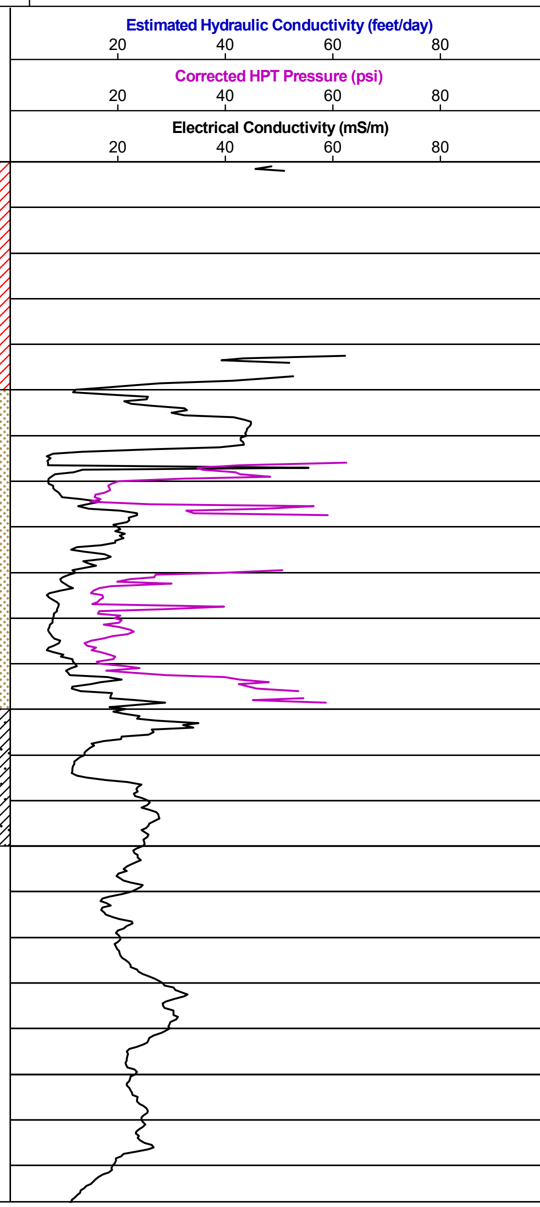
BORING LOG

BOREHOLE ID: *LTW-02*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/20/2005 to 1/16/2006*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398848.97*
EASTING: *2052352.87*
GROUND ELEVATION: *50.03 (feet NAVD88)*
TOC ELEVATION: *52.48 (feet NAVD88)*
TOTAL WELL DEPTH: *38 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		CLAY (CL); dark gray; stiff *(continued)*			
		CLAY (CL); dark gray; stiff			
20	-30	Medium to coarse grained SAND (SP); damp			
		Medium grained SAND (SP); damp			
		Medium grained SAND (SP); dark gray; wet			
		Medium grained SAND (SP); dark gray; wet; spots of medium soft clay			
15	-35				
		Sandy CLAY (CLS); light gray; medium dense; sticky			
10	-40				
5	-45				



End of Boring at 47.8 feet bgs.

All depths referenced to ground surface.

Total Depth: 47.8 ft bgs

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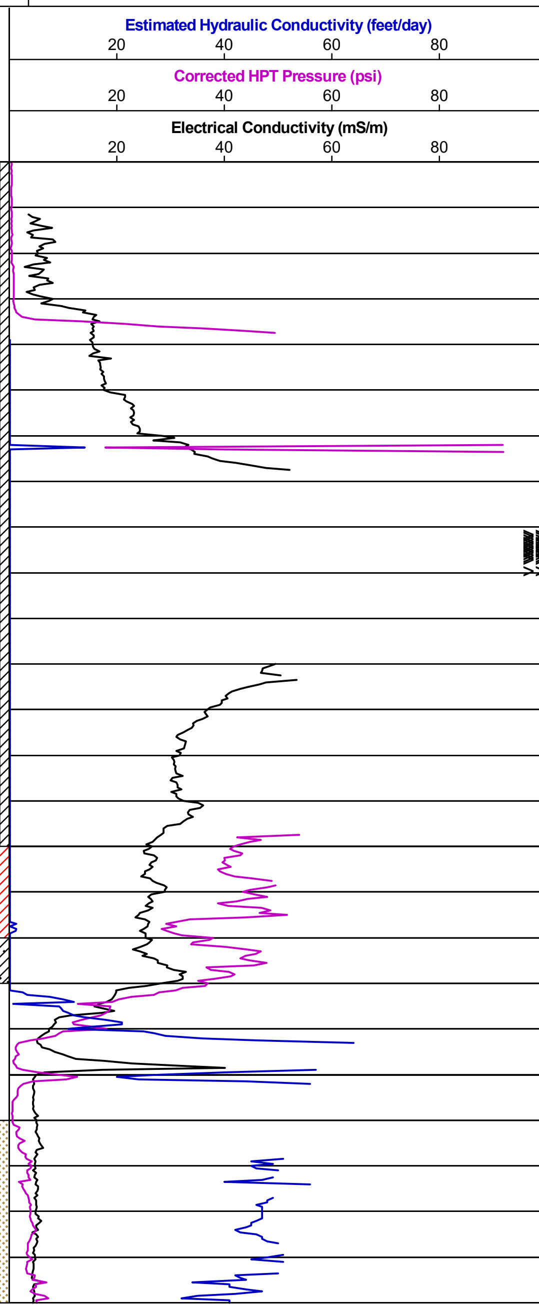
BORING LOG

BOREHOLE ID: *LTW-04*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/22/2005 to 12/22/2005*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *397280.23*
EASTING: *2052583.1*
GROUND ELEVATION: *49.34 (feet NAVD88)*
TOC ELEVATION: *51.86 (feet NAVD88)*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
		Silty CLAY (CL-ML); brown; soft; moist	Lithologic descriptions from historical log by Tracey Ovbey (Parsons) logged December, 2005. Corresponds to HP-09.
		Silty CLAY (CL-ML); light brown; dry; crumbly	
45			
	-5		
		Silty CLAY (CL-ML); light brown; medium stiff; dry	
			Double arrows indicate instances of HPT/EC responses that exceed limits.
40		Silty CLAY (CL-ML); orangeish brown; medium stiff; dry	
	-10		
		Silty CLAY (CL-ML); orangeish brown; medium stiff; dry	
35		Silty CLAY (CL-ML); orangeish brown; medium soft; moist; spots of soft light gray clay	
	-15		
		CLAY (CL); orangeish brown; medium soft; moist; streaks of soft, light gray clay	
		Sandy CLAY (CLS); orangeish brown; soft; moist; streaks of soft, light gray clay	
		(NO CORE)	
30			
	-20		
		Fine to medium grained SAND (SP); orange; wet	
25		Medium grained SAND (SP); light gray; wet	
		Medium grained SAND (SP); orange; wet	



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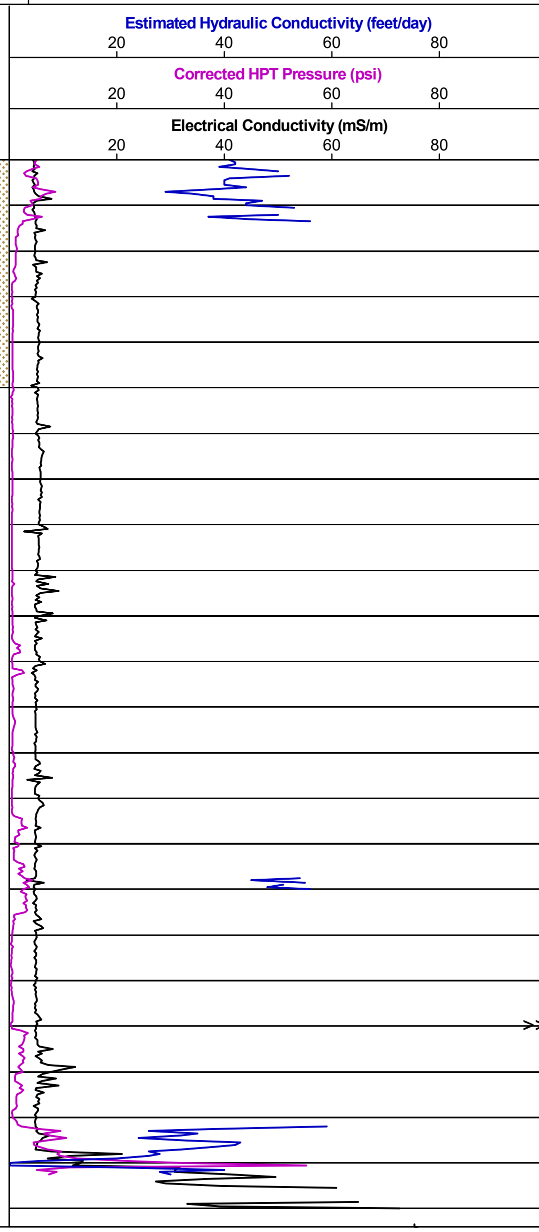
BORING LOG

BOREHOLE ID: *LTW-04*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/22/2005 to 12/22/2005*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *397280.23*
EASTING: *2052583.1*
GROUND ELEVATION: *49.34 (feet NAVD88)*
TOC ELEVATION: *51.86 (feet NAVD88)*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		Medium grained SAND (SP); orange; wet *(continued)*		
		Coarse grained SAND (SP); reddish orange; wet		
		Coarse grained SAND (SP); orange; wet; spots of very soft clay		
		Medium grained SAND (SP); orange; wet		
20				
	-30	Medium grained SAND (SP); light tan		
		LTW-04 soil boring terminated at 30.0 feet. Lithologic descriptions not available beyond this depth.		
15	-35			
10	-40			
5	-45			



End of Boring at 48.4 feet bgs.

All depths referenced to ground surface.

Total Depth: 48.4 ft bgs

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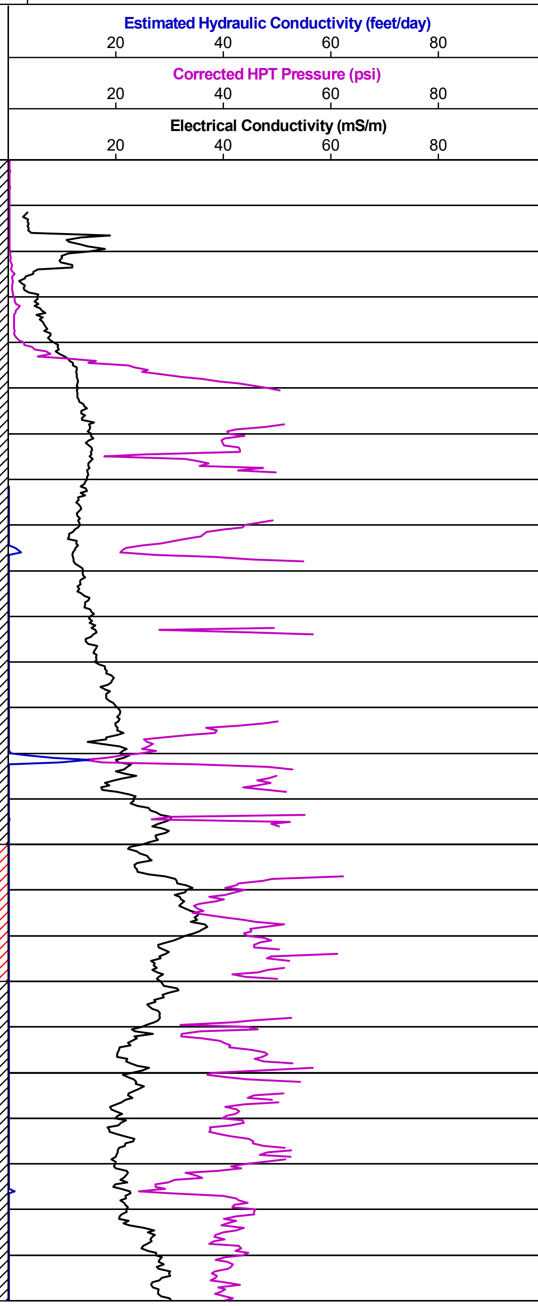
BORING LOG

BOREHOLE ID: *LTW-05*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/21/2005 to 12/21/2005*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396431.66*
EASTING: *2052737.17*
GROUND ELEVATION: *49.29 (feet NAVD88)*
TOC ELEVATION: *52.01 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		Silty CLAY brown; soft; moist			Lithologic descriptions from historical log by Tracey Ovbey (Parsons) logged December, 2005. Corresponds to HP-11.
		Silty CLAY brown; dry; crumbly			
45	-5				
		Silty CLAY brown; dry; crumbly			
40	-10	Silty CLAY brown; dry; spots of light brown			
		Silty CLAY orangeish brown; dry; spots of light gray			
		Silty CLAY orangeish brown and light gray; medium soft; moist			
35	-15	CLAY orangeish brown; medium stiff; moist; large streaks of medium soft light grey clay			
		Silty CLAY brown; soft; spots of soft light gray clay			
30	-20	Silty CLAY brown; medium soft; bands of soft light gray clay			
25					



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All depths referenced to ground surface.

Total Depth: 49.05 ft bgs

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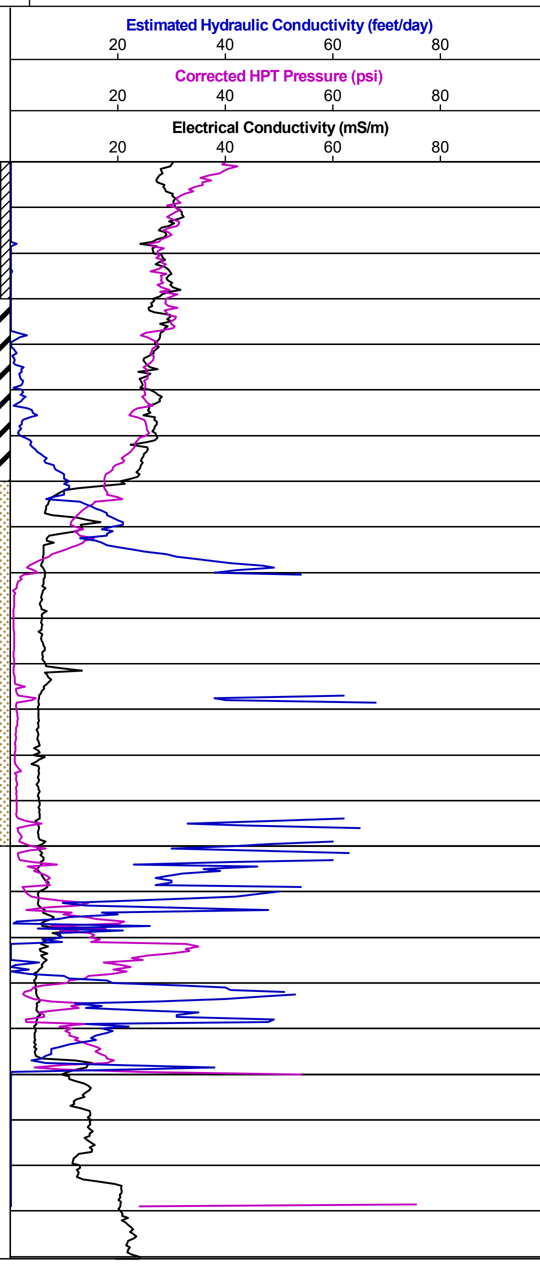
BORING LOG

BOREHOLE ID: *LTW-05*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *12/21/2005 to 12/21/2005*
GEOLOGIST: *Tracy Ovbey*
DRILLING CONTRACTOR: *Gregg Drilling*
DRILLER NAME: *Anthony Frye*
DRILLING METHOD: *N/A*

RIG TYPE: *N/A*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396431.66*
EASTING: *2052737.17*
GROUND ELEVATION: *49.29 (feet NAVD88)*
TOC ELEVATION: *52.01 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		Silty CLAY brown; medium soft; bands of soft light gray clay *(continued)*		
		CLAY light gray; very soft		
20	-30			
		CLAY tan; very soft; moist		
		Medium grained SAND light gray; very soft		
15		Medium grained SAND grayish orange; wet Medium grained SAND grayish orange; wet		
	-35			
		Medium grained SAND light orangeish brown; wet		
10	-40			
		LTW-05 soil boring terminated at 40.0 feet. Lithologic descriptions not available beyond this depth.		
5	-45			



End of Boring at 49.1 feet bgs.

All depths referenced to ground surface.

Total Depth: 49.05 ft bgs

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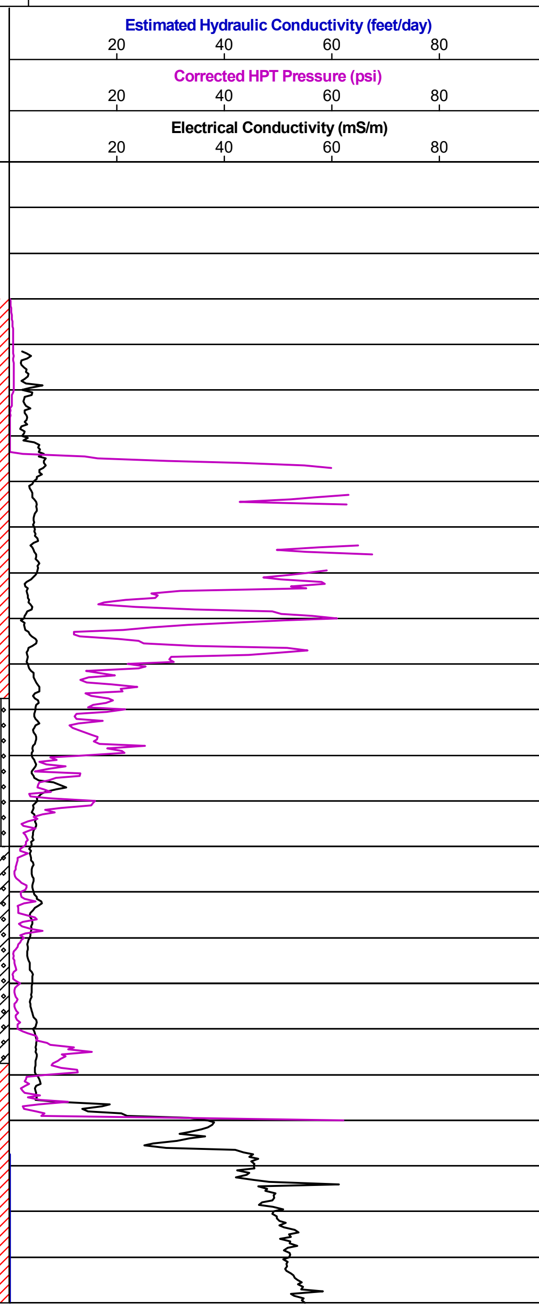
BORING LOG

BOREHOLE ID: *PIW-10*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/24/2019 to 6/24/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395104.674*
EASTING: *2052297.041*
GROUND ELEVATION: *73.304 (feet NAVD88)*
TOC ELEVATION: *76.451 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
75				
	0	CLAY with sand (CL); reddish brown with gray; stiff; moist		Hand auger to 5'. Corresponds to HP-13.
70	-5			
65		Silty SAND (SW-SM); orangeish brown to light brown; moist; homogenous		
	-10			
		Fine to medium grained Silty SAND (SW-SC); gray; damp; mm-scale interlayers of gray silty clay		
60	-15			
		CLAY trace gravel (CL); black and gray; very stiff; moist; medium plasticity		
55	-20			



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Total Depth: 59 ft bgs

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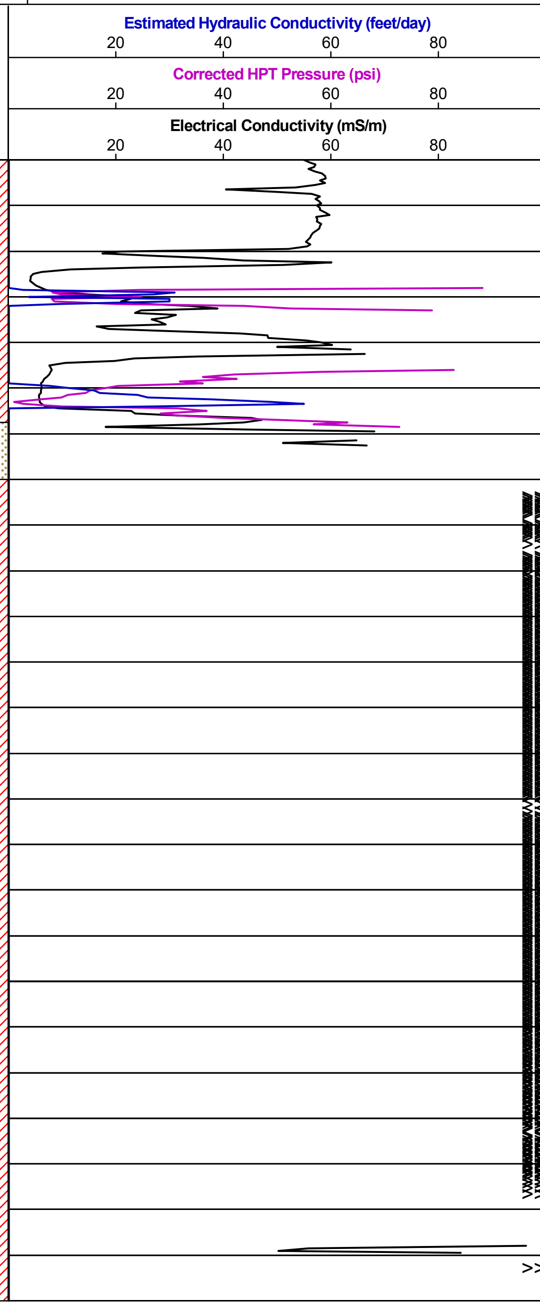
BORING LOG

BOREHOLE ID: *PIW-10*

PROJECT NAME: Additional Onsite Well Installation	**RIG TYPE:** *Geoprobe 7822DT*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *8.25"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *395104.674*
BORING DATE: *6/24/2019 to 6/24/2019*	**EASTING:** *2052297.041*
GEOLOGIST: *Rohit Warrier*	**GROUND ELEVATION:** *73.304 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *76.451 (feet NAVD88)*
DRILLER NAME: *Brian Thomas*	**TOTAL WELL DEPTH:** *7 ft*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*	**TOTAL BORING DEPTH:** *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
50		CLAY trace gravel (CL); black and gray; very stiff; moist; medium plasticity *(continued)*			
	-25	CLAY trace fine to medium sand (CL); black and gray; stiff; moist			
45		Medium to coarse grained SAND (SP); black and gray; loose; wet			
	-30	CLAY (CL); black and gray; stiff; moist; mica-rcih interlayer at 31'			Double arrows indicate instances of HPT/EC responses that exceed limits.
40					
	-35				
35					
	-40				
30					
	-45				



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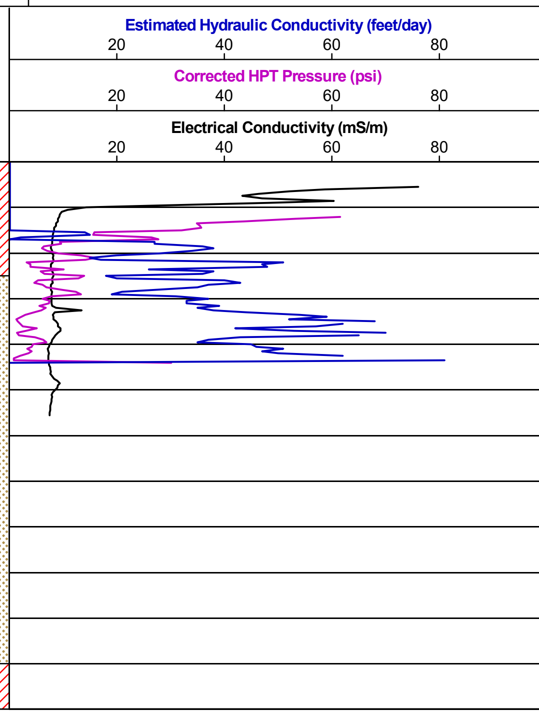
BORING LOG

BOREHOLE ID: *PIW-10*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/24/2019 to 6/24/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395104.674*
EASTING: *2052297.041*
GROUND ELEVATION: *73.304 (feet NAVD88)*
TOC ELEVATION: *76.451 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
25		CLAY (CL); black and gray; stiff; moist; mica-rcih interlayer at 31' *(continued)*		Lithology described from sonic cores 49-59' 15' of heaving sands
	-50	Medium to coarse grained SAND (SP); black and gray; medium stiff; moist; quartz rich grains and trace mica, lignite present		
20	-55			
15		CLAY (CL); gray; stiff to dense; medium plasticity		



End of Boring at 59.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 59 ft bgs

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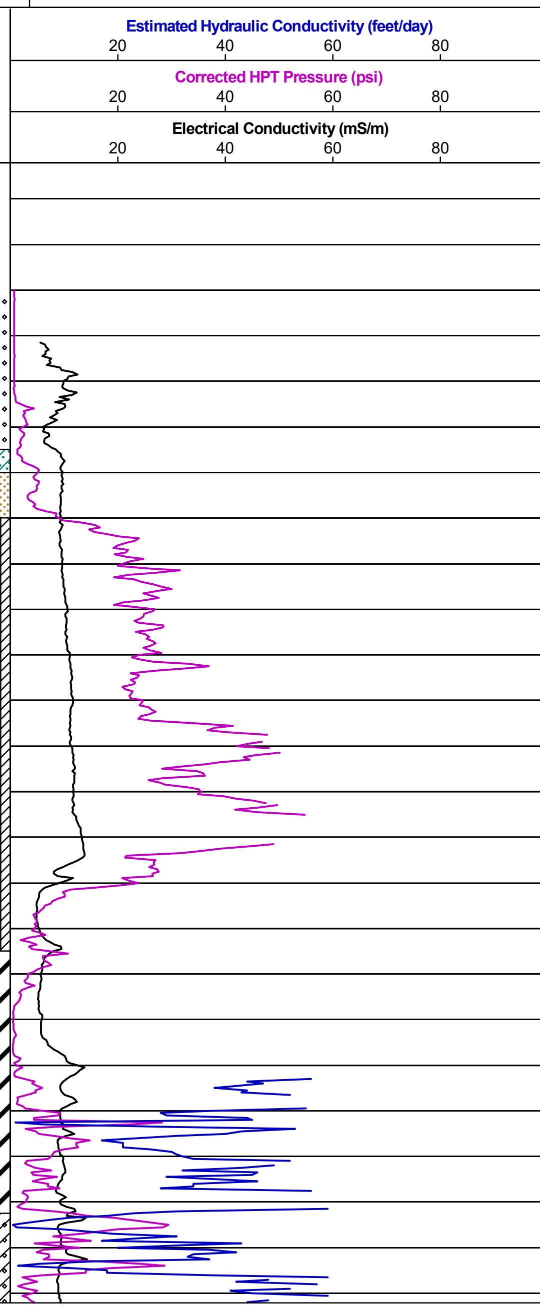
BORING LOG

BOREHOLE ID: *PIW-1*

PROJECT NAME: Additional Onsite Well Installation	**RIG TYPE:** *Geoprobe 7822DT*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *8.25"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *400540.611*
BORING DATE: *6/27/2019 to 6/27/2019*	**EASTING:** *2051792.586*
GEOLOGIST: *Sarah Walker*	**GROUND ELEVATION:** *50.78 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *54.198 (feet NAVD88)*
DRILLER NAME: *Brian Thomas*	**TOTAL WELL DEPTH:** *17.8 ft*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*	**TOTAL BORING DEPTH:** *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
	0	Fine grained SAND with fine to coarse gravel (SW); angular; light brown; color transitions to gray at 3'		Hand auger to 5'. Corresponds to HP-01.
50				
				Possible road fill material
		SAND with clay (SC); black		
		Fine to medium grained Silty SAND (SP); brown		
	-5	Clayey SILT with sand (CL-ML); light brown; soft; damp; Clay content increases around 7.75' moisture content increases at 13.5; mm scale sand layers		
45				
	-10			
40				
	-15	CLAY (CL); light gray; very soft; wet; high plasticity		
35				
		CLAY (CL); light brown; very stiff; moist; 1in sand lense at 19.5 ft.		
	-20			
		Fine to medium grained SAND (SW); grayish brown with light brown; wet; mm to cm scale clay lense		
30				



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All depths referenced to ground surface.

Total Depth: 46.2 ft bgs

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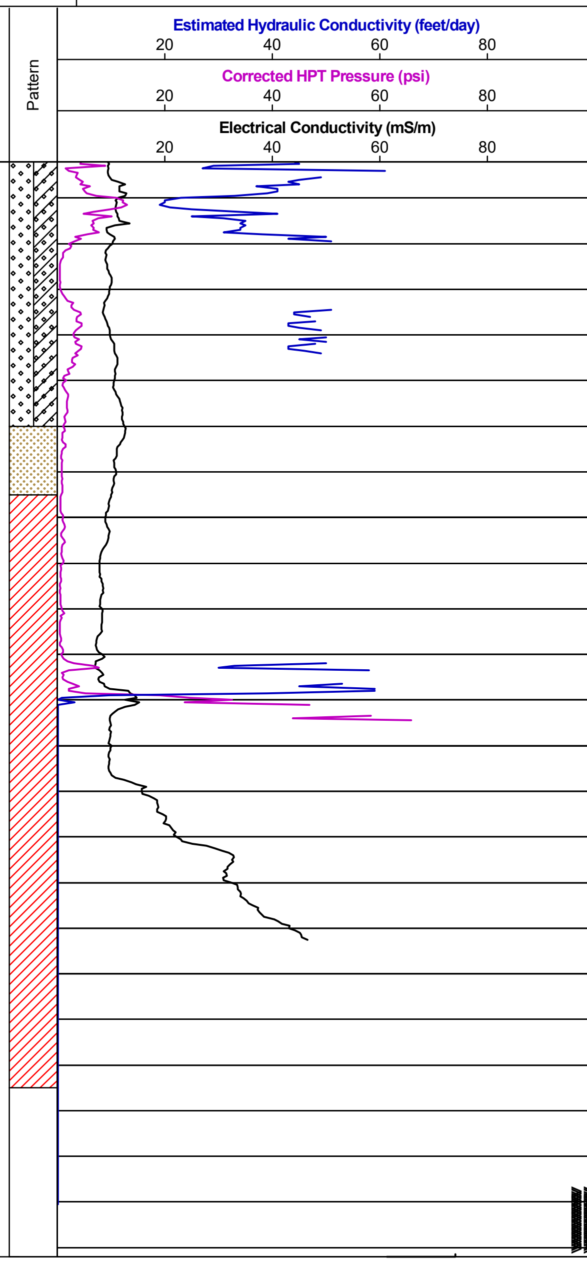
BORING LOG

BOREHOLE ID: *PIW-1*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/27/2019 to 6/27/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *400540.611*
EASTING: *2051792.586*
GROUND ELEVATION: *50.78 (feet NAVD88)*
TOC ELEVATION: *54.198 (feet NAVD88)*
TOTAL WELL DEPTH: *17.8 ft*
TOTAL BORING DEPTH: *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
25	-25	Fine to medium grained SAND (SW); grayish brown with light brown; wet; mm to cm scale clay lense *(continued)*	
		Coarse grained SAND (SP); brown; subangular; wet; 4" of lignite, black platey cleavage	
20	-30	CLAY with mica (CL); light gray; very stiff; damp; Lense of fine silty sand at 36-37.5'; mica rich Highly expansive clays at 30-42.5'	Highly expansive clay in 30-35 interval sampled; Driller pushed 2.5 ft instead of full 5'
15	-35		
10	-40		Dual tube got stuck at 40' terminate boring at 42.5'
		PIW-1 soil boring terminated at 42.5 feet. Lithologic descriptions not available beyond this depth.	Double arrows indicate instances of HPT/EC responses that exceed limits.
5	-45		



End of Boring at 46.2 feet bgs.

All depths referenced to ground surface.

Total Depth: 46.2 ft bgs

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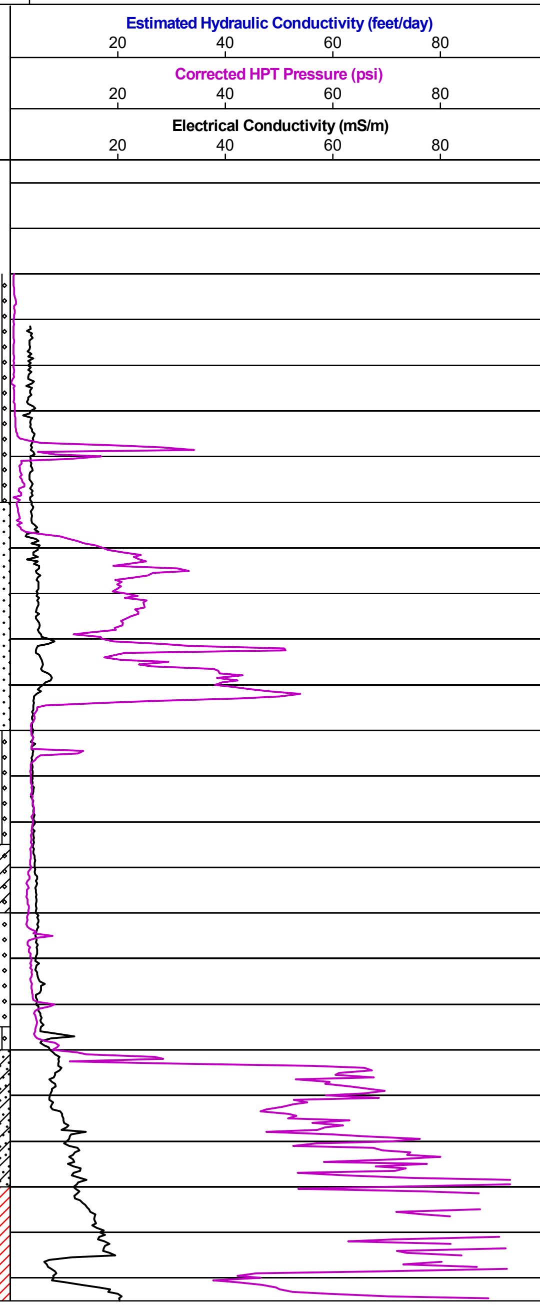
BORING LOG

BOREHOLE ID: *PIW-2*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Wiedner (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Vern Olsen*
DRILLING METHOD: *Sonic*

RIG TYPE: *Terra Sonic TSI 150C*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *50 (feet NAVD88)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *79 ft*
TOTAL BORING DEPTH: *79 ft*



Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
50	0	Fine grained Silty SAND with some organics (SW-SM); light brown to tannish brown; loose; moist		Hand auger to 5'. Corresponds to HP-27.
45	-5	Fine grained Silty SAND with trace mica (SP-SM); light brown; loose; dry		
40	-10	Fine to medium grained Silty SAND (SW-SM); light brown; loose; dry to moist		
		Fine to medium grained SAND with some clay (SW-SC); orangeish brown; loose; moist; red and brown mottling throughout		
		Medium grained SAND with some mica (SW); reddish brown; loose; moist		
35	-15			
		Fine grained Silty SAND (SW-SM); tannish white to light gray; loose; moist		
		Clayey SAND with silt (SP-SC); gray to dark gray; dense; moist		
30	-20	CLAY with mica (CL); dark gray; loose/stiff; fine-grained sandy parting and trace lignite		Run 7" casing to 20'

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All depths referenced to ground surface.

Total Depth: 79 ft bgs

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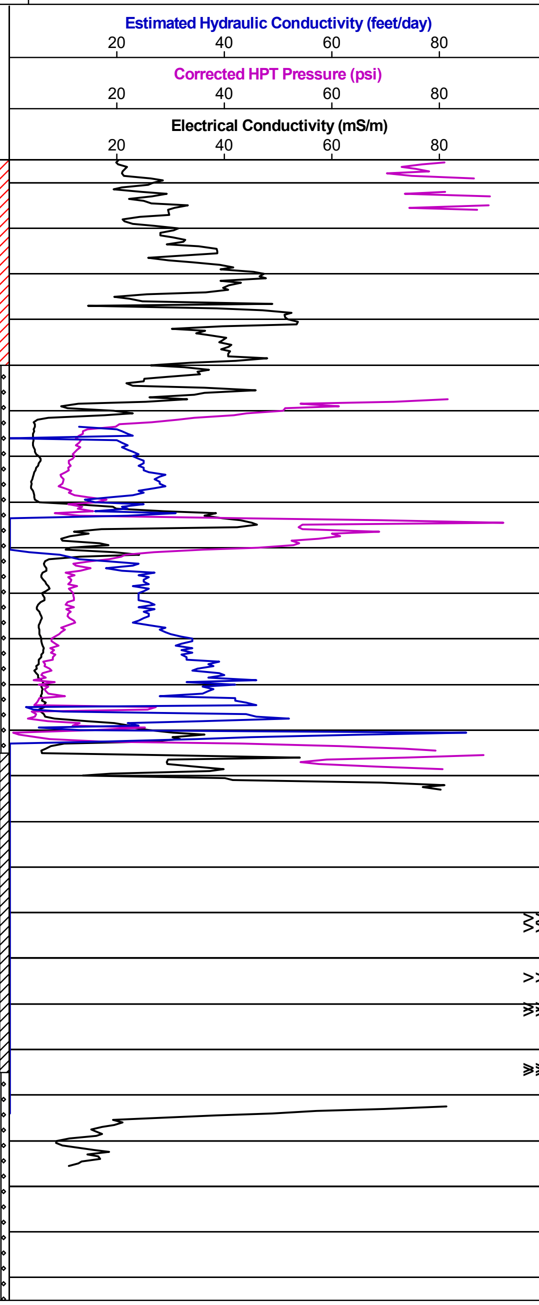
BORING LOG

BOREHOLE ID: *PIW-2*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Wiedner (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Vern Olsen*
DRILLING METHOD: *Sonic*

RIG TYPE: *Terra Sonic TSI 150C*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *50 (feet NAVD88)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *79 ft*
TOTAL BORING DEPTH: *79 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		CLAY with mica (CL); dark gray; loose/stiff; fine-grained sandy parting and trace lignite *(continued)*			
25	-25				
		Medium grained Silty SAND (SW-SM); dark gray to gray; dense; moist; oragnic rich at 28' (3" thick), clay lenses throughout			
		Fine grained Silty SAND with mica (SW-SM); gray to light gray; loose/dense; moist			
20	-30				
		Medium grained Silty SAND (SW-SM); gray; moist to wet; mica rich, orangic rich layer at 35'			
15	-35				
		CLAY with silt (CL-ML); dark gray; very stiff; dry to moist; sandy parting			
					Double arrows indicate instances of HPT/EC responses that exceed limits.
10	-40				
		Medium to coarse grained Silty SAND (SW-SM); dark gray to medium gray; wet; mica rich			
5	-45				



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BORING LOG

BOREHOLE ID: *PIW-2*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Wiedner (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Vern Olsen*
DRILLING METHOD: *Sonic*

RIG TYPE: *Terra Sonic TSI 150C*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *50 (feet NAVD88)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *79 ft*
TOTAL BORING DEPTH: *79 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
		Medium to coarse grained Silty SAND (SW-SM); dark gray to medium gray; wet; mica rich *(continued)*			
0	-50	Medium grained Clayey SAND (SP-SC); medium gray; dense; moist; mica rich			
		CLAY (CL); dark gray; hard; moist to dry			
		Fine to medium grained Silty SAND with mica (SW-SM); dark gray to light gray; wet; mica and orgnaic rich, possibly lignite, clay lense at 54'			
-5	-55	CLAY with trace mica (CL-ML); dark gray to gray; hard; wet; medium-grained sandy parting			
-10	-60	Fine to medium grained Clayey SAND with some mica (SW-SC); dark gray; wet; clay lense at 60' and 63' (<3mm)			
-15	-65	Very fine grained CLAY (CL-ML); dark gray; stiff; moist; light gray, very fine grained clay parting throughout			
-20	-70	Very fine to fine grained Silty SAND (SW-SM); light gray; loose; moist			
		Sandy CLAY WITH SILT with trace mica (CL); light gray; hard; dry; laminated			

(Continued Next Page)

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BORING LOG

BOREHOLE ID: *PIW-2*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Wiedner (Parsons)*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Vern Olsen*
DRILLING METHOD: *Sonic*

RIG TYPE: *Terra Sonic TSI 150C*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *50 (feet NAVD88)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *79 ft*
TOTAL BORING DEPTH: *79 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
		Sandy CLAY WITH SILT with trace mica (CL); light gray; hard; dry; laminated *(continued)*			
-25	-75				

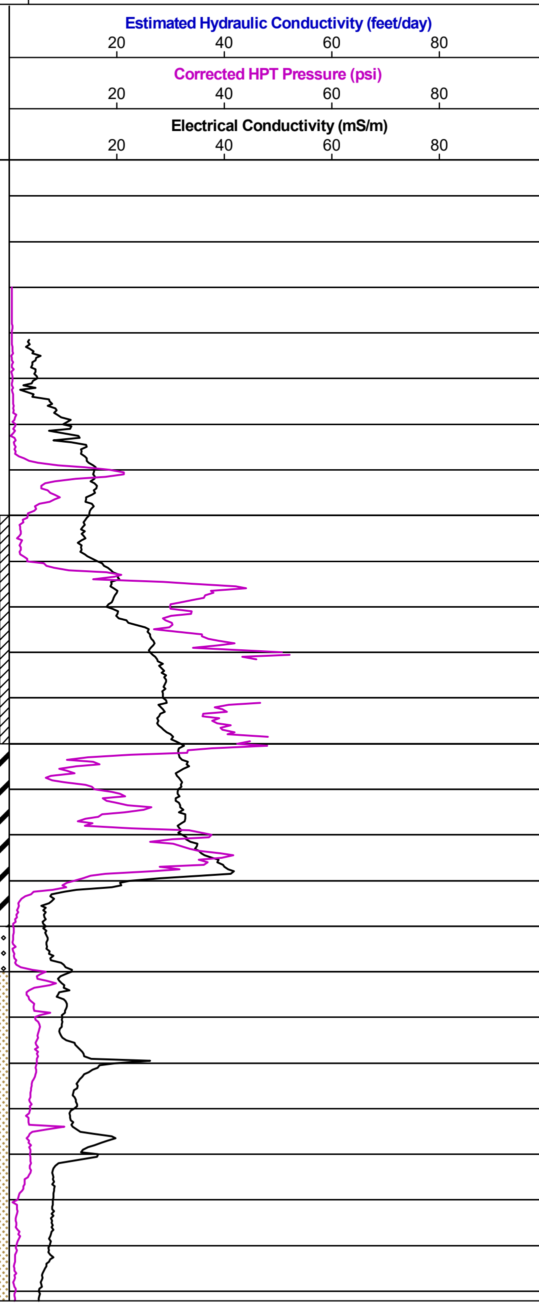
End of Boring at 79.0 feet bgs.

Geosyntec Consultants of NC, PC NC License No.: C-3500 — Geosyntec Consultants of NC, PC, 2501 Blue Ridge Rd. Suite 430, Raleigh NC, 27607, Telephone: 919-870-0576	# BORING LOG **BOREHOLE ID:** *PIW-3*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399711.752*
EASTING: *2052088.802*
GROUND ELEVATION: *50.513 (feet NAVD88)*
TOC ELEVATION: *53.315 (feet NAVD88)*
TOTAL WELL DEPTH: *19 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
50	0	SILT (ML); brown; dry; non plastic		Hand auger to 5'. Corresponds to HP-24.
45	-5	SILT with clay (CL-ML); reddish brown; hard; dry		
40	-10	Silty CLAY with some mica (CH); gray with reddish brown; medium stiff; high plasticity		
		Fine to medium grained SAND with some fine to medium gravel (SW); subangular; brown; loose to medium dense; wet; Poorly-sorted		
35	-15	Fine to medium grained SAND (SP); brown; loose to medium dense; wet; 1/2" seam of high plastic gray clay at 17.2"		
30	-20	Fine to medium grained SAND with some mica (SP); brown; loose; wet		



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All depths referenced to ground surface.

Total Depth: 44.55 ft bgs

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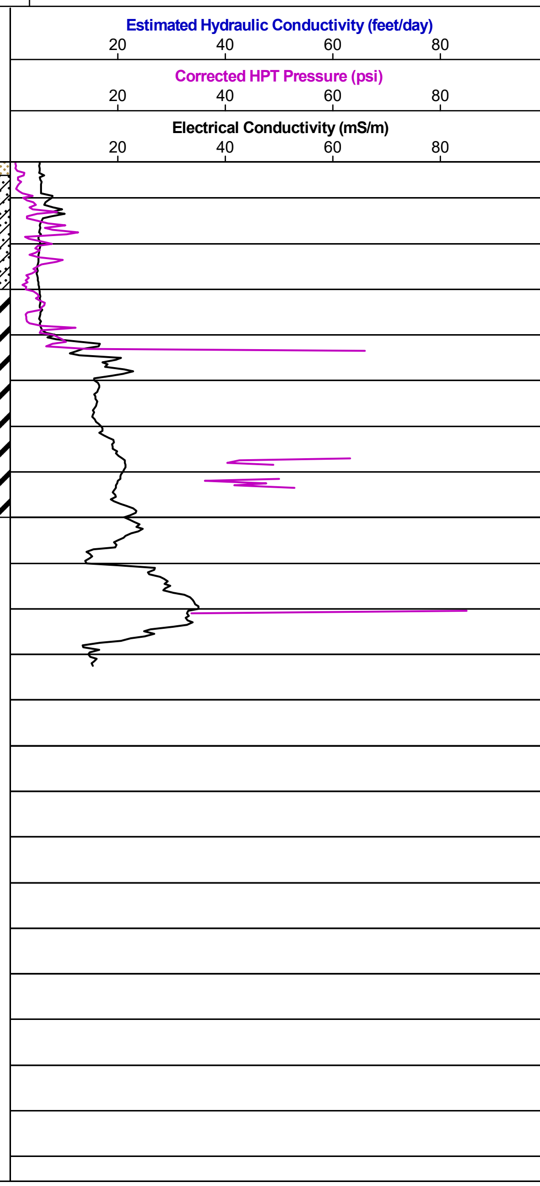
BORING LOG

BOREHOLE ID: *PIW-3*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399711.752*
EASTING: *2052088.802*
GROUND ELEVATION: *50.513 (feet NAVD88)*
TOC ELEVATION: *53.315 (feet NAVD88)*
TOTAL WELL DEPTH: *19 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		Fine to medium grained SAND with clay (SP-SC); dark gray; medium dense; wet; interbedded with high plastic, gray clay lenses			Lignitic material at 23-25'
25	-25	CLAY (CH); dark gray; very hard; dry; high plasticity			
20	-30	PIW-3D soil boring terminated at 30.0 feet. Lithologic descriptions not available beyond this depth.			
15	-35				
10	-40				



End of Boring at 44.6 feet bgs.

All depths referenced to ground surface.

Total Depth: 44.55 ft bgs

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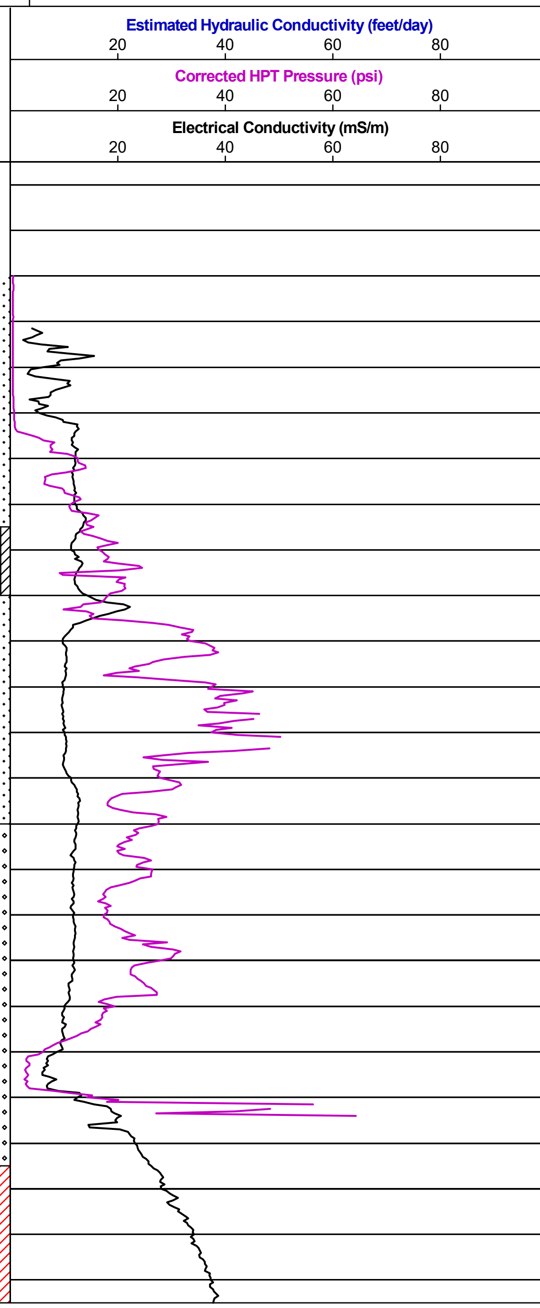
BORING LOG

BOREHOLE ID: *PIW-5*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/9/2019 to 7/9/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398520.381*
EASTING: *2051951.26*
GROUND ELEVATION: *72.68 (feet NAVD88)*
TOC ELEVATION: *75.188 (feet NAVD88)*
TOTAL WELL DEPTH: *9.75 ft*
TOTAL BORING DEPTH: *45 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
75				
	0	Fine to medium grained SAND with silt (SP-SM); brown tan; loose; damp		Hand auger to 5'. Corresponds to HP-10.
70				
	-5	Silty CLAY (CL-ML); reddish brown and light gray; firm; moist		
65		Fine grained Silty SAND (SP-SM); loose; damp from 7'		
	-10			
60		Medium to coarse grained SAND (SW); brown to tannish orange; loose; wet; 3" gray clay layer from 13.75-14'		
	-15			
55				
	-20	CLAY with trace sand (CL); black to gray; firm; moist; trace sand at 35'		



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All depths referenced to ground surface.

Total Depth: 45 ft bgs

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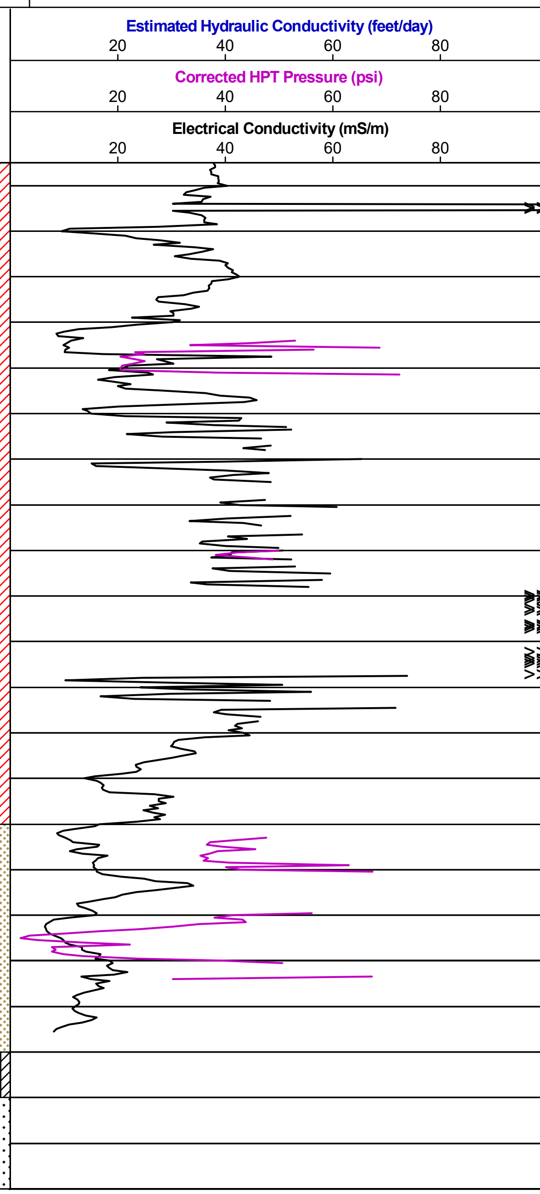
BORING LOG

BOREHOLE ID: *PIW-5*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/9/2019 to 7/9/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398520.381*
EASTING: *2051951.26*
GROUND ELEVATION: *72.68 (feet NAVD88)*
TOC ELEVATION: *75.188 (feet NAVD88)*
TOTAL WELL DEPTH: *9.75 ft*
TOTAL BORING DEPTH: *45 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
50		CLAY with trace sand (CL); black to gray; firm; moist; trace sand at 35' *(continued)*			Double arrows indicate instances of HPT/EC responses that exceed limits.
	-25				
45					
	-30				
40					
	-35				
35		Medium to coarse grained SAND (SP); light gray; medium stiff; moist; interbedded with mm-scale clay seams from 39' to 39.5'			
	-40				
30		Silty CLAY (CL-ML); dark gray to gray; medium firm; moist			
		Fine to medium grained Silty SAND (SP-SM); dark gray to light gray; medium to very firm; moist; interbedded with mm-scale silty clay seams			
	-45				



End of Boring at 45.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 45 ft bgs

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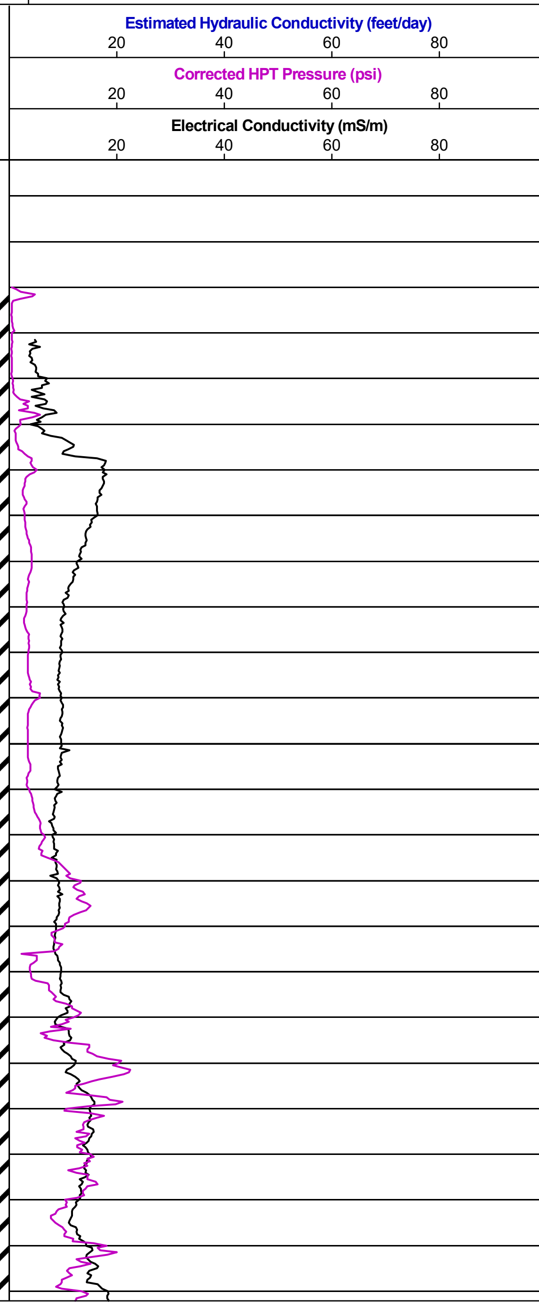
BORING LOG

BOREHOLE ID: *PIW-6*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/28/2019 to 6/28/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398118.144*
EASTING: *2052540.567*
GROUND ELEVATION: *49.85 (feet NAVD88)*
TOC ELEVATION: *53.359 (feet NAVD88)*
TOTAL WELL DEPTH: *18 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
50	0	SILT with trace sand (ML); reddish brown; soft; dry; increasing sand fraction with depth, moist at 13.5'			Hand auger to 5'. Corresponds to HP-08.
45	-5				
40	-10				
35	-15	CLAY with silt (CH); reddish brown to olive gray; medium stiff; moist; silt lenses (15'-25.9'), increasing moisture at 24.5'			
30	-20				



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All depths referenced to ground surface.

Total Depth: 40.6 ft bgs

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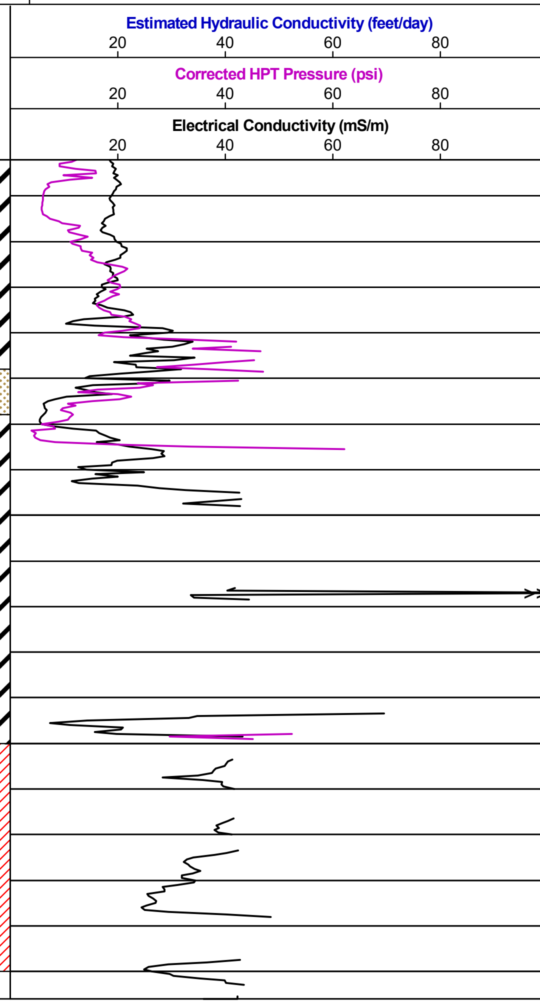
BORING LOG

BOREHOLE ID: *PIW-6*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/28/2019 to 6/28/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398118.144*
EASTING: *2052540.567*
GROUND ELEVATION: *49.85 (feet NAVD88)*
TOC ELEVATION: *53.359 (feet NAVD88)*
TOTAL WELL DEPTH: *18 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		CLAY with silt (CH); reddish brown to olive gray; medium stiff; moist; silt lenses (15'-25.9'), increasing moisture at 24.5' *(continued)*		
25	-25	CLAY (CH); dark gray; medium stiff; moist; homogenous		
		SAND (SP); yellowish red and gray; medium dense; moist; dark gray clay lenses from 27'-27.2'		
		CLAY (CH); dark gray; medium stiff; moist; medium gray sand lense at 28.6'-28.8'		
20	-30	CLAY (CH); dense; moist; homogenous with suspected lignite lenses (<1/4") from 33'-34'		Double arrows indicate instances of HPT/EC responses that exceed limits.
15	-35	CLAY with some mica (CL); medium gray; stiff; moist; thin dark gray banding		
10	-40	PIW-3D soil boring terminated at 40.0 feet. Lithologic descriptions not available beyond this depth. End of Boring at 40.6 feet bgs.		



All depths referenced to ground surface.

Total Depth: 40.6 ft bgs

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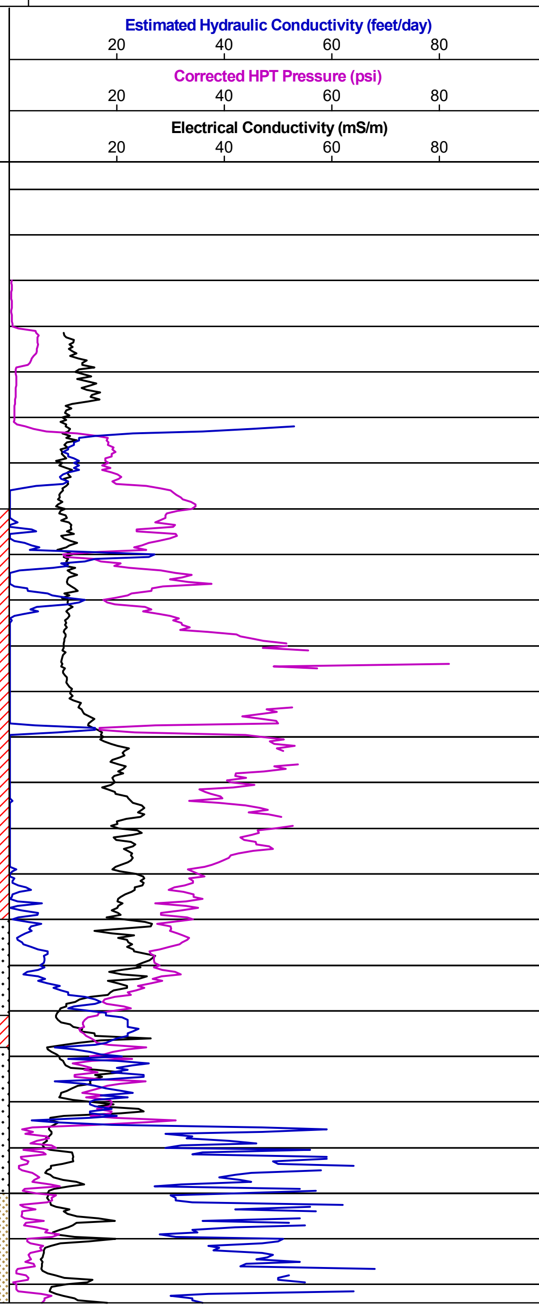
BORING LOG

BOREHOLE ID: *PIW-7*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396787.693*
EASTING: *2052595.368*
GROUND ELEVATION: *45.778 (feet NAVD88)*
TOC ELEVATION: *48.597 (feet NAVD88)*
TOTAL WELL DEPTH: *29 ft*
TOTAL BORING DEPTH: *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Comments
45	0	SILT with sand (ML); reddish brown to brown; medium stiff; moist	Hand auger to 5'. Corresponds to HP-10.
40	-5	CLAY (CL); medium gray with yellowish red; very soft; moist	
35	-10		
		Fine grained SAND with silt (SP-SM); reddish brown with gray; moist	
30	-15	CLAY with trace silt (CL); gray; very soft; moist; with yellowish to red streaking	
		SAND with silt (SP-SM); gray to yellowish red; loose; moist; with some stratification between gray and yellowish red sands, gray sands ~2" thick	
25	-20	Fine to medium grained SAND (SP); light gray yellowish red; loose; wet; with small lens of silty dark gray sand	



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All depths referenced to ground surface.

Total Depth: 50 ft bgs

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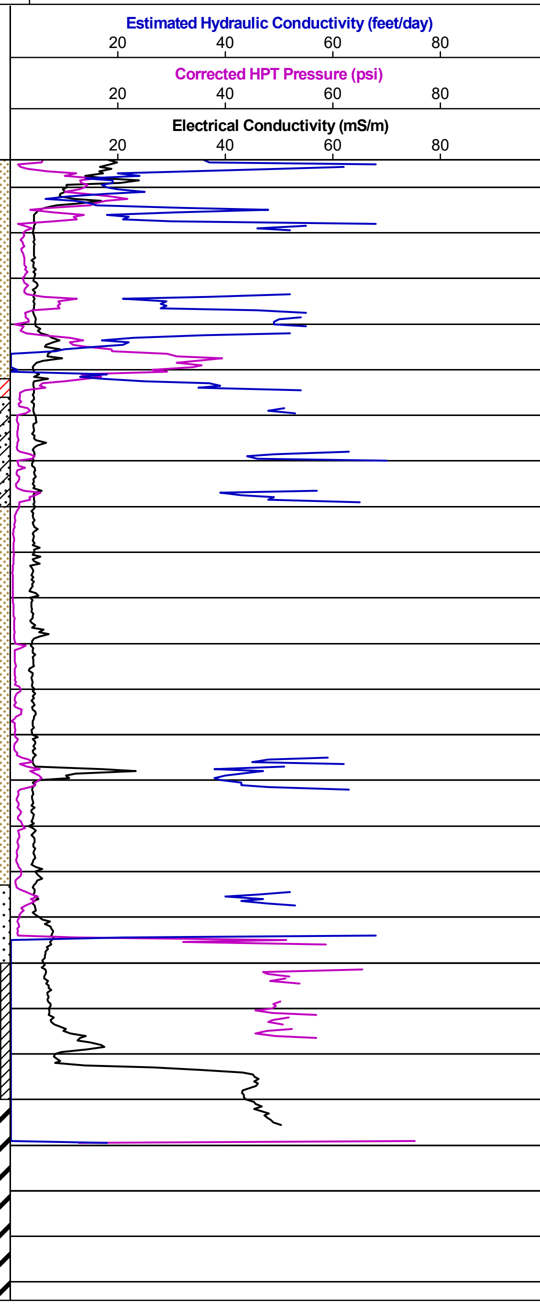
BORING LOG

BOREHOLE ID: *PIW-7*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396787.693*
EASTING: *2052595.368*
GROUND ELEVATION: *45.778 (feet NAVD88)*
TOC ELEVATION: *48.597 (feet NAVD88)*
TOTAL WELL DEPTH: *29 ft*
TOTAL BORING DEPTH: *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		Fine to medium grained SAND (SP); light gray yellowish red; loose; wet; with small lens of silty dark gray sand *(continued)*			
	-25				
20					
		CLAY (CL); dark gray; medium stiff; moist; interbedded with thin (0.5" thick) bands of dark gray clay			
		Fine grained SAND (SP-SC); yellowish red to gray; medium dense; moist; with stratified with thin (.5") bands of dark gray clay			
	-30	Fine to medium grained SAND (SP); dark gray; medium dense; wet; homogenous, with thin (0.5") band of hard black material, possibly lignite			
15					
	-35				
10					
		Fine grained SAND and silt (SP-SM); gray; medium dense; moist; with thick bands of dark gray material			
	-40	Fine grained SAND and silt (CL-ML); medium dense; moist; increasing clay fraction with depth			
5					
		CLAY (CH); medium gray; moist; homogenous			
	-45	CLAY with trace sand (CH); greenish gray; very stiff; dry; thin banding of darker gray material; visible micaceous grains, with other dark gray mineral banding visible in some places			
0					



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BORING LOG

BOREHOLE ID: *PIW-7*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396787.693*
EASTING: *2052595.368*
GROUND ELEVATION: *45.778 (feet NAVD88)*
TOC ELEVATION: *48.597 (feet NAVD88)*
TOTAL WELL DEPTH: *29 ft*
TOTAL BORING DEPTH: *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) 20 40 60 80 / Corrected HPT Pressure (psi) 20 40 60 80 / Electrical Conductivity (mS/m) 20 40 60 80	Comments
	-50	CLAY with trace sand (CH); greenish gray; very stiff; dry; thin banding of darker gray material; visible micaceous grains, with other dark gray mineral banding visible in some places *(continued)*			

End of Boring at 50.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 50 ft bgs

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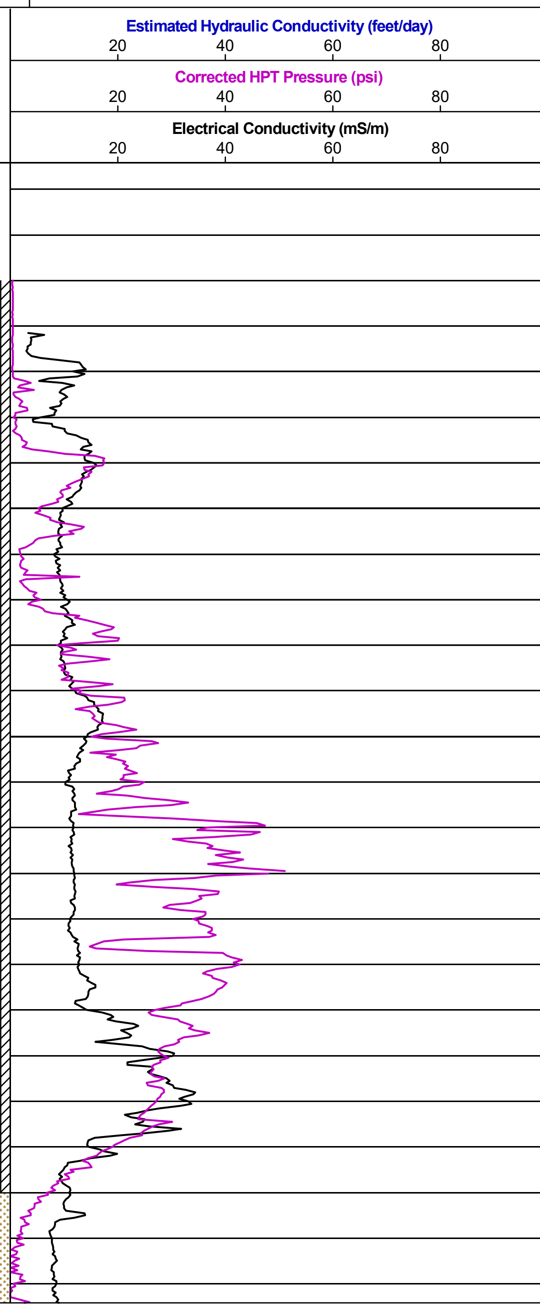
BORING LOG

BOREHOLE ID: *PIW-8*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396403.378*
EASTING: *2052682.019*
GROUND ELEVATION: *45.919 (feet NAVD88)*
TOC ELEVATION: *48.518 (feet NAVD88)*
TOTAL WELL DEPTH: *35.5 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
45	0	Silty CLAY (CL-ML); reddish brown; dry		Hand auger to 5'. Corresponds to HP-32.
40	-5			
35	-10	Silty CLAY (CL-ML); reddish brown with gray; soft; moist; interbedded clay and silt throughout, clay becomes moist and more sandy at 19.5' to 20'		
30	-15			
25	-20	Fine grained SAND (SP); yellowish red to reddish brown; loose; moist to wet; Black bands appear organic; fine to medium grained from 29'; approximately 1" band of lignite at 28'		



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All depths referenced to ground surface.

Total Depth: 46.55 ft bgs

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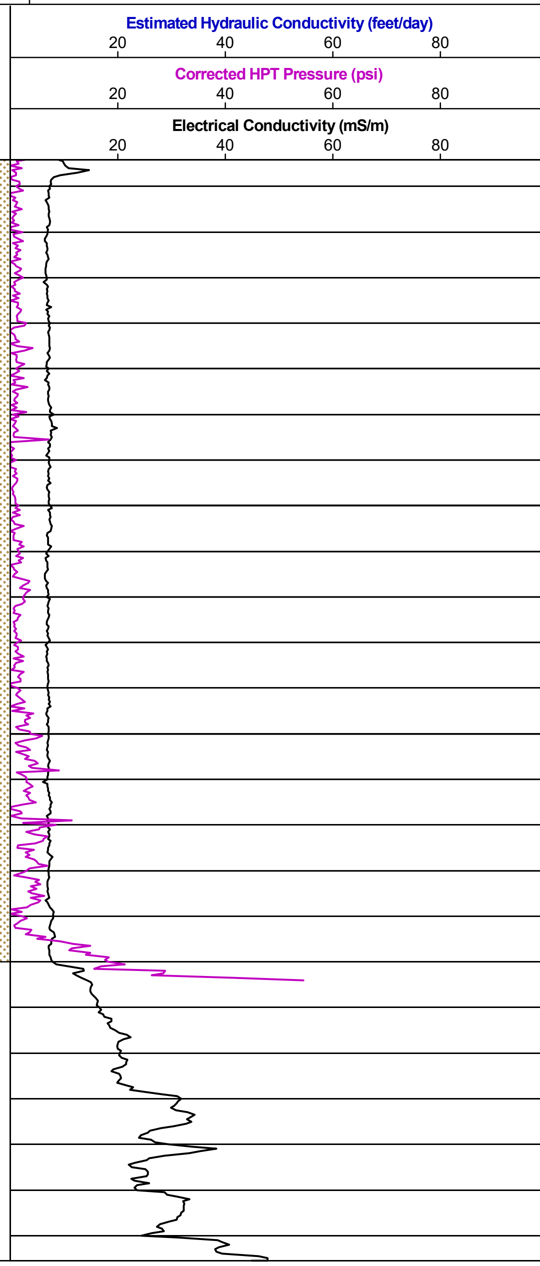
BORING LOG

BOREHOLE ID: *PIW-8*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396403.378*
EASTING: *2052682.019*
GROUND ELEVATION: *45.919 (feet NAVD88)*
TOC ELEVATION: *48.518 (feet NAVD88)*
TOTAL WELL DEPTH: *35.5 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		Fine grained SAND (SP); yellowish red to reddish brown; loose; moist to wet; Black bands appear organic; fine to medium grained from 29'; approximately 1" band of lignite at 28' *(continued)*		
	-25			Heaving sand
20				
	-30	Fine to medium grained SAND (SP); dark gray; wet; visible mica grains, llignite laminations at 33.1', 34.5', and 35'		
15				
	-35			
10				
		Increased lignitic laminations from 37.5' to 40' (~1/4" to 1.5" thick)		
	-40	PIW-8D soil boring terminated at 44.55 feet. Lithologic descriptions not available beyond this depth.		
5				
	-45			
0				



End of Boring at 46.6 feet bgs.

All depths referenced to ground surface.

Total Depth: 46.55 ft bgs

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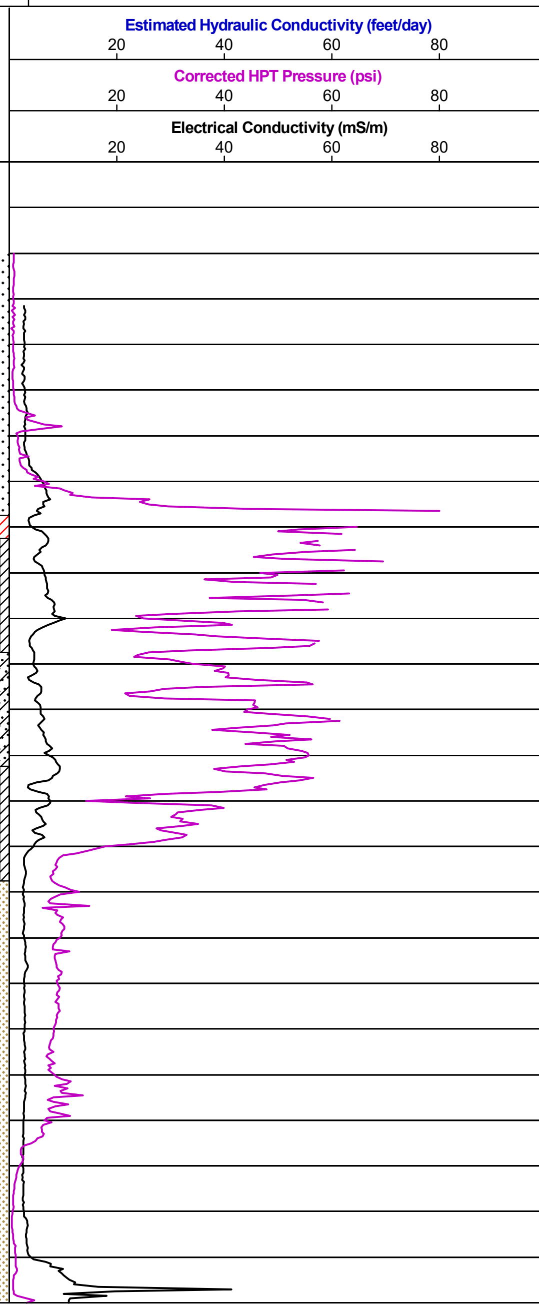
BORING LOG

BOREHOLE ID: *PIW-9*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
	0	Fine to medium grained SAND with silt (SP-SM); grayish brown with reddish brown; loose; dry; trace rounded pebbles (`~2mm)			Hand auger to 5'. Lithology descriptions from 0-40' taken from PIW-9S. Corresponds to HP-12.
75					
	-5	CLAY (CL); gray with red; medium stiff; moist			
70		Silty CLAY (CL-ML); grayish brown with reddish brown; stiff; moist			
		Silty SAND with trace clay (SP-SC); tannish brown; loose; moist			
	-10				
65		Silty CLAY (CL-ML); reddish brown and reddish gray; soft; moist			
		Fine to medium grained SAND (SP); tannish white; loose; moist; interbedded with mm-scale clay lenses; wet at 22.5' to 23'			
	-15				
60					
	-20				
55					



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All depths referenced to ground surface.

Total Depth: 55.95 ft bgs

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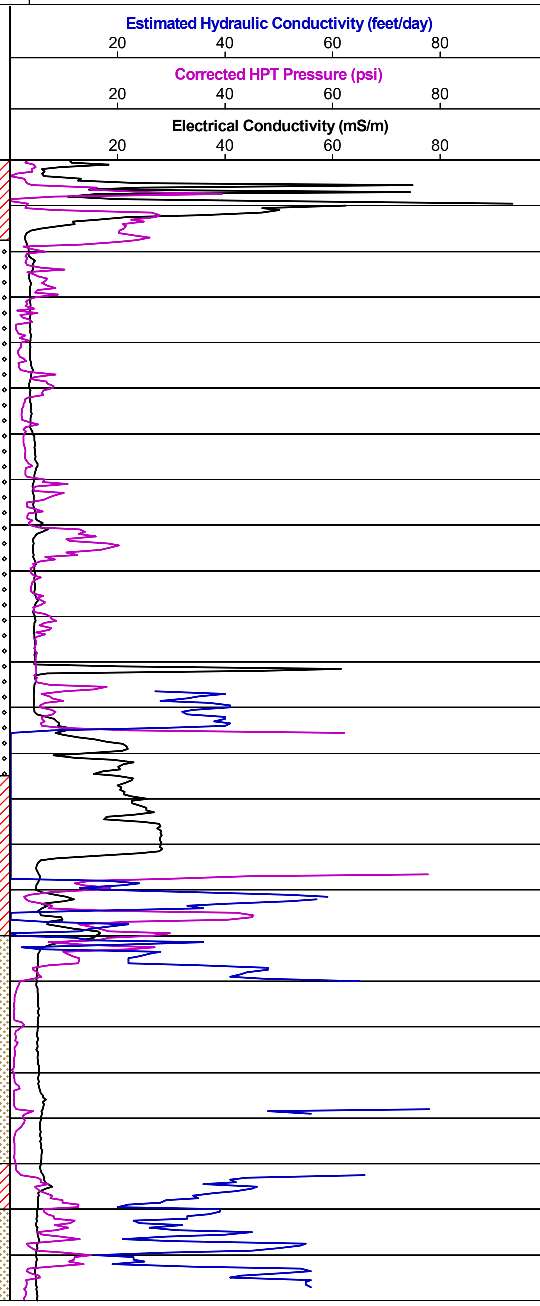
BORING LOG

BOREHOLE ID: *PIW-9*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Comments
		CLAY with trace silt (CL); grayish black; firm; moist; trace lignite		
	-25	Medium to coarse grained SAND (SW); tannish white; loose; wet; intebedded with mm-scale clay lenses		
50				
	-30			
45		Coarse grained SAND (SW); blackish gray; loose; wet; 1 in clay layer at 32.5' and lignitte appears in last inch of run		
	-35			
40		CLAY (CL); blackish gray; moist; with mm-scale sand layers and 0.5" lignite layer at 38'		
	-40	Coarse grained SAND with trace mica (SP); gray with brown; loose; wet; redoximorphic features		Heaving sands
35				
	-45	CLAY (CL); blackish brown with black; stiff; moist; laminated		
30		Medium to coarse grained SAND with trace mica (SP); dark gray; medium dense; moist		



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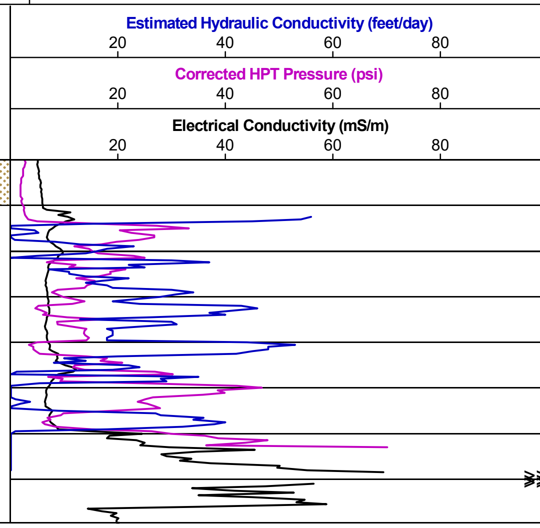
BORING LOG

BOREHOLE ID: *PIW-9*

PROJECT NAME: Additional Onsite Well Installation
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Estimated Hydraulic Conductivity (feet/day) / Corrected HPT Pressure (psi) / Electrical Conductivity (mS/m)	Comments
		Medium to coarse grained SAND with trace mica (SP); dark gray; medium dense; moist *(continued)*			
	-50	PIW-9D soil boring terminated at 49.0 feet. Lithologic descriptions not available beyond this depth.			Double arrows indicate instances of HPT/EC responses that exceed limits.
25					
	-55				



End of Boring at 56.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 55.95 ft bgs

APPENDIX D
Soil Boring Logs and Well Construction Logs

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
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BORING LOG

BOREHOLE ID: *Bladen-1S*

PROJECT NAME: Offsite Characterization	**RIG TYPE:** *USDOT1075864*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *6"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *387516.283*
BORING DATE: *8/14/2019 to 8/14/2019*	**EASTING:** *2050234.779*
GEOLOGIST: *Brandon Peach*	**GROUND ELEVATION:** *81.566 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *81.31 (feet NAVD88)*
DRILLER NAME: *James Smith*	**TOTAL WELL DEPTH:** *10.25 ft*
DRILLING METHOD: *Sonic*	**TOTAL BORING DEPTH:** *16 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
80		Fine to medium grained Silty SAND (SP-SM); tan to brown; loose; moist; orangic-rich			Cement grout; Bentonite chips	Hand auger to 5'
	-5	CLAY trace mica (CL); gray to brown; soft; moist; medium plasticity		2.0	2-inch PVC casing	
75		Fine to medium grained Silty SAND (SP-SM); tan to orange; loose; moist; wet at 6.75'			Filter pack (sand)	
		CLAY WITH SILT trace organics (CL); orangeish tan to brown; firm; moist; medium plasticity			2-inch PVC screen (0.010 inch)	
	-10	CLAY with fine sand (CH); reddish brown; firm; moist; low plasticity; mm-layers fine-grained sand interlayers with orange laminations				
70				9.0	Backfill Plug	
	-15	CLAY trace mica (CH); black to gray; very hard; moist; low to medium plasticity				

End of Boring at 16.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 16 ft bgs

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
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BORING LOG

BOREHOLE ID: *Bladen-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/13/2019 to 8/13/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *387519.56*
EASTING: *2050248.831*
GROUND ELEVATION: *81.72 (feet NAVD88)*
TOC ELEVATION: *81.52 (feet NAVD88)*
TOTAL WELL DEPTH: *47.25 ft*
TOTAL BORING DEPTH: *47 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
80		Medium grained Silty SAND (SP-SM); tan to brown; loose; moist				Hand auger to 5'
75	-5			4.0		
		CLAY with silt (CL); gray to brown; soft; moist				
	-10	Medium grained Silty SAND (SP-SM); tan to brown; loose; moist; wet from 10-10.5'				
70		Silty SAND (SM); reddish brown to orange; soft; moist; laminations of orange fine-grained sand		7.0		
	-15	CLAY with fine sand (CL); grayish red brown; hard; moist; trace mica				
65		CLAY (CH); gray to black; stiff; moist; fat, 6" lignite layer			Cement grout	
60	-20			10.0	2-inch PVC casing	

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BORING LOG

BOREHOLE ID: *Bladen-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/13/2019 to 8/13/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *387519.56*
EASTING: *2050248.831*
GROUND ELEVATION: *81.72 (feet NAVD88)*
TOC ELEVATION: *81.52 (feet NAVD88)*
TOTAL WELL DEPTH: *47.25 ft*
TOTAL BORING DEPTH: *47 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
55		CLAY (CH); gray to black; stiff; moist; fat, 6" lignite layer *(continued)*				7" casing installed
	-30					
50				10.0	Bentonite chips	
		SAND (SP); light gray to dark gray; loose; wet				
	-35					
45						
	-40				Filter pack (sand)	
40					2-inch PVC screen (0.010 inch)	
	-45					
35						

End of Boring at 47.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 47 ft bgs

BORING LOG

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BOREHOLE ID: *Bladen-2S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/16/2019 to 8/16/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *368818.784*
EASTING: *2042884.349*
GROUND ELEVATION: *143.01 (feet NAVD88)*
TOC ELEVATION: *142.62 (feet NAVD88)*
TOTAL WELL DEPTH: *20.25 ft*
TOTAL BORING DEPTH: *22 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained Silty SAND (SP-SM); light brown to tan; loose; moist; gray laminations				Hand auger to 5'
140					Cement grout	
	-5			2.0	Bentonite chips	
135						
		Medium grained Silty SAND (SC-SM); reddish brown with gray; loose; moist				
	-10				2-inch PVC casing	
				6.0		
130		SAND some silt (SP-SM); tan; loose; saturated				
	-15				Filter pack (sand)	
					2-inch PVC screen (0.010 inch)	
125						
	-20			5.0	Backfill Plug	

End of Boring at 22.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 22 ft bgs

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BORING LOG

BOREHOLE ID: *Bladen-2D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *368824.414*
EASTING: *2042879.777*
GROUND ELEVATION: *143.114 (feet NAVD88)*
TOC ELEVATION: *142.85 (feet NAVD88)*
TOTAL WELL DEPTH: *75.25 ft*
TOTAL BORING DEPTH: *77 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained Silty SAND (SP-SM); whiteish tan to brownish tan; loose; dry; organic-rich				Hand auger to 5'
140						
	-5			2.0		
		Medium grained Silty SAND (SP-SM); orangeish brown; loose; moist				
		Fine grained Clayey SAND with silt (SC); tannish gray; loose; moist				
135						
		Medium grained Silty SAND (SP-SM); reddish brown; loose; moist; gray laminations, coarse-grained at 12-14'				
	-10					
				8.0		
130						
		Medium to coarse grained SAND (SP); whiteish tan; loose; wet; orange oxidized layers at 22-23'				
	-15					
125						
	-20					
				10.0		
120						

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BORING LOG

BOREHOLE ID: *Bladen-2D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *368824.414*
EASTING: *2042879.777*
GROUND ELEVATION: *143.114 (feet NAVD88)*
TOC ELEVATION: *142.85 (feet NAVD88)*
TOTAL WELL DEPTH: *75.25 ft*
TOTAL BORING DEPTH: *77 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium to coarse grained SAND (SP); whiteish tan; loose; wet; orange oxidized layers at 22-23' *(continued)*				
		Silty SAND (SP-SM); orangeish tan with gray; loose; wet to moist; gray laminations				
		LIGNITE with clay (CH); grayish black gray; soft; wet; medium plasticity				
115		CLAY (CH); grayish black; firm; moist; medium plasticity				
	-30					
				10.0		
110					Cement grout	
	-35					
105					2-inch PVC casing	
	-40					
				10.0		
100						
	-45					
95						

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BORING LOG

BOREHOLE ID: *Bladen-2D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/15/2019 to 8/15/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *James Smith*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *368824.414*
EASTING: *2042879.777*
GROUND ELEVATION: *143.114 (feet NAVD88)*
TOC ELEVATION: *142.85 (feet NAVD88)*
TOTAL WELL DEPTH: *75.25 ft*
TOTAL BORING DEPTH: *77 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY (CH); grayish black; firm; moist; medium plasticity *(continued)*		10.0		
90						
	-55	Medium grained SAND trace mica (SP); grayish black; loose; moist to wet; cm-scale interlayers from 56-56.5', lignite chips at 57', coarser from 61-75.5				
85						
	-60					
				6.0		
80						
	-65					
					Bentonite chips	
75						
	-70					
					Filter pack (sand)	
					2-inch PVC screen (0.010 inch)	
70						

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BORING LOG

BOREHOLE ID: *Bladen-2D*

PROJECT NAME: Offsite Characterization	**RIG TYPE:** *USDOT1075864*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *6"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *368824.414*
BORING DATE: *8/15/2019 to 8/15/2019*	**EASTING:** *2042879.777*
GEOLOGIST: *Brandon Peach*	**GROUND ELEVATION:** *143.114 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *142.85 (feet NAVD88)*
DRILLER NAME: *James Smith*	**TOTAL WELL DEPTH:** *75.25 ft*
DRILLING METHOD: *Sonic*	**TOTAL BORING DEPTH:** *77 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY (CH); light gray to gray; firm; moist; medium plasticity			Backfill Plug	

End of Boring at 77.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 77 ft bgs

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

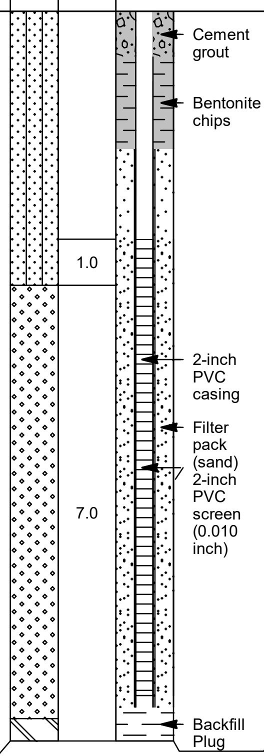
BORING LOG

BOREHOLE ID: *Bladen-3S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/20/2019 to 8/20/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396859.62*
EASTING: *2059014.363*
GROUND ELEVATION: *79.401 (feet NAVD88)*
TOC ELEVATION: *78.84 (feet NAVD88)*
TOTAL WELL DEPTH: *15.25 ft*
TOTAL BORING DEPTH: *16 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND with silt (SP-SM); brownish orange to brownish tan; loose; moist			Cement grout; Bentonite chips	Hand auger to 5'
75	-5			1.0		
		Coarse grained (SW); brown to orange; loose; wet			2-inch PVC casing; Filter pack (sand); 2-inch PVC screen (0.010 inch)	
70	-10			7.0		
65	-15					
		Clay (CL); dark brown to gray; firm; moist; medium plasticity; fat			Backfill Plug	



End of Boring at 16.0 feet bgs.

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Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *Bladen-3D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/19/2019 to 8/19/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396854.291*
EASTING: *2059007.993*
GROUND ELEVATION: *79.588 (feet NAVD88)*
TOC ELEVATION: *79.09 (feet NAVD88)*
TOTAL WELL DEPTH: *44 ft*
TOTAL BORING DEPTH: *46 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained Silty SAND (SP-SM); orangeish red brown; loose; moist; trace organics				Hand auger to 5'
75	-5			1.0		Barrel stuck so run 16-26 ft run
70	-10			10.0		
65	-15	CLAY (CH); black gray; firm; moist			Cement grout	
60	-20			10.0	2-inch PVC casing	
55		Medium grained SAND with silt (SP); black gray; firm; wet				

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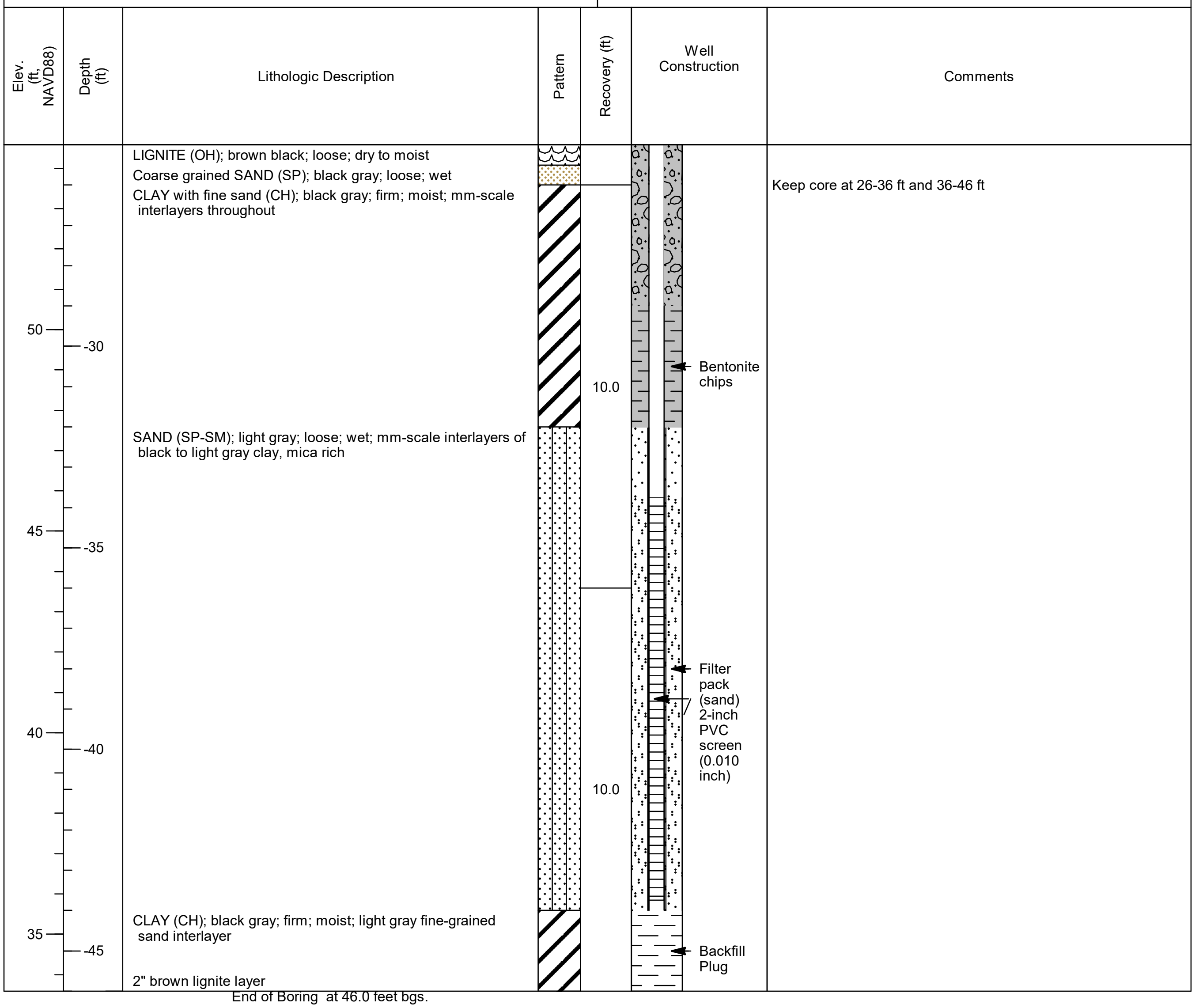
BORING LOG

BOREHOLE ID: *Bladen-3D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/19/2019 to 8/19/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396854.291*
EASTING: *2059007.993*
GROUND ELEVATION: *79.588 (feet NAVD88)*
TOC ELEVATION: *79.09 (feet NAVD88)*
TOTAL WELL DEPTH: *44 ft*
TOTAL BORING DEPTH: *46 ft*



All depths referenced to ground surface.

Total Depth: 46 ft bgs

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BORING LOG

BOREHOLE ID: *Bladen-4S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/21/2019 to 8/21/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *363260.51*
EASTING: *2087638.883*
GROUND ELEVATION: *64.645 (feet NAVD88)*
TOC ELEVATION: *64.26 (feet NAVD88)*
TOTAL WELL DEPTH: *15 ft*
TOTAL BORING DEPTH: *15 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		SAND (SP); brown; loose; moist; becomes tan-orange and then beige-white with increasing depth			Cement grout; Bentonite chips	Hand auger to 5'
60	-5			1.0		
		Medium to coarse grained SAND with gravel (SW); tan to white; loose; wet; rounded mm-scale gravel			2-inch PVC casing; Filter pack (sand)	
55	-10			9.0	2-inch PVC screen (0.010 inch)	
		Fine grained Silty SAND (SP-SM); light gray to dark gray; soft; moist to wet; mm-scale clay layers in bottom 1", traace mica				
50	-15					

End of Boring at 15.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 15 ft bgs

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BORING LOG

BOREHOLE ID: *Bladen-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/21/2019 to 8/21/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *363252.434*
EASTING: *2087638.292*
GROUND ELEVATION: *64.669 (feet NAVD88)*
TOC ELEVATION: *64.23 (feet NAVD88)*
TOTAL WELL DEPTH: *52 ft*
TOTAL BORING DEPTH: *52 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND (SP); brown; loose; moist; becomes tan-orange, then beige-white with increased depth				Hand auger to 5'
60	-5			1.0		
		Coarse grained SAND with gravel (SW); white to tan; loose; wet				
55	-10			10.0		
		Fine grained Silty SAND trace mica (SP-SM); tan to gray; moist to wet; becomes light to dark gray with increasing depth Redoximorphic features- oxidized				
50	-15					
		Medium to coarse grained SAND with coarse gravel (SW); brown to black; loose; wet; cm-scale coarse gravel				
		FAT CLAY (CH); black to gray; firm; moist				
45	-20			10.0	Cement grout	
40						

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BORING LOG

BOREHOLE ID: *Bladen-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/21/2019 to 8/21/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *363252.434*
EASTING: *2087638.292*
GROUND ELEVATION: *64.669 (feet NAVD88)*
TOC ELEVATION: *64.23 (feet NAVD88)*
TOTAL WELL DEPTH: *52 ft*
TOTAL BORING DEPTH: *52 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		FAT CLAY (CH); black to gray; firm; moist *(continued)*			2-inch PVC casing	Switch to 4x6
35	-30			10.0		
		Fine grained Silty SAND				
30	-35	Coarse grained SAND (SP); gray to black; loose; wet				
25	-40	CLAY (SP-SM); gray to black; soft to firm; wet; intricately layered fine-grained silty sand in clay		10.0		
		Coarse grained SAND			Bentonite chips	
20	-45	FAT CLAY (CH); firm; moist; lignite layer at the base				
		Coarse grained SAND (SP); gray to black; loose; wet		5.0	Filter pack (sand)	
15					2-inch PVC	

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BORING LOG

BOREHOLE ID: *Bladen-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *8/21/2019 to 8/21/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *T. Ardito*
DRILLING METHOD: *Sonic*

RIG TYPE: *USDOT1075864*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *363252.434*
EASTING: *2087638.292*
GROUND ELEVATION: *64.669 (feet NAVD88)*
TOC ELEVATION: *64.23 (feet NAVD88)*
TOTAL WELL DEPTH: *52 ft*
TOTAL BORING DEPTH: *52 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Coarse grained SAND (SP); gray to black; loose; wet *(continued)*			screen (0.010 inch)	

End of Boring at 52.0 feet bgs.

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BORING LOG

BOREHOLE ID: *Cumberland-1S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/13/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *25 ft*
TOTAL BORING DEPTH: *25 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium grained Silty SAND (SP); dark brown to gray; loose; dry				Hand auger to 5'
		Medium grained Silty SAND (SP); brown; loose; moist				
105	-5	Medium grained Silty SAND (SW); brown; loose; moist		2.0	Cement grout	
		Medium grained SAND with silt (SP); tan and white; loose; moist				
		Fine to medium grained SAND (SP); light brown; loose; wet				
100	-10			10.0	Bentonite chips 2-inch PVC casing	
95	-15					
		Medium to coarse grained SAND (SP); subangular; loose; wet			Filter pack (sand) 2-inch PVC screen (0.010 inch)	
90	-20	Medium grained SAND (SP); light gray; loose; wet; 2" organic-rich seam at 21'; possible lignite		6.0		
		Medium grained SAND (SP); dark gray; loose; wet				

End of Boring at 25.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 25 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *52 ft*
TOTAL BORING DEPTH: *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained Silty SAND (SP-SM); dark brown to gray; loose to dry; topsoil				Hand auger to 5'
		Fine to medium grained Silty SAND with clay (SP-SM); light brown and tan; loose; moist				
105	-5					
		Coarse grained SAND (SP); tan and white; subangular to subrounded; loose; moist		2.0		
		Fine to medium grained SAND (SP); light gray; loose; wet; 1 ft bed of coarser grained sand at 14.5-15.5ft				
100	-10					
				7.0		
95	-15					
		Coarse grained SAND (SW); orange and reddish orange; loose; wet; iron oxidation				
		Coarse grained SAND (SP)			Cement grout	
90	-20					
				7.0		

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BORING LOG

BOREHOLE ID: *Cumberland-1D*

PROJECT NAME: Offsite Characterization	**RIG TYPE:** *Geoprobe 8150 LS (GV5)*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *4"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *Not recorded*
BORING DATE: *9/12/2019 to 9/12/2019*	**EASTING:** *Not recorded*
GEOLOGIST: *Sarah Walker*	**GROUND ELEVATION:** *110 (feet NAVD88) (approximate)*
DRILLING CONTRACTOR: *SAEDACCO*	**TOC ELEVATION:** *Not Recorded*
DRILLER NAME: *Will Keyes*	**TOTAL WELL DEPTH:** *52 ft*
DRILLING METHOD: *Sonic*	**TOTAL BORING DEPTH:** *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Silty CLAY with sand (CL-ML); dark gray with dark brown; soft; moist			2-inch PVC casing	
		Medium grained SAND (SP); orange and reddish orange; loose; wet				
		Fine grained SAND with clay (SP); gray with dark gray; loose; wet; dark gray clay seams 1-10cm thick; mica rich				
80	-30					
75	-35	Lean grained CLAY (CL); dark gray; firm; moist				
		Fine grained SAND (SP); loose; wet; black organic-rich seams throughout 1' clay lense at 48-49ft			Bentonite chips	
70	-40					
65	-45				Filter pack (sand) 2-inch PVC screen (0.010 inch)	
				14.6		

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BORING LOG

BOREHOLE ID: *Cumberland-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *52 ft*
TOTAL BORING DEPTH: *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Lean grained CLAY (CL); dark gray; firm; moist				
		Fine grained SAND (SP); loose; wet; mica rich				
		Lean grained CLAY (SL); dark gray; firm; moist				
55	-55	Fine grained SAND (SP); loose; wet; grainsize coarsens at 58'				
		Lean grained CLAY (CL); dark gray; firm; moist			Backfill Plug	
50	-60					
				10.0		
45	-65					

End of Boring at 67.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 67 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-2S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Alli Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.98615 approximate*
EASTING: *-78.752831 approximate*
GROUND ELEVATION: *123 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *17 ft*
TOTAL BORING DEPTH: *17 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Silty SAND (SW); light brown to brown; angular; dry			Cement grout; Bentonite chips	Hand auger to 5'
120						
	-5	Fine grained Clayey SAND (SW-SC); reddish gray to purplish gray; dense; moist		2.0		
		Fine grained SAND (SP); dark brown to reddish brown; loose; wet				
		Fine grained SAND (SP); dark brown to reddish brown; angular; loose; wet; roots present				
115					2-inch PVC casing	
		Fine grained SAND (SP); tan to orangeish brown; angular; loose				
	-10					
		Medium to coarse grained SAND (SP); orange and white; loose; wet			Filter pack (sand)	
				9.0	2-inch PVC screen (0.010 inch)	
110		Coarse grained SAND (SW); white to orangeish tan; loose; wet				
	-15					

End of Boring at 17.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 17 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-2D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Alli Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.986197 approximate*
EASTING: *-78.752883 approximate*
GROUND ELEVATION: *123 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *57 ft*
TOTAL BORING DEPTH: *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Silty SAND (SW); light brown; angular; loose; dry				Hand auger to 5'. Advance 8" protective casing
120						
	-5	Clayey SAND some silt (SW-SC); light brown and tan; dense; moist; low plasticity				
		Fine grained SAND (SP); purplish gray to reddish brown; loose; moist		2.0		
		Fine to medium grained SAND (SW); dark brown; dense; moist				
115		Medium grained SAND (SW); brown; angular to subangular; loose; wet				
		Medium to coarse grained SAND (SP); brown; angular; loose; wet				
	-10					
				3.0		
110						
	-15					
		Medium grained SAND (SW); light brown; loose; wet				
105		Medium to coarse grained SAND (SW); tan to grayish white; loose; wet; trace silt				
		Fine grained SAND (SP); light brown; loose; wet				
	-20					
		Medium to coarse grained SAND with gravel (SW); yellowish tan; loose; wet		10.0	Cement grout	
100						

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BORING LOG

BOREHOLE ID: *Cumberland-2D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Alli Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.986197 approximate*
EASTING: *-78.752883 approximate*
GROUND ELEVATION: *123 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *57 ft*
TOTAL BORING DEPTH: *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium to coarse grained SAND with gravel (SW); yellowish tan; loose; wet *(continued)*				
		Fine grained SAND (SP); orange to yellowish brown; soft; wet; trace mica				
95		Fine grained SAND (SP); light gray to white; wet; mica			2-inch PVC casing	
	-30	Fine grained SAND (SP); dark gray; moist; mica				
		CLAY (CH); dark gray; hard; moist; high plasticity; mica abundant		10.0		
90						
	-35					
85		CLAY (CH); dark gray; hard; moist; high plasticity; mica abundant; trace lignite				
	-40					
				10.0		
80					Bentonite chips	
	-45					
		SAND with clay (SW-SC); dark gray; angular; dense; wet; mica abundant				
		Fine to medium grained SAND (SP); dark gray; loose; wet; mica abundant				
75						

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BORING LOG

BOREHOLE ID: *Cumberland-2D*

PROJECT NAME: Offsite Characterization	**RIG TYPE:** *Geoprobe 8140LS*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *6"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *34.986197 approximate*
BORING DATE: *9/12/2019 to 9/12/2019*	**EASTING:** *-78.752883 approximate*
GEOLOGIST: *Alli Vo*	**GROUND ELEVATION:** *123 (feet NAVD88) (approximate)*
DRILLING CONTRACTOR: *SAEDACCO*	**TOC ELEVATION:** *Not Recorded*
DRILLER NAME: *Brent Romec*	**TOTAL WELL DEPTH:** *57 ft*
DRILLING METHOD: *Sonic*	**TOTAL BORING DEPTH:** *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND (SP); dark gray; loose; wet; mica abundant *(continued)*			Filter pack (sand)	
		CLAY (CH); dark gray; hard; moist; high plasticity; mica abundant		10.0	2-inch PVC screen (0.010 inch)	
70		Fine to medium grained SAND (SP); angular; loose; mica abundant				
	55					

End of Boring at 57.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 57 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-3S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/12/2019 to 9/12/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *14 ft*
TOTAL BORING DEPTH: *14 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium grained SAND (SP); tan; loose; dry			Cement grout	Hand auger to 5'
105	-5	Medium grained SAND (SP); tan; loose; dry; root material present		2.0	Bentonite chips	
		Medium grained SAND (SP); tan to light brown; loose; wet			2-inch PVC casing	
100	-10	Medium grained SAND (SP); brown to light brown; loose; wet		3.0	Filter pack (sand)	
		Fine to medium grained SAND (SP); brown; loose; wet			2-inch PVC screen (0.010 inch)	

End of Boring at 14.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 14 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-3D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *42 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium grained SAND (SP); medium tan; loose; dry				Hand auger to 5'
105	-5	Medium grained SAND (SP); light tan; loose; dry		2.0		
100	-10	Medium to coarse grained SAND with gravel (SW); brown; subangular; loose; moist; coarsens downward		8.0	Cement grout; 2-inch PVC casing	
95	-15	CLAY (CL); medium gray; stiff; moist				
		Coarse grained SAND with gravel (SW); light gray; subrounded; loose; wet			Bentonite chips	
90	-20	Medium to coarse grained SAND (SP); light gray; loose; wet; organic rich seam at 25'		5.0	Filter	

(Continued Next Page)

BORING LOG

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BOREHOLE ID: *Cumberland-3D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *42 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium to coarse grained SAND (SP); light gray; loose; wet; organic rich seam at 25' *(continued)*			pack (sand) 2-inch PVC screen (0.010 inch)	
		Fine to medium grained Clayey SAND (SP-SC); light gray; wet; high plasticity				
80	-30					
		CLAY (CL); light gray; stiff; moist		9.3		
75	-35				Backfill Plug	
		Fine to medium grained Clayey SAND (SP-SC); light gray; wet; high plasticity		7.0		
70	-40					

End of Boring at 42.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 42 ft bgs

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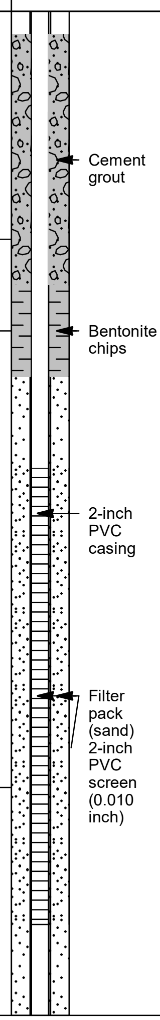
BORING LOG

BOREHOLE ID: *Cumberland-4S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Alli Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.884772 approximate*
EASTING: *-78.739107 approximate*
GROUND ELEVATION: *117 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *22 ft*
TOTAL BORING DEPTH: *22 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND (SP); yellowish brown; angular; loose; dry				Hand auger to 5'
115						
	-5	Fine to medium grained SAND (SP); yellow brown to tan; angular; loose; wet		2.2		
		Fine to medium grained SAND (SP); reddish gray; angular; loose; wet				
110		Fine to medium grained SAND (SP); gray to light gray; subangular; loose; wet				
		Fine grained SAND with silt (SP); dark brown to black; subangular; loose; wet				
	-10					
105				9.0		
	-15	Fine grained SAND (SP); dark reddish brown; loose; wet				
100		Fine grained SAND (SP); dark reddish brown; loose; wet				
	-20	Fine grained Silty SAND (SW-SM); reddish brown; dense; wet		10.0		
95						



End of Boring at 22.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 22 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/10/2019 to 9/10/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.884788 approximate*
EASTING: *-78.737069 approximate*
GROUND ELEVATION: *117 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *67 ft*
TOTAL BORING DEPTH: *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND (SP); reddish brown to brown; subangular; loose; dry				Hand auger to 5'
115						
	-5	Fine to medium grained SAND (SP); tan to light brown; loose; moist; organic rich seam at 5.5'		2.0		Heaving sands
		Fine to medium grained SAND (SP); orangeish brown to tan; loose; moist; trace silt				
110		Fine to medium grained SAND (SP); light brown to reddish gray; loose; wet				
		Fine to medium grained SAND (SP); light brown to gray; subangular; loose to soft; moist				
		Fine grained SAND (SP); dark brown; subangular; loose; wet				
	-10					
105				8.0		
	-15					
100		Fine grained SAND (SP); brown to dark brown				
	-20	Fine grained SAND (SP); dark brown to reddish brown; loose; wet				
95				10.0		

(Continued Next Page)

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Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *Cumberland-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/10/2019 to 9/10/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.884788 approximate*
EASTING: *-78.737069 approximate*
GROUND ELEVATION: *117 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *67 ft*
TOTAL BORING DEPTH: *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND (SP); dark brown to reddish brown; loose; wet *(continued)*				Large wood debris present
		Fine grained SAND (SP); dark brown; loose; wet				
90		Fine to medium grained SAND (SP); dark brown then reddish brown; loose; wet			Cement grout	
	-30					
85				7.0	2-inch PVC casing	
	-35	SILT (ML); tan to orange brown; hard; moist; trace mica				
80		Fine to medium grained SAND (SP); yellowish brown; loose; wet				
		Silty SAND (SW-SM); orangeish brown; subangular; loose; wet				
	-40	Fine grained SAND some (SW); orangeish brown; soft; moist; trace fine gravel				
75		Fine to medium grained SAND some silt (SW); orangeish brown; loose; moist; trace gravel		7.0		
		Coarse grained SAND clay (SP); orangeish brown; subangular; loose; wet				
		Fine grained SAND (SP-SM); orangeish brown; angular; soft; wet				
	-45					
70		SAND with (SP-SM); light gray; firm; moist; trace mica				
		Fine to medium grained SAND clay (SP); light gray to dark gray; angular; loose; wet; trace mica				
		Fine grained SAND (SP); angular; dense; wet; clay lenses				

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BORING LOG

BOREHOLE ID: *Cumberland-4D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/10/2019 to 9/10/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *34.884788 approximate*
EASTING: *-78.737069 approximate*
GROUND ELEVATION: *117 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *67 ft*
TOTAL BORING DEPTH: *67 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		SAND (SP-SC); dark gray to gray; angular; wet; some mica				
		CLAY (CH); dark gray; hard; moist; high plasticity; mica abundant				
65		Fine to medium grained SAND (SW); gray; angular; loose; wet; mica abundant		10.0		
		CLAY (CH); dark gray; hard; moist; high plasticity; gray mica				
	-55	SAND (SW-SM); gray; dense; wet; mica abundant; dark gray mm-scale clay lenses throughout; trace lignite			Bentonite chips	
60		Fine to medium grained SAND (SP); gray; loose; wet; mica abundant				
	-60	Medium to coarse grained SAND (SW); gray to dark gray; loose; wet; mica abundant				
		CLAY with (CH); gray; hard; moist; high plasticity; mica present			Filter pack (sand)	
55		Medium to coarse grained SAND clay (SW); gray; loose; wet; mica abundant		10.0	2-inch PVC screen (0.010 inch)	
	-65	CLAY (CH); dark gray; hard; moist; high plasticity; mica present				
50		Medium to coarse grained SAND (SW-SC); dark gray; dense; wet; mica abundant, little gravel				

End of Boring at 67.0 feet bgs.

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BORING LOG

BOREHOLE ID: *Cumberland-5S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *24 ft*
TOTAL BORING DEPTH: *24 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Sandy SILT with gravel (ML); grayish brown; loose; dry; asphalt & gravel 0.5ft-1.5ft				Hand auger to 5'
		Medium grained SAND (SP); light brown to tan; subangular; loose; moist				
		Medium grained SAND (SP); brown to dark brown; subangular; loose; moist				
105	-5			0.5	Cement grout	
		SAND with gravel (SW); light gray to dark gray; loose; wet				
		Silty CLAY (CL-ML); dark brown; soft; wet; high plasticity				
100	-10					
		Medium to coarse grained Gravelly SAND (SP); brown; subangular; loose; wet		5.0	Bentonite chips; 2-inch PVC casing	
95	-15					
		Coarse grained SAND with gravel (SW); light brown; loose; wet; fine grain size with depth			Filter pack (sand); 2-inch PVC screen (0.010 inch)	
90	-20			5.0		
		Medium grained SAND (SP); light brown; loose; wet				

End of Boring at 24.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 24 ft bgs

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BORING LOG

BOREHOLE ID: *Cumberland-5D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *57 ft*
TOTAL BORING DEPTH: *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Sandy SILT (ML); organic rich layers of concrete 1-2" thick and gravel at 1ft and 2.5ft				Hand auger to 5'
		Medium grained SAND (SP); light brown to tan; subangular to subrounded; loose; moist; root material present				
		Medium grained SAND (SP); dark brown; subangular to subrounded; loose; moist; root material present				
105	-5	Medium grained SAND with gravel (SW); light gray to dark gray; loose; wet				
		Silty CLAY (CL-ML); dark brown; soft; wet; high plasticity; root material				
100	-10	Medium to coarse grained SAND (SP); brown; subangular; loose; wet		5.0		
95	-15					
		Coarse grained SAND (SP); light brown; angular to subangular; loose; wet				
		Coarse grained SAND with gravel (SW); light brown; loose; wet				
90	-20					
		Coarse grained SAND with gravel (SW); light brown to light gray; loose; wet		8.0		
		CLAY (CH); medium gray; stiff; moist; high plasticity; sand lenses throughout			Cement grout	

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BORING LOG

BOREHOLE ID: *Cumberland-5D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/11/2019 to 9/11/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Will Keyes*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8150 LS (GV5)*
BOREHOLE DIA: *4"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *Not Recorded*
TOTAL WELL DEPTH: *57 ft*
TOTAL BORING DEPTH: *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY (CH); medium gray; stiff; moist; high plasticity; sand lenses throughout *(continued)*				
		Fine grained SAND with clay (SP-SC); light gray to medium gray; loose; wet; mica rich; lignite throughout			2-inch PVC casing	
80	-30			9.5		
		CLAY (CH); medium gray; stiff; moist; high plasticity; sand lenses throughout				
75	-35					
		Fine grained SAND (SP); light gray; loose; wet; organic rich laminations; some lignite present				
70	-40					
65	-45					
					Bentonite chips	

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PROJECT NAME: Offsite Characterization **PROJECT NO:** *TR0795* **SITE LOCATION:** *Fayetteville, NC* **BORING DATE:** *9/11/2019 to 9/11/2019* **GEOLOGIST:** *Sarah Walker* **DRILLING CONTRACTOR:** *SAEDACCO* **DRILLER NAME:** *Will Keyes* **DRILLING METHOD:** *Sonic*	**RIG TYPE:** *Geoprobe 8150 LS (GV5)* **BOREHOLE DIA:** *4"* **SAMPLING METHOD:** *Dual Tube* **NORTHING:** *Not recorded* **EASTING:** *Not recorded* **GROUND ELEVATION:** *110 (feet NAVD88) (approximate)* **TOC ELEVATION:** *Not Recorded* **TOTAL WELL DEPTH:** *57 ft* **TOTAL BORING DEPTH:** *57 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND (SP); light gray; loose; wet; organic rich laminations; some lignite present *(continued)*			Filter pack (sand)	
55	-55				2-inch PVC screen (0.010 inch)	

End of Boring at 57.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 57 ft bgs

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BORING LOG

BOREHOLE ID: *Robeson-1S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/9/2019 to 9/9/2019*
GEOLOGIST: *Allison Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *110 (feet NAVD88)*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *27 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained Silty SAND (SP-SM); tan brown; loose; moist				Hand auger to 5'
		Fine grained Silty SAND some clay (SP-SC); light brown orangeish tan; dense; moist to dry				
105	-5			1.6		
		Coarse grained Clayey SILT some sand (ML); light reddish gray; firm; moist to dry; medium plasticity; red and orange laminations			Cement grout	
		Sandy SILT with clay (ML); light reddish gray; firm; moist to dry; red and orange laminations				
100	-10					
		Fine grained SAND with some silt (SP-SM); light gray orangeish tan; dense				
		Fine grained Silty SAND (SP-SM); whiteish tan becomes orangeish tan; loose; moist		10.0		
					2-inch PVC casing Bentonite chips	
95	-15					
		Fine grained SAND (SP); yellowish brown with gray; loose; wet; pink and gray laminations				
		Fine grained SAND with clay (SP-SC); pinkish orange with light gray; firm; wet; coarse sand layer				
90	-20					
		Fine grained SAND (SP); light gray with orangeish pink; dense; wet; trace mica		10.0	Filter pack (sand) 2-inch PVC screen (0.010 inch)	

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BORING LOG

BOREHOLE ID: *Robeson-1S*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/9/2019 to 9/9/2019*
GEOLOGIST: *Allison Vo*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *110 (feet NAVD88)*
TOTAL WELL DEPTH: *27 ft*
TOTAL BORING DEPTH: *27 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND with clay (SP); orange; soft; wet				
		CLAY (CH); dark gray; stiff; moist				

End of Boring at 27.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 27 ft bgs

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Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *Robeson-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/4/2019 to 9/4/2019*
GEOLOGIST: *Amy Kenwell*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *110 (feet NAVD88)*
TOTAL WELL DEPTH: *53 ft*
TOTAL BORING DEPTH: *53 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		SAND with silt (SP); light tan with orangeish brown; loose to fine; moist; 8" topsoil				Hand auger to 5'
105	-5	CLAY with sand (CL); orangeish tan; firm; moist; low plasticity		1.6		
		CLAY with some sand (CL); light gray with orange; firm; moist; orange streaks		5.0		
100	-10					
		Fine grained Silty SAND (SP-SM); pinkish tan with light orangeish gray; loose; wet; medium grains near bottom		5.0		
95	-15					
		Fine grained Silty SAND (SP-SM); light gray and orangeish gray; loose; wet; trace mica		10.0	Cement grout	
90	-20					

(Continued Next Page)

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Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *Robeson-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/4/2019 to 9/4/2019*
GEOLOGIST: *Amy Kenwell*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *110 (feet NAVD88)*
TOTAL WELL DEPTH: *53 ft*
TOTAL BORING DEPTH: *53 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY with some sand (CH); light orange; soft; wet; high plasticity; trace mica				
		SAND with silt and clay (SP-SM); light orange; loose; wet			2-inch PVC casing	
		Coarse grained SAND (SP); firm; wet; with lignite				Installed 8" protective casing to 29' followed by 4 x 6
		CLAY (CH); gray; firm to hard; moist; high plasticity				
80	-30					
		Clayey SAND (SP-SC); dark gray; dense; wet; medium grain				
		CLAY with sand (CH); dark gray; hard; moist; high plasticity; less sand toward top				
75	-35					
		SAND with silt (SP); light gray; loose; wet; fine to medium grained; lignite at 46ft				
70	-40				Bentonite chips	
				10.0		
65	-45					
		Coarse grained SAND (SW); light gray; loose; wet			Filter pack (sand)	
					2-inch PVC screen (0.010 inch)	
		Coarse grained SAND with silt (SP); gray; loose; wet				

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BORING LOG

BOREHOLE ID: *Robeson-1D*

PROJECT NAME: Offsite Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *9/4/2019 to 9/4/2019*
GEOLOGIST: *Amy Kenwell*
DRILLING CONTRACTOR: *SAEDACCO*
DRILLER NAME: *Brent Romec*
DRILLING METHOD: *Sonic*

RIG TYPE: *Geoprobe 8140LS*
BOREHOLE DIA: *6"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *Not recorded*
EASTING: *Not recorded*
GROUND ELEVATION: *110 (feet NAVD88) (approximate)*
TOC ELEVATION: *110 (feet NAVD88)*
TOTAL WELL DEPTH: *53 ft*
TOTAL BORING DEPTH: *53 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Coarse grained SAND with silt (SP); gray; loose; wet *(continued)*		6.0		
		CLAY with sand (CH); dark gray; soft; wet; high plasticity; sand is fine grained				

End of Boring at 53.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 53 ft bgs

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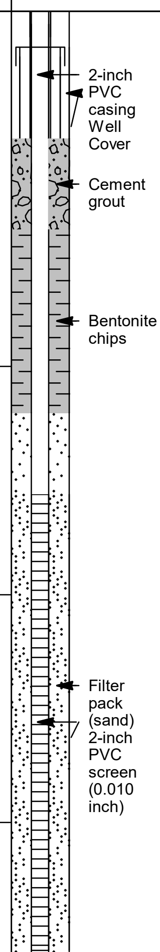
BORING LOG

BOREHOLE ID: *PIW-1S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/27/2019 to 6/27/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *400540.611*
EASTING: *2051792.586*
GROUND ELEVATION: *50.78 (feet NAVD88)*
TOC ELEVATION: *54.198 (feet NAVD88)*
TOTAL WELL DEPTH: *17.8 ft*
TOTAL BORING DEPTH: *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
	0	Fine grained SAND with fine to coarse gravel (SW); light brown; color transitions to gray at 3'				Hand auger to 5'.
50						
		SAND with clay (SC); black				Possible road fill material
		Fine to medium grained Silty SAND (SP); brown				
	-5	Clayey SILT with sand (CL-ML); light brown; soft; damp; Clay content increases around 7.75' moisture content increases at 13.5; mm scale sand layers				
45				3.5		
	-10					
40				3.3		
	-15	CLAY (CL); light gray; very soft; wet; high plasticity				
35				3.0		
		CLAY (CL); light brown; very stiff; moist; 1in sand lense at 19.5 ft.				
	-20					
30		Fine to medium grained SAND (SP-SC); grayish brown with light brown; wet; mm to cm scale clay lense				



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BORING LOG

BOREHOLE ID: *PIW-1S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/27/2019 to 6/27/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *400540.611*
EASTING: *2051792.586*
GROUND ELEVATION: *50.78 (feet NAVD88)*
TOC ELEVATION: *54.198 (feet NAVD88)*
TOTAL WELL DEPTH: *17.8 ft*
TOTAL BORING DEPTH: *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND (SP-SC); grayish brown with light brown; wet; mm to cm scale clay lense *(continued)*		4.0		
25	-25			4.0		
		Coarse grained SAND (SP); brown; subangular; wet; 4" of lignite, black platey cleavage				
20	-30	CLAY with mica (CH); light gray; very stiff; damp; Lense of fine silty sand at 36-37.5'; mica rich Highly expansive clays at 30-42.5'		3.0		Highly expansive clay in 30-35 interval sampled; Driller pushed 2.5 ft instead of full 5'
				3.0		
15	-35			5.0		
				4.5		
10	-40			4.5		Dual tube got stuck at 40' terminate boring at 42.5'
		PIW-1 soil boring terminated at 42.5 feet. Lithologic descriptions not available beyond this depth.				
5	-45					

End of Boring at 46.2 feet bgs.

All depths referenced to ground surface.

Total Depth: 46.2 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-1D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/27/2019 to 6/27/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *400547.772*
EASTING: *2051801.42*
GROUND ELEVATION: *49.529 (feet NAVD88)*
TOC ELEVATION: *52.33 (feet NAVD88)*
TOTAL WELL DEPTH: *24.5 ft*
TOTAL BORING DEPTH: *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50	0				Well Cover	Hand auger to 5'.
		SAND with clay (SC); black		3.5		
45	-5	Fine to medium grained Silty SAND (SP); brown				
		Clayey SILT with sand (CL-ML); light brown; soft; damp; Clay content increases around 7.75' moisture content increases at 13.5; mm scale sand layers		3.3		
40	-10				Cement grout	
					2-inch PVC casing	
35	-15	CLAY (CL); light gray; very soft; wet; high plasticity		3.0		
30	-20	CLAY (CL); light brown; very stiff; moist; 1in sand lense at 19.5 ft.				
		Fine to medium grained SAND (SP-SC); grayish brown with light brown; wet; mm to cm scale clay lense			Bentonite chips	

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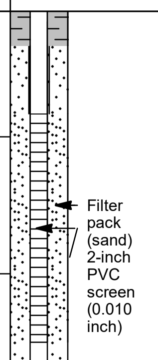
BORING LOG

BOREHOLE ID: *PIW-1D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/27/2019 to 6/27/2019*
GEOLOGIST: *Sarah Walker*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *400547.772*
EASTING: *2051801.42*
GROUND ELEVATION: *49.529 (feet NAVD88)*
TOC ELEVATION: *52.33 (feet NAVD88)*
TOTAL WELL DEPTH: *24.5 ft*
TOTAL BORING DEPTH: *42.5 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND (SP-SC); grayish brown with light brown; wet; mm to cm scale clay lense *(continued)*		4.0		
25	-25					
		Coarse grained SAND (SP); brown; subangular; wet; 4" of lignite, black platey cleavage				
20	-30	CLAY with mica (CH); light gray; very stiff; damp; Lense of fine silty sand at 36-37.5'; mica rich Highly expansive clays at 30-42.5'		4.0 3.0		
				3.0		
15	-35			5.0		
				4.5		
10	-40			5.0		



End of Boring at 42.5 feet bgs.

All depths referenced to ground surface.

Total Depth: 42.5 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-3D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399711.752*
EASTING: *2052088.802*
GROUND ELEVATION: *50.513 (feet NAVD88)*
TOC ELEVATION: *53.315 (feet NAVD88)*
TOTAL WELL DEPTH: *19 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
					Well Cover	
50	0	SILT (ML); brown; dry; non plastic				Hand auger to 5'.
45	-5	SILT with clay (CL-ML); reddish brown; hard; dry		5.0	Cement grout 2-inch PVC casing	
40	-10	Silty CLAY with some mica (CH); gray with reddish brown; medium stiff; high plasticity		4.5		
		Fine to medium grained GRAVEL with some fine to medium sand (GP); brown; loose to medium dense; wet; Poorly-sorted				
35	-15	Fine to medium grained SAND (SP); brown; loose to medium dense; wet; 1/2" seam of high plastic gray clay at 17.2"		4.5	Bentonite chips	
30	-20	Fine to medium grained SAND with some mica (SP); brown; loose; wet; well-sorted			Filter pack (sand) 2-inch	

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BORING LOG

BOREHOLE ID: *PIW-3D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *399711.752*
EASTING: *2052088.802*
GROUND ELEVATION: *50.513 (feet NAVD88)*
TOC ELEVATION: *53.315 (feet NAVD88)*
TOTAL WELL DEPTH: *19 ft*
TOTAL BORING DEPTH: *30 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND with clay (SP-SC); dark gray; medium dense; wet; interbedded with high plastic, gray clay lenses		5.0	PVC screen (0.010 inch)	Lignitic material at 23-25'
25	-25	CLAY (CH); dark gray; very hard; dry; high plasticity		0.3		
20	-30	PIW-3D soil boring terminated at 30.0 feet. Lithologic descriptions not available beyond this depth.				
15	-35					
10	-40					

End of Boring at 44.6 feet bgs.

All depths referenced to ground surface.

Total Depth: 44.55 ft bgs

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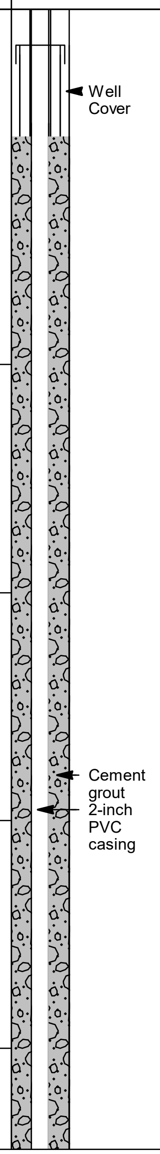
BORING LOG

BOREHOLE ID: *PIW-4D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/1/2019 to 7/1/219*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398817.363*
EASTING: *2052102.819*
GROUND ELEVATION: *50.367 (feet NAVD88)*
TOC ELEVATION: *53.041 (feet NAVD88)*
TOTAL WELL DEPTH: *32.3 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50	0	Silty CLAY with trace sand (SC); brown; moist				Hand auger to 5'
45	-5	Silty CLAY (CL-ML); brown; very hard; moist; low plasticity				
		Silty CLAY (CL); gray; very hard; moist; medium plasticity		4.1		
		Sandy CLAY with trace gravel (CL-ML); gray; subrounded-rounded; very soft; wet; medium plasticity				
40	-10	CLAY (CH) CLAY (CH); dark gray; hard; moist; high plasticity; fine to medium grained sand 10.3-10.8' with trace wood at 10.5'		3.5		
35	-15	CLAY (CH); dark gray; very hard; moist; high plasticity; 0.25" sand seams 16'-17', fine grained medium gray sand, micaeous 16'-17'		5.0		
30	-20	CLAY with mica (CH); dark gray; very hard; moist; high plasticity; fine-grained micaceous sand ~2" thick at 23.8', 3" thick at 24.6'				



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All depths referenced to ground surface.

Total Depth: 40 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-4D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/1/2019 to 7/1/219*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Nathan Mariard*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398817.363*
EASTING: *2052102.819*
GROUND ELEVATION: *50.367 (feet NAVD88)*
TOC ELEVATION: *53.041 (feet NAVD88)*
TOTAL WELL DEPTH: *32.3 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY with mica (CH); dark gray; very hard; moist; high plasticity; fine-grained micaceous sand ~2" thick at 23.8', 3" thick at 24.6' *(continued)*		5.0		
25	-25	CLAY with mica (CH); dark gray; hard; moist; high plasticity; increasing sand fraction below 28.5', trace to some lignite at 29.2"		4.5	Bentonite chips	
20	-30	Fine to medium grained SAND with trace silt (SP-SM); dark gray; medium dense; wet; Well-sorted, trace clay lenses at 30-31, increasing sand from below 31', trace lignite at 30.5'		4.2	Filter pack (sand)	
15	-35	Fine to medium grained SAND (SP); medium dense; wet; Well-sorted, trace lignite at 37-38'		3.0	2-inch PVC screen (0.010 inch)	
		Sandy CLAY (CL); light gray; moist; low to medium plasticity				
	-40	End of Boring at 40.0 feet bgs.				

All depths referenced to ground surface.

Total Depth: 40 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-5S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/9/2019 to 7/9/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398520.381*
EASTING: *2051951.26*
GROUND ELEVATION: *72.68 (feet NAVD88)*
TOC ELEVATION: *75.188 (feet NAVD88)*
TOTAL WELL DEPTH: *9.75 ft*
TOTAL BORING DEPTH: *45 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
75					Well Cover	
	0	Fine to medium grained SAND with silt (SP-SM); brown tan; loose; damp				Hand auger to 5'. Corresponds to HP-10.
70					Cement grout 2-inch PVC casing	
	-5	Silty CLAY (CL-ML); reddish brown and light gray; firm; moist				
65		Fine grained Silty SAND (SP-SM); loose; damp from 7'			Bentonite chips	
	-10					
60		Medium to coarse grained SAND (SW); brown to tannish orange; loose; wet; 3" gray clay layer from 13.75-14'			Filter pack (sand) 2-inch PVC screen (0.010 inch)	
	-15					
55						
	-20	CLAY with trace sand (CL); black to gray; firm; moist; trace sand at 35'				

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BORING LOG

BOREHOLE ID: *PIW-5S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/9/2019 to 7/9/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398520.381*
EASTING: *2051951.26*
GROUND ELEVATION: *72.68 (feet NAVD88)*
TOC ELEVATION: *75.188 (feet NAVD88)*
TOTAL WELL DEPTH: *9.75 ft*
TOTAL BORING DEPTH: *45 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50		CLAY with trace sand (CL); black to gray; firm; moist; trace sand at 35' *(continued)*				
	-25					
45						
	-30					
40						
	-35					
35		Medium to coarse grained SAND (SP); light gray; medium stiff; moist; interbedded with mm-scale clay seams from 39' to 39.5'				
	-40					
30		Silty CLAY (CL-ML); dark gray to gray; medium firm; moist				
		Fine to medium grained Silty SAND (SP-SM); dark gray to light gray; medium to very firm; moist; interbedded with mm-scale silty clay seams				
	-45					

End of Boring at 45.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 45 ft bgs

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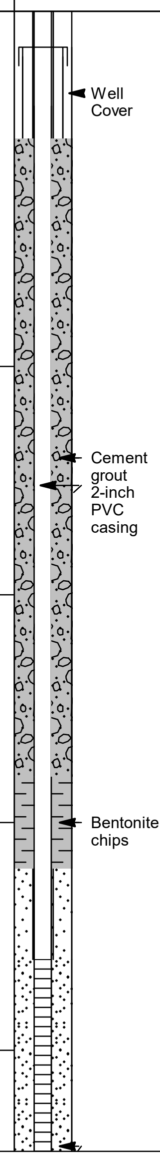
BORING LOG

BOREHOLE ID: *PIW-6S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/28/2019 to 6/28/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398118.144*
EASTING: *2052540.567*
GROUND ELEVATION: *49.85 (feet NAVD88)*
TOC ELEVATION: *53.359 (feet NAVD88)*
TOTAL WELL DEPTH: *18 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50	0	SILT with trace sand (ML); reddish brown; soft; dry; increasing sand fraction with depth, moist at 13.5'				Hand auger to 5'. Corresponds to HP-08.
45	-5			3.5		
40	-10			3.5		
35	-15	CLAY with silt (CL); reddish brown to olive gray; medium stiff; moist; silt lenses (15'-25.9'), increasing moisture at 24.5'		4.3		
30	-20					



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BORING LOG

BOREHOLE ID: *PIW-6S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/28/2019 to 6/28/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *398118.144*
EASTING: *2052540.567*
GROUND ELEVATION: *49.85 (feet NAVD88)*
TOC ELEVATION: *53.359 (feet NAVD88)*
TOTAL WELL DEPTH: *18 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY with silt (CL); reddish brown to olive gray; medium stiff; moist; silt lenses (15'-25.9'), increasing moisture at 24.5' *(continued)*		3.8	Filter pack (sand) 2-inch PVC screen (0.010 inch)	
25	-25					
		CLAY (CH); dark gray; medium stiff; moist; homogenous				
		SAND (SP); yellowish red and gray; medium dense; moist; dark gray clay lenses from 27'-27.2'		5.0		
		CLAY (CH); dark gray; medium stiff; moist; medium gray sand lense at 28.6'-28.8'				
20	-30	CLAY (CH); dense; moist; homogenous with suspected lignite lenses (<1/4") from 33'-34'		5.0		
15	-35	CLAY with some mica (CL); medium gray; stiff; moist; thin dark gray banding		3.0		
10	-40	PIW-3D soil boring terminated at 40.0 feet. Lithologic descriptions not available beyond this depth. End of Boring at 40.6 feet bgs.				

All depths referenced to ground surface.

Total Depth: 40.6 ft bgs

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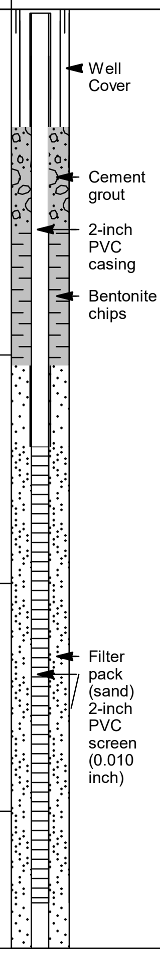
BORING LOG

BOREHOLE ID: *PIW-7S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396786.995*
EASTING: *2052589.486*
GROUND ELEVATION: *45.809 (feet NAVD88)*
TOC ELEVATION: *48.392 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *18 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
45	0	SILT with sand (ML); reddish brown to brown; medium stiff; moist				Hand auger to 5'.
40	-5	CLAY (CL); medium gray with yellowish red; very soft; moist		3.4		
35	-10			3.8		
		Fine grained SAND with silt (SP-SM); reddish brown with gray; moist				
30	-15	CLAY with trace silt (CL); gray; very soft; moist; with yellowish to red streaking		3.9		
		SAND with silt (SP-SM); gray to yellowish red; loose; moist; with some stratification between gray and yellowish red sands, gray sands ~2" thick				



End of Boring at 18.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 18 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-7D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396787.693*
EASTING: *2052595.368*
GROUND ELEVATION: *45.778 (feet NAVD88)*
TOC ELEVATION: *48.597 (feet NAVD88)*
TOTAL WELL DEPTH: *29 ft*
TOTAL BORING DEPTH: *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
					Well Cover	
45	0	SILT with sand (ML); reddish brown to brown; medium stiff; moist				Hand auger to 5'.
40	-5	CLAY (CL); medium gray with yellowish red; very soft; moist		3.4		
35	-10			3.8	Cement grout	
		Fine grained SAND with silt (SP-SM); reddish brown with gray; moist			2-inch PVC casing	
30	-15	CLAY with trace silt (CL); gray; very soft; moist; with yellowish to red streaking				
		SAND with silt (SP-SM); gray to yellowish red; loose; moist; with some stratification between gray and yellowish red sands, gray sands ~2" thick		3.9		
25	-20	Fine to medium grained SAND trace clay (SP-SC); light gray yellowish red; loose; wet; with small lens of silty dark gray sand				

(Continued Next Page)

BORING LOG

BOREHOLE ID: *PIW-7D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/25/2019 to 6/25/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396787.693*
EASTING: *2052595.368*
GROUND ELEVATION: *45.778 (feet NAVD88)*
TOC ELEVATION: *48.597 (feet NAVD88)*
TOTAL WELL DEPTH: *29 ft*
TOTAL BORING DEPTH: *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine to medium grained SAND trace clay (SP-SC); light gray yellowish red; loose; wet; with small lens of silty dark gray sand *(continued)*		5.0	Bentonite chips	
20	-25					
		CLAY (CL); dark gray; medium stiff; moist; interbedded with thin (0.5" thick) bands of dark gray clay		5.0		
		Fine grained SAND (SP-SC); yellowish red to gray; medium dense; moist; with stratified with thin (.5") bands of dark gray clay				
15	-30	Fine to medium grained SAND (SP); dark gray; medium dense; wet; homogenous, with thin (0.5") band of hard black material, possibly lignite		3.2	Filter pack (sand); 2-inch PVC screen (0.010 inch)	
10	-35			4.0		
		Fine grained SAND and silt (SP-SM); gray; medium dense; moist; with thick bands of dark gray material				
5	-40	Fine grained SAND and silt (CL-ML); medium dense; moist; increasing clay fraction with depth		4.5		
		CLAY (CH); medium gray; very stiff; moist; homogenous				
0	-45	CLAY with trace sand (CH); greenish gray; very stiff; dry; thin banding of darker gray material; visible micaceous grains, with other dark gray mineral banding visible in some places				

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BORING LOG

BOREHOLE ID: *PIW-7D*

PROJECT NAME: Onsite Black Creek Characterization	**RIG TYPE:** *Geoprobe 7822DT*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *8.25"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *396787.693*
BORING DATE: *6/25/2019 to 6/25/2019*	**EASTING:** *2052595.368*
GEOLOGIST: *Ryan Gabelman*	**GROUND ELEVATION:** *45.778 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *48.597 (feet NAVD88)*
DRILLER NAME: *Daniel Ferrell*	**TOTAL WELL DEPTH:** *29 ft*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*	**TOTAL BORING DEPTH:** *50 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY with trace sand (CH); greenish gray; very stiff; dry; thin banding of darker gray material; visible micaceous grains, with other dark gray mineral banding visible in some places *(continued)*		3.5		
	-50					

End of Boring at 50.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 50 ft bgs

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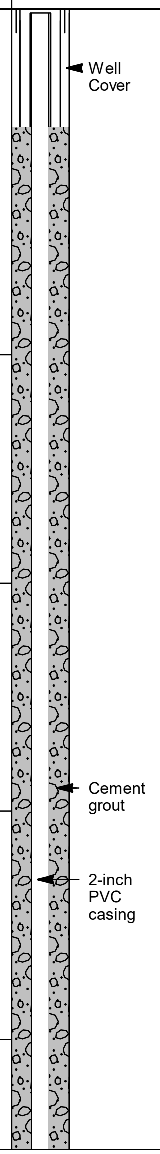
BORING LOG

BOREHOLE ID: *PIW-8D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396403.378*
EASTING: *2052682.019*
GROUND ELEVATION: *45.919 (feet NAVD88)*
TOC ELEVATION: *48.518 (feet NAVD88)*
TOTAL WELL DEPTH: *35.5 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
	0	Silty CLAY (CL-ML); reddish brown; dry				Hand auger to 5'.
45						
	-5					
40				4.8		
	-10	Silty CLAY (CL-ML); reddish brown with gray; soft; moist; interbedded clay and silt throughout, clay becomes moist and more sandy at 19.5' to 20'				
35				5.0		
	-15					
30				4.4		
	-20	Fine grained SAND (SP); yellowish red to reddish brown; loose; moist to wet; Black bands appear organic; fine to medium grained from 29'; approximately 1" band of lignite at 28'				
25						



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All depths referenced to ground surface.

Total Depth: 46.55 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-8D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Ryan Gabelman*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Daniel Ferrell*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396403.378*
EASTING: *2052682.019*
GROUND ELEVATION: *45.919 (feet NAVD88)*
TOC ELEVATION: *48.518 (feet NAVD88)*
TOTAL WELL DEPTH: *35.5 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Fine grained SAND (SP); yellowish red to reddish brown; loose; moist to wet; Black bands appear organic; fine to medium grained from 29'; approximately 1" band of lignite at 28' *(continued)*		3.0		
20	-25					Heaving sand
				3.2		
15	-30	Fine to medium grained SAND (SP); dark gray; wet; visible mica grains, lignite laminations at 33.1', 34.5', and 35'			Bentonite chips	
				3.9		
10	-35				Filter pack (sand)	
		Increased lignitic laminations from 37.5' to 40' (~1/4" to 1.5" thick)		4.1	2-inch PVC screen (0.010 inch)	
5	-40	PIW-8D soil boring terminated at 44.55 feet. Lithologic descriptions not available beyond this depth.				
0	-45					

End of Boring at 46.6 feet bgs.

All depths referenced to ground surface.

Total Depth: 46.55 ft bgs

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BORING LOG

BOREHOLE ID: *PIW-9S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:**
NORTHING: *396148.111*
EASTING: *2052251.101*
GROUND ELEVATION: *76.801 (feet NAVD88)*
TOC ELEVATION: *79.532 (feet NAVD88)*
TOTAL WELL DEPTH: *24.75 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
					Well Cover	
	0	Fine to medium grained SAND with silt (SP-SM); grayish brown with reddish brown; loose; dry; trace rounded pebbles (`~2mm)				Hand auger to 5'
75						
	-5					
		CLAY (CL); gray with red; medium stiff; moist				
70		Silty CLAY (CL-ML); grayish brown with reddish brown; stiff; moist		4.3		
		Silty SAND with trace clay (SP-SC); tannish brown; loose; moist			Cement grout	
	-10				2-inch PVC casing	
65		Silty CLAY (CL-ML); reddish brown and reddish gray; soft; moist		4.0		
		Fine to medium grained SAND trace clay (SP-SC); tannish white; loose; moist; interbedded with mm-scale clay lenses; wet at 22.5' to 23'				
	-15					
60				3.0		
	-20					
					Bentonite chips	
55						

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Total Depth: 40 ft bgs

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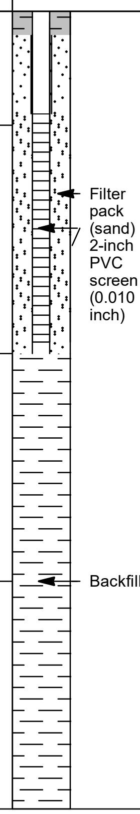
BORING LOG

BOREHOLE ID: *PIW-9S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/26/2019 to 6/26/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:**
NORTHING: *396148.111*
EASTING: *2052251.101*
GROUND ELEVATION: *76.801 (feet NAVD88)*
TOC ELEVATION: *79.532 (feet NAVD88)*
TOTAL WELL DEPTH: *24.75 ft*
TOTAL BORING DEPTH: *40 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
				3.3		
		CLAY with trace silt (CL); grayish black; firm; moist; trace lignite				
	-25	Medium to coarse grained SAND (SW); tannish white; loose; wet; intebedded with mm-scale clay lenses				
50				3.8	Filter pack (sand) 2-inch PVC screen (0.010 inch)	
	-30					
45		Coarse grained SAND (SW); blackish gray; loose; wet; 1 in clay layer at 32.5' and lignitte appears in last inch of run		4.0		
	-35				Backfill	
40		CLAY (CL); blackish gray; moist; with mm-scale sand layers and 0.5" lignite layer at 38'		5.0		
	-40					



End of Boring at 40.0 feet bgs.

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BORING LOG

BOREHOLE ID: *PIW-9D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
					Well Cover	
	0	Fine to medium grained SAND with silt (SP-SM); grayish brown with reddish brown; loose; dry; trace rounded pebbles (`~2mm)				Hand auger to 5'. Lithology descriptions from 0-40' taken from PIW-9S.
75						
	-5					
		CLAY (CL); gray with red; medium stiff; moist				
70		Silty CLAY (CL-ML); grayish brown with reddish brown; stiff; moist		4.3		
		Silty SAND with trace clay (SP-SC); tannish brown; loose; moist				
	-10					
65		Silty CLAY (CL-ML); reddish brown and reddish gray; soft; moist		4.0		
		Fine to medium grained SAND with trace clay (SP-SC); tannish white; loose; moist; interbedded with mm-scale clay lenses; wet at 22.5' to 23'				
	-15					
60				3.0	Cement grout	
					2-inch PVC casing	
	-20					
55				3.3		

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BORING LOG

BOREHOLE ID: *PIW-9D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		CLAY with trace silt (CL); grayish black; firm; moist; trace lignite				
	-25	Medium to coarse grained SAND (SW); tannish white; loose; wet; intebedded with mm-scale clay lenses				
50				3.8		
	-30					
45		Coarse grained SAND (SW); blackish gray; loose; wet; 1 in clay layer at 32.5' and lignitte appears in last inch of run		4.0		
	-35					
40		CLAY (CL); blackish gray; moist; with mm-scale sand layers and 0.5" lignite layer at 38'		5.0	Bentonite chips	
	-40	Coarse grained SAND with trace mica (SP); gray with brown; loose; wet; redoximorphic features				Heaving sands
35					Filter pack (sand) 2-inch PVC screen (0.010 inch)	
	-45	CLAY (CL); blackish brown with black; stiff; moist; laminated				
30		Medium to coarse grained SAND with trace mica (SP); dark gray; medium dense; moist			Backfill	

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BORING LOG

BOREHOLE ID: *PIW-9D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/3/2019*
GEOLOGIST: *Brandon Peach*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *396155.974*
EASTING: *2052250.911*
GROUND ELEVATION: *76.748 (feet NAVD88)*
TOC ELEVATION: *79.529 (feet NAVD88)*
TOTAL WELL DEPTH: *40 ft*
TOTAL BORING DEPTH: *49 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
		Medium to coarse grained SAND with trace mica (SP); dark gray; medium dense; moist *(continued)*				
		PIW-9D soil boring terminated at 49.0 feet. Lithologic descriptions not available beyond this depth.				
	-50					
25						
	-55					

End of Boring at 56.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 55.95 ft bgs

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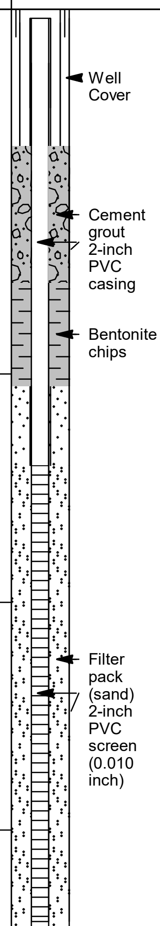
BORING LOG

BOREHOLE ID: *PIW-10S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/24/2019 to 6/24/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395104.674*
EASTING: *2052297.041*
GROUND ELEVATION: *73.304 (feet NAVD88)*
TOC ELEVATION: *76.451 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
75						
	0	CLAY with sand (CL); reddish brown with gray; stiff; moist				Hand auger to 5'.
70						
	-5			5.0		
65		Silty SAND (SW-SM); orangeish brown to light brown; moist; homogenous				
	-10					
		Fine to medium grained Silty SAND (SW-SC); gray; damp; mm-scale interlayers of gray silty clay		3.5		
60						
	-15					
		CLAY trace gravel (CL); black and gray; very stiff; moist; medium plasticity		5.0		
55						
	-20					



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BORING LOG

BOREHOLE ID: *PIW-10S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/24/2019 to 6/24/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395104.674*
EASTING: *2052297.041*
GROUND ELEVATION: *73.304 (feet NAVD88)*
TOC ELEVATION: *76.451 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50		CLAY trace gravel (CL); black and gray; very stiff; moist; medium plasticity *(continued)*		5.0		
	-25	CLAY trace fine to medium sand (CL); black and gray; stiff; moist		5.0		
45		Medium to coarse grained SAND (SP); black and gray; loose; wet				
	-30	CLAY (CH); black and gray; stiff; moist; mica-rcih interlayer at 31'		5.0		
40	-35			0.0		
35	-40			5.0		
30	-45					

(Continued Next Page)

Geosyntec consultants

Geosyntec Consultants of NC, P.C.
NC License No.: C-3500 and C-295

Geosyntec Consultants of NC, PC
2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *PIW-10S*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *6/24/2019 to 6/24/2019*
GEOLOGIST: *Rohit Warrier*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Brian Thomas*
DRILLING METHOD: *Direct Push/ Hollow Stem Auger*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395104.674*
EASTING: *2052297.041*
GROUND ELEVATION: *73.304 (feet NAVD88)*
TOC ELEVATION: *76.451 (feet NAVD88)*
TOTAL WELL DEPTH: *7 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
25		CLAY (CH); black and gray; stiff; moist; mica-rcih interlayer at 31' *(continued)*				Lithology described from sonic cores 49-59'
	-50	Medium to coarse grained SAND (SP); black and gray; medium stiff; moist; quartz rich grains and trace mica, lignite present, well-sorted				15' of heaving sands
20						
	-55					
15		CLAY (CL); gray; stiff to dense; medium plasticity				

End of Boring at 59.0 feet bgs.

All depths referenced to ground surface.

Total Depth: 59 ft bgs

Geosyntec consultants

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NC License No.: C-3500 and C-295

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2501 Blue Ridge Rd. Suite 430
Raleigh NC, 27607
Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *PIW-10D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Allison Vo*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Isaac Young*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395098.787*
EASTING: *2052293.844*
GROUND ELEVATION: *73.339 (feet NAVD88)*
TOC ELEVATION: *76.199 (feet NAVD88)*
TOTAL WELL DEPTH: *53 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
75					Well Cover	
	0	CLAY with sand (CL); reddish brown with gray; stiff; moist; low plasticity				Hand auger to 5'. Lithologic descriptions from soil borings co-located with PIW-10S.
70	-5					
65				5.0		
		Silty SAND (SW-SM); orangeish brown to light brown; moist; homogenous, well-sorted				
	-10				2-inch PVC casing	
		Fine to medium grained Silty SAND (SW-SC); moist; interbedded with gray silty clay		3.5		
60	-15					
		CLAY with trace gravel (CL); black and gray; very stiff; moist; medium plasticity		5.0		
55	-20					

(Continued Next Page)

Geosyntec consultants Geosyntec Consultants of NC, P.C. NC License No.: C-3500 and C-295 Geosyntec Consultants of NC, PC 2501 Blue Ridge Rd. Suite 430 Raleigh NC, 27607 Telephone: 919-870-0576	**BORING LOG** **BOREHOLE ID:** *PIW-10D*

PROJECT NAME: Onsite Black Creek Characterization	**RIG TYPE:** *Geoprobe 7822DT*
PROJECT NO: *TR0795*	**BOREHOLE DIA:** *8.25"* **SAMPLING METHOD:** *Dual Tube*
SITE LOCATION: *Fayetteville, NC*	**NORTHING:** *395098.787*
BORING DATE: *7/2/2019 to 7/2/2019*	**EASTING:** *2052293.844*
GEOLOGIST: *Allison Vo*	**GROUND ELEVATION:** *73.339 (feet NAVD88)*
DRILLING CONTRACTOR: *Cascade*	**TOC ELEVATION:** *76.199 (feet NAVD88)*
DRILLER NAME: *Isaac Young*	**TOTAL WELL DEPTH:** *53 ft*
DRILLING METHOD: *Direct Push / Sonic*	**TOTAL BORING DEPTH:** *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
50		CLAY with trace gravel (CL); black and gray; very stiff; moist; medium plasticity *(continued)*		5.0	Cement grout	
	-25	CLAY (CL); black and gray; stiff; moist; medium plasticity; interbedded with fine to medium grained sand and silt		5.0		
45		Medium to coarse grained SAND (SP); black and gray; wet				
	-30	CLAY (CH); black and gray; stiff; moist; mica-rcih seam at 31'		5.0		
40	-35			0.0		
35	-40			5.0		
30	-45					

(Continued Next Page)

Geosyntec consultants

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NC License No.: C-3500 and C-295

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2501 Blue Ridge Rd. Suite 430
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Telephone: 919-870-0576

BORING LOG

BOREHOLE ID: *PIW-10D*

PROJECT NAME: Onsite Black Creek Characterization
PROJECT NO: *TR0795*
SITE LOCATION: *Fayetteville, NC*
BORING DATE: *7/2/2019 to 7/2/2019*
GEOLOGIST: *Allison Vo*
DRILLING CONTRACTOR: *Cascade*
DRILLER NAME: *Isaac Young*
DRILLING METHOD: *Direct Push / Sonic*

RIG TYPE: *Geoprobe 7822DT*
BOREHOLE DIA: *8.25"* **SAMPLING METHOD:** *Dual Tube*
NORTHING: *395098.787*
EASTING: *2052293.844*
GROUND ELEVATION: *73.339 (feet NAVD88)*
TOC ELEVATION: *76.199 (feet NAVD88)*
TOTAL WELL DEPTH: *53 ft*
TOTAL BORING DEPTH: *59 ft*

Elev. (ft, NAVD88)	Depth (ft)	Lithologic Description	Pattern	Recovery (ft)	Well Construction	Comments
25		CLAY (CH); black and gray; stiff; moist; mica-rcih seam at 31' *(continued)*		5.0		Lithology described from sonic cores 49-59'
	-50	Medium to coarse grained SAND (SP); black and gray; medium stiff; moist; quartz rich grains and trace mica Medium grained SAND (SP); black and gray; moist; well-sorted, lignite, micaceous			Bentonite chips	
20						
	-55				Filter pack (sand) 2-inch PVC screen (0.010 inch)	
15		CLAY (CL); gray; stiff; medium plasticity				

End of Boring at 59.0 feet bgs.

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

Date Started	: 7/30/2019
Date Completed	: 7/30/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

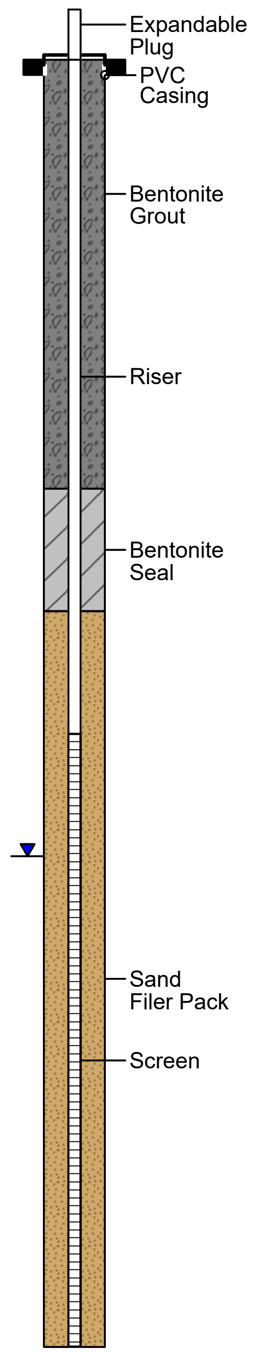
LOG OF BORING: PW-01

(Page 1 of 1)

NAD83 1983	: NC SP Coordinates
Northing	: 399064.799
Easting	: 2049654.303
Completed Depth:	: 21'
Boring Depth	: 22'
Elevation/TOC	: 146.627 / 149.547

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 146.627	Depth in feet
0				146.63	0
1	0-2' SILTY SAND: Light tan/gray.	SM		145.63	1
2				144.63	2
3	2-12' CLAYEY SAND: Yellowish brown (7.5YR 5/4), soft, sub-angular, damp.			143.63	3
4				142.63	4
5				141.63	5
6	Clay content decreases with depth.			140.63	6
7		SC		139.63	7
8				138.63	8
9				137.63	9
10				136.63	10
11	At 11', intermittent oxidation color change to yellowish brown (10YR 6/4).	SC		135.63	11
12				134.63	12
13	12-20.5' SAND WITH SILT: Pale brown (10YR 6/3), very fine to fine grained sand, very firm, loose/soft, damp/moist.			133.63	13
14				132.63	14
15				131.63	15
16		SP		130.63	16
17	Medium to coarse grained at 16'.			129.63	17
18	Color change to light pale purple at 18'.			128.63	18
19				127.63	19
20				126.63	20
21	20.5-22' CLAY: Black/very dark brown (10YR 2/1), stiff/firm, plastic, damp. Lignite layer at 21.5'. End of boring at 22'.	CL		125.63	21
22					22

Well: PW-01
TOC Elev: : 149.547



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (11-21')

WELL CONSTRUCTION
Bentonite Grout : 0-7'
Bentonite Seal : 7-9'
Sand Filter Pack : 9-21'

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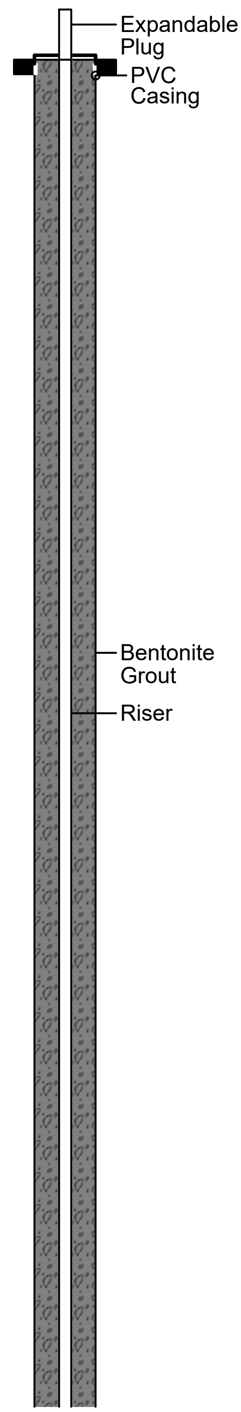
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/29/2019 Date Completed : 7/30/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-02 (Page 1 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 399779.064 Easting : 2050649.466 Completed Depth: : 60' Boring Depth : 67' Elevation/TOC : 143.764 / 146.431
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 143.764	Depth in feet
0	0-2' SILTY SAND: Light tan/gray, loose, very fine to fine grained.	SM		143.76	0
1				142.76	1
2	2-15' CLAYEY SAND: Yellowish brown (7.5YR 5/4), soft, sub-angular, very fine to fine grained, damp.	SC		141.76	2
3				140.76	3
4				139.76	4
5				138.76	5
6				137.76	6
7				136.76	7
8				135.76	8
9				134.76	9
10				133.76	10
11				132.76	11
12	Increasing to medium grained with depth.			131.76	12
13				130.76	13
14				129.76	14
15	15-23' SILTY CLAY: Dark grayish brown (7.5YR 4/2) with sand and mica, stiff, firm, damp.	CH		128.76	15
16				127.76	16
17				126.76	17
18				125.76	18
19				124.76	19
20				123.76	20
21				122.76	21
22	Clayey sand lens at 21'.			121.76	22
23	23-24' SILTY CLAY: Very dark gray (10YR 3/1).	CH		120.76	23
24	24-30' CLAY: Black (10YR 2/1), stiff, firm, plastic, damp.	CL		119.76	24
25					25

Well: PW-02
TOC Elev: : 146.431



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (50-60')

WELL CONSTRUCTION

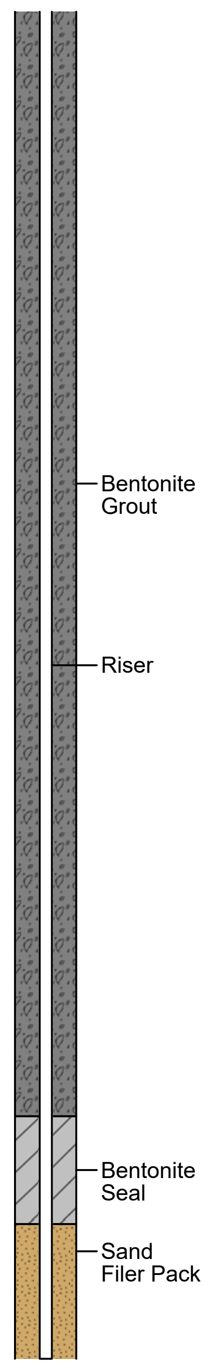
Bentonite Grout	: 0-45.5'
Bentonite Seal	: 45.5-47.5'
Sand Filter Pack	: 47.5-60'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/29/2019 Date Completed : 7/30/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-02 (Page 2 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 399779.064 Easting : 2050649.466 Completed Depth: : 60' Boring Depth : 67' Elevation/TOC : 143.764 / 146.431
Project Number: 449338		

Well: PW-02
TOC Elev: : 146.431

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 143.764	Depth in feet
25		CL		118.76	25
26				117.76	26
27				116.76	27
28				115.76	28
29				114.76	29
30	30-45' CLAYEY SAND: Moderate to dark reddish brown (5R 4/3 & 3/4), very fine to fine grained, soft, loose, moist to saturated.	SC		113.76	30
31				112.76	31
32				111.76	32
33				110.76	33
34				109.76	34
35				108.76	35
36				107.76	36
37				106.76	37
38				105.76	38
39				104.76	39
40				103.76	40
41				102.76	41
42				101.76	42
43				100.76	43
44				99.76	44
45	45-60' SILTY SAND: Light brownish gray (10YR 6/2) from 45-51', very fine to fine grained, loose, soft, moist to saturated.	SM		98.76	45
46				97.76	46
47				96.76	47
48				95.76	48
49				94.76	49
50					50



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (50-60')

WELL CONSTRUCTION
Bentonite Grout : 0-45.5'
Bentonite Seal : 45.5-47.5'
Sand Filter Pack : 47.5-60'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

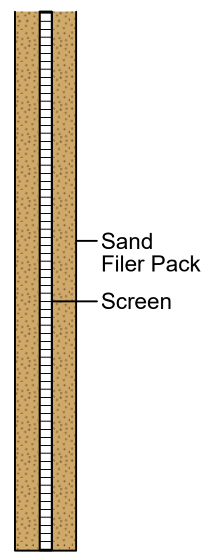
Date Started	: 7/29/2019
Date Completed	: 7/30/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

LOG OF BORING: PW-02

NAD83 1983	: NC SP Coordinates
Northing	: 399779.064
Easting	: 2050649.466
Completed Depth:	: 60'
Boring Depth	: 67'
Elevation/TOC	: 143.764 / 146.431

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 143.764
50		SM	93.76
51	Oxidation layer (orange) at 51'.	SM	92.76
52			91.76
53			90.76
54			89.76
55	Color change to brownish gray at 55'.	SM	88.76
56			87.76
57			86.76
58			85.76
59			84.76
60	60-65' CLAY: Black (10YR 2/1), stiff, firm, mica present, damp. Lignite layer at 61'.	CL	83.76
61			82.76
62			81.76
63			80.76
64			79.76
65	65-67' SILTY SAND: Very dark gray (10YR 3/1), soft, loose, micaceous, damp to moist.	SM	78.76
66			77.76
67	End of boring at 67'.		76.76
68			75.76
69			74.76
70			73.76
71			72.76
72			71.76
73			70.76
74			69.76
75			

Well: PW-02
TOC Elev: : 146.431



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (50-60')

WELL CONSTRUCTION

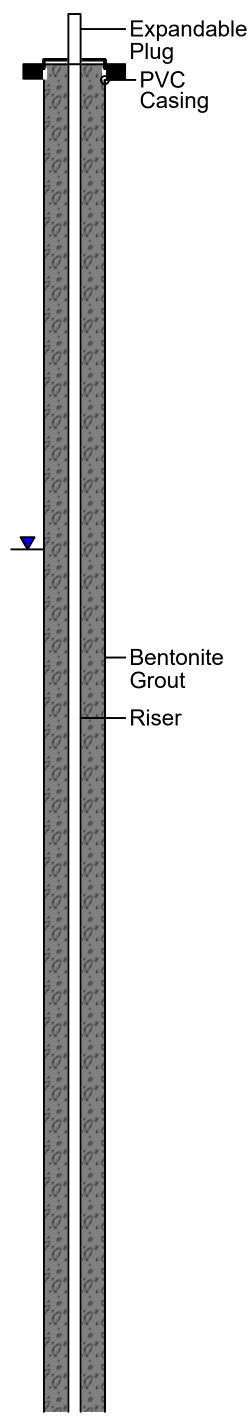
Bentonite Grout	: 0-45.5'
Bentonite Seal	: 45.5-47.5'
Sand Filter Pack	: 47.5-60'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/23/2019 Date Completed : 7/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-03** (Page 1 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 397339.809 Easting : 2050765.319 Completed Depth: : 45' Boring Depth : 67' Elevation/TOC : 144.968 / 147.967
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 144.968	Depth in feet
0			144.97	0
1	0-2' SILTY SAND: Sand with silt.	SM	143.97	1
2			142.97	2
3	2-7.5' CLAYEY SAND: Yellowish red brown (7.5YR 5/4), fine to medium to coarse grained, loose to stiff, friable, red oxidation, damp.		141.97	3
4			140.97	4
5	Clay lens at 5'.	SC	139.97	5
6			138.97	6
7			137.97	7
8	7.5-12.5' SAND: Yellowish brown (10YR 5/3), poorly sorted, medium to coarse grained, soft, loose, damp to moist. At 9', yellowish red (10YR 6/6), fine grained sand, well sorted, saturated.		136.97	8
9			135.97	9
10		SP	134.97	10
11			133.97	11
12			132.97	12
13			131.97	13
14	12.5-16' CLAY WITH SAND: Light brownish gray (10YR 3/1), red oxidation (7.5YR 5/8) reddish yellow.	CL	130.97	14
15	Sand lens at 15'.		129.97	15
16			128.97	16
17			127.97	17
18	16-28' CLAY: Dark gray (10YR 3/1), very stiff, hard, moderate to high plasticity, sub-angular blocks, damp.		126.97	18
19			125.97	19
20			124.97	20
21		CL	123.97	21
22			122.97	22
23			121.97	23
24			120.97	24
25				25

Well: PW-03
TOC Elev: : 147.967



Well Construction Information

WELL RISER

Material : PVC
Diameter : 2"

WELL SCREEN

Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (35-45')

WELL CONSTRUCTION

Bentonite Grout : 0-31'
Bentonite Seal : 31-33'
Sand Filter Pack : 33-45'

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DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

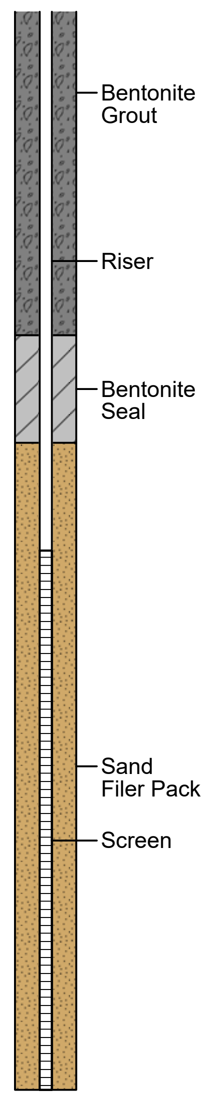
Date Started : 7/23/2019
Date Completed : 7/23/2019
Drilling Method : Sonic
Sampling Method : Continuous Core
Drilling Firm : Cascade
Lead Driller : James Smith
Lead Driller License # : 4472-A
Geologist : Danielle Delgado
Boring Log By : Danielle Delgado

LOG OF BORING: PW-03

NAD83 1983 : NC SP Coordinates
Northing : 397339.809
Easting : 2050765.319
Completed Depth: : 45'
Boring Depth : 67'
Elevation/TOC : 144.968 / 147.967

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 144.968	Depth in feet
25	25-35' CLAY continued:	CL	119.97	25
26			118.97	26
27			117.97	27
28	Clay with gravel and lignite layer at 28'.		116.97	28
29			115.97	29
30	Clay with silt and trace of mica at 30'.		114.97	30
31			113.97	31
32			112.97	32
33			111.97	33
34			110.97	34
35			109.97	35
36	35-45' SILTY SAND: Bluish light gray, well sorted, very fine to fine grained, soft, loose, trace of mica, moist.	SM	108.97	36
37			107.97	37
38			106.97	38
39			105.97	39
40			104.97	40
41			103.97	41
42	Lignite layer at 42'.		102.97	42
43			101.97	43
44			100.97	44
45			99.97	45
46	45-50' CLAY: Black, firm, stiff, damp.	CL	98.97	46
47			97.97	47
48			96.97	48
49			95.97	49
50				50

Well: PW-03
TOC Elev: : 147.967



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (35-45')

WELL CONSTRUCTION
Bentonite Grout : 0-31'
Bentonite Seal : 31-33'
Sand Filter Pack : 33-45'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/23/2019 Date Completed : 7/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-03 (Page 3 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 397339.809 Easting : 2050765.319 Completed Depth: : 45' Boring Depth : 67' Elevation/TOC : 144.968 / 147.967
Project Number: 449338		

Well: PW-03
TOC Elev: : 147.967

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 144.968	Depth in feet
50				94.97	50
51	50-54' SILTY SAND: Medium to dark gray, well sorted, medium to coarse grained, trace of mica, loose, stiff, intermittent lignite lenses, moist to saturated.			93.97	51
52		SM		92.97	52
53				91.97	53
54				90.97	54
55	54-58' CLAY: Black with blue mottling, firm, stiff, intermittent sand lenses, damp.			89.97	55
56		CL		88.97	56
57				87.97	57
58				86.97	58
59	58-67' SAND: Light gray to olive gray with intermittent dark gray lignite layers, well sorted, very fine to fine grained, trace of mica, moist to saturated.			85.97	59
60				84.97	60
61				83.97	61
62				82.97	62
63		SP		81.97	63
64				80.97	64
65				79.97	65
66				78.97	66
67	End of boring at 67'.			77.97	67
68				76.97	68
69				75.97	69
70				74.97	70
71				73.97	71
72				72.97	72
73				71.97	73
74				70.97	74
75					75

Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (35-45')

WELL CONSTRUCTION

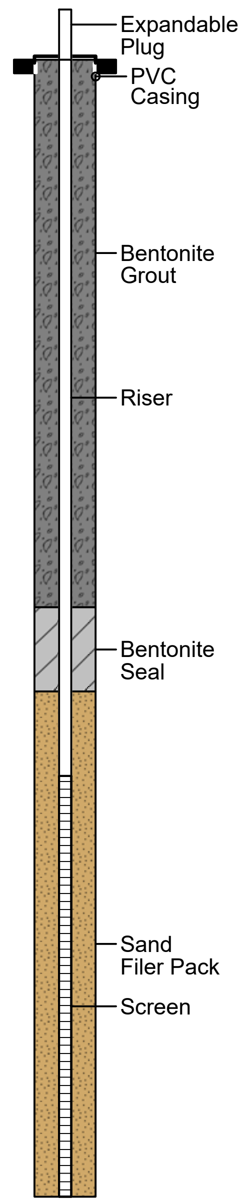
Bentonite Grout	: 0-31'
Bentonite Seal	: 31-33'
Sand Filter Pack	: 33-45'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/23/2019 Date Completed : 7/24/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-04 (Page 1 of 1)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 394659.549 Easting : 2050940.657 Completed Depth: : 27' Boring Depth : 32' Elevation/TOC : 94.736 / 97.751

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 94.736
0	0-18' SAND:		94.74
1	Brown (10YR 5/3), fine to coarse grained, poorly sorted, loose, soft, damp to moist.		93.74
2			92.74
3	Becomes more coarse with depth. Intermittent clay lenses.		91.74
4			90.74
5			89.74
6			88.74
7			87.74
8			86.74
9		SP	85.74
10			84.74
11			83.74
12	Color change at 12', clean sand.		82.74
13	Reddish yellowish oxidation at 14'.		81.74
14			80.74
15			79.74
16			78.74
17	Color change to olive/dark brown and becomes coarser grained at 17'.		77.74
18	18-27' SILTY SAND:		76.74
19	Bluish light gray to olive, medium to coarse grained, loose, soft, trace of mica, moist.		75.74
20			74.74
21			73.74
22		SM	72.74
23			71.74
24	Very fine to fine grained at 24'.		70.74
25			69.74
26			68.74
27	27-30' CLAY:		67.74
28	Dark gray/black, trace of mica, firm, stiff, moist.	CL	66.74
29			65.74
30	30-32' SILTY SAND:		64.74
31	Light gray, very fine to fine grained. End of boring at 32'.	SM	63.74
32			

Well: PW-04
TOC Elev: : 97.751



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (17-27')

WELL CONSTRUCTION
Bentonite Grout : 0-13'
Bentonite Seal : 13-15'
Sand Filter Pack : 15-27'

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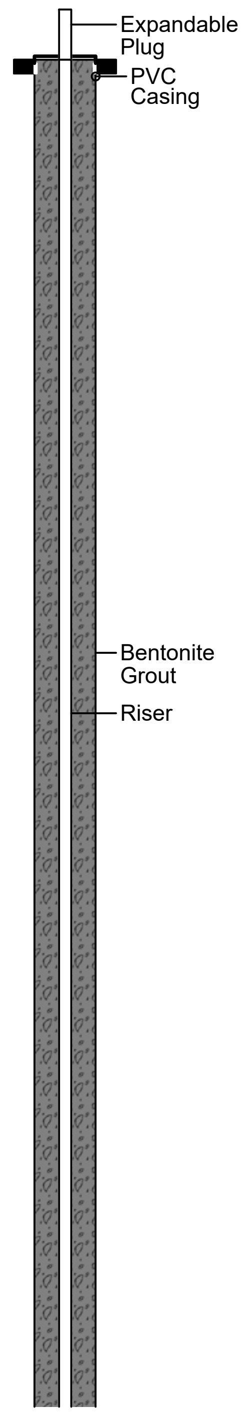
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/26/2019 Date Completed : 7/26/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-05** (Page 1 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 395873.1 Easting : 2047812.929 Completed Depth: : 75' Boring Depth : 77' Elevation/TOC : 147.158 / 150.336

Depth in feet	DESCRIPTION	USCS
0-2	0-2' SILTY SAND: Brown, loose, damp.	SM
2-12.5	2-12.5' CLAYEY SAND: Yellowish brown (7.5YR 5/6), fine to medium grained, loose, sub-angular blocky grains, damp.	SC
12.5-14	12.5-14' CLAYEY SILT WITH SAND: Pinkish gray (7.5YR 6/2), sub-angular blocky grains, pink oxidation, damp.	ML
14-20	14-20' SAND WITH SILT: Well sorted, (5Y 6/3), very fine to fine grained sand, loose, soft, damp. Very pale brown (10YR 8/2) at 15'. Yellow (10YR 8/6) at 16'. Silt decreases with depth.	SM
20-30	20-45.5' SAND WITH SILT: Light gray (10YR 7/1), medium to coarse grained, intermittment orange oxidation layers.	SM

Depth in feet	Surf. Elev. 147.158
0	147.16
1	146.16
2	145.16
3	144.16
4	143.16
5	142.16
6	141.16
7	140.16
8	139.16
9	138.16
10	137.16
11	136.16
12	135.16
13	134.16
14	133.16
15	132.16
16	131.16
17	130.16
18	129.16
19	128.16
20	127.16
21	126.16
22	125.16
23	124.16
24	123.16
25	122.16
26	121.16
27	120.16
28	119.16
29	118.16
30	

Well: PW-05
TOC Elev: : 150.336



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (65-75')

WELL CONSTRUCTION

Bentonite Grout	: 0-60.5'
Bentonite Seal	: 60.5-63'
Sand Filter Pack	: 63-75'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

Date Started	: 7/26/2019
Date Completed	: 7/26/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

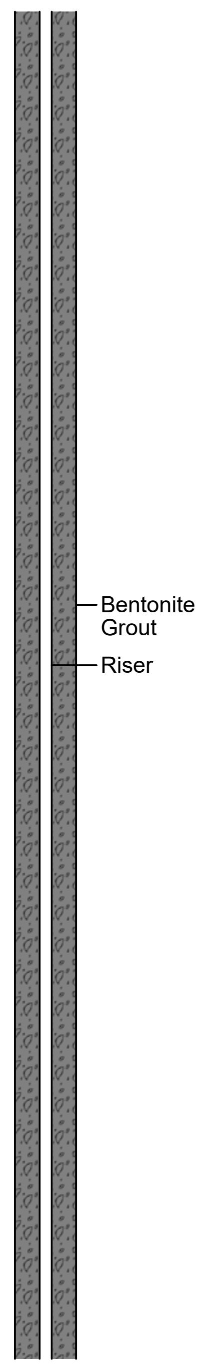
LOG OF BORING: PW-05

NAD83 1983	: NC SP Coordinates
Northing	: 395873.1
Easting	: 2047812.929
Completed Depth:	: 75'
Boring Depth	: 77'
Elevation/TOC	: 147.158 / 150.336

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 147.158
30–45.5	Medium to coarse grained with depth. Moisture content increases with depth.	SM	117.16 – 102.16
45.5–52	45.5-52' SILTY CLAY: Very dark gray (5Y 3/1) , trace amount of sand and mica present, soft, firm, plastic, damp to moist.	CH	101.16 – 96.16
52–60	52-70' SAND: Yellowish brown (10YR 6/6), silt and mica present, well sorted, very fine to fine grained, loose, soft, micaceous, moist to saturated.	SP	95.16 – 88.16

Surf. Elev. by depth: 30: 117.16; 31: 116.16; 32: 115.16; 33: 114.16; 34: 113.16; 35: 112.16; 36: 111.16; 37: 110.16; 38: 109.16; 39: 108.16; 40: 107.16; 41: 106.16; 42: 105.16; 43: 104.16; 44: 103.16; 45: 102.16; 46: 101.16; 47: 100.16; 48: 99.16; 49: 98.16; 50: 97.16; 51: 96.16; 52: 95.16; 53: 94.16; 54: 93.16; 55: 92.16; 56: 91.16; 57: 90.16; 58: 89.16; 59: 88.16

Well: PW-05
TOC Elev: : 150.336



Well Construction Information

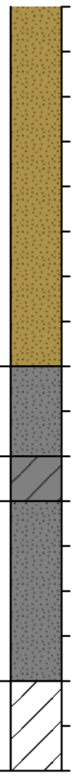
WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (65-75')

WELL CONSTRUCTION
Bentonite Grout : 0-60.5'
Bentonite Seal : 60.5-63'
Sand Filter Pack : 63-75'

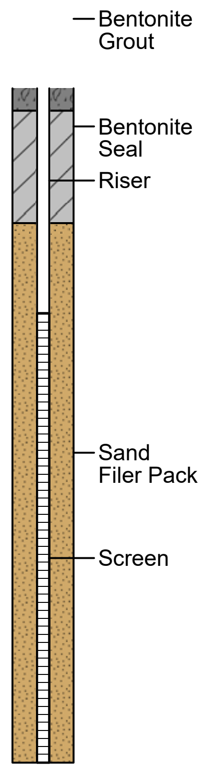
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209 The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338	Date Started : 7/26/2019 Date Completed : 7/26/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-05** (Page 3 of 3) NAD83 1983 : NC SP Coordinates Northing : 395873.1 Easting : 2047812.929 Completed Depth: : 75' Boring Depth : 77' Elevation/TOC : 147.158 / 150.336



Depth in feet	DESCRIPTION	USCS	Surf. Elev. 147.158	Depth in feet
60			87.16	60
61			86.16	61
62			85.16	62
63			84.16	63
64		SP	83.16	64
65			82.16	65
66			81.16	66
67			80.16	67
68	Color change to dark gray at 68'.		79.16	68
69		SP	78.16	69
70	70-71' CLAY: Dark gray, firm.	CL	77.16	70
71	71-75' SAND: Dark gray, well sorted, medium to coarse grained, very loose, micaceous, lignite with clay layer at 73', very moist.		76.16	71
72			75.16	72
73		SP	74.16	73
74			73.16	74
75	75-77' CLAY.		72.16	75
76		CL	71.16	76
77	End of boring at 77'.		70.16	77
78			69.16	78
79			68.16	79
80			67.16	80
81			66.16	81
82			65.16	82
83			64.16	83
84			63.16	84
85			62.16	85
86			61.16	86
87			60.16	87
88			59.16	88
89			58.16	89
90				90

Well: PW-05
TOC Elev: : 150.336



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (65-75')

WELL CONSTRUCTION
Bentonite Grout : 0-60.5'
Bentonite Seal : 60.5-63'
Sand Filter Pack : 63-75'

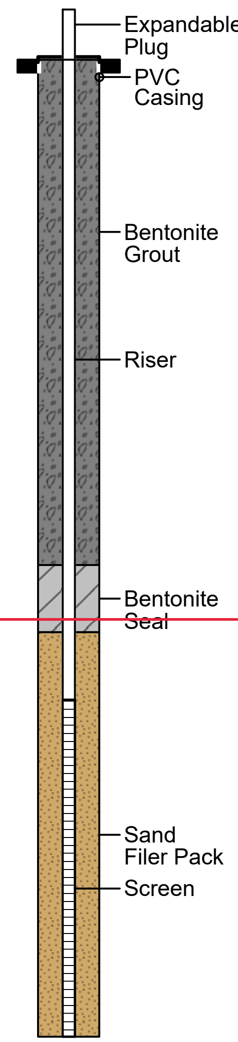
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/29/2019 Date Completed : 7/29/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-06** (Page 1 of 1)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 392868 Easting : 2045288.765 Completed Depth: : 29' Boring Depth : 37' Elevation/TOC : 144.755 / 147.691
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 144.755
0	0-5' SILTY SAND: Light gray, poorly sorted.	ML	144.76
5	5-27' SAND WITH SILT: Light grayish brown (10YR 6/2), loose, soft, fine to coarse grained, poorly sorted, damp to moist. Coarseness increases with depth. Orange oxidation layer at 16'.	SP	139.76
20	Light tan, well sorted, very fine to fine grained at 20'.	SP	124.76
27	27-35' SILTY CLAY: Black to very dark brown (10YR 2/1), stiff, firm, plastic, damp to moist. Lignite layer at 34'.	CH	117.76
35	35-37' SAND WITH SILT: Very dark gray (10YR 3/1), loose, soft, very fine to fine grained, micaceous, damp to moist.	SP	109.76
37	End of boring at 37'.		107.76

Surf. Elev. scale (0–40 ft): 144.76, 143.76, 142.76, 141.76, 140.76, 139.76, 138.76, 137.76, 136.76, 135.76, 134.76, 133.76, 132.76, 131.76, 130.76, 129.76, 128.76, 127.76, 126.76, 125.76, 124.76, 123.76, 122.76, 121.76, 120.76, 119.76, 118.76, 117.76, 116.76, 115.76, 114.76, 113.76, 112.76, 111.76, 110.76, 109.76, 108.76, 107.76, 106.76, 105.76

Well: PW-06
TOC Elev: : 147.691



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (19-29')

WELL CONSTRUCTION
Bentonite Grout : 0-15'
Bentonite Seal : 15-17'
Sand Filter Pack : 17-29'

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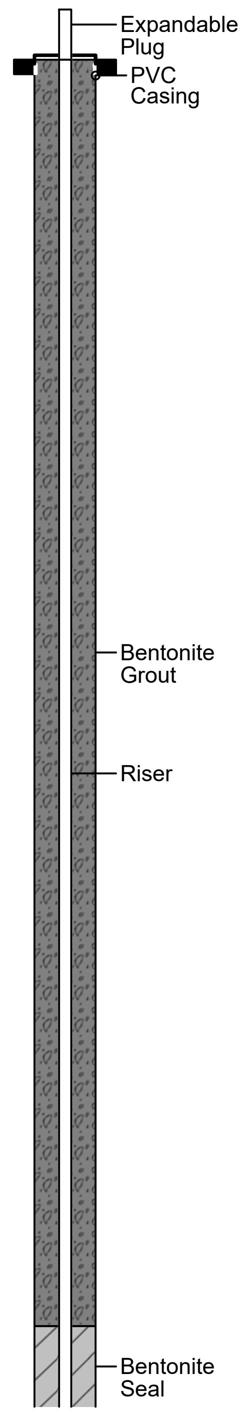
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/24/2019 Date Completed : 7/24/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-07 (Page 1 of 2)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 390847.706 Easting : 2049258.256 Completed Depth: : 38 Boring Depth : 47' Elevation/TOC : 144.9 / 148.16
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 144.9	Depth in feet
0			144.9	0
1	0-2.5' SILTY SAND: Red yellow (7.5YR 5/8), fine grained, damp.	SM	143.9	1
2			142.9	2
3	2.5-7' SAND: Red yellow (7.5YR 5/8), trace of clay, intermittent clay lens throughout, damp.	SP	141.9	3
4			140.9	4
5			139.9	5
6			138.9	6
7	7-10' SAND: Brown (7.5YR 5/3), fine to medium grained, wet.	SP	137.9	7
8			136.9	8
9			135.9	9
10	10-27' SAND: Pinkish gray (7.5YR 8/2) to light gray at 14', fine to medium sand at 13' then back to fine sand at 14', intermittent clay lens throughout (>3mm), dry.	SP	134.9	10
11			133.9	11
12			132.9	12
13	Light gray (7.5YR 8/2), fine grained sand at 15'.		131.9	13
14			130.9	14
15			129.9	15
16	At 16', orange brown, very fine sand, damp.	SP	128.9	16
17	Light gray to gray, fine grained sand, damp.	SP	127.9	17
18			126.9	18
19			125.9	19
20	Sandy clay at 20'.		124.9	20
21			123.9	21
22			122.9	22
23			121.9	23
24	White (8/1), very fine sand, heavy metals present.	SP	120.9	24
25				25

Well: PW-07
TOC Elev: : 148.16



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (28-38')

WELL CONSTRUCTION

Bentonite Grout	: 0-23.5
Bentonite Seal	: 23.5-26'
Sand Filter Pack	: 26-38'

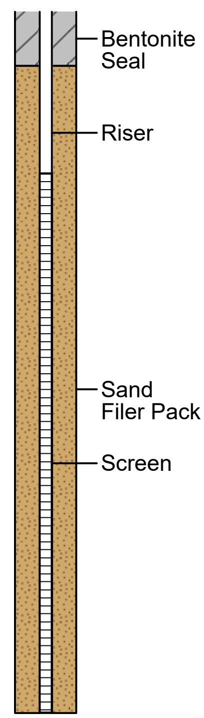
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/24/2019 Date Completed : 7/24/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-07 (Page 2 of 2)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 390847.706 Easting : 2049258.256 Completed Depth: : 38 Boring Depth : 47' Elevation/TOC : 144.9 / 148.16

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 144.9
25-27	Red yellow (7.5YR 7/8), medium grained sand, coarse grained at 26.5'. Gray (7.5YR 7/1), wet. Heavy metals present.	SP	119.9 - 117.9
27-38	27-37' SAND: Gray (7.5YR 6/1), medium to coarse grained, saturated. At 32', pinkish white (7.5YR), sub-angular, medium grained, moist. Light gray at 35'. At 37', orange yellow very fine sand, mica present.	SP	117.9 - 106.9
38-39	38-39' SAND: Brown (7.5YR 5/6), fine grained, wet.	SP	106.9 - 105.9
39-40	39-40' SAND WITH SILT: Clay lens at 39.5', mica present, damp.	ML	105.9 - 104.9
40-46	40-46' CLAY WITH SAND: Dark gray, medium stiff, light gray with mica sand layers throughout.	SC	104.9 - 98.9
46-47	Brown medium grained sand at 46-47'.	SC	98.9 - 97.9
47	End of boring at 47'.		97.9

Depth	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Elev.	119.9	118.9	117.9	116.9	115.9	114.9	113.9	112.9	111.9	110.9	109.9	108.9	107.9	106.9	105.9	104.9	103.9	102.9	101.9	100.9	99.9	98.9	97.9	96.9	95.9	

Well: PW-07
TOC Elev: : 148.16



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (28-38')

WELL CONSTRUCTION
Bentonite Grout : 0-23.5
Bentonite Seal : 23.5-26'
Sand Filter Pack : 26-38'

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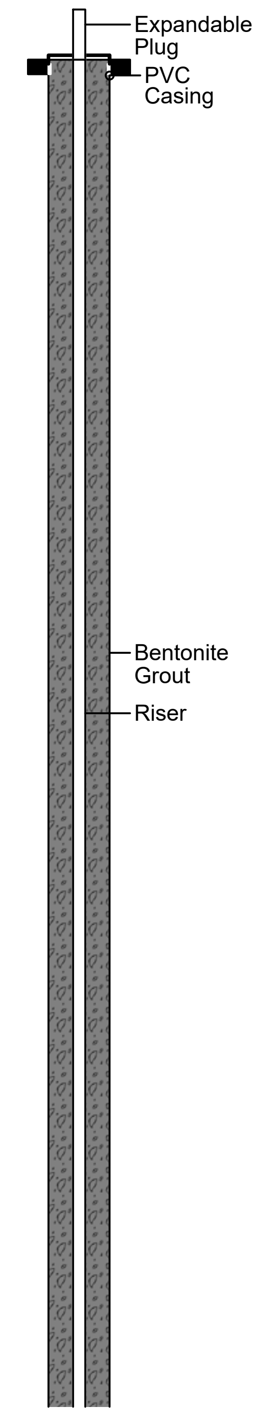
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/12/2019 Date Completed : 8/12/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	**LOG OF BORING: PW-09** (Page 1 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 54' Boring Depth : 69' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.
0–8	0-8' SILTY SAND: Light brown to tan, fine grained to 7', medium grained at 8-9', loose, dry.	SP		
8–9	8-9' SAND WITH SILT: Light brown, medium grained, 1/2" clay lens at 8.5', damp.	SP		
9–11	9-11' SAND: Brown, medium grained, 1/2" organic layer at 10', wet.	SP		
11–19	11-18' SILTY SAND: Brown, medium grained, trace of mica from 11-15', wet throughout. 2" organic layer at 15', abundant mica starting at 15'. 18-19': Brown, fine grained, abundant mica, wet.	SM		
19–21.5	19-21.5': Brown to light brown, fine to medium grained, abundant mica, wet.	SM		
21.5–24	21-5-22.5' SILTY SAND: Gray, fine to medium grained, abundant mica, wet. 2" gray clay lens at 23' and 23.5', firm, damp.	SM		
24–25	24-29' SAND: Fine grained, abundant organics, abundant mica.	SP		

Well: PW-09
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (44-54')

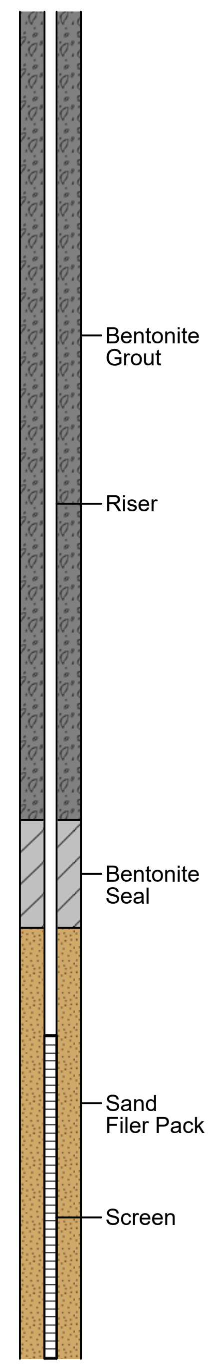
WELL CONSTRUCTION
Bentonite Grout : 0-40'
Bentonite Seal : 40-42'
Sand Filter Pack : 42-54'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/12/2019 Date Completed : 8/12/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-09 (Page 2 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 54' Boring Depth : 69' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.
25-28		SP		
28-29	2" clay lens at 28'.	SP		
29-31	29-31' SILTY SAND: Brown, fine grained, mica present, wet.	SM		
31-32	31-32' SILTY SAND: Gray, fine grained, abundant mica, 4" clay lens at 31', coarse sand at 32', firm, moist.	ML		
32-34	32-34' CLAYEY SAND: Gray, abundant mica, organics present.	SC		
34-35	34-35' CLAY: Gray, firm, very fine grained sand lens throughout.	CL		
35-39	35-39': Dark gray, fine sand layers throughout, stiff, mica rich, organic rich from 36-38', damp.	CL		
39-43	39-41' SAND WITH CLAY: Dark gray, medium to coarse grained, small clay lens throughout, wood fragments at 39.5', wet. 41-42': Coarse grained sand, very loose, wet. 42-43': Clayey sand, wood fragments, lignite present, approximate 2" clay lens at 42.5', wet.	SC		
43-46	43-46' SAND: Dark gray, fine grained, loose, mica present, approximate 3" clay lens at 43.5', wet.	SP		
46-50	46-51.5' CLAY: Dark gray, stiff, trace of mica, damp.	CL		

Well: PW-09
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (44-54')

WELL CONSTRUCTION
Bentonite Grout : 0-40'
Bentonite Seal : 40-42'
Sand Filter Pack : 42-54'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

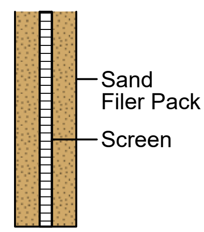
Date Started	: 8/12/2019
Date Completed	: 8/12/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: Vern Olsen
Lead Driller License #	: 2774-A
Geologist	: Brandon Weidner
Boring Log By	: Brandon Weidner

LOG OF BORING: PW-09

NAD83 1983	: NC SP Coordinates
Northing	:
Easting	:
Completed Depth:	: 54'
Boring Depth	: 69'
Elevation/TOC	:

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
50-51.5		CL			50-51.5
51.5-53	51.5-53' CLAYEY SAND WITH SILT: Dark gray, coarse grained, 2" clay lens at 52', wet.	SC			51.5-53
53-56	53-56' CLAY: Dark gray, stiff, damp.	CL			53-56
56-62	56-59' CLAYEY SAND WITH SILT: Light gray, fine to medium grained, trace of mica, damp. 59-62': Very fine to fine grained.	SC			56-62
62-65.5	62-65.5' SILTY CLAY: Light gray, stiff, mica present, damp.	CH			62-65.5
65.5-69	65.5-69' CLAYEY SAND WITH SILT: Fine to medium grained, loose at 68.5', abundant mica, heavy minerals abundant, moist.	SC			65.5-69
69	End of boring at 69'.				69

Well: PW-09
TOC Elev: :



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (44-54')

WELL CONSTRUCTION

Bentonite Grout	: 0-40'
Bentonite Seal	: 40-42'
Sand Filter Pack	: 42-54'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

Date Started	: 8/8/2019
Date Completed	: 8/9/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: Vern Olsen
Lead Driller License #	: 2774-A
Geologist	: Brandon Weidner
Boring Log By	: Brandon Weidner

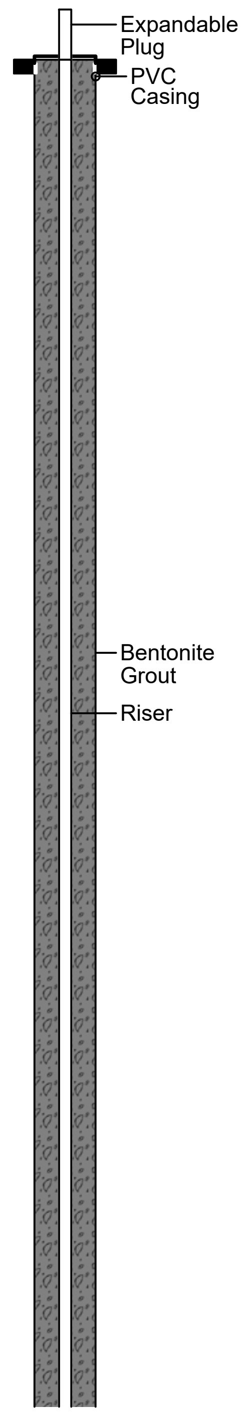
LOG OF BORING: PW-10R

NAD83 1983	: NC SP Coordinates
Northing	: 398516.115
Easting	: 2051936.585
Completed Depth:	: 68'
Boring Depth	: 79'
Elevation/TOC	: 73.28 / 75.9

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 73.28
0-3.5	0-3.5' SILTY SAND: Brown, fine grained, loose, organic roots present, damp.	SM	73.28
3.5-9	3.5-9' CLAYEY SAND: Light brown, fine grained, firm chunks that break apart, 3" clay lens at 8', dry.	SC	69.78
9-11	9-11' CLAYEY SAND: Gray, fine grained, mica present, damp.	SC	64.28
11-15.5	11-15.5' SAND: Orange brown, medium grained, moist.	SP	62.28
15.5-18	15.5-18' SAND: Gray, medium grained, lignite layers at 17.5' and 16', moist.	SP	57.78
18-20	18-20' CLAY: Dark gray with light gray, fine sand lens throughout, firm.	CL	55.28
20-21	20-21' SAND: Brown, medium grained, wet.	SP	53.28
21-34	21-34' CLAY: Dark gray clay with fine grained and light gray sand lens, firm.	CL	52.28

Depth in feet	Surf. Elev.
0	73.28
1	72.28
2	71.28
3	70.28
4	69.28
5	68.28
6	67.28
7	66.28
8	65.28
9	64.28
10	63.28
11	62.28
12	61.28
13	60.28
14	59.28
15	58.28
16	57.28
17	56.28
18	55.28
19	54.28
20	53.28
21	52.28
22	51.28
23	50.28
24	49.28
25	48.28
26	47.28
27	46.28
28	45.28
29	44.28
30	

Well: PW-10R
TOC Elev: 75.9



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (57-67')

WELL CONSTRUCTION

Bentonite Grout	: 0-52.5'
Bentonite Seal	: 52.5-54.5'
Sand Filter Pack	: 54.5-68'

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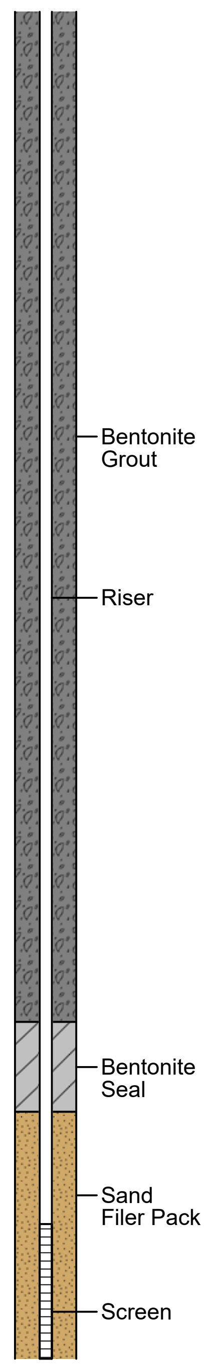
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/8/2019 Date Completed : 8/9/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-10R (Page 2 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 398516.115 Easting : 2051936.585 Completed Depth: : 68' Boring Depth : 79' Elevation/TOC : 73.28 / 75.9

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 73.28
30		CL	43.28
31		CL	42.28
32		CL	41.28
33		CL	40.28
34	34-38.5' SAND: Dark gray, fine grained, moist, wood fragments at 35', abundant mica, light gray layer at 37.5', wood fragments at 38.5'.	SP	39.28
35			38.28
36			37.28
37			36.28
38			35.28
38.5	38.5-39.5' CLAYEY SAND: Dark gray, fine grained, damp, wood fragment present, abundant mica.	SC	
39			34.28
39.5	39.5-42' CLAY: Dark gray, firm, sand layer at 41', wood fragments at 39.5', damp. 42-44.5': Layers of light gray, fine sands, interbedded. 44.5-57': Fine sand from 45.5-45' and at 46', damp.	CL	
40			33.28
41			32.28
42			31.28
43			30.28
44			29.28
45			28.28
46			27.28
47			26.28
48			25.28
49			24.28
50			23.28
51			22.28
52			21.28
53			20.28
54			19.28
55			18.28
56			17.28
57	57-59' SAND: Dark gray, medium grained, abundant mica, moist.	SP	16.28
58			15.28
59	59-60' CLAY: Dark gray, firm, mica present.	CL	14.28
60			

Well: PW-10R
TOC Elev: 75.9



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (57-67')

WELL CONSTRUCTION
Bentonite Grout : 0-52.5'
Bentonite Seal : 52.5-54.5'
Sand Filter Pack : 54.5-68'

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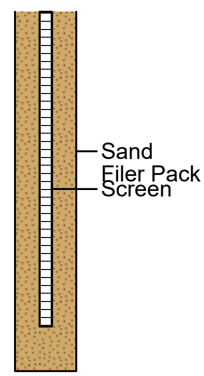
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/8/2019 Date Completed : 8/9/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	**LOG OF BORING: PW-10R** (Page 3 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 398516.115 Easting : 2051936.585 Completed Depth: : 68' Boring Depth : 79' Elevation/TOC : 73.28 / 75.9

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 73.28	Depth in feet
60				13.28	60
61	60-67.5' CLAYEY SAND: Light gray, medium grained, moist.			12.28	61
62				11.28	62
63				10.28	63
64		SC		9.28	64
65				8.28	65
66				7.28	66
67				6.28	67
68				5.28	68
69	67.5-72' SILTY CLAY: Light gray, hard.			4.28	69
70		CH		3.28	70
71				2.28	71
72				1.28	72
73				.28	73
74	72-75' CLAYEY SAND: Light gray, fine grained transitioning to medium grained at 75', firm from 72-74.5', loose at 75'.			-.72	74
75	75-78.5': Light gray, fine grained, firm.	SC		-1.72	75
76				-2.72	76
77				-3.72	77
78				-4.72	78
79	78.5-79' SILTY CLAY: Light gray, hard. End of boring at 79'.	CH		-5.72	79
80				-6.72	80
81				-7.72	81
82				-8.72	82
83				-9.72	83
84				-10.72	84
85				-11.72	85
86				-12.72	86
87				-13.72	87
88				-14.72	88
89				-15.72	89
90					90

Well: PW-10R
TOC Elev: 75.9



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (57-67')

WELL CONSTRUCTION
Bentonite Grout : 0-52.5'
Bentonite Seal : 52.5-54.5'
Sand Filter Pack : 54.5-68'

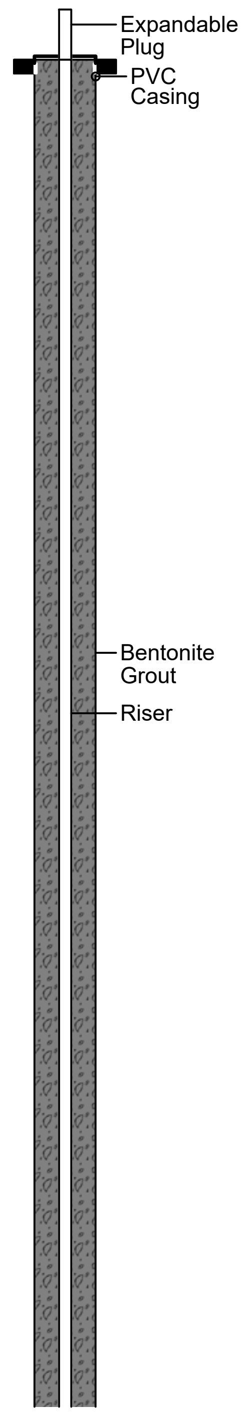
09-24-2019 F:\Logs\Fayetteville\PW-10R.bor

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/25/2019 Date Completed : 7/26/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-11** (Page 1 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 394354.363 Easting : 2052226.721 Completed Depth: : 64' Boring Depth : 77' Elevation/TOC : 70.187 / 73.263
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 70.187
0			70.19
1	0-4' SILTY SAND: Brown (10YR 5/3), trace of clay, very fine to fine grained, sub-angular blocky, damp.		69.19
2		SM	68.19
3			67.19
4			66.19
5	4-6' SAND WITH SILT: Light brown (10YR 6/4), very fine to fine grained, loose, damp.	SP	65.19
6			64.19
7	6-10' SILTY SAND WITH CLAY: Grayish brown (10YR 5/1), very fine to fine grained, sub-angular blocky, damp.		63.19
8		SM	62.19
9			61.19
10			60.19
11	10-65' SAND WITH SILT: Light yellowish brown (10YR 6/4), trace of clay, loose, sub-angular, damp.		59.19
12			58.19
13			57.19
14			56.19
15			55.19
16			54.19
17	At 17, medium to coarse grained with depth, intermittent clay lenses.		53.19
18			52.19
19			51.19
20		SP	50.19
21			49.19
22			48.19
23			47.19
24	At 24', intermittent light gray to light yellowish brown.		46.19
25			45.19
26			44.19
27			43.19
28			42.19
29			41.19
30			

Well: PW-11
TOC Elev: : 73.263



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (53-63')

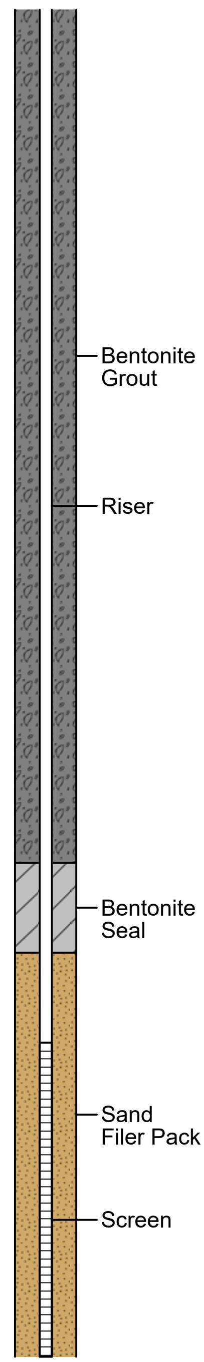
WELL CONSTRUCTION
Bentonite Grout : 0-49'
Bentonite Seal : 49-51'
Sand Filter Pack : 51-64'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/25/2019 Date Completed : 7/26/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-11 (Page 2 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 394354.363 Easting : 2052226.721 Completed Depth: : 64' Boring Depth : 77' Elevation/TOC : 70.187 / 73.263

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 70.187	Depth in feet
30				40.19	30
31		SP		39.19	31
32	At 32', color change to dark yellowish brown (10YR 4/5), medium to coarse grained increases with depth.			38.19	32
33				37.19	33
34				36.19	34
35				35.19	35
36				34.19	36
37				33.19	37
38				32.19	38
39				31.19	39
40				30.19	40
41				29.19	41
42		SP		28.19	42
43				27.19	43
44	4" black clay layer at 44', firm, stiff, damp.			26.19	44
45				25.19	45
46	At 46.5', sand with silt, medium to coarse grained, color change (10YR 3/1).			24.19	46
47				23.19	47
48				22.19	48
49				21.19	49
50				20.19	50
51				19.19	51
52	At 52', very dark gray, moist. Thick lignite and clay layer.			18.19	52
53				17.19	53
54				16.19	54
55				15.19	55
56	At 56', intermittent organic matter, black color with wood chips present, lignite layers.	SP		14.19	56
57				13.19	57
58				12.19	58
59				11.19	59
60					60

Well: PW-11
TOC Elev: : 73.263



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (53-63')

WELL CONSTRUCTION
Bentonite Grout : 0-49'
Bentonite Seal : 49-51'
Sand Filter Pack : 51-64'

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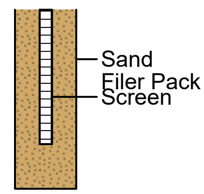
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/25/2019 Date Completed : 7/26/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	**LOG OF BORING: PW-11** (Page 3 of 3)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 394354.363 Easting : 2052226.721 Completed Depth: : 64' Boring Depth : 77' Elevation/TOC : 70.187 / 73.263

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 70.187	Depth in feet
60		SP		10.19	60
61				9.19	61
62				8.19	62
63				7.19	63
64				6.19	64
65	65-75' SILTY SAND: Light bluish gray (2.5Y 6/1), clay and traces of mica present, sub-angular blocky, very stiff and dense, damp to moist. Friable when dry.	SM		5.19	65
66				4.19	66
67				3.19	67
68				2.19	68
69				1.19	69
70				.19	70
71				-.81	71
72				-1.81	72
73				-2.81	73
74				-3.81	74
75	75-77' CLAYEY SILT: Bluish dark gray (2.5Y 4/1), sand and trace of mica present, sub-angular, stiff, damp.	ML		-4.81	75
76				-5.81	76
77	End of boring at 77'.			-6.81	77
78				-7.81	78
79				-8.81	79
80				-9.81	80
81				-10.81	81
82				-11.81	82
83				-12.81	83
84				-13.81	84
85				-14.81	85
86				-15.81	86
87				-16.81	87
88				-17.81	88
89				-18.81	89
90					90

Well: PW-11
TOC Elev: : 73.263



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (53-63')

WELL CONSTRUCTION
Bentonite Grout : 0-49'
Bentonite Seal : 49-51'
Sand Filter Pack : 51-64'

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DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

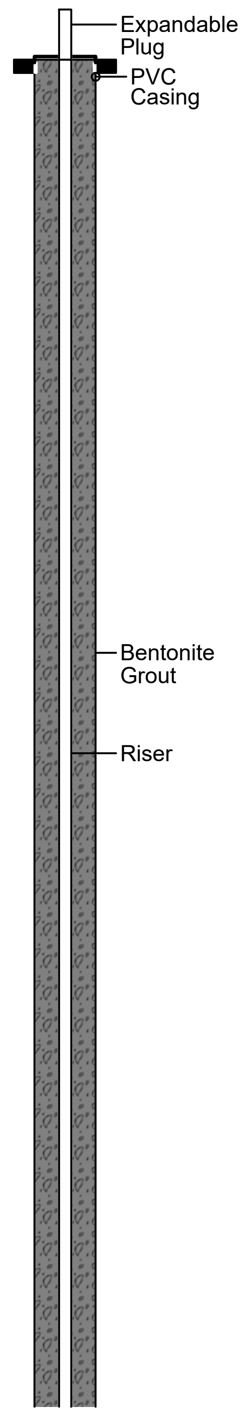
Date Started	: 7/30/2019
Date Completed	: 8/1/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

LOG OF BORING: PW-12

NAD83 1983	: NC SP Coordinates
Northing	: 399500.447
Easting	: 2047063.51
Completed Depth:	: 119'
Boring Depth	: 147'
Elevation/TOC	: 148.054 / 150.61

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 148.054
0-2	0-2' SILTY SAND: Light gray and tan, loose.	SM	148.05–146.05
2-12	2-12' CLAYEY SAND: Yellowish brown (7.5YR 5/4), very fine to fine grained, soft, sub-angular blocky, damp. Clay content decreases with depth.	SC	146.05–136.05
12-35	12-35' SAND WITH SILT: Yellowish brown (7.5YR 6/3), very fine to fine grained, loose, soft, damp to moist. At 16', changes to medium to coarse grained, color lightens. At 20', pale brown (10YR 6/3), coarse grained sand. At 27', Intermittent thin clay lenses. 6" black clay layer at 33', firm, stiff, damp, followed by a 6" dark gray silty clay layer that has orange oxidation veins, firm, stiff, damp.	SP	136.05–114.05

Well: PW-12
TOC Elev: : 150.61



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (109-119')

WELL CONSTRUCTION

Bentonite Grout	: 0-103'
Bentonite Seal	: 103-106'
Sand Filter Pack	: 106-119'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

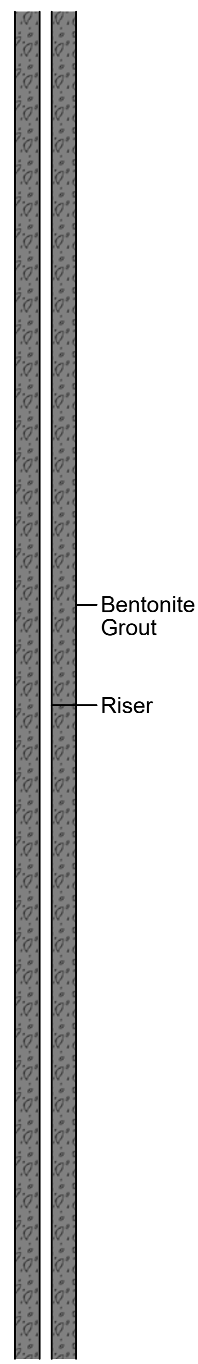
Date Started	: 7/30/2019
Date Completed	: 8/1/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

LOG OF BORING: PW-12

NAD83 1983	: NC SP Coordinates
Northing	: 399500.447
Easting	: 2047063.51
Completed Depth:	: 119'
Boring Depth	: 147'
Elevation/TOC	: 148.054 / 150.61

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 148.054
35–39	34-39' SAND: Yellowish brown, fine to medium grained, loose, soft, damp to moist.	SP	113.05–109.05
39–44	39-44' CLAYEY SAND WITH SILT: Dark to very dark gray (10YR 3/1), soft, loose, damp to moist. Intermittent clay with mica lenses throughout, black, stiff, firm, damp to moist.	SC	109.05–104.05
44–70	44-82' SAND WITH SILT: Yellowish brown (10YR 5/6), fine to medium grained, loose, damp to moist. Intermittent laminated silty clay, dark gray lenses throughout. At 51.5', lignite layer, color change to olive black/brownish black (5Y 2/1). At 57', light olive gray (5Y 6/1), loose, saturated. At 62.5', Lignite layer followed by interbedded laminated silty clay lenses/layers. Lignite layer at 68'. Very fine to fine grained at 68.5'.	SP	104.05–78.05

Well: PW-12
TOC Elev: : 150.61



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (109-119')

WELL CONSTRUCTION

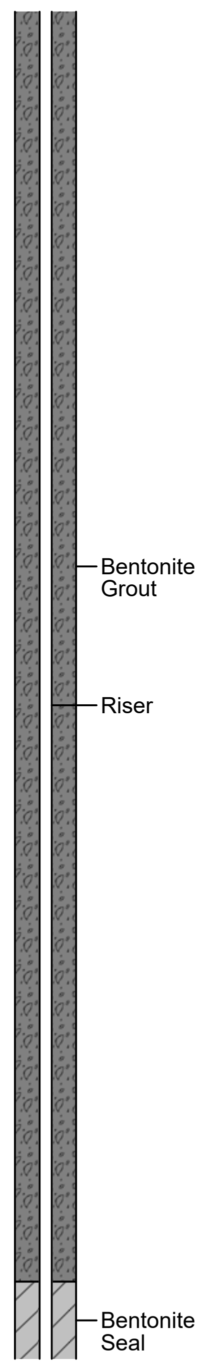
Bentonite Grout	: 0-103'
Bentonite Seal	: 103-106'
Sand Filter Pack	: 106-119'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/30/2019 Date Completed : 8/1/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-12 (Page 3 of 5)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 399500.447 Easting : 2047063.51 Completed Depth: : 119' Boring Depth : 147' Elevation/TOC : 148.054 / 150.61

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 148.054
70		SP	78.05
71	Changes to medium to coarse grained with depth.	SP	77.05
72			76.05
73			75.05
74			74.05
75			73.05
76			72.05
77			71.05
78			70.05
79	At 79', interbedded laminated silty clay layer then back to very fine to fine grained.		69.05
80			68.05
81			67.05
82		CL	66.05
83			65.05
84	84-94' CLAY: Olive gray (5YR 2/1), stiff, plastic, firm, damp.		64.05
85			63.05
86			62.05
87			61.05
88			60.05
89			59.05
90	At 90', intermittent lignite and sand layer.		58.05
91			57.05
92	At 92', Lignite layer.		56.05
93			55.05
94		SP	54.05
95	94-123' SAND WITH SILT: Olive gray (5Y 4/1), very fine to fine grained, interbedded laminated silty clay.		53.05
96			52.05
97			51.05
98			50.05
99			49.05
100			48.05
101			47.05
102			46.05
103			45.05
104			44.05
105			

Well: PW-12
TOC Elev: : 150.61



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (109-119')

WELL CONSTRUCTION
Bentonite Grout : 0-103'
Bentonite Seal : 103-106'
Sand Filter Pack : 106-119'

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PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

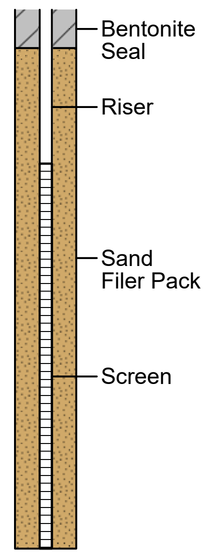
Date Started	: 7/30/2019
Date Completed	: 8/1/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Danielle Delgado
Boring Log By	: Danielle Delgado

LOG OF BORING: PW-12

NAD83 1983	: NC SP Coordinates
Northing	: 399500.447
Easting	: 2047063.51
Completed Depth:	: 119'
Boring Depth	: 147'
Elevation/TOC	: 148.054 / 150.61

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 148.054	Depth in feet
105		SP	43.05	105
106			42.05	106
107			41.05	107
108	Lignite layer at 108'.		40.05	108
109	Increasing grain size with depth.		39.05	109
110			38.05	110
111			37.05	111
112			36.05	112
113			35.05	113
114		SP	34.05	114
115			33.05	115
116			32.05	116
117			31.05	117
118	Coarse grained 118-119'.		30.05	118
119	Large pieces of lignite with clay 119-122'.		29.05	119
120			28.05	120
121			27.05	121
122	Sand lense 122-123'.		26.05	122
123	123-130' CLAY: Olive gray, stiff, plastic, firm, damp.		25.05	123
124			24.05	124
125			23.05	125
126	Coarse grained sand layer at 126'. Lignite layer from 127-129'.	CL	22.05	126
127			21.05	127
128			20.05	128
129	Silty clay from 129-130'.		19.05	129
130	130-143' CLAYEY SAND WITH SILT: Light olive gray, very fine to fine grained, loose, moist.		18.05	130
131			17.05	131
132			16.05	132
133			15.05	133
134			14.05	134
135		SC	13.05	135
136			12.05	136
137			11.05	137
138			10.05	138
139	Clay lense at 139'.		9.05	139
140				140

Well: PW-12
TOC Elev: : 150.61



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (109-119')

WELL CONSTRUCTION

Bentonite Grout	: 0-103'
Bentonite Seal	: 103-106'
Sand Filter Pack	: 106-119'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 7/30/2019 Date Completed : 8/1/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Danielle Delgado Boring Log By : Danielle Delgado	LOG OF BORING: PW-12 (Page 5 of 5)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 399500.447 Easting : 2047063.51 Completed Depth: : 119' Boring Depth : 147' Elevation/TOC : 148.054 / 150.61

Well: PW-12
TOC Elev: : 150.61

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 148.054	Depth in feet
140		SC		8.05	140
141				7.05	141
142				6.05	142
143	143-147' SILTY CLAY WITH SAND: Olive gray (5Y 4/1), firm, hard, damp.	CH		5.05	143
144				4.05	144
145				3.05	145
146				2.05	146
147	End of boring at 147'.			1.05	147
148				.05	148
149				-.95	149
150				-1.95	150
151				-2.95	151
152				-3.95	152
153				-4.95	153
154				-5.95	154
155				-6.95	155
156				-7.95	156
157				-8.95	157
158				-9.95	158
159				-10.95	159
160				-11.95	160
161				-12.95	161
162				-13.95	162
163				-14.95	163
164				-15.95	164
165				-16.95	165
166				-17.95	166
167				-18.95	167
168				-19.95	168
169				-20.95	169
170				-21.95	170
171				-22.95	171
172				-23.95	172
173				-24.95	173
174				-25.95	174
175					175

Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (109-119')

WELL CONSTRUCTION
Bentonite Grout : 0-103'
Bentonite Seal : 103-106'
Sand Filter Pack : 106-119'

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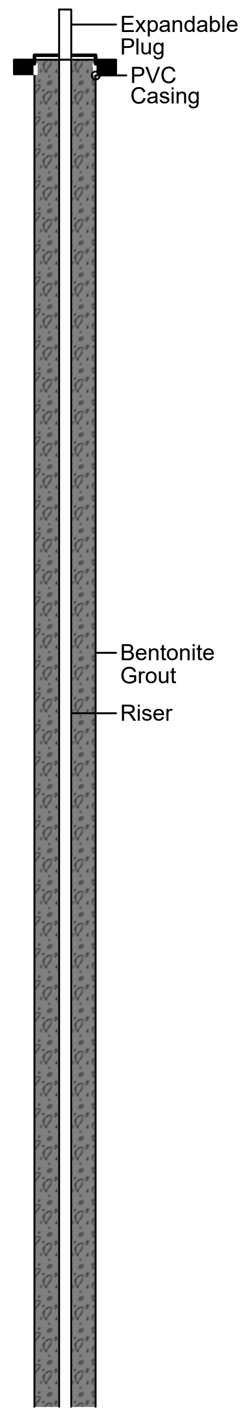
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/20/2019 Date Completed : 8/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Bret Nemeth Boring Log By : Bret Nemeth	LOG OF BORING: PW-13 (Page 1 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 130' Boring Depth : 147' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
0-5	0-5' CLAYEY SAND: Brown, medium dense, trace of gravel, poorly sorted, medium grained, moist.	SC			
5-7	5-7' SANDY CLAY: Brown, stiff, slightly plastic, moist.	CL			
7-20	7-20' SAND: Tan, loose, fine grained, well sorted, moist. Becoming coarse grained and medium dense at 17'.	SW			
20-25	20-27' SAND: Brown and tan, medium dense, coarse grained, well sorted, moist.	SW			

Well: PW-13
TOC Elev: :



Well Construction Information

WELL RISER

Material : PVC
Diameter : 2"

WELL SCREEN

Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (120-130')

WELL CONSTRUCTION

Bentonite Grout : 0-115'
Bentonite Seal : 115-118'
Sand Filter Pack : 118-130'

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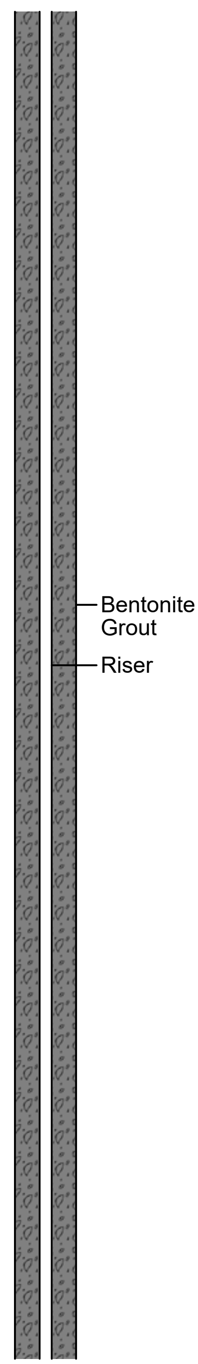
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/20/2019 Date Completed : 8/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Bret Nemeth Boring Log By : Bret Nemeth	**LOG OF BORING: PW-13** (Page 2 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 130' Boring Depth : 147' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
25-27		SW			25-27
27-28.75	27-28.75' SAND: Brown, medium dense, coarse grained, well sorted with trace of gravel, moist.	SW			
28.75-29.5	28.75-29.5' CLAY: Brown, highly plastic, soft, wet.	CH			
29.5-45.5	29.5-40' SAND: Brown, loose, coarse grained, well sorted, moist. Becoming more tan at 30.5'. Becoming more brown at 32'. Becoming more tan at 33'. Becomes brown/tan mottled at 38.75'. 40-45.5': Brown/tan mottled, loose, well sorted, coarse grained, moist.	SW			
45.5-47	45.5-47' CLAYEY SAND: Brown, medium dense, well sorted, medium grained, moist.	SC			
47-50	47-51' SAND: Brown, loose, well sorted, coarse grained, moist. Becoming red/brown/tan mottled at 49'.	SW			50

Well: PW-13
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

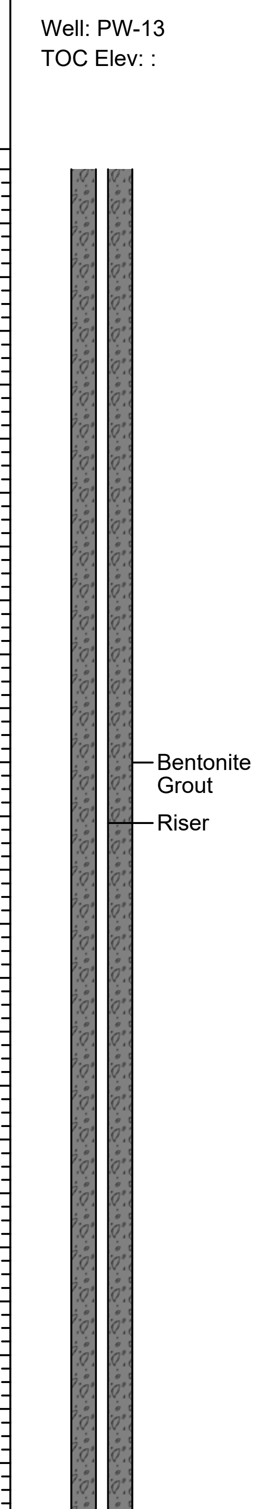
WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (120-130')

WELL CONSTRUCTION
Bentonite Grout : 0-115'
Bentonite Seal : 115-118'
Sand Filter Pack : 118-130'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/20/2019 Date Completed : 8/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Bret Nemeth Boring Log By : Bret Nemeth	**LOG OF BORING: PW-13** (Page 3 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 130' Boring Depth : 147' Elevation/TOC :
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
50–51		SW			50–51
51–62	51-62' SILTY SAND: Red, medium dense, coarse grained, well sorted, moist. At 55.5', becoming more brown, wet. At 57', becoming reddish brown. 60-62': Reddish brown, medium dense, coarse grained, well sorted, trace of clay at 61'.	SM			51–62
62–64	62-64' CLAY: Gray, stiff, moderately plastic, moist.	CH			62–64
64–66.5	64-66.5' SAND: Gray, dense, medium grained, well sorted, trace of silt, moist.	SW			64–66.5
66.5–67	66.5-67' CLAY: Dark gray, stiff, highly plastic, moist.	CH			66.5–67
67–69	67-69' SILTY SAND: Dark gray, dense, medium grained, well sorted, wet.	SM			67–69
69–75	69-79.5' CLAY: Gray, stiff, highly plastic, moist. At 70', dark gray, very stiff, micaceous.	CH			69–75



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (120-130')

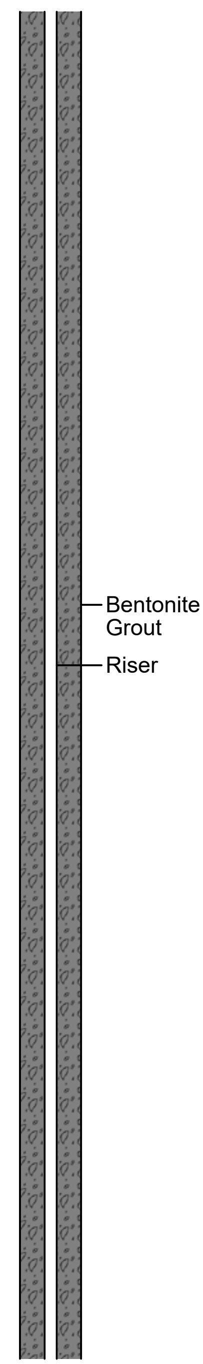
WELL CONSTRUCTION
Bentonite Grout : 0-115'
Bentonite Seal : 115-118'
Sand Filter Pack : 118-130'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/20/2019 Date Completed : 8/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Bret Nemeth Boring Log By : Bret Nemeth	LOG OF BORING: PW-13 (Page 4 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 130' Boring Depth : 147' Elevation/TOC :
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
75-79.5	Gray to dark gray, very stiff, highly plastic, micaceous, moist.	CH			75-79.5
79.5-81	79.5-81' SILTY SAND: Dark gray, dense, coarse grained, well sorted, wet.	SM			79.5-81
81-82.75	81-82.75' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH			81-82.75
82.75-83.5	82.75-83.5' SILTY SAND: Dark gray, dense, coarse grained, well sorted, wet.	SM			82.75-83.5
83.5-85	83.5-85' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH			83.5-85
85-86.5	85-86.5' SILTY SAND: Dark gray, dense, coarse grained, well sorted with trace of clay, moist.	SM			85-86.5
86.5-91	86.5-91' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH			86.5-91
91-97	91-97' SILTY SAND: Gray, dense, coarse grained, well sorted, trace of organic erratics, moist.	SM			91-97
97-99	97-99' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH			97-99
99-100	99-110.5' SILTY SAND: Dark gray, dense, coarse grained, well sorted, some clay, wet.	SM			99-100

Well: PW-13
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (120-130')

WELL CONSTRUCTION
Bentonite Grout : 0-115'
Bentonite Seal : 115-118'
Sand Filter Pack : 118-130'

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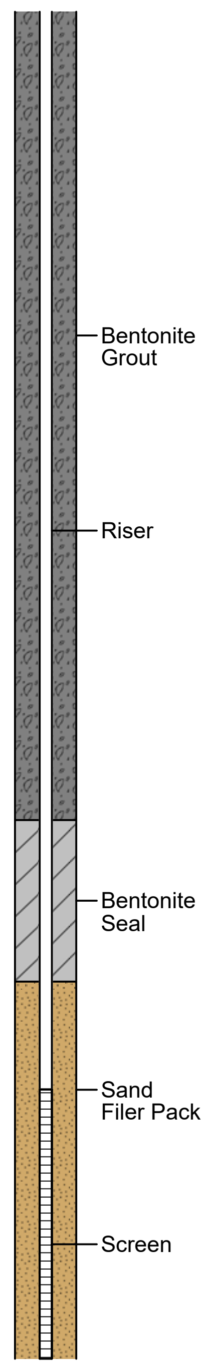
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/20/2019 Date Completed : 8/23/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Bret Nemeth Boring Log By : Bret Nemeth	LOG OF BORING: PW-13 (Page 5 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 130' Boring Depth : 147' Elevation/TOC :
Project Number: 449338		

Well: PW-13
TOC Elev: :

Depth in feet	DESCRIPTION	USCS
100-110.5	100-110.5': Dark gray silty sand with some clay, dense, coarse grained, well sorted, wet.	SM
110.5-111.5	110.5-111.5' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH
111.5-112	111.5-112' SAND WITH CLAY: Dark gray, dense, medium grained, well sorted, wet.	SC
112-115	112-115' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH
115-117.75	115-117.75' SAND: Light gray, medium dense, medium grained, well sorted, moist.	SW
117.75-118.5	117.75-118.5' CLAY: Dark gray, very stiff, highly plastic, moist to wet.	CH
118.5-118.75	118.5-118.75' SAND: Red, dense, medium grained, well sorted, wet.	SW
118.75-125.5	118.75-125.5' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH
125	Becoming wet at 125'.	



Well Construction Information

WELL RISER

Material : PVC
Diameter : 2"

WELL SCREEN

Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (120-130')

WELL CONSTRUCTION

Bentonite Grout : 0-115'
Bentonite Seal : 115-118'
Sand Filter Pack : 118-130'

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

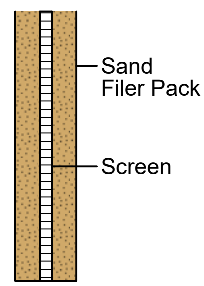
Date Started	: 8/20/2019
Date Completed	: 8/23/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Bret Nemeth
Boring Log By	: Bret Nemeth

LOG OF BORING: PW-13

NAD83 1983	: NC SP Coordinates
Northing	:
Easting	:
Completed Depth:	: 130'
Boring Depth	: 147'
Elevation/TOC	:

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.
125–125.5		CH		
125.5–126	125.5-126' SILTY SAND: Gray, dense, medium grained, well sorted, wet.	SM		
126–127	126-127' CLAY: Dark gray, very stiff, highly plastic, moist to wet.	CH		
127–130	127-130' SILTY SAND: Light gray, dense, medium grained, well sorted, wet.	SM		
130–140	130-140' SILTY CLAY: Gray, stiff, moderately plastic, moist. Cape Fear Confining at 132'. Becoming light gray.	CL		
140–142	140-142' SILTY CLAY: Light gray, stiff, moderately plastic, moist.	CL		
142–142.5	142-142.5' SILTY SAND: Light gray, dense, fine grained, well sorted, wet.	SM		
142.5–147	142.5-147' SILTY CLAY: Light gray, stiff, moderately plastic, moist.	CL		
147	End of boring at 147' bgs.			

Well: PW-13
TOC Elev: :



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (120-130')

WELL CONSTRUCTION

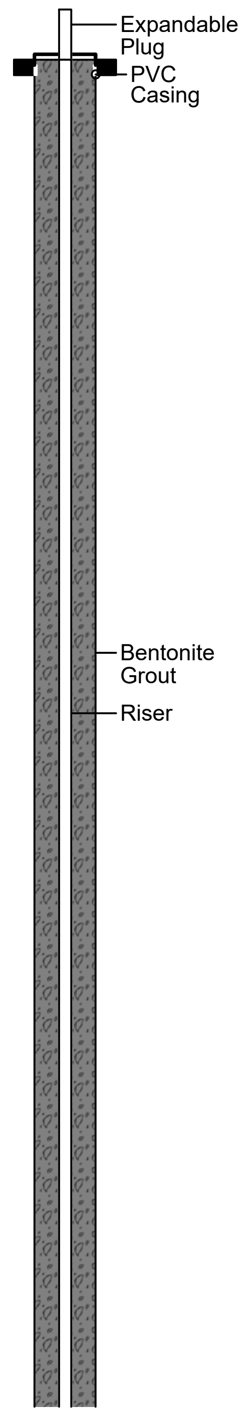
Bentonite Grout	: 0-115'
Bentonite Seal	: 115-118'
Sand Filter Pack	: 118-130'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	**LOG OF BORING: PW-14** (Page 1 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
0–2	0-1' SAND: First inch, topsoil, grass, and rock then light tan medium grained sand with little sand silt pockets, slightly damp. 1-2': No organics.	SP			
2–7	2-3': Orangish brown fine sand with very little clay, damp. 3-4': Orangish brown with few rocks, fine grained sand with little orange mottling, slightly damp. 4-7': Fine to medium grained sand with very little silt, loose, no organics, slightly damp.	SP			
7–8.25	7-7.5': Tan, fine to medium grained with little clay, damp. 7.5-8': Orange, medium grained, damp. 8-8.25': Tan, fine grained, damp.	SP			
8.25–12	8.25-12' SAND: Gray, fine grained with very little silt, damp.	SP			
12–15	12-15' SAND: Light tan, fine to medium grained, saturated.	SP			
15–16	15-16' SAND/SANDY CLAY: Orangish brown fine to coarse sand with very little clay, saturated, grades to fine to medium grained sandy clay, soft.	SC			
16–17	16-17' CLAY: Dark gray with decreasing sand.	CL			
17–17.5	17-17.5' CLAYEY SAND: Tan, fine to medium grained, damp.	SC			
17.5–22	17.5-22' CLAY: Dark gray, stiff, slightly damp.	CL			

Well: PW-14
TOC Elev: :



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (136-146')

WELL CONSTRUCTION

Bentonite Grout	: 0-131'
Bentonite Seal	: 131-134'
Sand Filter Pack	: 134-146'

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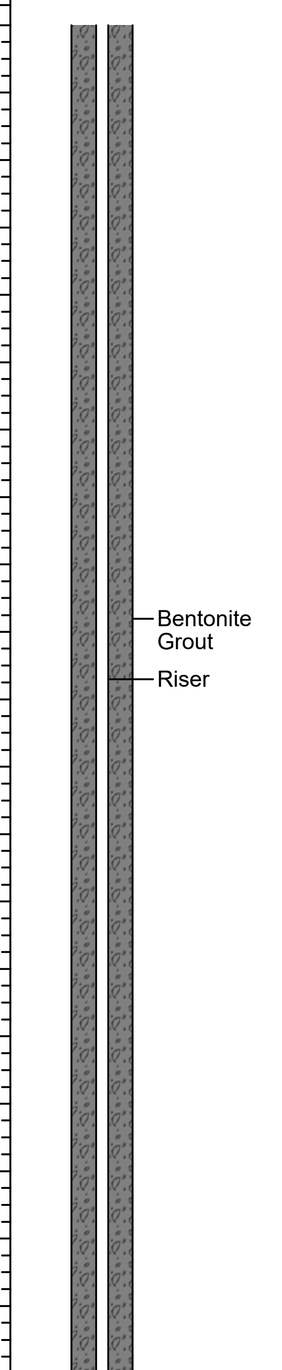
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	LOG OF BORING: PW-14 (Page 2 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS
20	20-22' CLAY: Dark gray, stiff, slightly damp.	CL
22	22-22.5': Little silt present.	CL
	22.5-27': Slightly stiff, slightly damp.	CL
27	27-28': Fine sand and organic material, black throughout.	CL
28	28-29.5': Dark gray, fine sandy clay with black organic material, wood and sand, orange and black.	CL
31	29.5-35': Dark gray, stiff, slightly damp.	CL
35	35-36.5': Micaceous, very fine sandy clay.	CL
36.5	36.5-37.5': SAND: Light tan, loose, medium grained with very few orangish brown clay nodules.	SP
37.5	37.5-38': SANDY CLAY: Dark gray, fine grained, slightly damp.	CL
38	38-40' SAND: Gray, loose, fine to medium grained, micaceous, damp.	SP

Surf. Elev.



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

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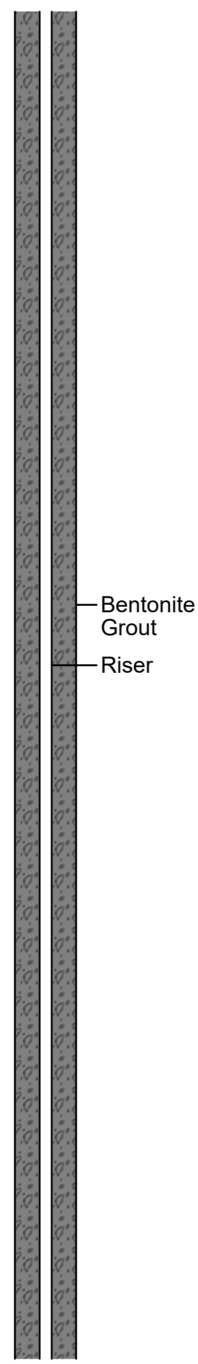
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	LOG OF BORING: PW-14 (Page 3 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
40	40-41.5': Stiff clay with fine sand.	CL			40
41.5	41.5-46.5' SILTY SAND: Light gray, fine grained, micaceous, loose.	ML			
46.5	46.5-52' CLAY: Dark gray, tight, slightly damp.	CL			
52	52-53.25' CLAYEY SAND: Dark gray, slightly damp. Fine to medium grained, damp. 53.25-56.5': Medium to coarse grained.	SC			52
56.5	56.5-62' CLAY: Dark gray, stiff.	CL			
60					60

Well: PW-14
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

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DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

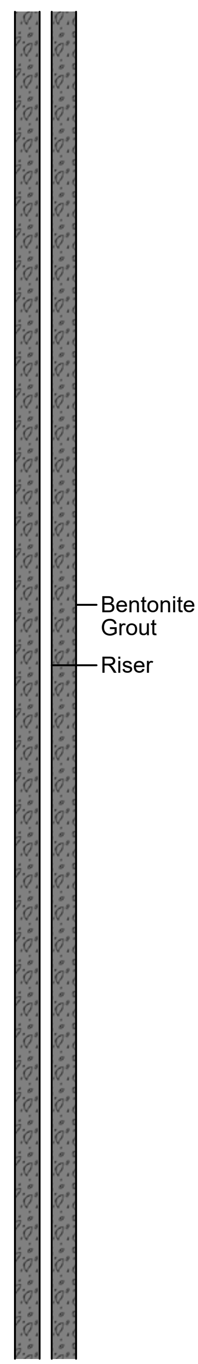
Date Started	: 8/26/2019
Date Completed	: 8/27/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Ken Stuart/Bret Nemeth
Boring Log By	: Ken Stuart/Bret Nemeth

LOG OF BORING: PW-14

NAD83 1983	: NC SP Coordinates
Northing	:
Easting	:
Completed Depth:	: 146'
Boring Depth	: 157'
Elevation/TOC	:

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
60–61		CL			60–61
61–62.5	62-62.5': Fine to medium grained sandy clay with lignite at last 2" (chunks >1"), soft, damp.	CL			61–62.5
62.5–72.25	62.5-69' SAND: Loose, fine to medium grained, very damp to wet. 69-71': Gray, fine to medium sand with many lignite chunks throughout and little clay lens, loose, damp. Dark gray silty clay with mica present at 71-71.5', stiff. 71.5-72.25': Medium to coarse grained, loose, micaceous.	SC			62.5–72.25
72.25–77	72.25-77' SILTY CLAY: Dark gray, stiff.	CL			72.25–77
77–80	77-89.5' CLAY: Dark gray, moderately plastic, very stiff, fissile, micaceous, moist.	CH			77–80

Well: PW-14
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	LOG OF BORING: PW-14 (Page 5 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
80	80-89.5' CLAY: Dark gray, moderately plastic, very stiff, fissile, micaceous, moist.	CH			80
89.5	89.5-90': Becomes wet, medium stiff.				
90	90-92': Becomes moist and stiff.				
92	92-93': Becomes medium stiff, wet.				
93	93-94.5' SAND: Gray, coarse grained, well sorted, dense, moist.	SW			93
94.5	94.5-96.5' CLAY: Dark gray, highly plastic, stiff, fissile, micaceous, moist. Becoming very stiff at 96'. Becoming medium stiff and moderately plastic at 96.5'.	CH			
96.5	96.5-97' SAND: Dark gray, coarse grained, well sorted sand with clay, dense, moist.	SW			
97	97-97.5' CLAY: Dark gray, medium stiff, highly plasic, micaceous moist.	CH			97
97.5	97.5-99' SAND: Light gray, medium stiff, coarse grained, dense, well sorted, moist.	SW			
99	99-101' CLAY:	CH			99

Well: PW-14
TOC Elev: :

Bentonite Grout
Riser

Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

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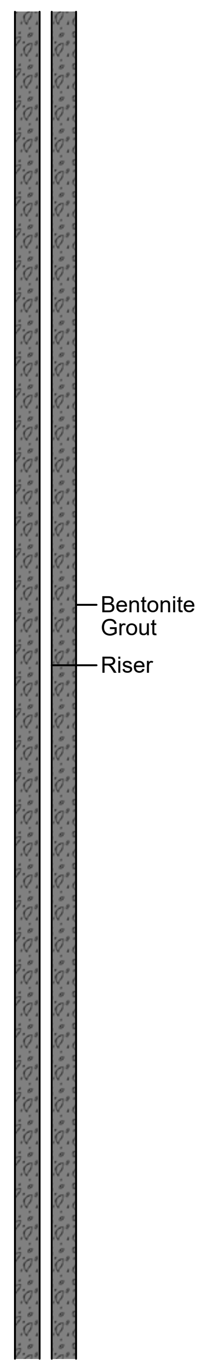
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	LOG OF BORING: PW-14 (Page 6 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.
100	Dark gray, medium stiff, highly plastic, fissile, micaceous, wet.	CH		
101	101-108' SAND: Gray, medium grained, dense, well sorted, micaceous, wet.	SW		
103	Becoming lighter gray at 103.5'.			
107	Trace of silt at 107.5'.			
108	108-108.5' CLAY: Dark gray, very stiff, highly plastic, micaceous, moist.	CH		
108.5	108.5-108.75' SANDY CLAY: Dark gray, soft, moderately plastic, wet.	CL		
108.75	108.75-110' CLAY: Dark gray, very stiff, highly plastic, fissile, micaceous, moist.	CH		
110	110-111' CLAYEY SAND: Dark gray, dense, medium grained, well sorted, micaceous, wet.	SC		
111	111-121.5' CLAY: Dark gray, very stiff, highly plastic, fissile, micaceous, moist.	CH		
117	Becomes stiff at 117'.			

Well: PW-14
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

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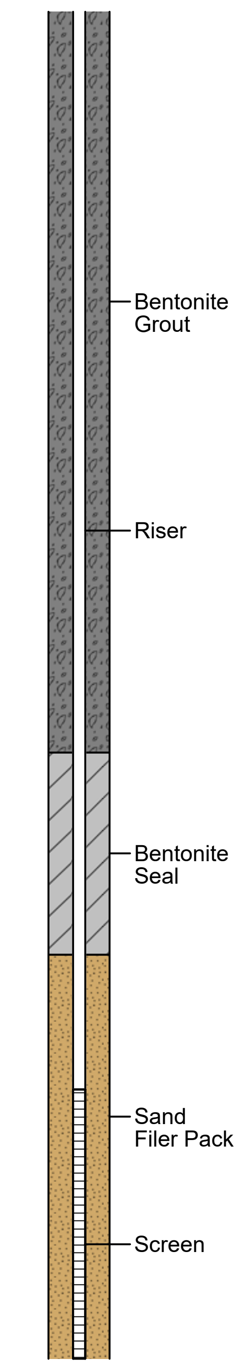
DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/26/2019 Date Completed : 8/27/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : James Smith Lead Driller License # : 4472-A Geologist : Ken Stuart/Bret Nemeth Boring Log By : Ken Stuart/Bret Nemeth	LOG OF BORING: PW-14 (Page 7 of 8)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : Easting : Completed Depth: : 146' Boring Depth : 157' Elevation/TOC :

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.	Depth in feet
120–121.5	Dark gray clay, very stiff to stiff, highly plastic, fissile, micaceous, moist.	CH			
121.5–132	121.5-132' SAND: Light gray, medium dense, medium grained, well sorted, micaceous, moist.	SW			
132–136.5	132-136.5' SILTY SAND: Dark gray, medium dense, medium grained, well sorted, micaceous, moist.	SM			
136.5–139.75	136.5-139.75' CLAY: Dark gray, stiff, highly plastic, fissile, micaceous, moist.	CH			
139.75–140	139.75-143' SILTY SAND:	SM			

Well: PW-14
TOC Elev: :



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (136-146')

WELL CONSTRUCTION
Bentonite Grout : 0-131'
Bentonite Seal : 131-134'
Sand Filter Pack : 134-146'

DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

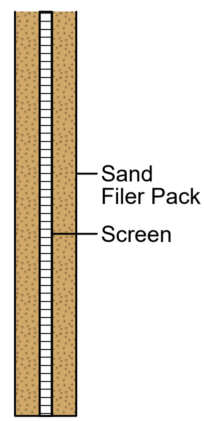
Date Started	: 8/26/2019
Date Completed	: 8/27/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: James Smith
Lead Driller License #	: 4472-A
Geologist	: Ken Stuart/Bret Nemeth
Boring Log By	: Ken Stuart/Bret Nemeth

LOG OF BORING: PW-14

NAD83 1983	: NC SP Coordinates
Northing	:
Easting	:
Completed Depth:	: 146'
Boring Depth	: 157'
Elevation/TOC	:

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev.
140–143	139.75-143' SILTY SAND: Gray, medium dense, coarse grained, well sorted, becomes medium grained and micaceous at 140.5', wet.	SM		
143–146	143-146' CLAYEY SAND: Light gray, medium dense, medium to fine grained, well sorted, wet.	SC		
146–157	146-150' SILTY CLAY: Light gray, very stiff, moderately plastic with fine grained sand, moist. 150-157': Stiff, slightly plastic with fine sand, moist to wet.	CL		
157	End of boring at 157' bgs.			

Well: PW-14
TOC Elev.: :



Well Construction Information

WELL RISER
- Material : PVC
- Diameter : 2"

WELL SCREEN
- Material : Schedule 40 PVC
- Diameter : 2"
- Slot Size : 0.010"
- Length : 10' (136-146')

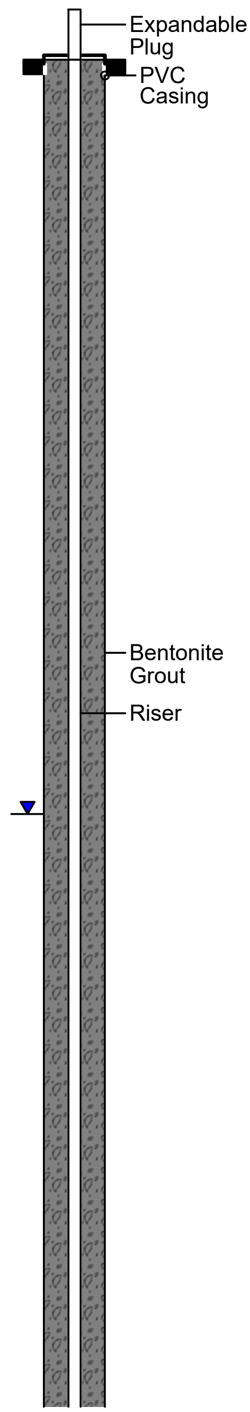
WELL CONSTRUCTION
- Bentonite Grout : 0-131'
- Bentonite Seal : 131-134'
- Sand Filter Pack : 134-146'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/13/2019 Date Completed : 8/14/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	# LOG OF BORING: PW-15R (Page 1 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project		NAD83 1983 : NC SP Coordinates Northing : 398900.875 Easting : 2051011.753 Completed Depth: : 120' Boring Depth : 139' Elevation/TOC : 133.33 / 136.14
Project Number: 449338		

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 133.33
0-4	0-4' SILTY SAND: Tan, fine grained, very loose, dry.	SM	133.33 – 129.33
4-5	4-5' CLAYEY SAND: Fine grained, damp.	SC	129.33 – 128.33
5-6	5-6': Orange yellow gray, medium grained, damp.	SC	128.33 – 127.33
6-7	6-7' CLAY: Gray, medium stiff, damp.	CL	127.33 – 126.33
7-9	7-9': Dark gray, stiff, trace of mica, damp.	CL	126.33 – 124.33
9-19	9-19': Dark gray clay with spots of orange brown at 9-11'. Stiff, crumbles from 11-12'. Dark gray clay interbedded sand layer, medium coarse, trace of organics, wet at 14'.	CL	124.33 – 114.33
19-25	19-25': Dark gray, medium stiff, organic rich at 19-21'. Light gray, interbedded fine sands at 22-23' (>1mm), damp.	CL	114.33 – 108.33

Well: PW-15R
TOC Elev: 136.14



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (110-120')

WELL CONSTRUCTION
Bentonite Grout : 0-106'
Bentonite Seal : 106-108'
Sand Filter Pack : 108-120'

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PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

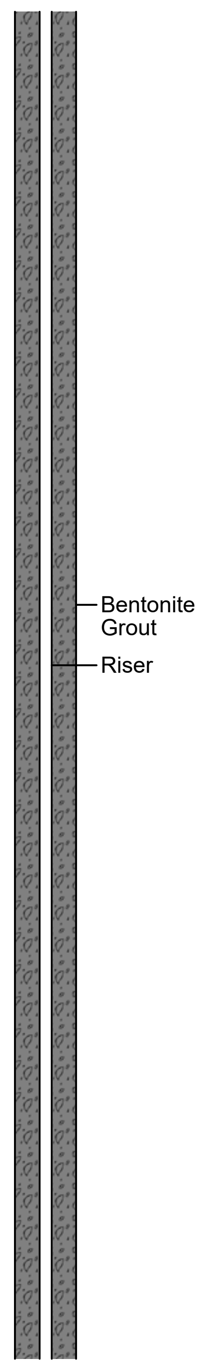
Date Started	: 8/13/2019
Date Completed	: 8/14/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: Vern Olsen
Lead Driller License #	: 2774-A
Geologist	: Brandon Weidner
Boring Log By	: Brandon Weidner

LOG OF BORING: PW-15R

NAD83 1983	: NC SP Coordinates
Northing	: 398900.875
Easting	: 2051011.753
Completed Depth:	: 120'
Boring Depth	: 139'
Elevation/TOC	: 133.33 / 136.14

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 133.33
25			108.33
25-29	25-29': Light gray, damp.	CL	107.33 – 104.33
29-31	29-31' CLAYEY SAND: Dark gray, medium grained, wet.	SC	104.33 – 102.33
31-32	31-32' SAND: Gray to greenish gray, medium to coarse grained, loose.	SP	102.33 – 101.33
32-33	32-33': Light brown, moist.	SP	101.33 – 100.33
33-36	33-36': White to tan fine grained sand, very loose. 1" clay lens at 36', dry.	SP	100.33 – 97.33
36-39	36-39' SILTY SAND: Yellowish orange, light brown to brown and red brown color, fine grained, loose, clay at 36', damp at 39'.	SM	97.33 – 94.33
39-41	39-41' SAND: Medium to coarse grained, clay lens throughout (>1"), wet.	SP	94.33 – 92.33
41-45	41-45' CLAY: Dark gray, medium stiff, interbedded with fine sand (>1mm).	CL	92.33 – 88.33
45-49	45-49' CLAYEY SAND: Brown, clay lens throughout, ranging from >1mm to 1".	SC	88.33 – 84.33
49-50	49-51.5' SILTY SAND: Brown, tan, orange-yellowish, mica rich, moist, medium to fine grained at bottom.	SM	84.33

Well: PW-15R
TOC Elev: 136.14



Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (110-120')

WELL CONSTRUCTION

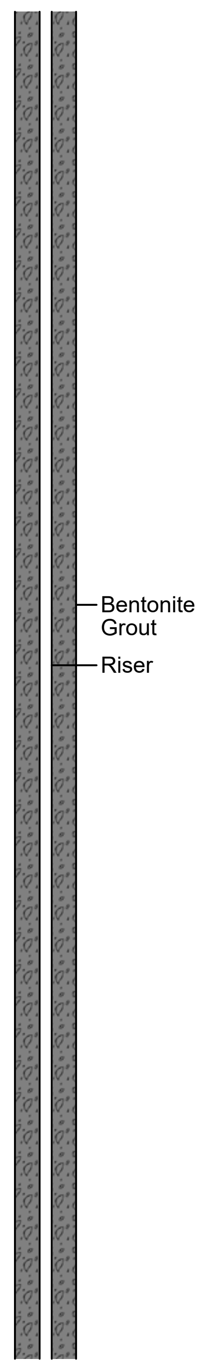
Bentonite Grout	: 0-106'
Bentonite Seal	: 106-108'
Sand Filter Pack	: 108-120'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/13/2019 Date Completed : 8/14/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-15R (Page 3 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 398900.875 Easting : 2051011.753 Completed Depth: : 120' Boring Depth : 139' Elevation/TOC : 133.33 / 136.14

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 133.33	Depth in feet
50		SM		83.33	50
51				82.33	51
52	51.5-52': Tan, light brown, very fine grained. 52-52.5': Gray color.	SM		81.33	52
53	52.5-62' CLAY: Dark gray, stiff, interbedded very fine light gray sand, damp.	CL		80.33	53
54				79.33	54
55				78.33	55
56				77.33	56
57				76.33	57
58				75.33	58
59				74.33	59
60				73.33	60
61				72.33	61
62	62-69' CLAYEY SAND: Dark gray, fine to medium grained, mica rich. Loose sand layers, medium grained at 65' and 67', both layers are 1' thick, moist.	SC		71.33	62
63				70.33	63
64				69.33	64
65				68.33	65
66				67.33	66
67				66.33	67
68				65.33	68
69	69-75' SILTY SAND: Dark gray, medium grained, moist. 2" organic layer at 70'. 5" clay lens at 71'. Very fine sand at 72'. 3" clay lens at 73'. 7" clay lens at 75'.	SM		64.33	69
70				63.33	70
71				62.33	71
72				61.33	72
73				60.33	73
74				59.33	74
75					75

Well: PW-15R
TOC Elev: 136.14



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (110-120')

WELL CONSTRUCTION
Bentonite Grout : 0-106'
Bentonite Seal : 106-108'
Sand Filter Pack : 108-120'

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PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

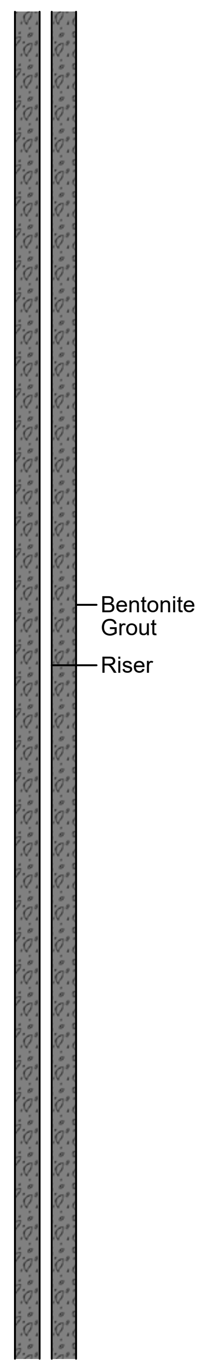
Date Started	: 8/13/2019
Date Completed	: 8/14/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: Vern Olsen
Lead Driller License #	: 2774-A
Geologist	: Brandon Weidner
Boring Log By	: Brandon Weidner

LOG OF BORING: PW-15R

NAD83 1983	: NC SP Coordinates
Northing	: 398900.875
Easting	: 2051011.753
Completed Depth:	: 120'
Boring Depth	: 139'
Elevation/TOC	: 133.33 / 136.14

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 133.33
75	75-79' SILTY SAND: Organic rich layer at 78.5'.	SM	58.33
76			57.33
77			56.33
78			55.33
79	79-88' CLAY: Dark gray, stiff, mica present, interbedded fine sand layers >1mm throughout, damp.	CL	54.33
80			53.33
81			52.33
82			51.33
83			50.33
84			49.33
85			48.33
86			47.33
87			46.33
88	88-97' SILTY SAND: Dark gray to light gray, medium grained, trace of micas, poorly sorted, moist.	SM	45.33
89			44.33
90			43.33
91			42.33
92			41.33
93			40.33
94			39.33
95			38.33
96			37.33
97	97-99': Fine grained.		36.33
98			35.33
99	99-103': Light gray to gray, medium grained, mica present.	SM	34.33
100			

Well: PW-15R
TOC Elev: 136.14



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (110-120')

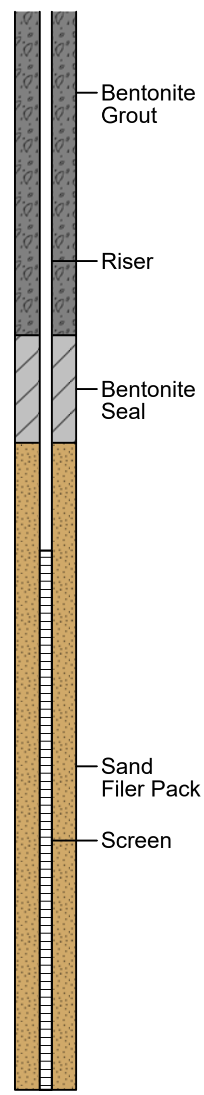
WELL CONSTRUCTION
Bentonite Grout : 0-106'
Bentonite Seal : 106-108'
Sand Filter Pack : 108-120'

DRAFT - Pending

PARSONS INFRASTRUCTURE 4704 Hedgemore Drive Charlotte, North Carolina 28209	Date Started : 8/13/2019 Date Completed : 8/14/2019 Drilling Method : Sonic Sampling Method : Continuous Core Drilling Firm : Cascade Lead Driller : Vern Olsen Lead Driller License # : 2774-A Geologist : Brandon Weidner Boring Log By : Brandon Weidner	LOG OF BORING: PW-15R (Page 5 of 6)
The Chemours Company FC, LLC Fayetteville P16 - P18 Delineation Well Drilling Project Project Number: 449338		NAD83 1983 : NC SP Coordinates Northing : 398900.875 Easting : 2051011.753 Completed Depth: : 120' Boring Depth : 139' Elevation/TOC : 133.33 / 136.14

Depth in feet	DESCRIPTION	USCS	GRAPHIC	Surf. Elev. 133.33	Depth in feet
100		SM		33.33	100
101				32.33	101
102				31.33	102
103		SM		30.33	103
104				29.33	104
105	103-109' SILTY SAND: Trace of clay at 103'.			28.33	105
106				27.33	106
107				26.33	107
108				25.33	108
109		SM		24.33	109
110				23.33	110
111				22.33	111
112	109-119': Gray to light gray, medium grained, mica present, moist, 2" clay lens at 118'.			21.33	112
113				20.33	113
114				19.33	114
115				18.33	115
116				17.33	116
117				16.33	117
118	Clay lens at 118'.			15.33	118
119	119-120': Fine grained.			14.33	119
120	120-121' CLAY: Dark gray, stiff.	CL		13.33	120
121	121-123' SILTY SAND: Dark gray to gray, fine grained, mica present, moist, approximately 1" clay lens at 122.5'.	MS		12.33	121
122				11.33	122
123	123-125': Medium grained, moist.			10.33	123
124				9.33	124
125					125

Well: PW-15R
TOC Elev: 136.14



Well Construction Information

WELL RISER
Material : PVC
Diameter : 2"

WELL SCREEN
Material : Schedule 40 PVC
Diameter : 2"
Slot Size : 0.010"
Length : 10' (110-120')

WELL CONSTRUCTION
Bentonite Grout : 0-106'
Bentonite Seal : 106-108'
Sand Filter Pack : 108-120'

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DRAFT - Pending

PARSONS INFRASTRUCTURE
4704 Hedgemore Drive
Charlotte, North Carolina 28209

The Chemours Company FC, LLC
Fayetteville
P16 - P18 Delineation Well Drilling Project

Project Number: 449338

Date Started	: 8/13/2019
Date Completed	: 8/14/2019
Drilling Method	: Sonic
Sampling Method	: Continuous Core
Drilling Firm	: Cascade
Lead Driller	: Vern Olsen
Lead Driller License #	: 2774-A
Geologist	: Brandon Weidner
Boring Log By	: Brandon Weidner

LOG OF BORING: PW-15R

NAD83 1983	: NC SP Coordinates
Northing	: 398900.875
Easting	: 2051011.753
Completed Depth:	: 120'
Boring Depth	: 139'
Elevation/TOC	: 133.33 / 136.14

Depth in feet	DESCRIPTION	USCS	Surf. Elev. 133.33
125	125-126' CLAY: Stiff, damp.	CL	8.33
126	126-128' SILTY SAN D: Dark gray to gray, medium grained, moist, clay lens at 127'.	SM	7.33
128	128-129' CLAY: Stiff, damp, interbedded light gray, fine grained sand >1mm.	CL	5.33
129	129-132' SILTY SAND: Very light gray, medium grained, poorly sorted, wet. Finer grained at 132'.	SM	4.33
132	132-136' SILTY CLAY: Light gray, trace of very fine sand, stiff, damp. 136-139': Light gray, stiff, damp.	CL	1.33
139	End of boring at 139'.		-5.67

Depth in feet	Surf. Elev.	Depth in feet
125	8.33	125
126	7.33	126
127	6.33	127
128	5.33	128
129	4.33	129
130	3.33	130
131	2.33	131
132	1.33	132
133	.33	133
134	-.67	134
135	-1.67	135
136	-2.67	136
137	-3.67	137
138	-4.67	138
139	-5.67	139
140	-6.67	140
141	-7.67	141
142	-8.67	142
143	-9.67	143
144	-10.67	144
145	-11.67	145
146	-12.67	146
147	-13.67	147
148	-14.67	148
149	-15.67	149
150		150

Well: PW-15R
TOC Elev: 136.14

Well Construction Information

WELL RISER

Material	: PVC
Diameter	: 2"

WELL SCREEN

Material	: Schedule 40 PVC
Diameter	: 2"
Slot Size	: 0.010"
Length	: 10' (110-120')

WELL CONSTRUCTION

Bentonite Grout	: 0-106'
Bentonite Seal	: 106-108'
Sand Filter Pack	: 108-120'

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APPENDIX E
Slug Test Data

TABLE E-1
ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

			LTW-01					LTW-03						LTW-04			
			Test 1	Test 2 [3]	Test 3 [3]	Test 4 [3]	Test 5 [3]	Test 1	Test 2	Test 3 [3]	Test 4 [3]	Test 5 [3]	Test 6 [3]	Test 1 [2]	Test 2 [2]	Test 3 [2]	Test 4 [2]
			Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual	Manual
			Slug Out	Slug Out	Slug Out	Slug Out	Slug Out	Slug In	Slug Out	Slug In	Slug Out	Slug In	Slug Out	Slug In	Slug In	Slug Out	Slug In
Well Information	Well Diameter (in)		2					2						2			
Well Information	Initial Boring Diameter (in)		6					6						6			
Well Information	Screen interval (ft BTOC)		11-26					15-30						12-27			
Well Information	Well Depth (ft BTOC)		26					30						27			
Well Information	Confined or Unconfined Aquifer		Unconfined					Unconfined						Unconfined			
Well Information	Aquifer Unit		Floodplain Deposits					Floodplain Deposits						Floodplain Deposits			
Well Information	Ground Surface Elevation		51.22					50.33						49.34			
Well Information	TOC Elevation (ft NAVD 88)		53.83					52.91						51.86			
Well Information	Static Water Level (ft BTOC)		16.24					12.85						8.71			
Well Information	Static Water Level (ft BLS)		13.63					10.27						6.19			
AQTESOLV Input	Initial Displacement (ft) [AQTESOLV H(0)]		2.08	2.24	2.10	2.13	2.14	-3.06	2.03	-2.82	2.62	-3.00	2.53	-3.13	-3.10	2.28	-2.56
AQTESOLV Input	Static Water Column Height (ft) [AQTESOLV H]		9.76					17.15						18.29			
AQTESOLV Input	Formation Saturated Thickness (ft) [AQTESOLV b]		16					13						41			
AQTESOLV Input	Vertical-to-Horizontal hydraulic conductivity anisotropy ratio [AQTESOLV Kv/Kh]		0.1					0.1						0.1			
AQTESOLV Input	Water level above top of well screen [AQTESOLV d]		-5.24					2.15						3.29			
AQTESOLV Input	Screen Length (ft) [AQTESOLV "L"]		15					15						15			
AQTESOLV Input	Inside Radius of Well Casing (ft) [AQTESOLV r(c)]		0.17					0.17						0.17			
AQTESOLV Input	Radius of Well (ft) [AQTESOLV r(w)]		0.5					0.5						0.5			
AQTESOLV Input	Well Skin Radius (ft) [AQTESOLV r(sk)]		0.5					0.5						0.5			
Slug Test Results	Bouwer-Rice (1976)	K (cm/sec)	6.10E-04	1.44E-04	1.81E-04	1.12E-04	2.03E-04	1.30E-03	1.66E-03	1.26E-04	1.40E-04	1.23E-04	1.28E-04	1.43E-05	8.39E-05	3.70E-05	1.05E-04
Slug Test Results	Hvorslev (1951)	K (cm/sec)	8.99E-04	1.94E-04	2.41E-04	1.79E-04	2.68E-04	2.91E-03	3.34E-03	3.02E-04	3.12E-04	2.00E-04	2.76E-04	2.04E-05	1.17E-04	4.62E-05	1.49E-04
Slug Test Results	Geometric Mean	K (cm/sec)	2.43E-04					4.20E-04						5.43E-05			
Slug Test Results	Geometric Mean	K (feet/day)	0.69					1.19						0.15			

TABLE E-1
ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

			SMW-12									LTW-02				
			Test 1 [2]	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 9	Test 1	Test 2	Test 3	Test 4	Test 5
			Manual	Manual	Manual	Manual	Manual	Manual	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
			Slug In	Slug Out	Slug In	Slug Out	Slug In	Slug Out	psi	psi	psi	psi	psi	psi	psi	psi
Well Information	Well Diameter (in)		2									2				
Well Information	Initial Boring Diameter (in)		6									6				
Well Information	Screen interval (ft BTOC)		88-98									28-38				
Well Information	Well Depth (ft BTOC)		98									38				
Well Information	Confined or Unconfined Aquifer		Confined									Confined				
Well Information	Aquifer Unit		Black Creek Aquifer									Black Creek Aquifer				
Well Information	Ground Surface Elevation		116.33									50.03				
Well Information	TOC Elevation (ft NAVD 88)		113.72									52.48				
Well Information	Static Water Level (ft BTOC)		83.99									10.31				
Well Information	Static Water Level (ft BLS)		86.60									7.86				
AQTESOLV Input	Initial Displacement (ft) [AQTESOLV H(0)]		-2.41	1.91	-2.89	1.91	-2.56	1.91	2.67	3.55	3.44	3.99	3.57	3.89	3.34	4.43
AQTESOLV Input	Static Water Column Height (ft) [AQTESOLV H]		14.01									27.69				
AQTESOLV Input	Formation Saturated Thickness (ft) [AQTESOLV b]		20									15				
AQTESOLV Input	Vertical-to-Horizontal hydraulic conductivity anisotropy ratio [AQTESOLV Kv/Kh]		0.1									0.1				
AQTESOLV Input	Water level above top of well screen [AQTESOLV d]		4.01									17.69				
AQTESOLV Input	Screen Length (ft) [AQTESOLV "L"]		10									10				
AQTESOLV Input	Inside Radius of Well Casing (ft) [AQTESOLV r(c)]		0.17									0.17				
AQTESOLV Input	Radius of Well (ft) [AQTESOLV r(w)]		0.5									0.5				
AQTESOLV Input	Well Skin Radius (ft) [AQTESOLV r(sk)]		0.5									0.5				
Slug Test Results	Bouwer-Rice (1976)	K (cm/sec)	2.15E-02	1.72E-02	2.67E-03	4.05E-03	3.84E-03	4.14E-03	1.72E-02	1.60E-02	1.49E-02	9.45E-03	1.09E-02	1.05E-02	1.04E-02	1.12E-02
Slug Test Results	Hvorslev (1951)	K (cm/sec)	2.88E-02	2.40E-02	3.56E-03	5.55E-03	5.19E-03	5.64E-03	2.25E-02	2.17E-02	2.03E-02	1.30E-02	1.37E-02	1.32E-02	1.32E-02	1.30E-02
Slug Test Results	Geometric Mean	K (cm/sec)	1.00E-02									1.18E-02				
Slug Test Results	Geometric Mean	K (feet/day)	28.38									33.32				

TABLE E-1
ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

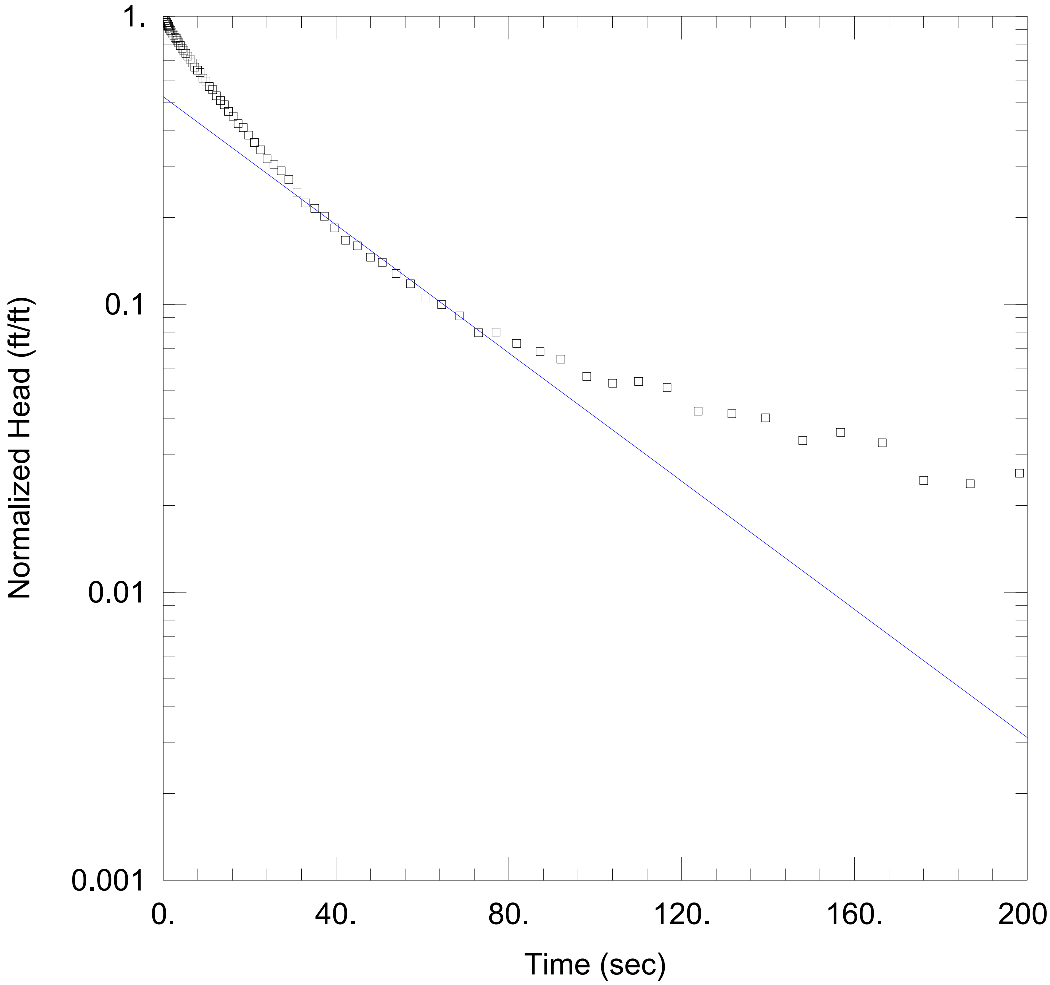
			LTW-05								BCA-01				
			Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Test 7	Test 8	Test 1	Test 2	Test 3	Test 4	Test 5
			Manual	Manual	Manual	Manual	Manual	Manual	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
			Slug In	Slug Out	Slug In	Slug Out	Slug In	Slug Out	psi	psi	psi	psi	psi	psi	psi
Well Information	Well Diameter (in)		2								2				
Well Information	Initial Boring Diameter (in)		6								6				
Well Information	Screen interval (ft BTOC)		29-44								101-91				
Well Information	Well Depth (ft BTOC)		44								101				
Well Information	Confined or Unconfined Aquifer		Confined								Confined				
Well Information	Aquifer Unit		Floodplain Deposits / Black Creek Aquifer								Black Creek Aquifer				
Well Information	Ground Surface Elevation		49.29								143.26				
Well Information	TOC Elevation (ft NAVD 88)		52.01								146.30				
Well Information	Static Water Level (ft BTOC)		9.62								57.96				
Well Information	Static Water Level (ft BLS)		6.90								54.93				
AQTESOLV Input	Initial Displacement (ft) [AQTESOLV H(0)]		-1.99	1.99	-2.22	1.82	-2.45	2.01	4.29	3.72	6.72	3.97	3.84	3.90	4.99
AQTESOLV Input	Static Water Column Height (ft) [AQTESOLV H]		34.38								43.04				
AQTESOLV Input	Formation Saturated Thickness (ft) [AQTESOLV b]		38								31				
AQTESOLV Input	Vertical-to-Horizontal hydraulic conductivity anisotropy ratio [AQTESOLV Kv/Kh]		0.1								0.1				
AQTESOLV Input	Water level above top of well screen [AQTESOLV d]		19.38								33.04				
AQTESOLV Input	Screen Length (ft) [AQTESOLV "L"]		15								10				
AQTESOLV Input	Inside Radius of Well Casing (ft) [AQTESOLV r(c)]		0.17								0.17				
AQTESOLV Input	Radius of Well (ft) [AQTESOLV r(w)]		0.5								0.5				
AQTESOLV Input	Well Skin Radius (ft) [AQTESOLV r(sk)]		0.5								0.5				
Slug Test Results	Bouwer-Rice (1976)	K (cm/sec)	1.78E-03	1.89E-03	2.67E-03	1.78E-03	2.40E-03	1.38E-03	1.57E-03	1.46E-03	4.60E-03	3.39E-03	7.97E-03	1.94E-03	3.57E-03
Slug Test Results	Hvorslev (1951)	K (cm/sec)	2.25E-03	2.32E-03	3.26E-03	1.99E-03	2.99E-03	1.71E-03	2.01E-03	1.81E-03	5.23E-03	3.62E-03	9.45E-03	2.11E-03	3.85E-03
Slug Test Results	Geometric Mean	K (cm/sec)	2.02E-03								4.07E-03				
Slug Test Results	Geometric Mean	K (feet/day)	5.73								11.54				

TABLE E-1
ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

			BCA-02					BCA-04				
			Test 1	Test 2	Test 3	Test 4	Test 5	Test 1	Test 2	Test 3	Test 4	Test 5
			Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
			psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
Well Information	Well Diameter (in)		2					2				
	Initial Boring Diameter (in)		6					6				
	Screen interval (ft BTOC)		102-92					104-94				
	Well Depth (ft BTOC)		102					104				
	Confined or Unconfined Aquifer		Confined					Confined				
	Aquifer Unit		Black Creek Aquifer					Black Creek Aquifer				
	Ground Surface Elevation		145.20					147.069				
	TOC Elevation (ft NAVD 88)		148.42					150.241				
	Static Water Level (ft BTOC)		73.40					27.52				
	Static Water Level (ft BLS)		70.18					24.35				
AQTESOLV Input	Initial Displacement (ft) [AQTESOLV H(0)]		4.52	4.31	6.80	4.99	5.10	3.93	3.72	3.52	3.49	3.86
	Static Water Column Height (ft) [AQTESOLV H]		28.60					76.48				
	Formation Saturated Thickness (ft) [AQTESOLV b]		33					34				
	Vertical-to-Horizontal hydraulic conductivity anisotropy ratio [AQTESOLV Kv/Kh]		0.1					0.1				
	Water level above top of well screen [AQTESOLV d]		18.60					66.48				
	Screen Length (ft) [AQTESOLV "L"]		10					10				
	Inside Radius of Well Casing (ft) [AQTESOLV r(c)]		0.17					0.17				
	Radius of Well (ft) [AQTESOLV r(w)]		0.5					0.5				
	Well Skin Radius (ft) [AQTESOLV r(sk)]		0.5					0.5				
Slug Test Results	Bouwer-Rice (1976)	K (cm/sec)	7.97E-03	6.93E-03	5.80E-03	5.80E-03	5.47E-03	2.48E-02	2.69E-02	2.66E-02	2.67E-02	2.60E-02
	Hvorslev (1951)	K (cm/sec)	9.77E-03	8.64E-03	7.11E-03	7.11E-03	6.71E-03	3.06E-02	2.96E-02	2.92E-02	2.93E-02	2.86E-02
	Geometric Mean	K (cm/sec)	7.02E-03					2.78E-02				
	Geometric Mean	K (feet/day)	19.90					78.74				

TABLE E-1
ESTIMATED HYDRAULIC CONDUCTIVITY
Chemours Fayetteville Works, North Carolina

Notes:
1. Pneumatic slug tests were performed only at locations where well screen was fully saturated. Manual slug tests were performed at all other well locations.
2. Initial displacement suspected to display oscillatory response likely due to inertial effects.
3. Initial displacement response curve suspected to display double-straight line effect due to drainage from filter pack. Analytical solutions are fit to the second-straight line displacement curve representing post-filter drainage, aquifer response.
4. Displacement time curves and AQTESOLV outputs used to summarize results here are included in this Appendix.
5. Abbreviations:
cm/sec - centimeter per second
ft BLS - feet below land surface
NAVD 88 - North American Vertical Datum 1988
ft BTOC - feet below top of casing
in - inches
ft - feet
ft/day - feet per day
K - hydraulic conductivity



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T1_br.aqt
Date: 08/15/19 Time: 10:40:05

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft Anisotropy Ratio (Kz/Kr): 0.1

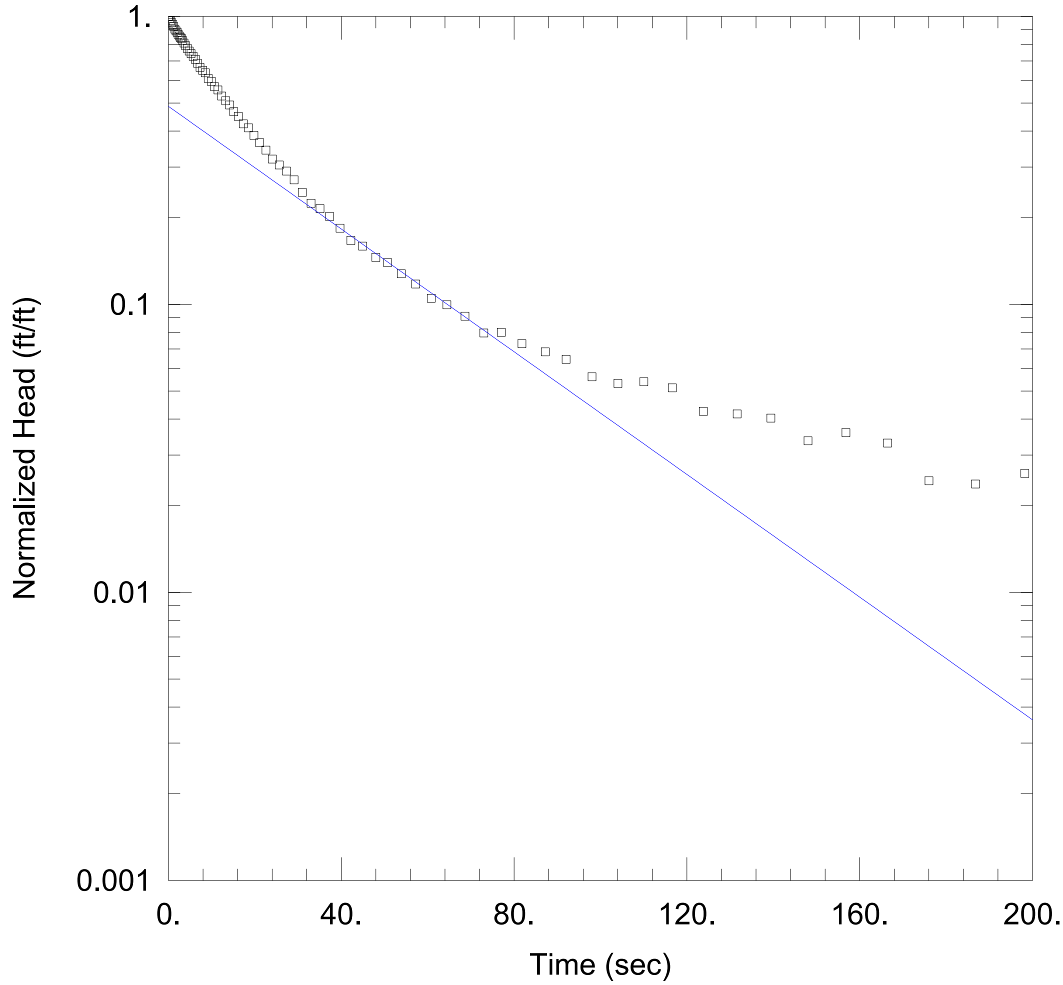
WELL DATA (BCA-01-T1)

Initial Displacement: 6.722 ft Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.0046 cm/sec y0 = 3.532 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T1_h.aqt
Date: 08/15/19 Time: 10:38:05

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

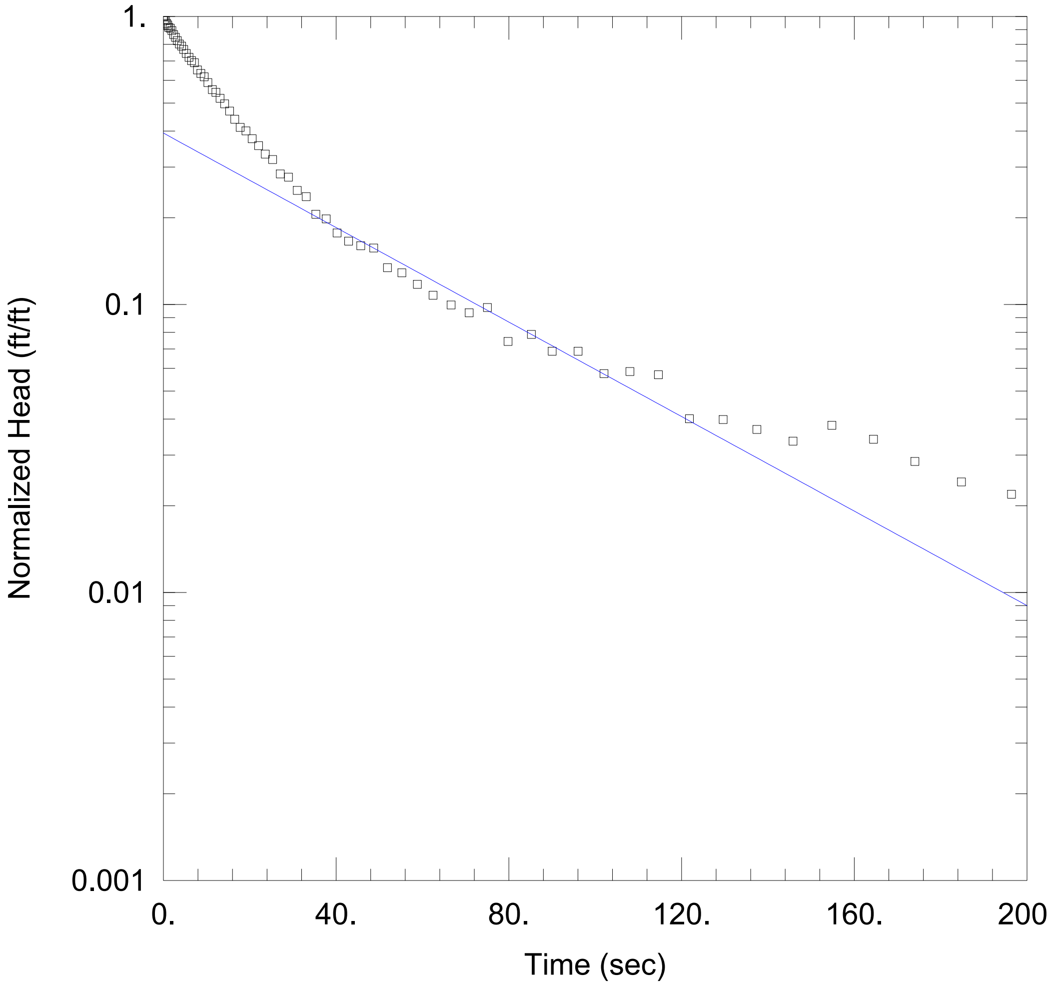
WELL DATA (BCA-01-T1)

Initial Displacement: 6.722 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.005228 cm/sec
y0 = 3.275 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T2_br.aqt
Date: 08/15/19 Time: 10:45:01

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

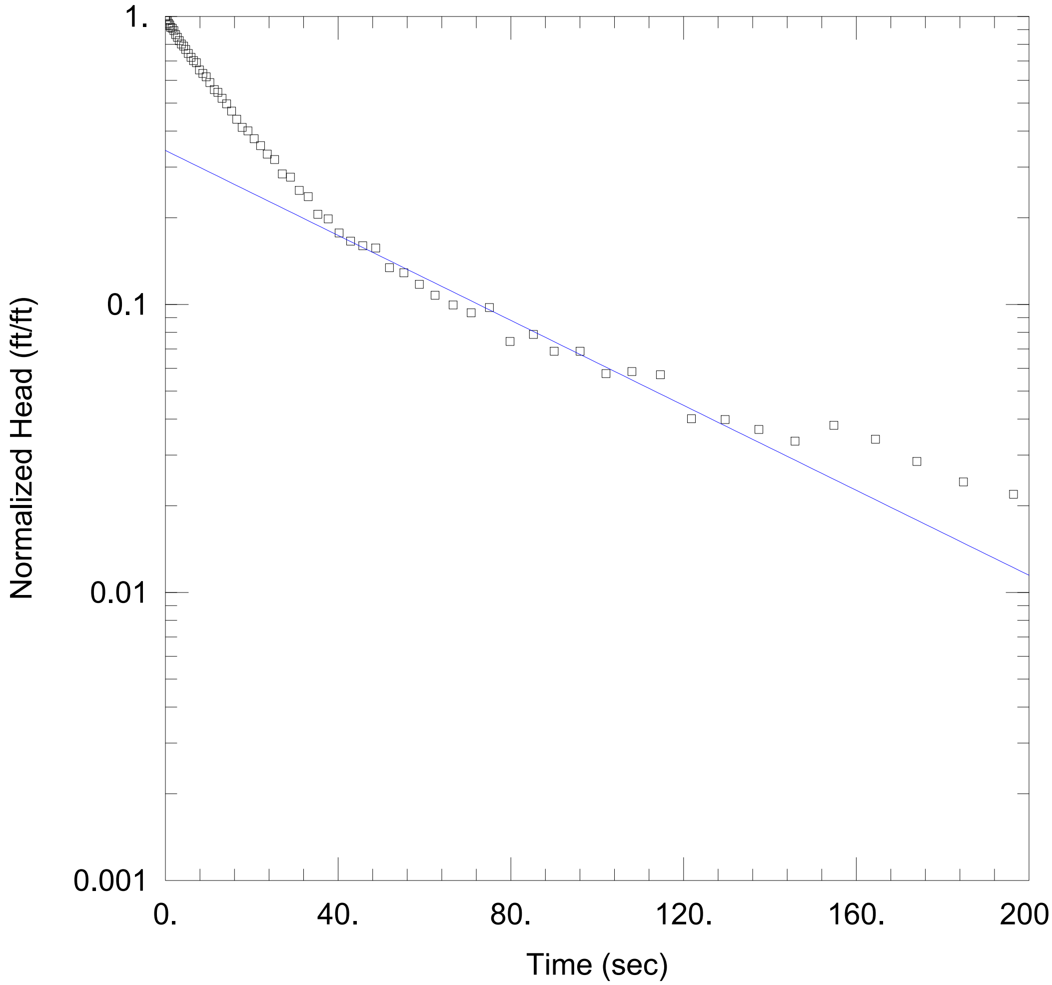
WELL DATA (BCA-01-T2)

Initial Displacement: 3.967 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.003392 cm/sec
y0 = 1.561 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T2_h.aqt
Date: 08/15/19 Time: 10:44:03

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

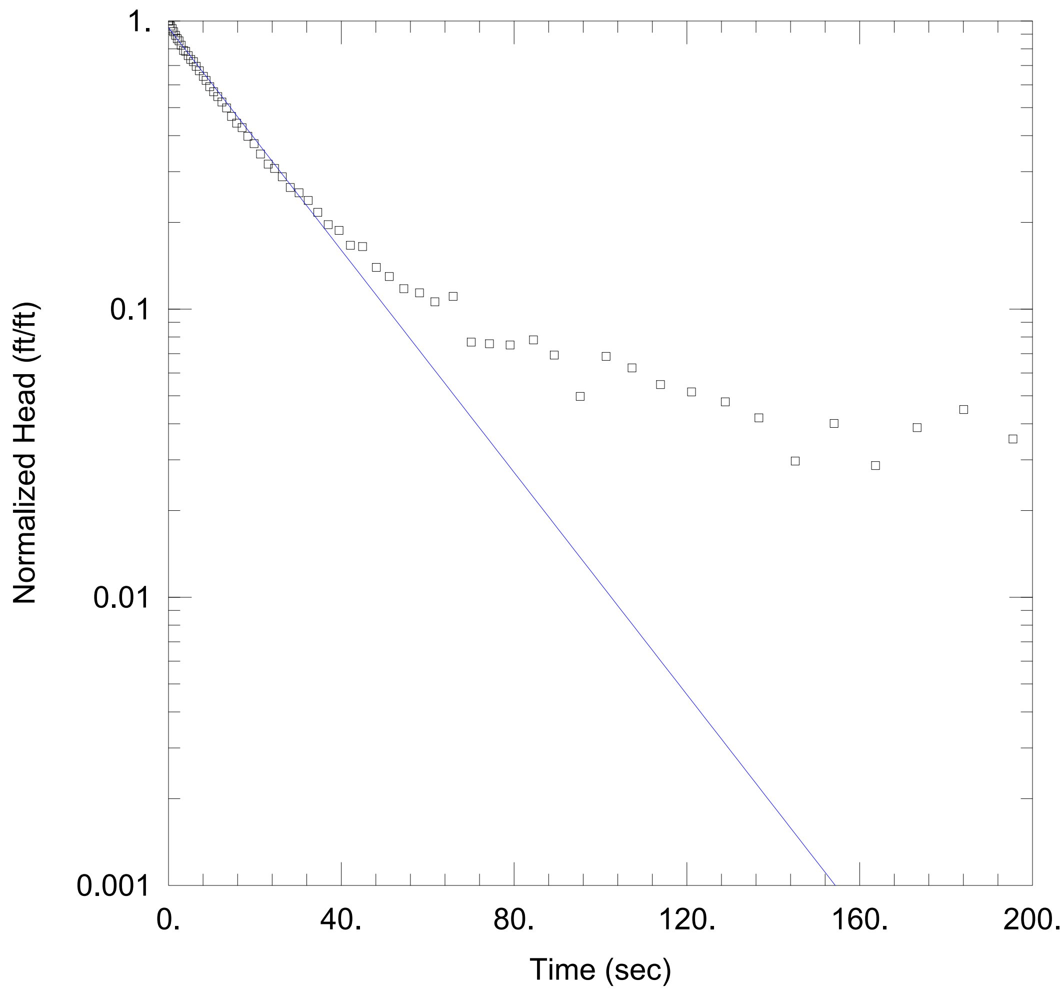
WELL DATA (BCA-01-T2)

Initial Displacement: 3.967 ft
Total Well Penetration Depth: 43.04 ft
Casing Radius: 0.17 ft
Static Water Column Height: 43.04 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.003621 cm/sec
y0 = 1.359 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T3_br.aqt
Date: 08/15/19 Time: 10:54:34

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft Anisotropy Ratio (Kz/Kr): 0.1

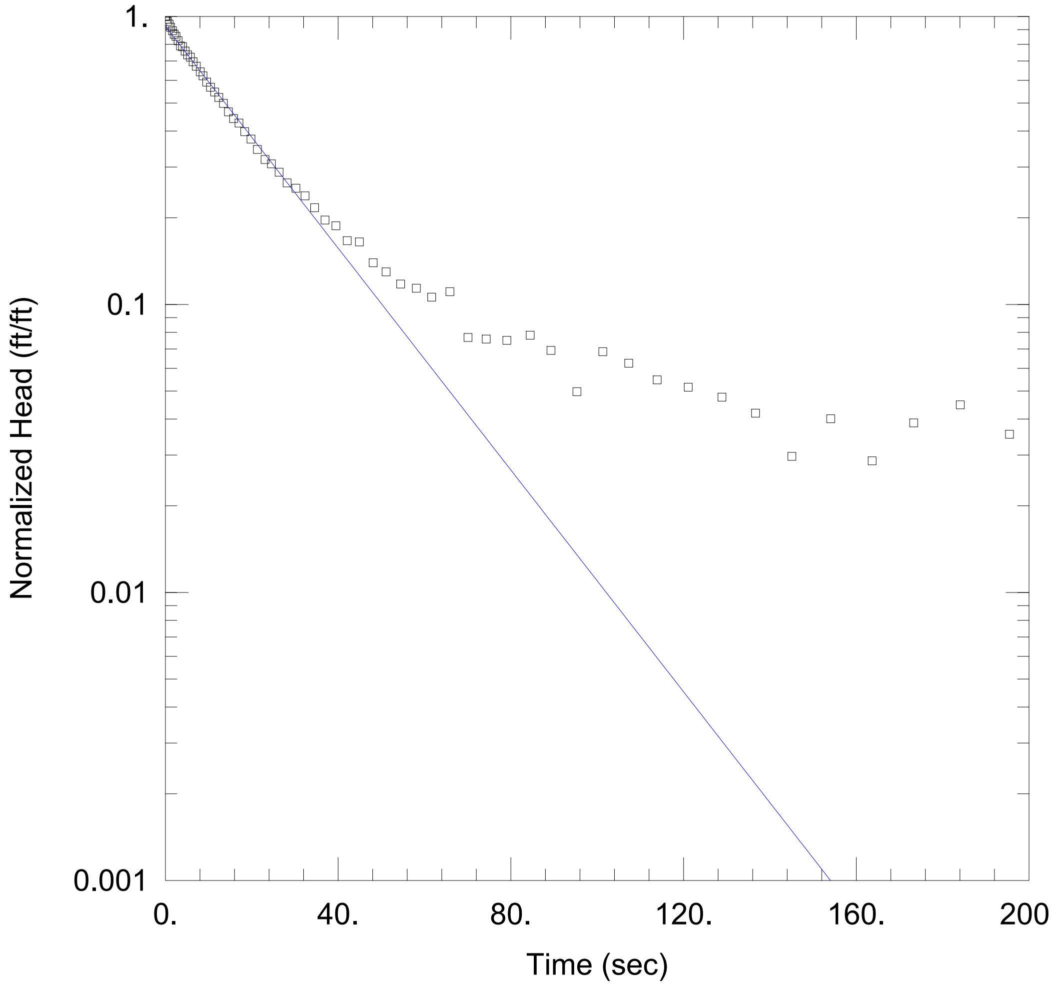
WELL DATA (BCA-01-T3)

Initial Displacement: 3.84 ft Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.007972 cm/sec y0 = 3.63 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T3_h.aqt
Date: 08/15/19 Time: 10:50:10

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

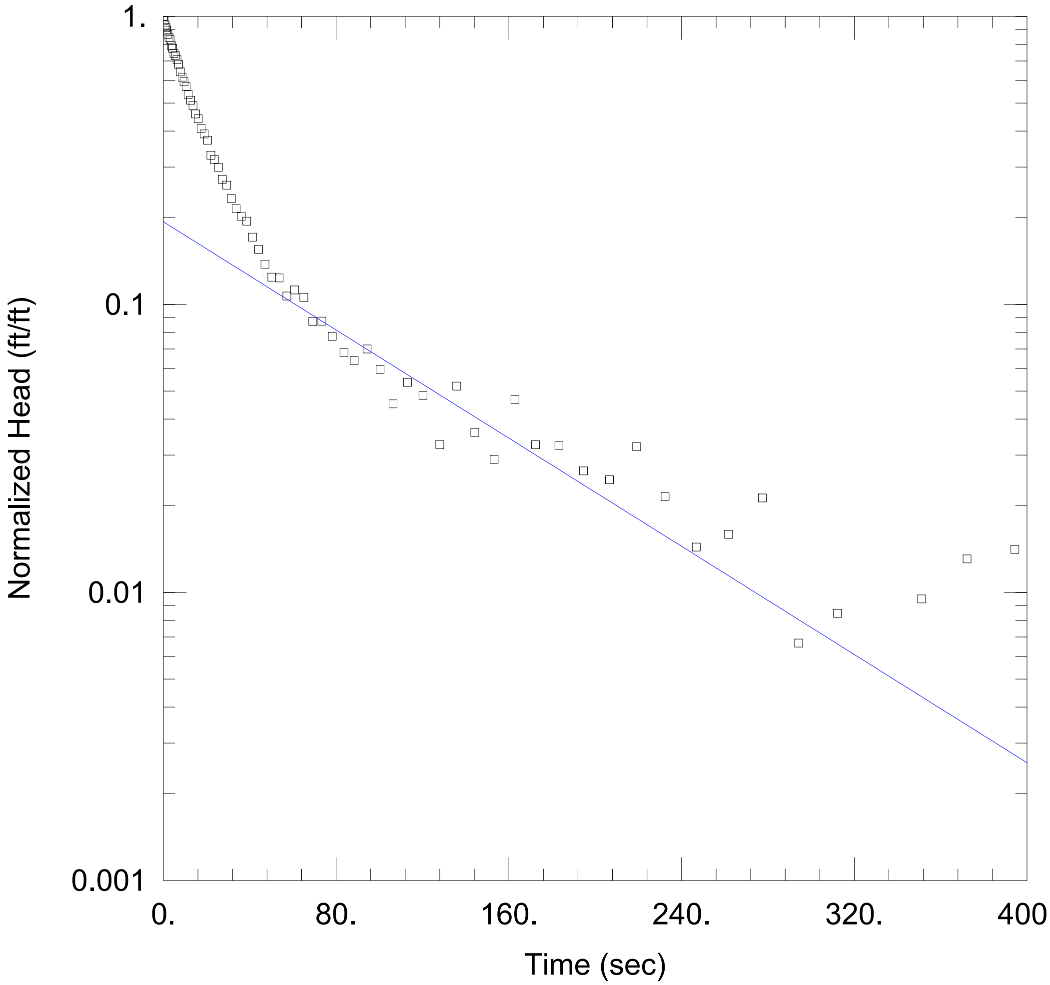
WELL DATA (BCA-01-T3)

Initial Displacement: 3.84 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.009452 cm/sec
y0 = 3.547 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T4_br.aqt
Date: 08/15/19 Time: 11:13:38

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

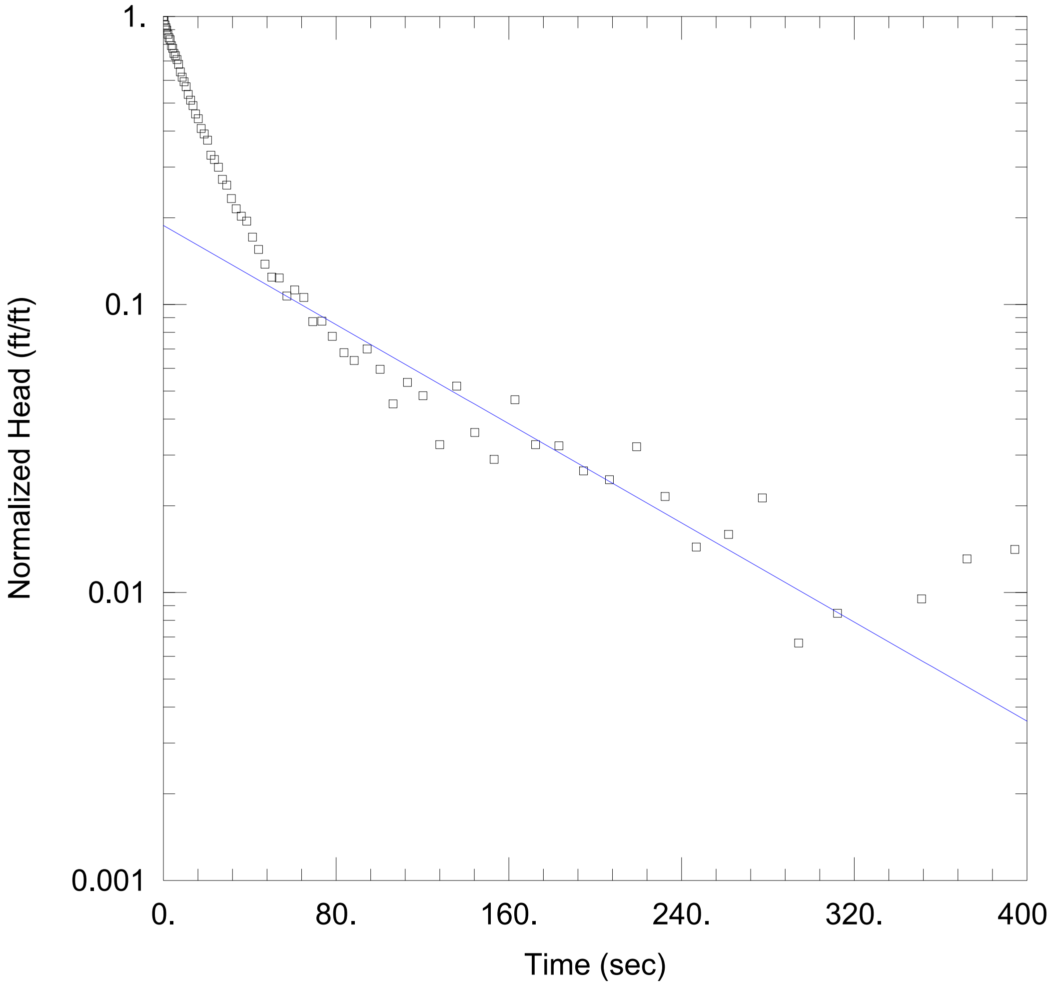
WELL DATA (BCA-01-T4)

Initial Displacement: 3.899 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001941 cm/sec
y0 = 0.7547 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T4_h.aqt
Date: 08/15/19 Time: 11:12:33

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

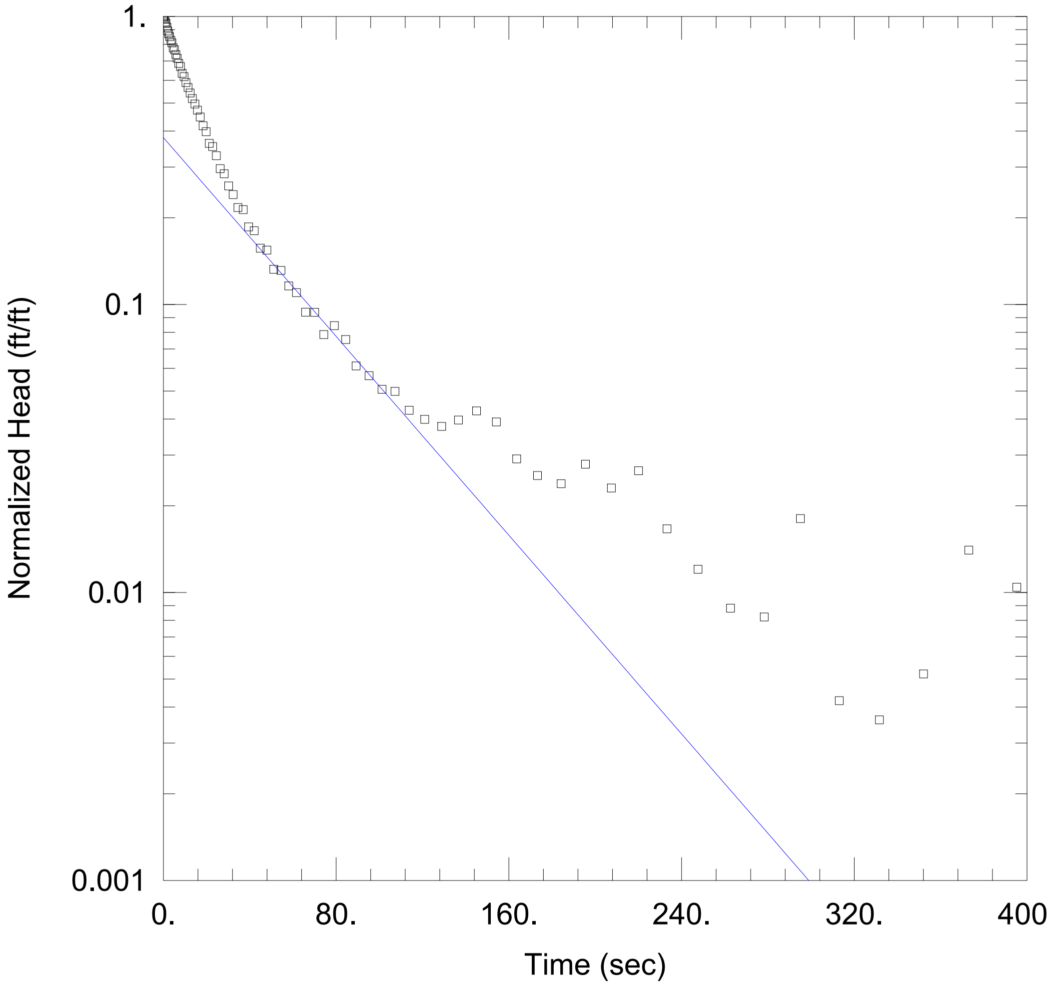
WELL DATA (BCA-01-T4)

Initial Displacement: 3.899 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002112 cm/sec
y0 = 0.7329 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T5_br.aqt
Date: 08/15/19 Time: 11:25:53

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

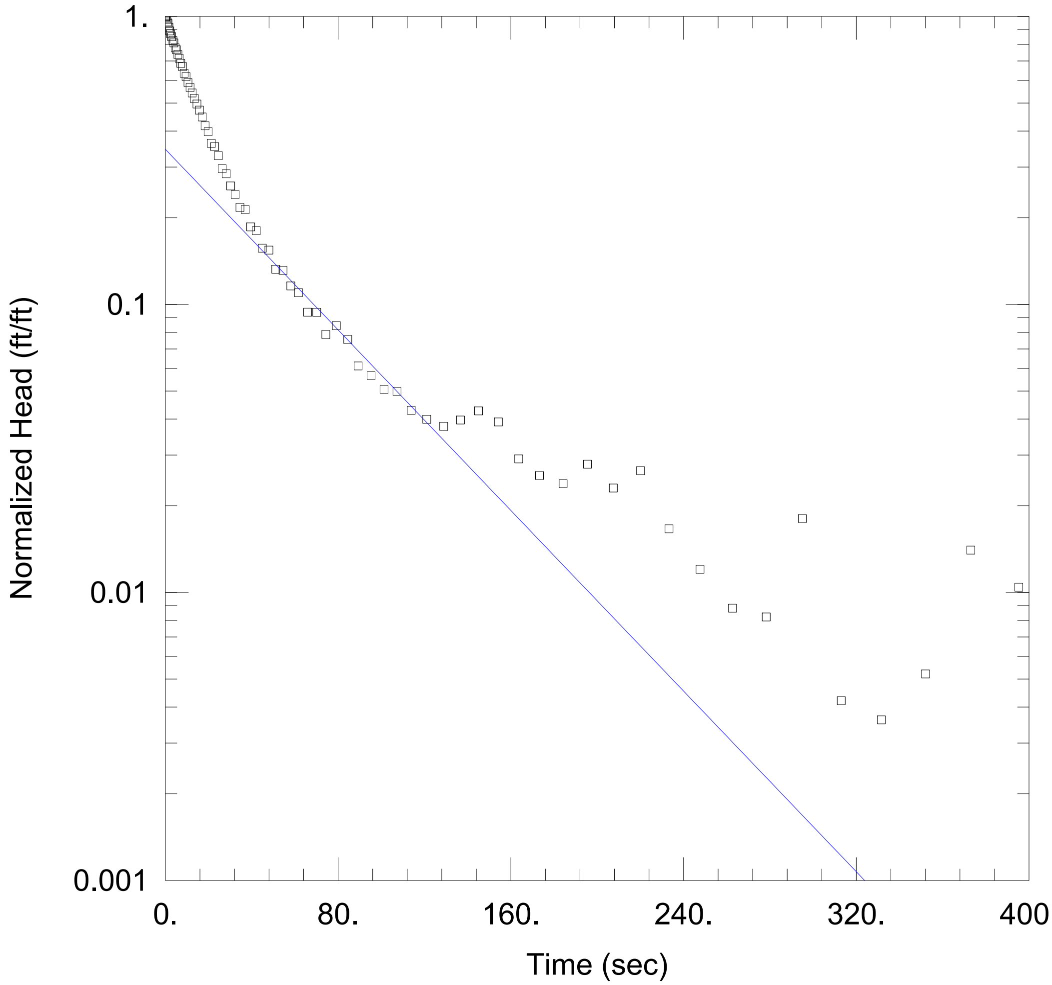
WELL DATA (BCA-01-T5)

Initial Displacement: 4.989 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.003568 cm/sec
y0 = 1.893 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-01\BCA-01-T5_h.aqt
Date: 08/15/19 Time: 11:17:48

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-01
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 31. ft
Anisotropy Ratio (Kz/Kr): 0.1

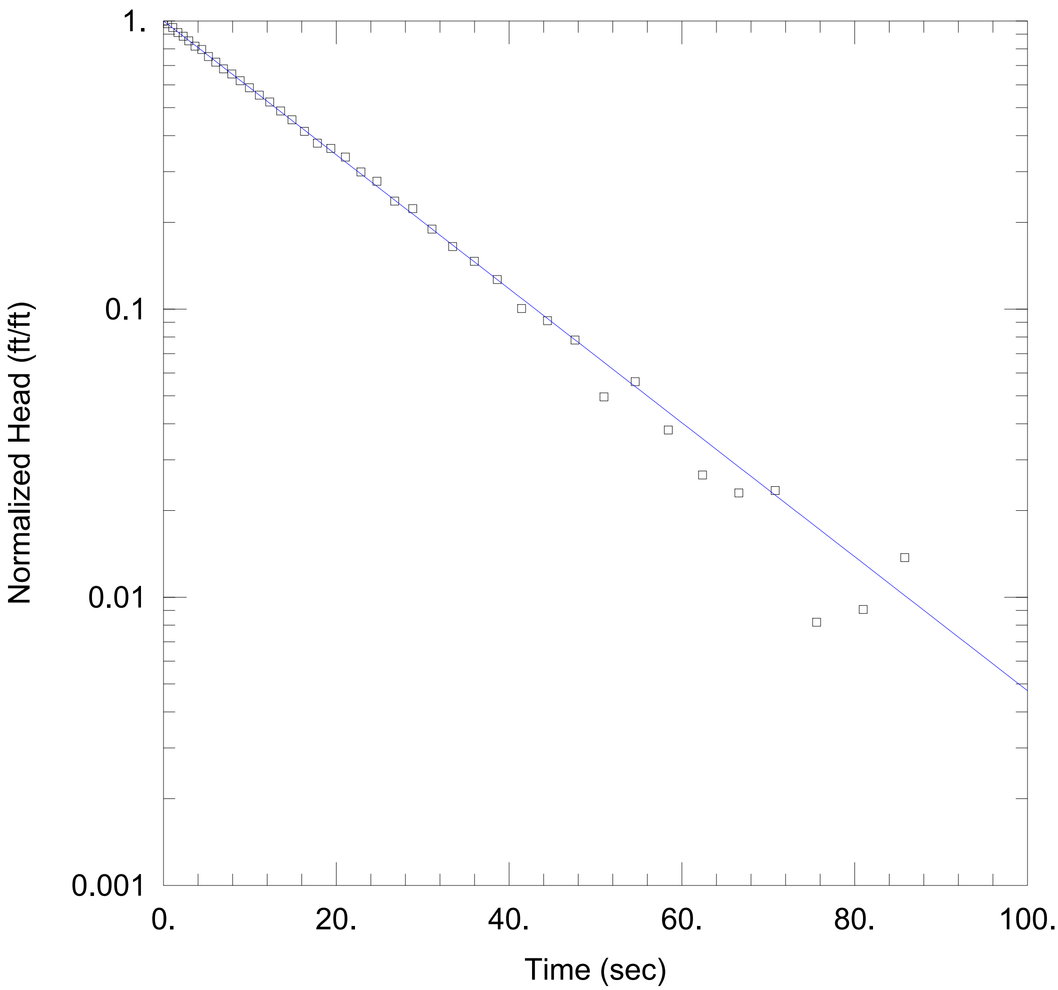
WELL DATA (BCA-01-T5)

Initial Displacement: 4.989 ft
Static Water Column Height: 43.04 ft
Total Well Penetration Depth: 43.04 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.003847 cm/sec
y0 = 1.724 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T1_br.aqt
Date: 08/15/19 Time: 11:23:09

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

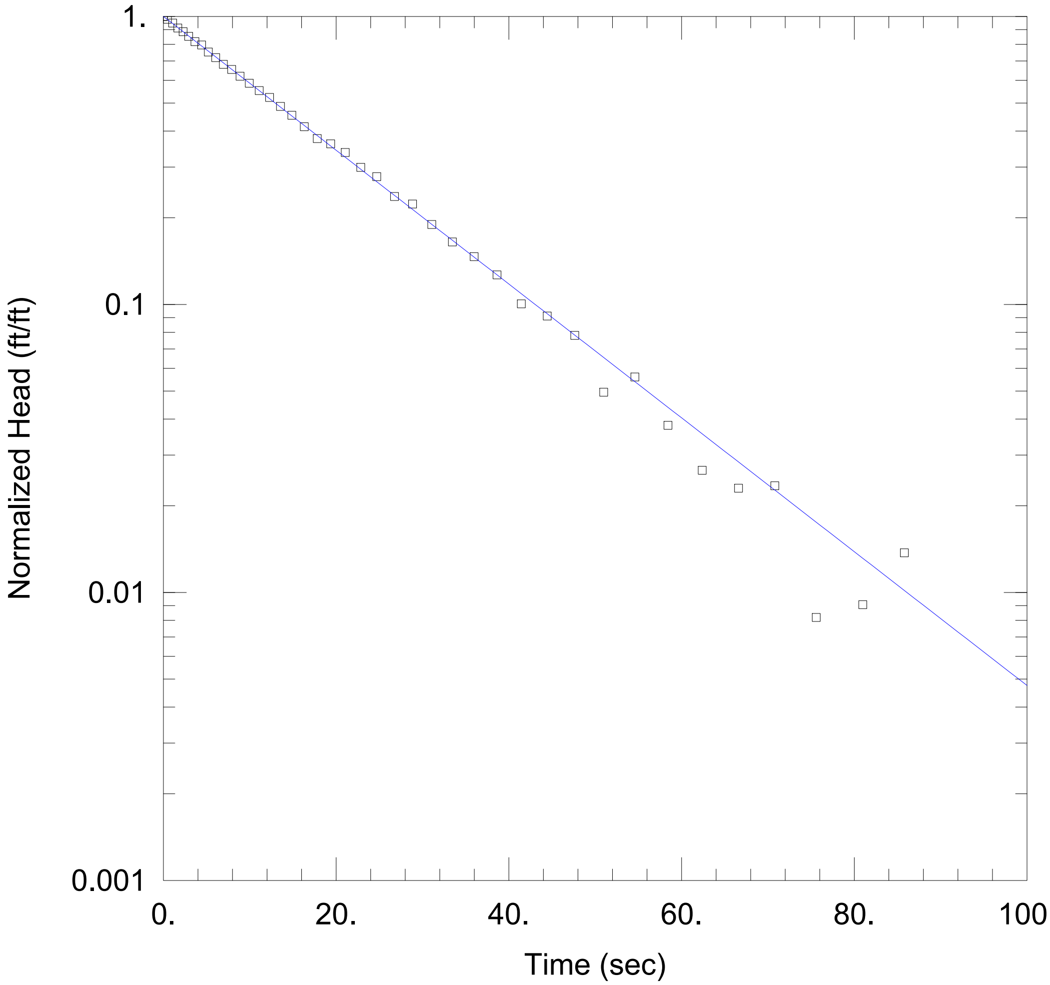
WELL DATA (BCA-02-T1)

Initial Displacement: 4.519 ft
Total Well Penetration Depth: 28.6 ft
Casing Radius: 0.17 ft
Static Water Column Height: 28.6 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.007974 cm/sec
y0 = 4.522 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T1_h.aqt
Date: 08/15/19 Time: 11:23:41

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

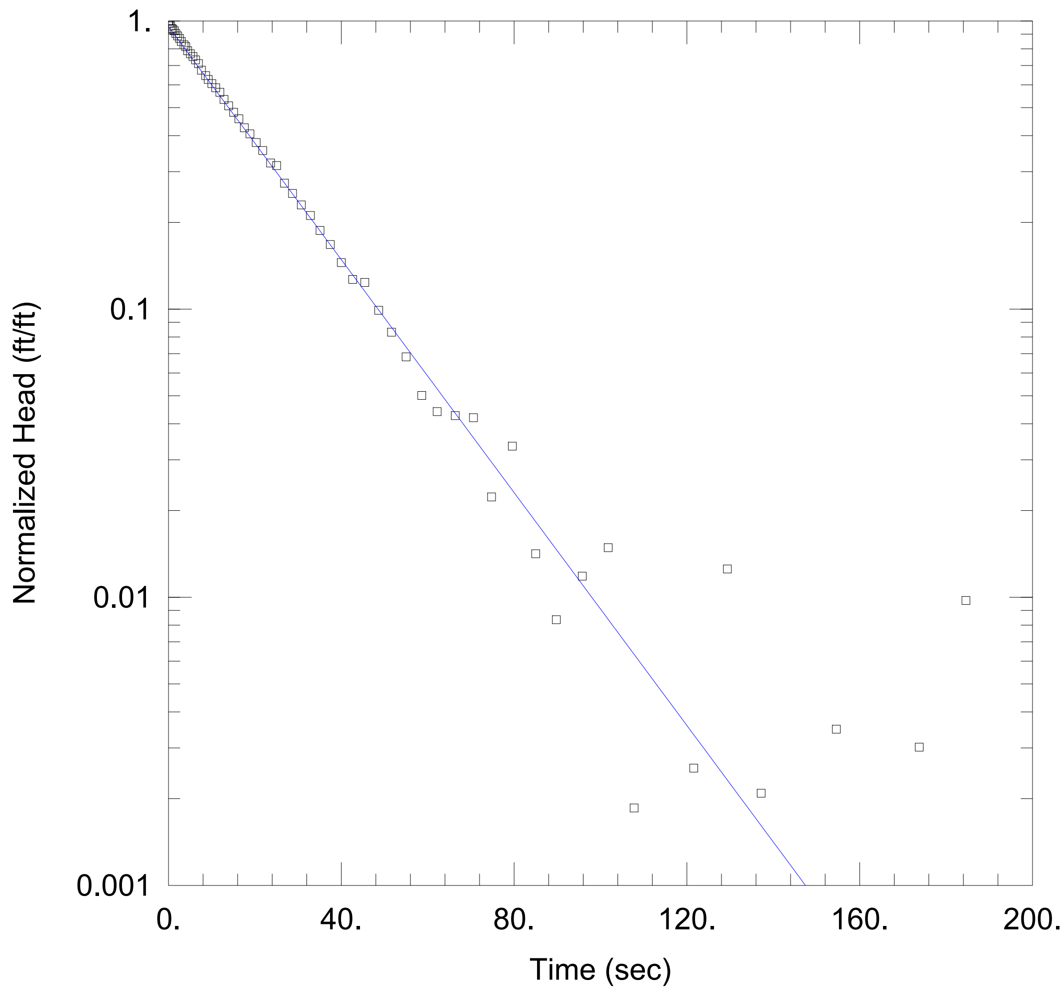
WELL DATA (BCA-02-T1)

Initial Displacement: 4.519 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.009772 cm/sec
y0 = 4.52 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T2_br.aqt
Date: 08/15/19 Time: 11:32:06

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.1

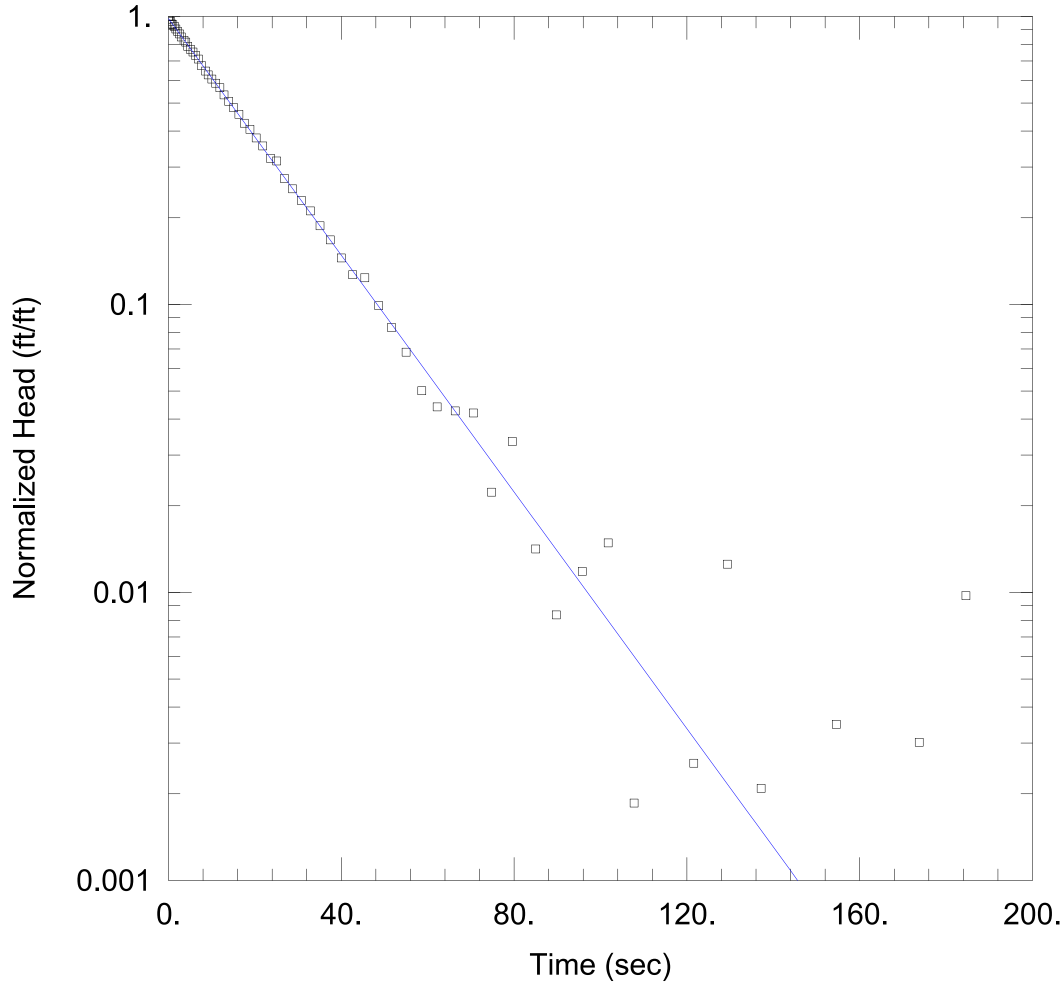
WELL DATA (BCA-02-T2)

Initial Displacement: 4.309 ft Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.006933 cm/sec y0 = 4.115 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T2_h.aqt
Date: 08/15/19 Time: 11:28:23

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

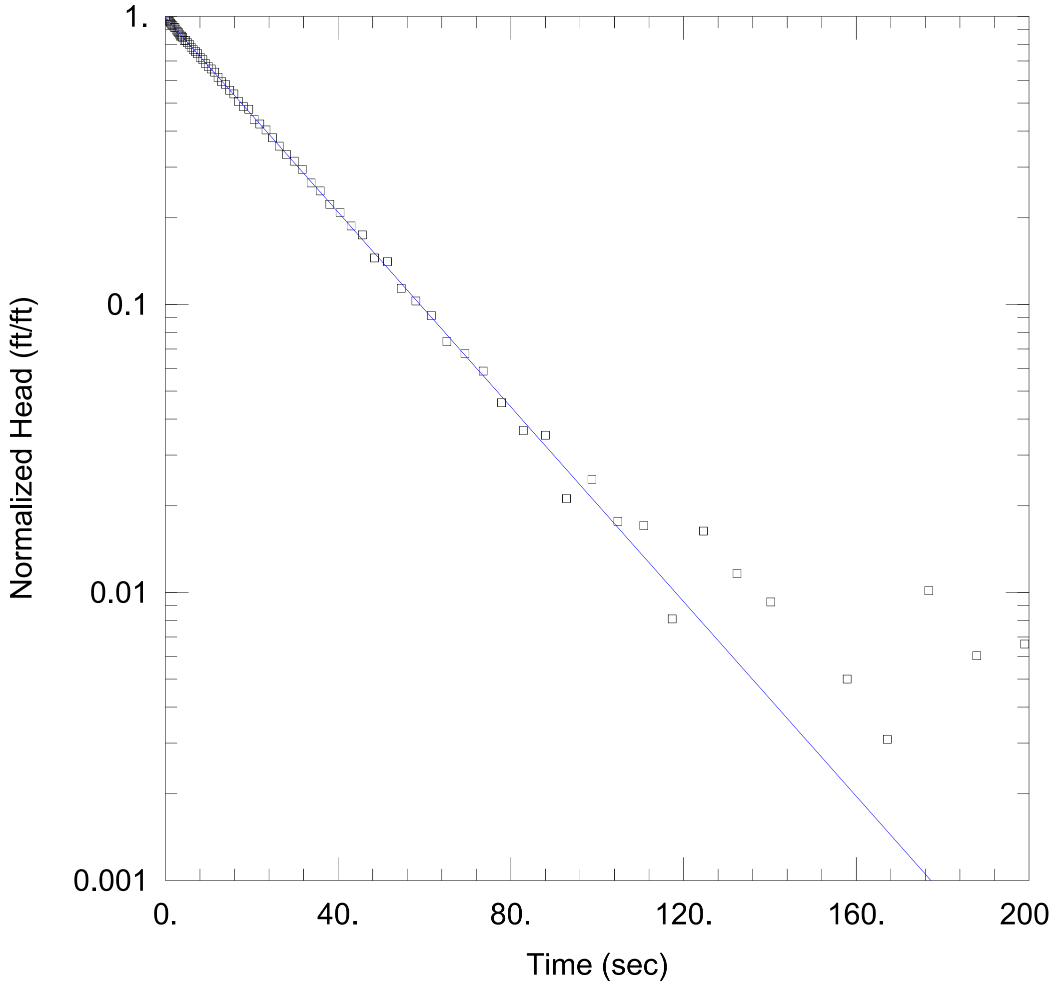
WELL DATA (BCA-02-T2)

Initial Displacement: 4.309 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.008641 cm/sec
y0 = 4.234 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T3_br.aqt
Date: 08/15/19 Time: 11:30:35

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

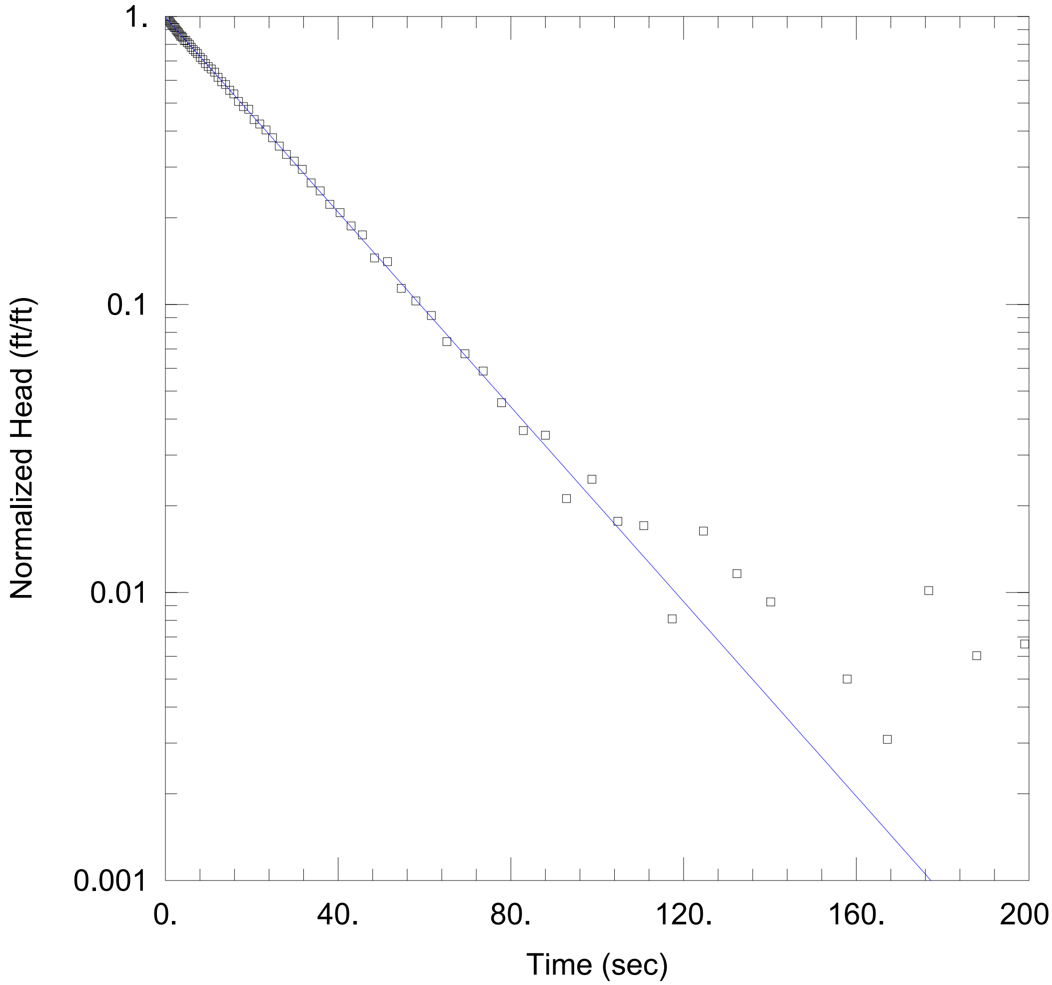
WELL DATA (BCA-02-T3)

Initial Displacement: 6.8 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.005797 cm/sec
y0 = 6.741 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T3_h.aqt
Date: 08/15/19 Time: 11:31:50

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

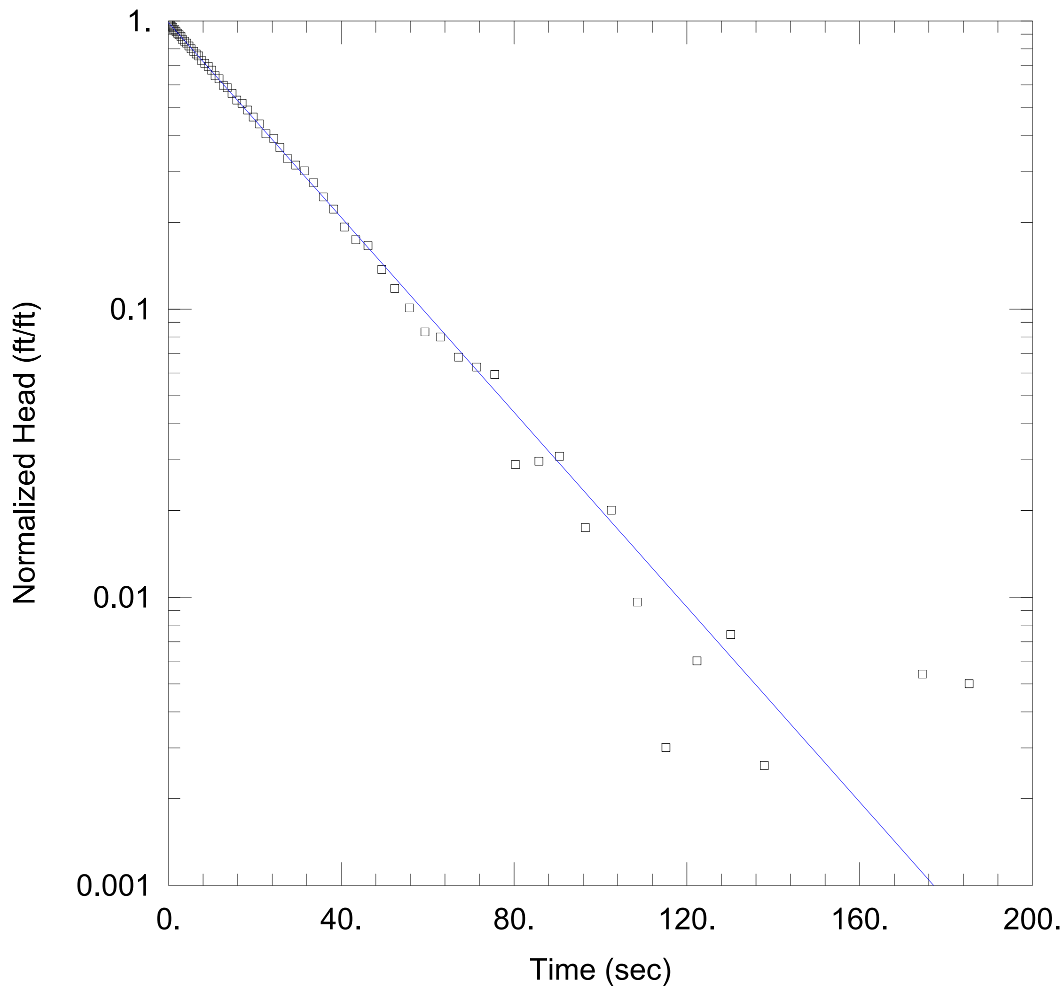
WELL DATA (BCA-02-T3)

Initial Displacement: 6.8 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.007108 cm/sec
y0 = 6.741 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T4_br.aqt
Date: 08/15/19 Time: 11:35:36

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

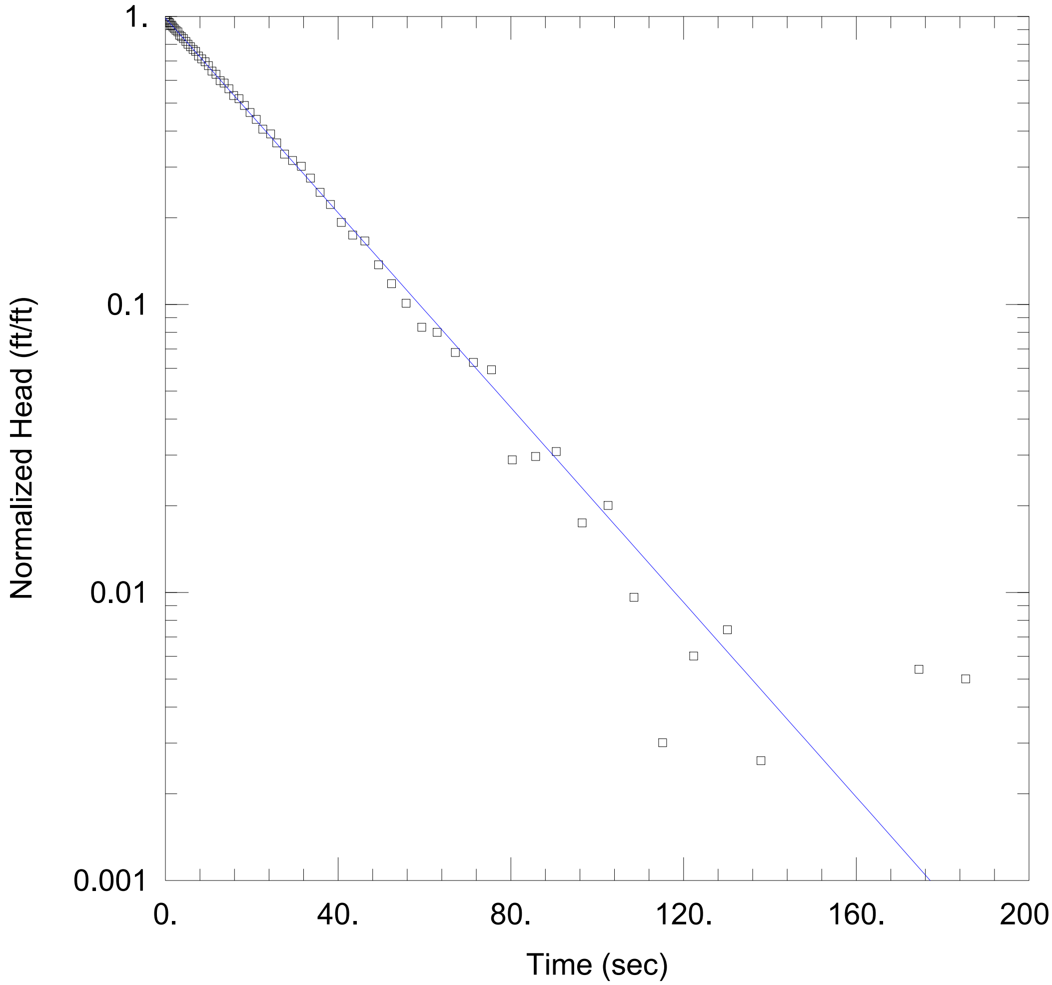
WELL DATA (BCA-02-T4)

Initial Displacement: 4.991 ft
Total Well Penetration Depth: 28.6 ft
Casing Radius: 0.17 ft
Static Water Column Height: 28.6 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.005799 cm/sec
y0 = 4.926 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T4_h.aqt
Date: 08/15/19 Time: 11:35:14

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

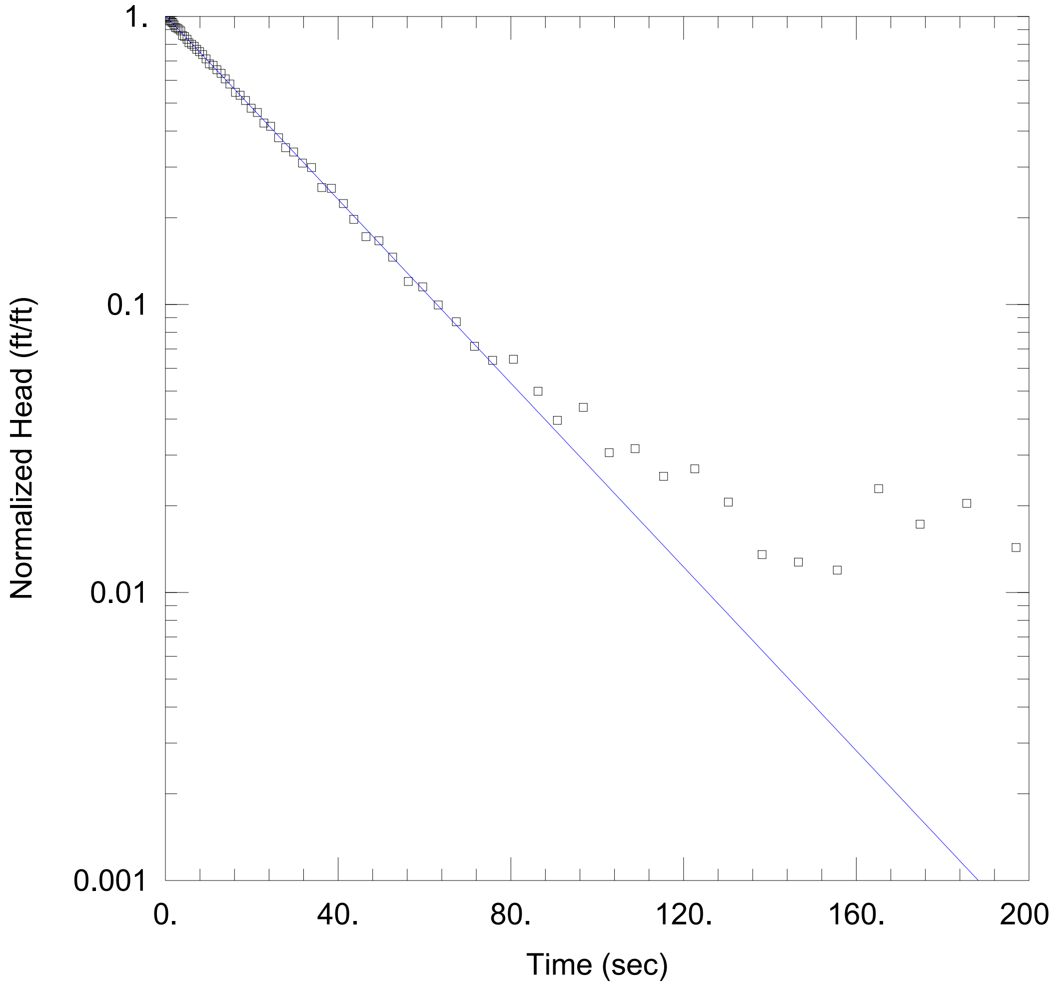
WELL DATA (BCA-02-T4)

Initial Displacement: 4.991 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.007111 cm/sec
y0 = 4.926 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T5_br.aqt
Date: 08/15/19 Time: 11:39:21

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft
Anisotropy Ratio (Kz/Kr): 0.1

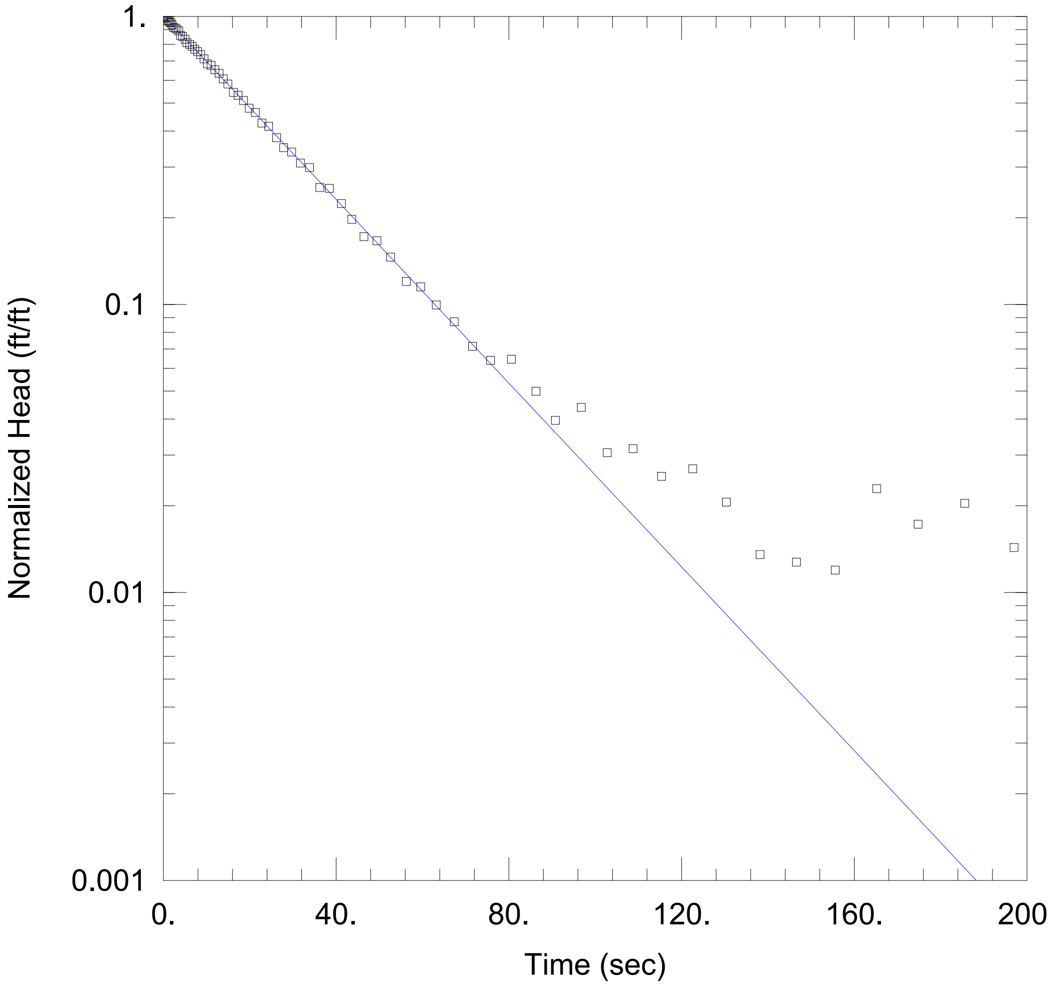
WELL DATA (BCA-02-T5)

Initial Displacement: 5.101 ft
Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.005472 cm/sec
y0 = 5.132 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-02\BCA-02-T5_h.aqt
Date: 08/15/19 Time: 11:40:04

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-02
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 33. ft Anisotropy Ratio (Kz/Kr): 0.1

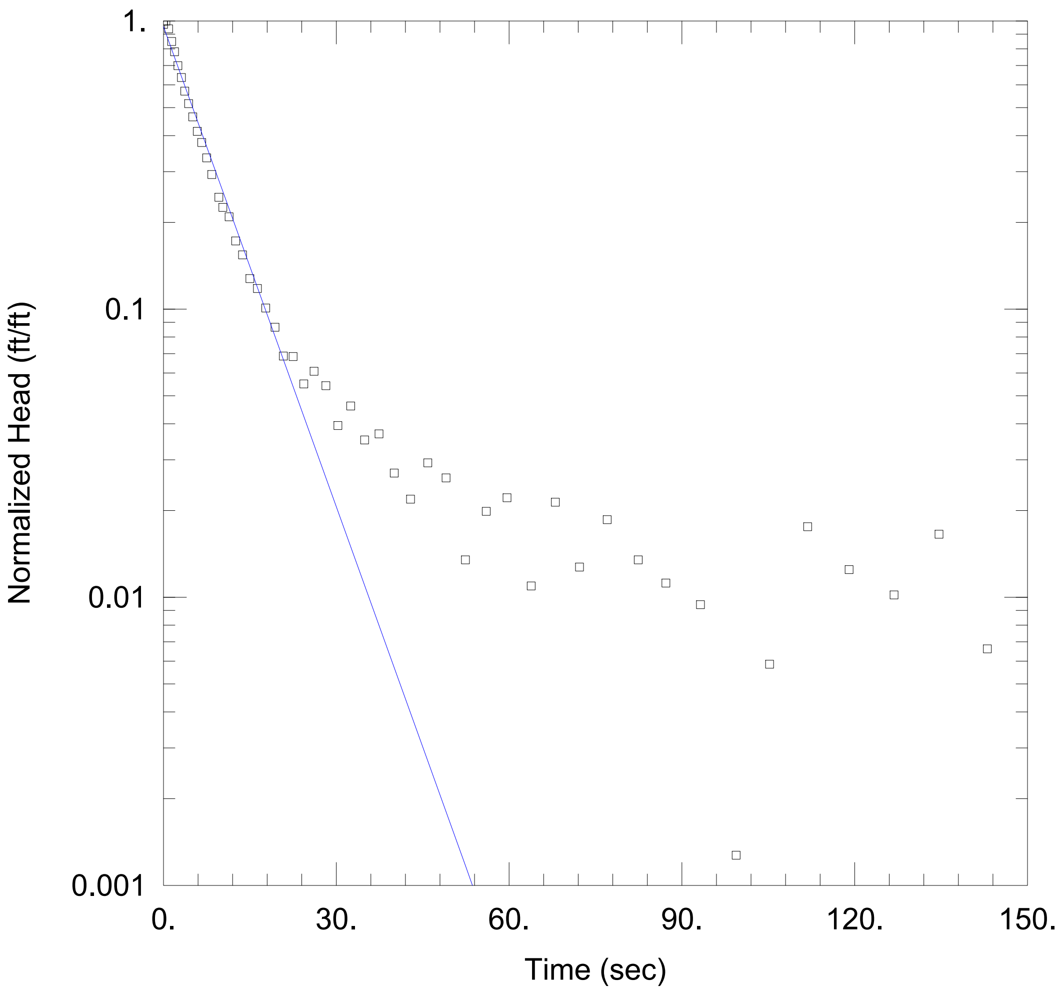
WELL DATA (BCA-02-T5)

Initial Displacement: 5.101 ft Static Water Column Height: 28.6 ft
Total Well Penetration Depth: 28.6 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.006709 cm/sec y0 = 5.132 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T1_br.aqt
Date: 08/15/19 Time: 11:47:45

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

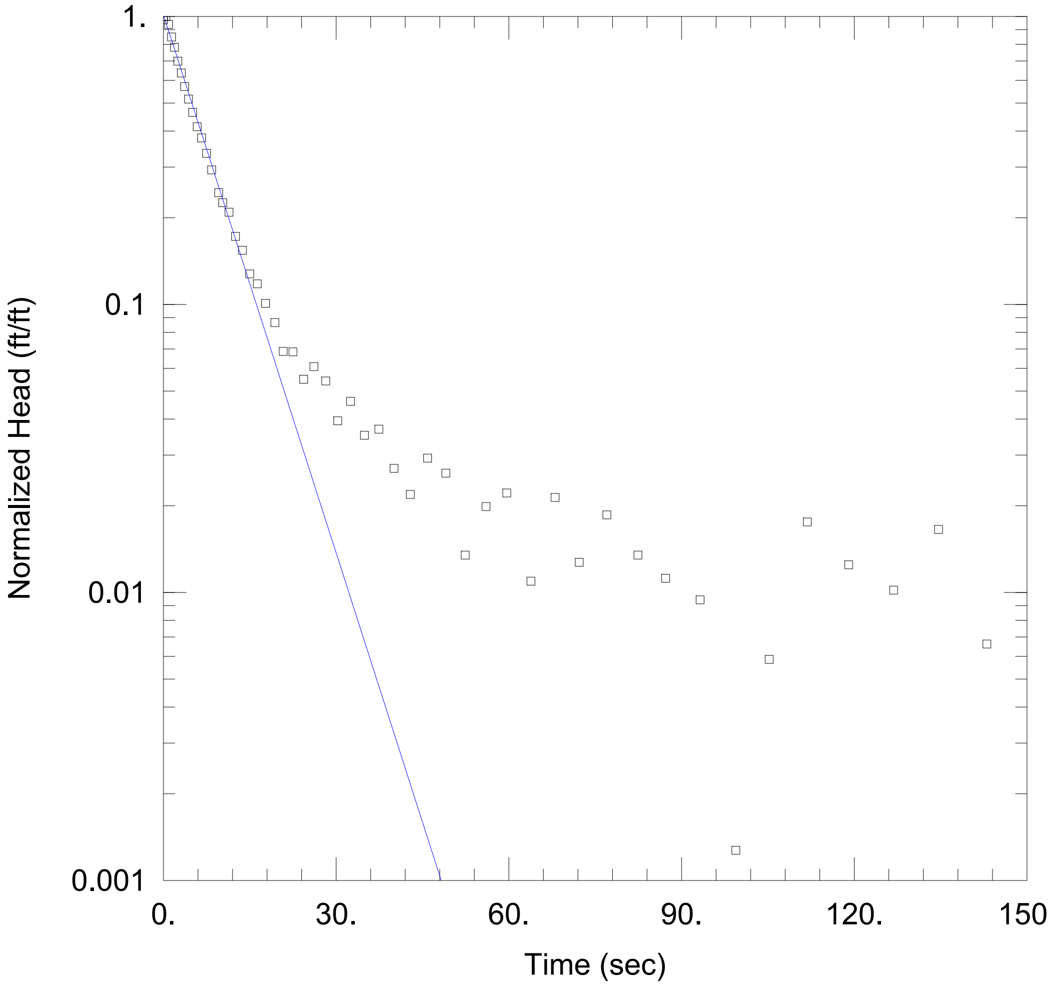
WELL DATA (BCA-04-T1)

Initial Displacement: 3.929 ft
Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.02481 cm/sec
y0 = 3.756 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T1_br.aqt
Date: 08/15/19 Time: 11:48:15

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

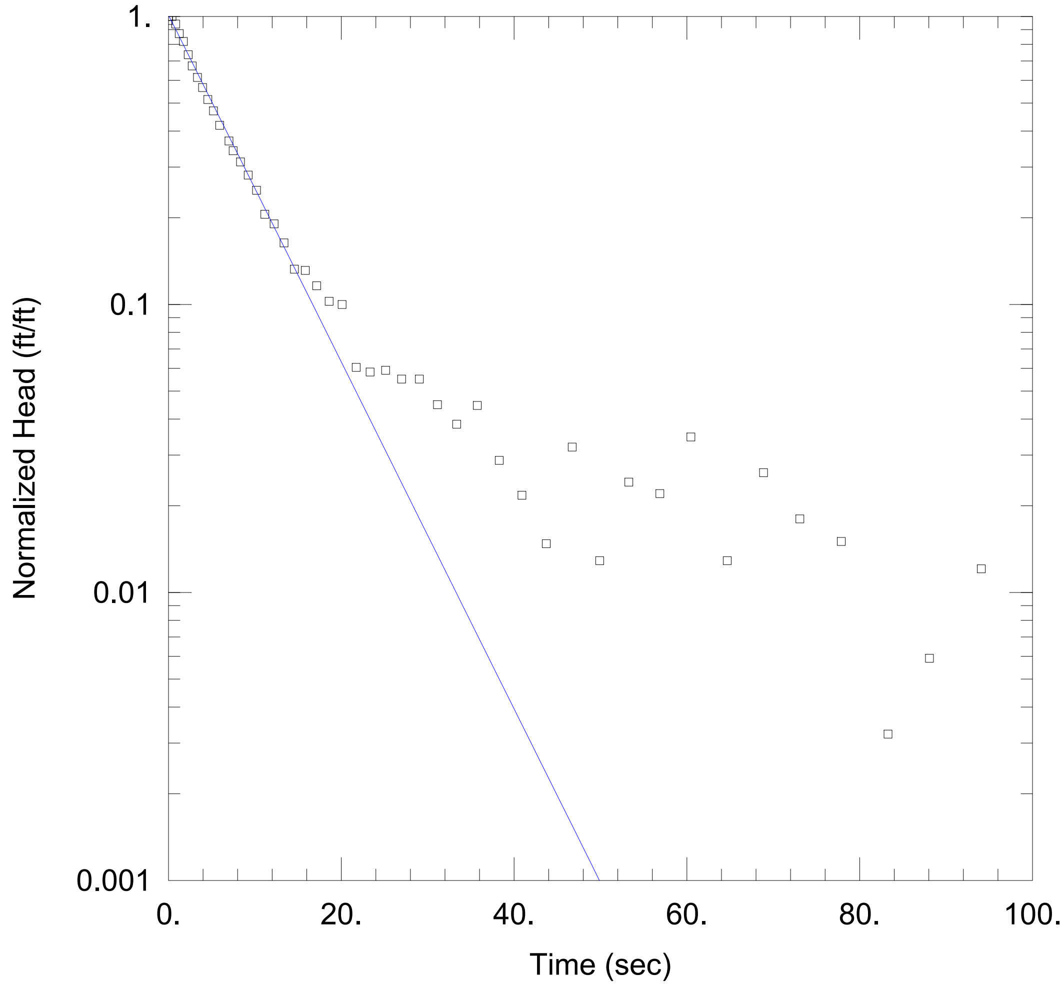
WELL DATA (BCA-04-T1)

Initial Displacement: 3.929 ft
Total Well Penetration Depth: 76.48 ft
Casing Radius: 0.17 ft
Static Water Column Height: 76.48 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.03059 cm/sec
y0 = 3.992 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T2_br.aqt
Date: 08/15/19 Time: 11:59:00

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

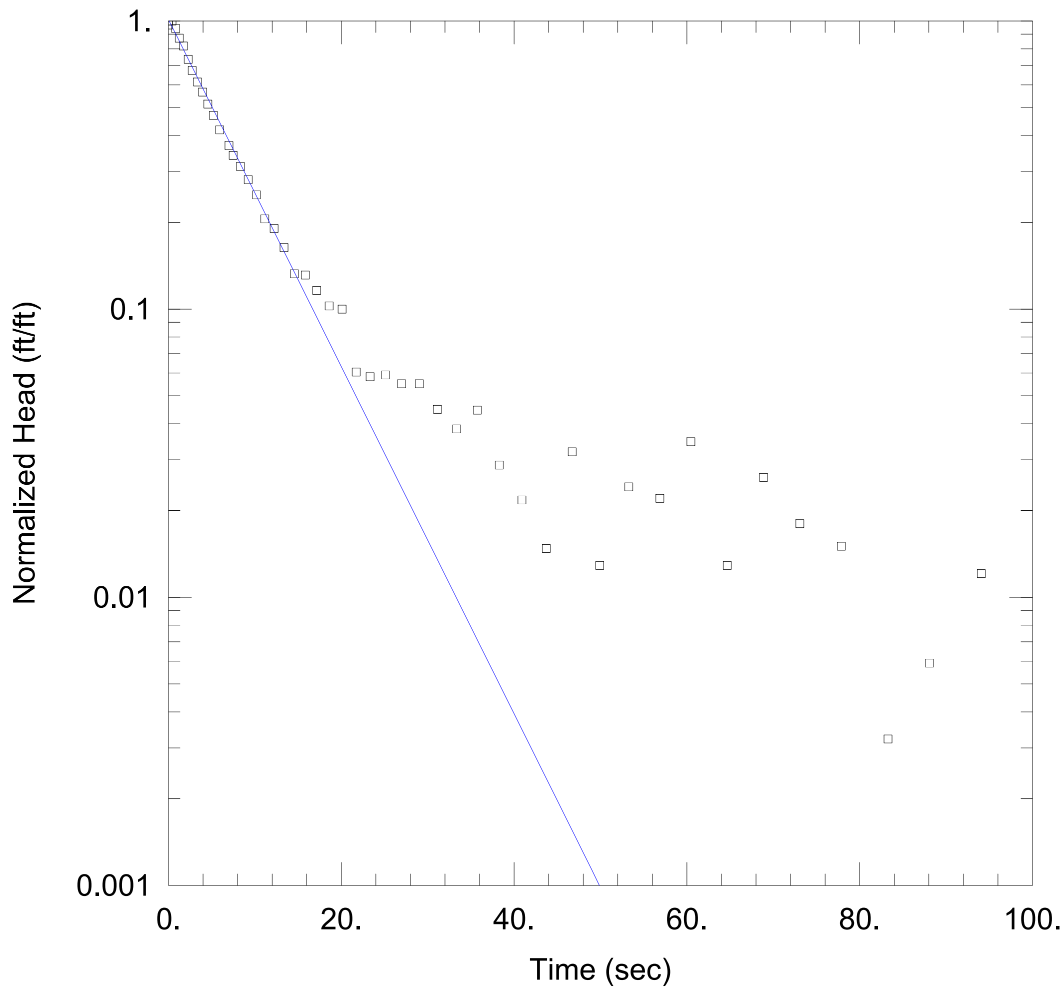
Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (BCA-04-T2)

Initial Displacement: 3.724 ft
Total Well Penetration Depth: 76.48 ft
Casing Radius: 0.17 ft
Static Water Column Height: 76.48 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice
K = 0.02691 cm/sec
y0 = 3.77 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T2_h.aqt
Date: 08/15/19 Time: 11:58:24

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

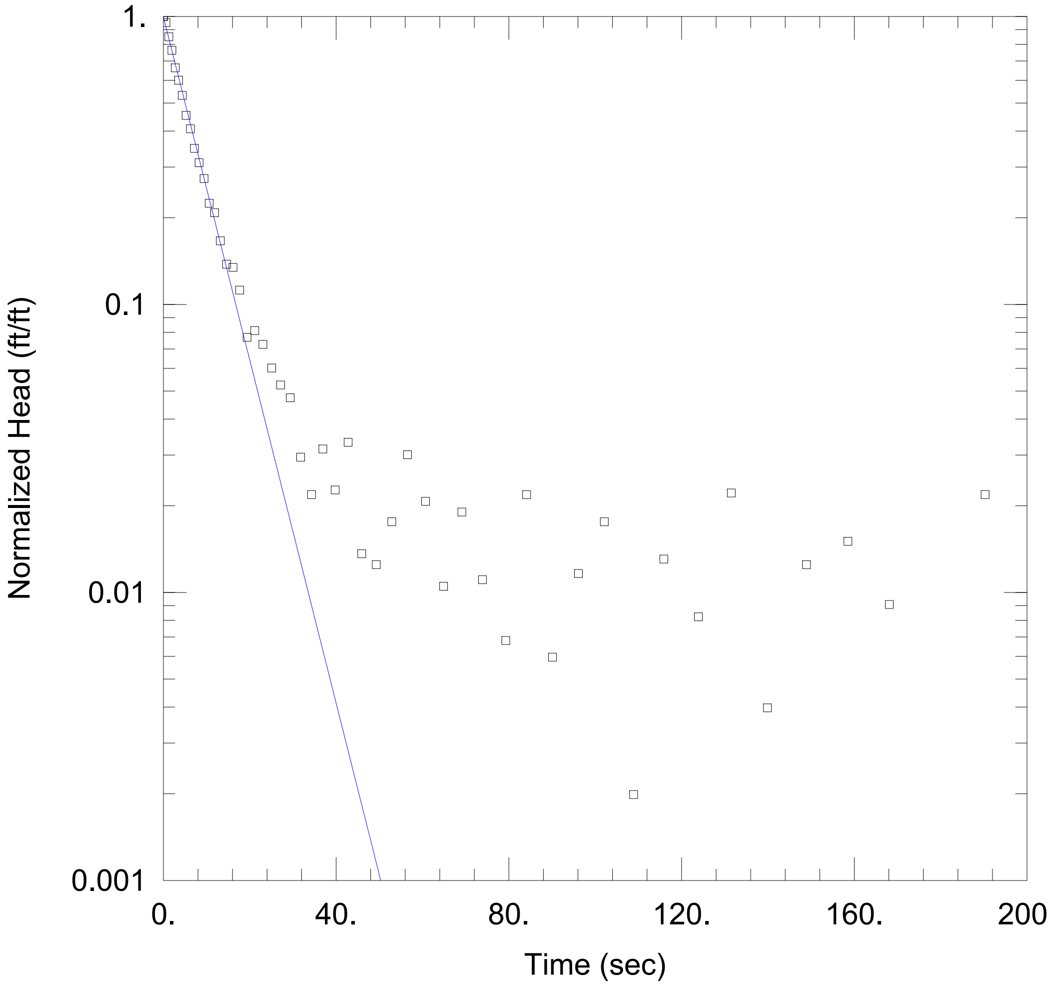
WELL DATA (BCA-04-T2)

Initial Displacement: 3.724 ft
Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.02957 cm/sec
y0 = 3.769 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T3_br.aqt
Date: 08/15/19 Time: 12:01:03

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

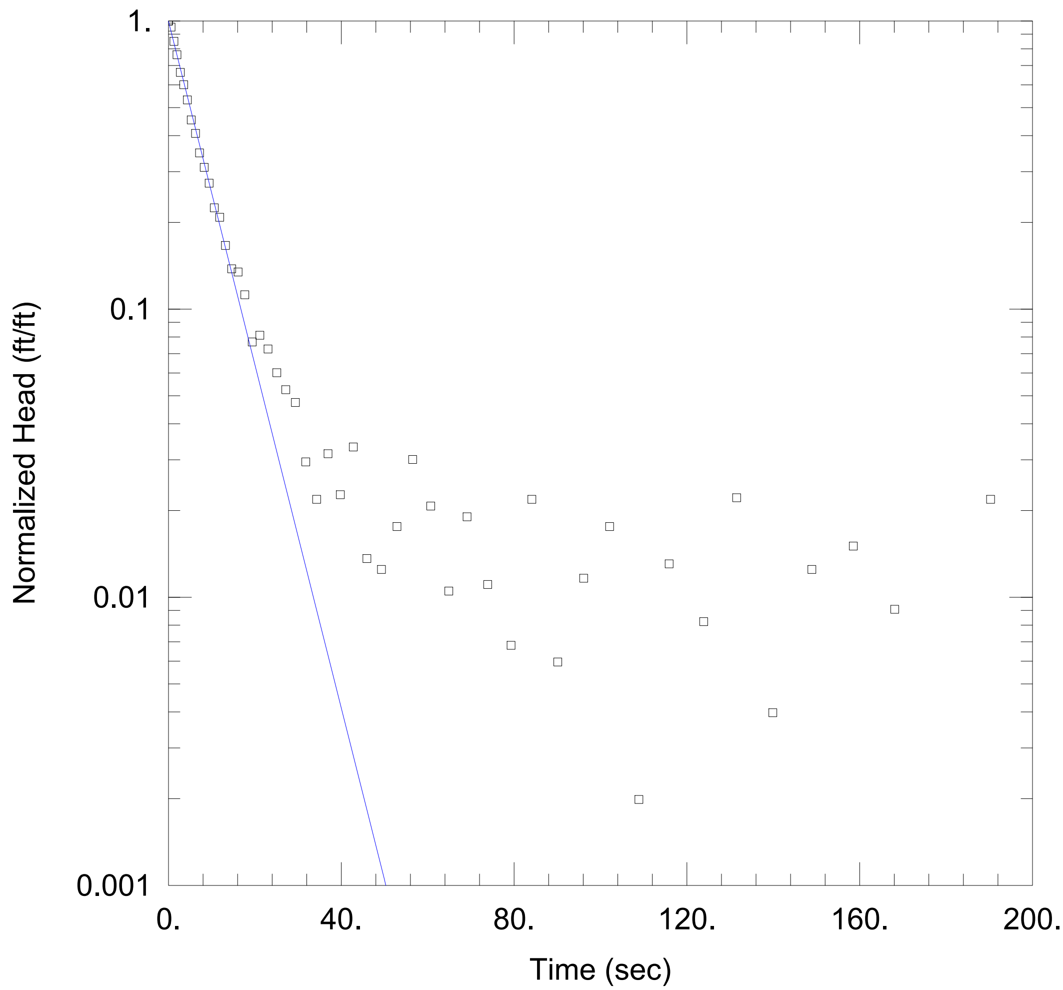
WELL DATA (BCA-04-T3)

Initial Displacement: 3.524 ft
Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.02661 cm/sec
y0 = 3.511 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T3_h.aqt
Date: 08/15/19 Time: 12:01:58

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

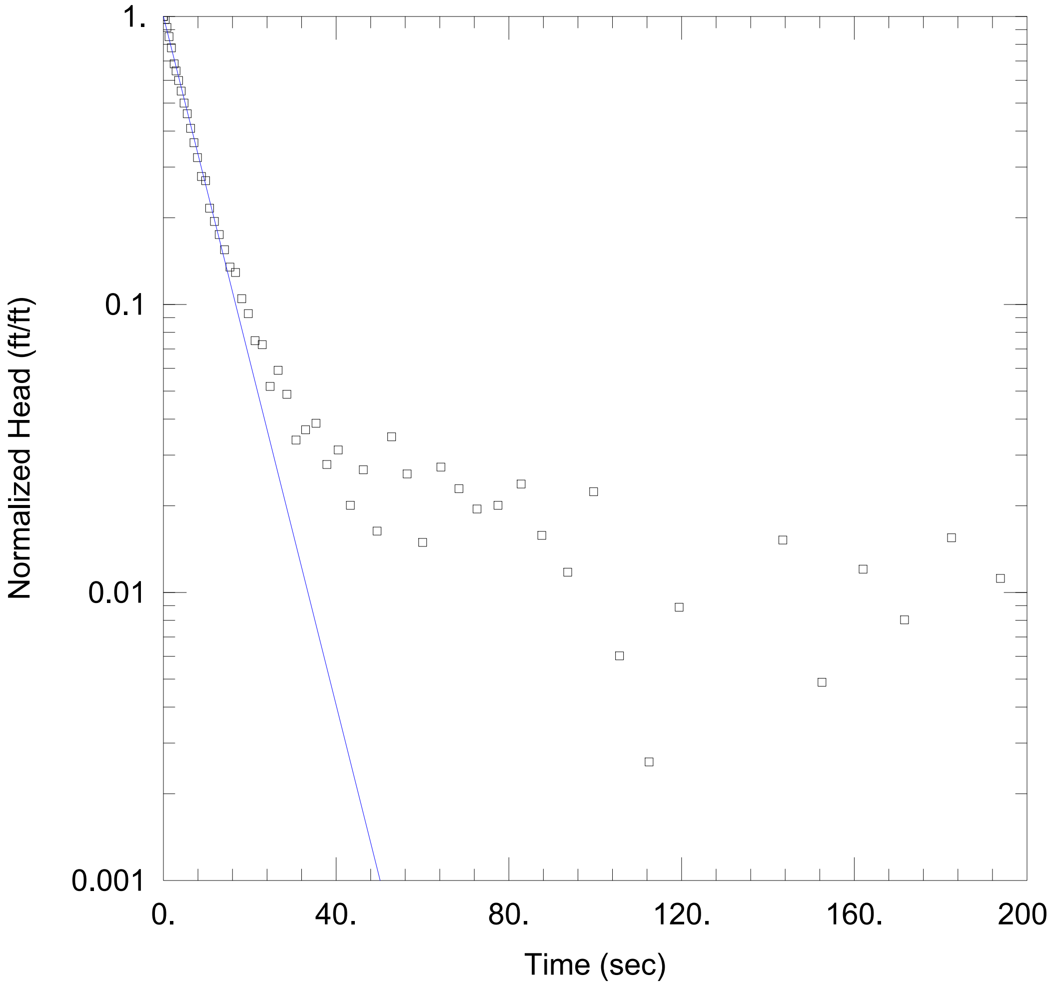
WELL DATA (BCA-04-T3)

Initial Displacement: 3.524 ft
Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.02924 cm/sec
y0 = 3.511 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T4_br.aqt
Date: 08/15/19 Time: 12:03:50

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft
Anisotropy Ratio (Kz/Kr): 0.1

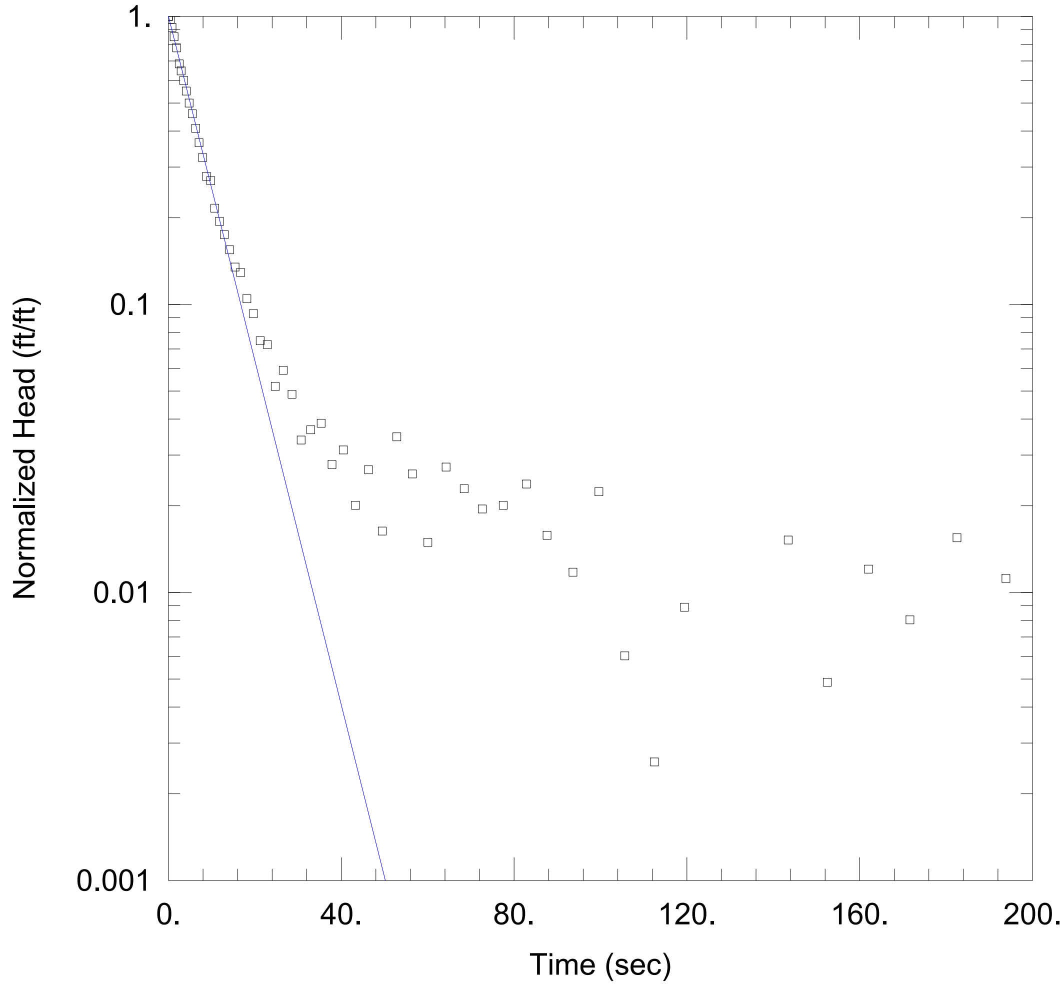
WELL DATA (BCA-04-T4)

Initial Displacement: 3.488 ft
Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.02671 cm/sec
y0 = 3.49 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T4_h.aqt
Date: 08/15/19 Time: 12:04:30

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft Anisotropy Ratio (Kz/Kr): 0.1

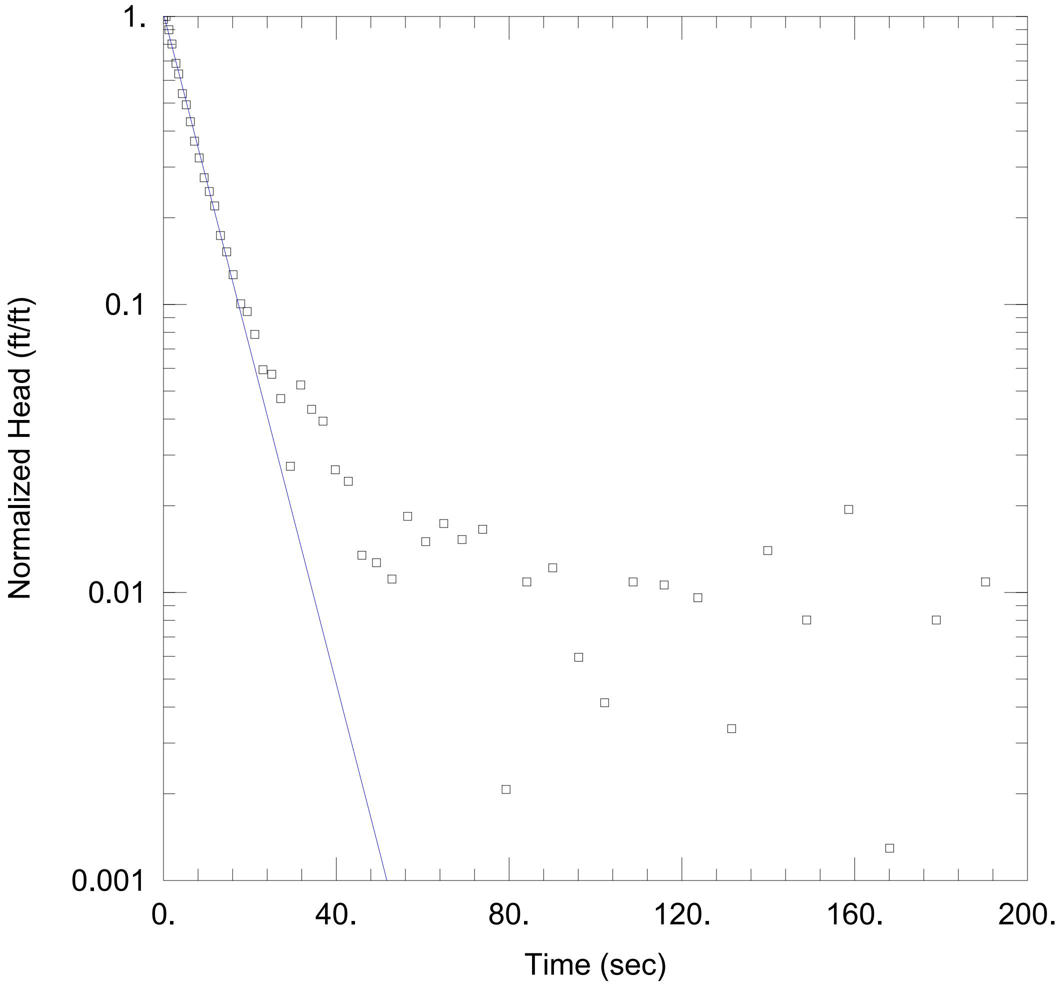
WELL DATA (BCA-04-T4)

Initial Displacement: 3.488 ft Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02934 cm/sec y0 = 3.49 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\BCA-04-T5_BR_con.aqt
Date: 08/15/19 Time: 12:06:17

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft Anisotropy Ratio (Kz/Kr): 0.1

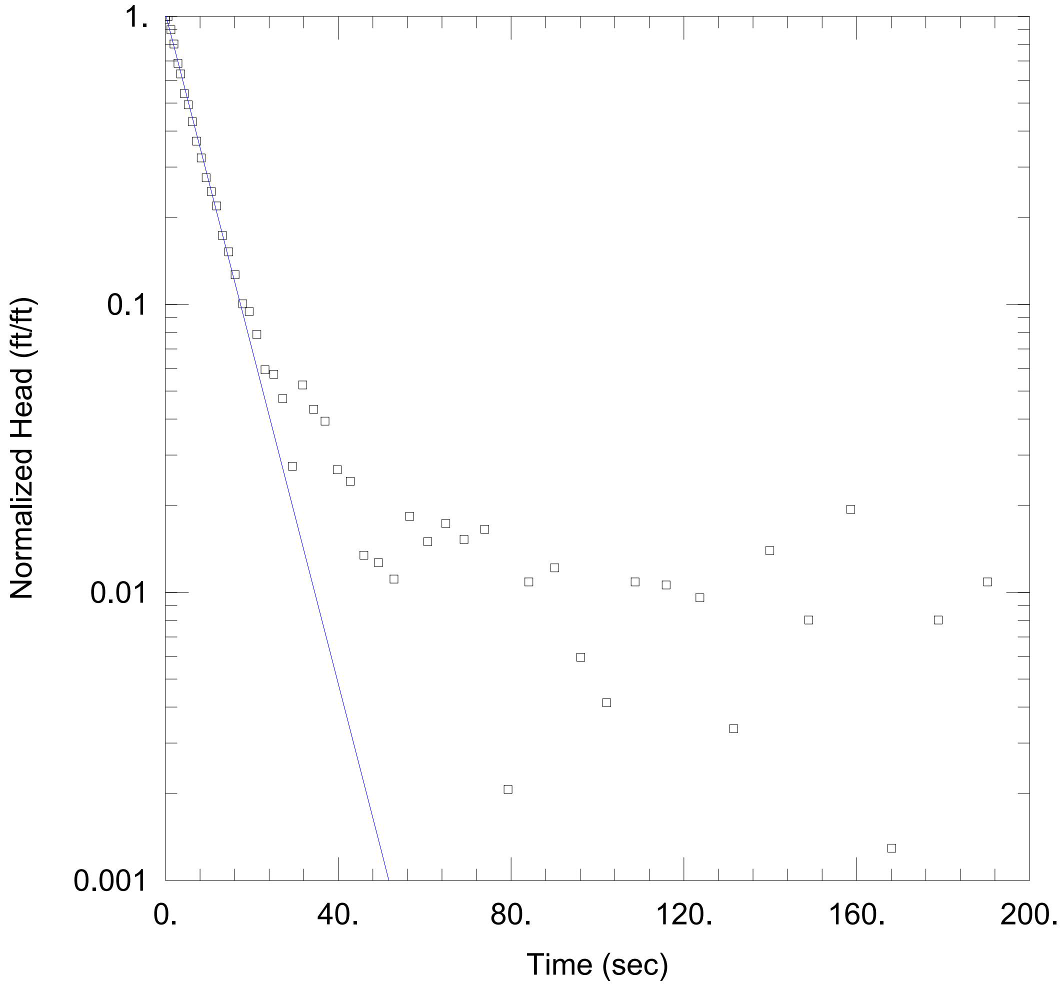
WELL DATA (BCA-04-T5)

Initial Displacement: 3.864 ft Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.026 cm/sec y0 = 3.958 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\BCA-04\BCA-04-T5_h.aqt
Date: 08/15/19 Time: 12:07:13

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: BCA-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 34. ft Anisotropy Ratio (Kz/Kr): 0.1

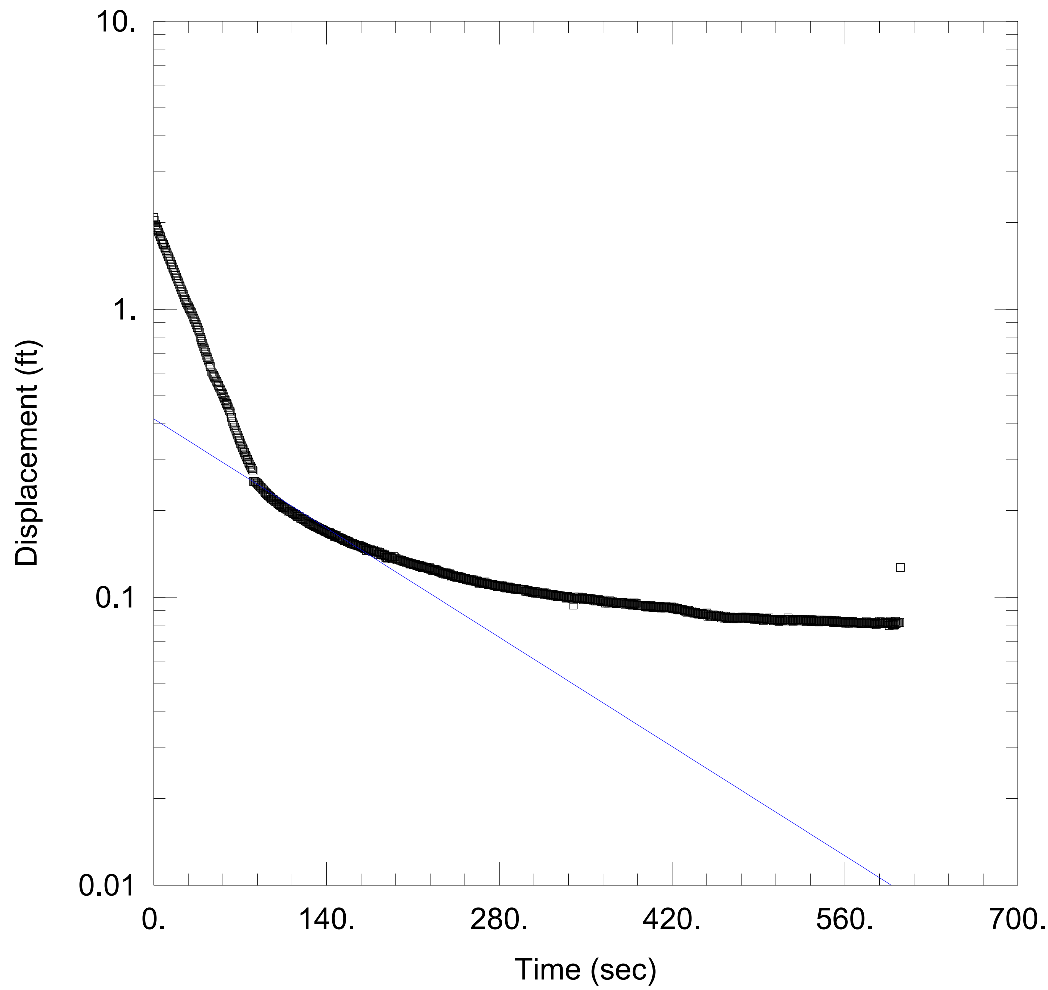
WELL DATA (BCA-04-T5)

Initial Displacement: 3.864 ft Static Water Column Height: 76.48 ft
Total Well Penetration Depth: 76.48 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02857 cm/sec y0 = 3.959 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T1_br.aqt
Date: 08/14/19 Time: 13:14:54

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft Anisotropy Ratio (Kz/Kr): 0.1

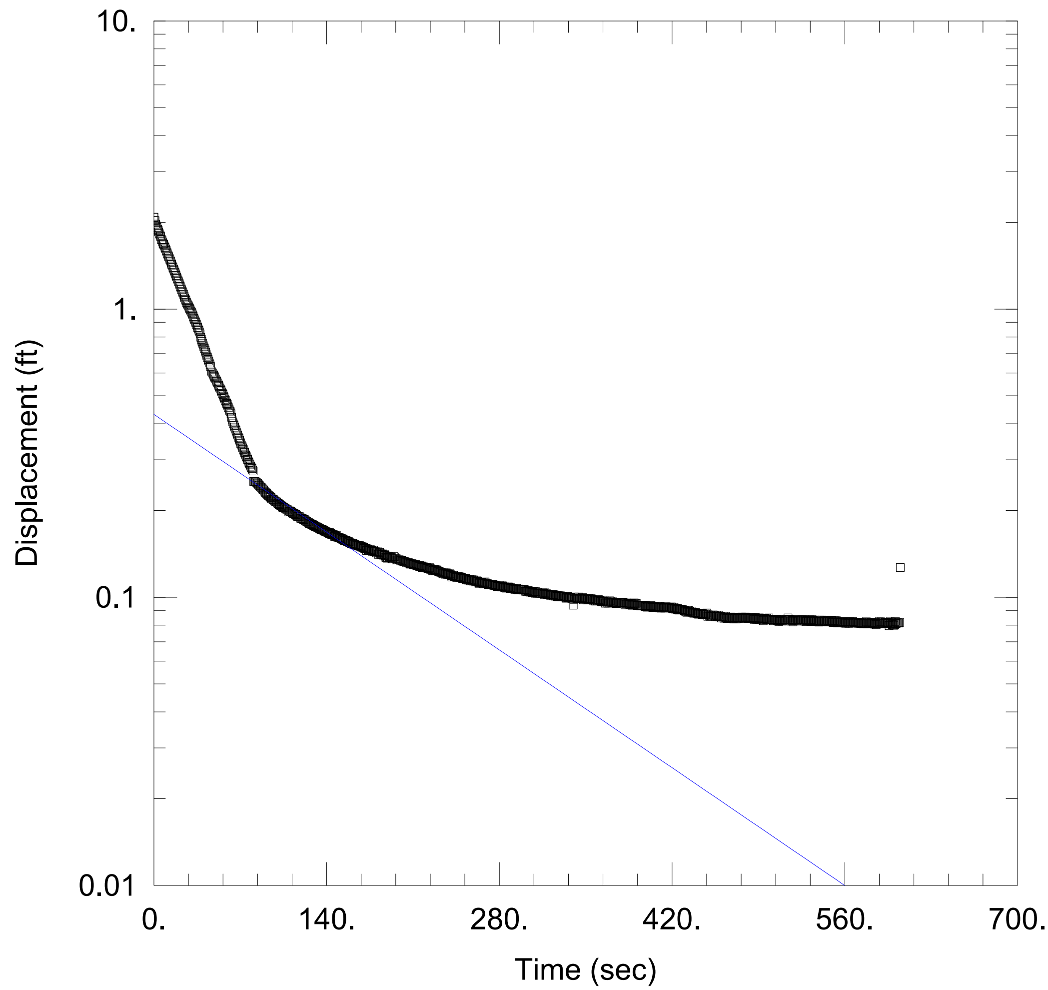
WELL DATA (LTW-01-T1)

Initial Displacement: 2.082 ft Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0006097 cm/sec y0 = 0.4163 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T1_h.aqt
Date: 08/14/19 Time: 13:15:42

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft Anisotropy Ratio (Kz/Kr): 0.1

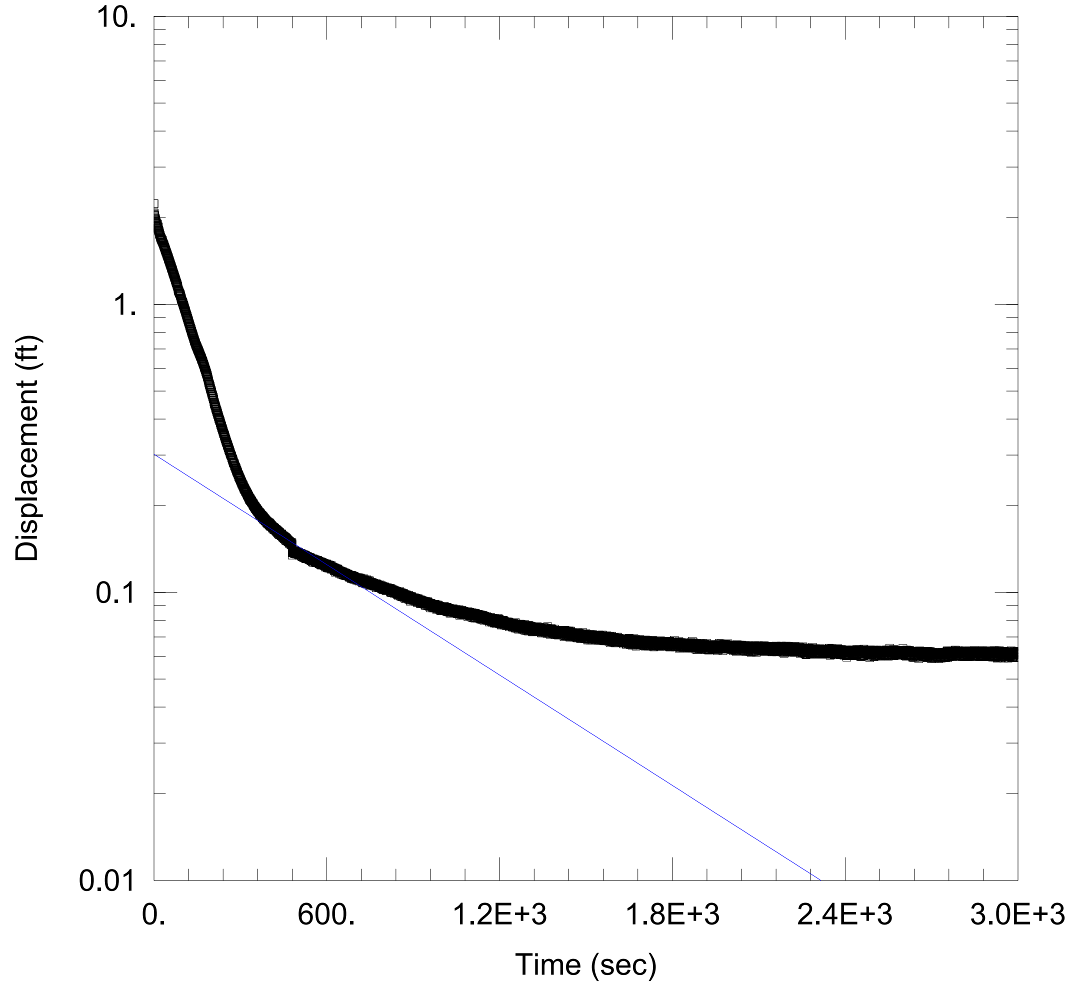
WELL DATA (LTW-01-T1)

Initial Displacement: 2.082 ft Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0008987 cm/sec y0 = 0.4312 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T2_br.aqt
Date: 08/14/19 Time: 13:17:05

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 0.1

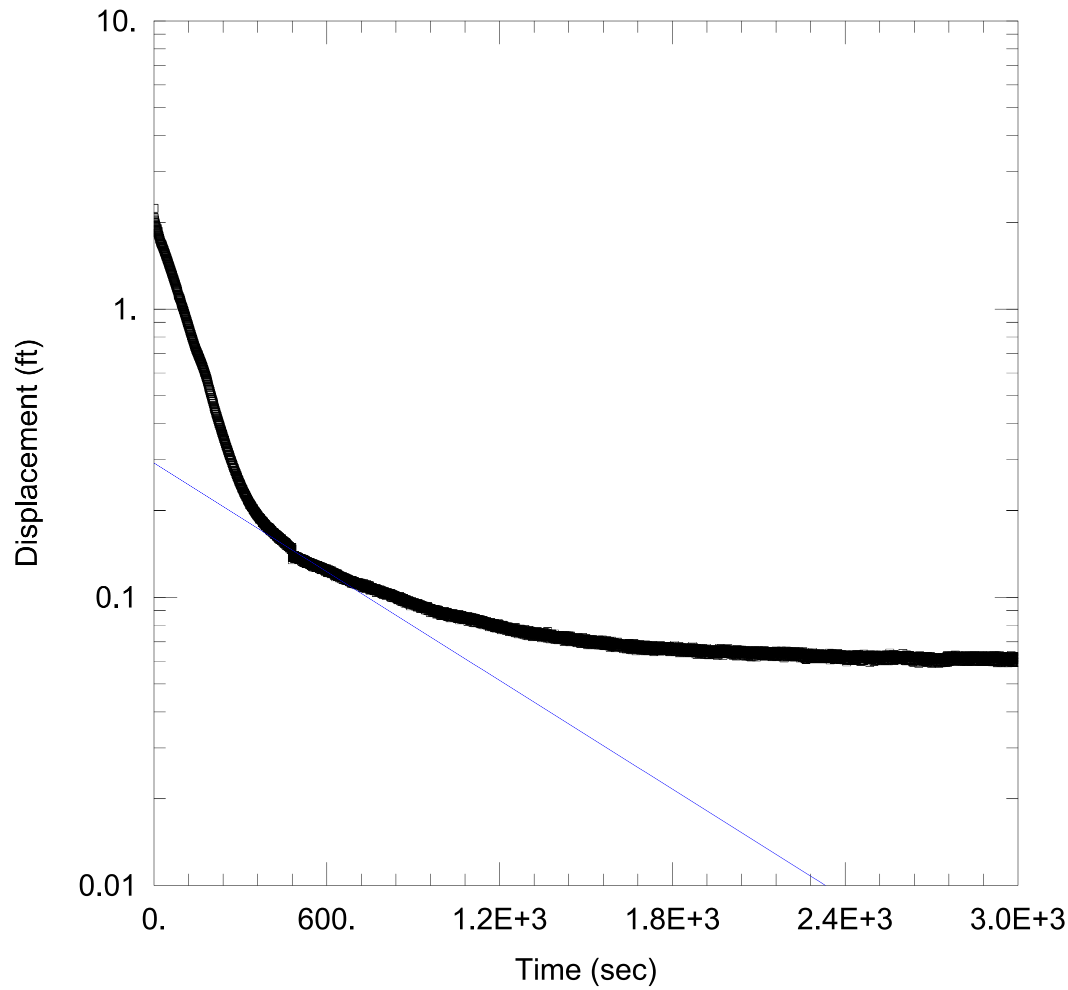
WELL DATA (LTW-01-T2)

Initial Displacement: 2.238 ft
Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001438 cm/sec
y0 = 0.302 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T2_h.aqt
Date: 08/14/19 Time: 13:18:06

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft Anisotropy Ratio (Kz/Kr): 0.1

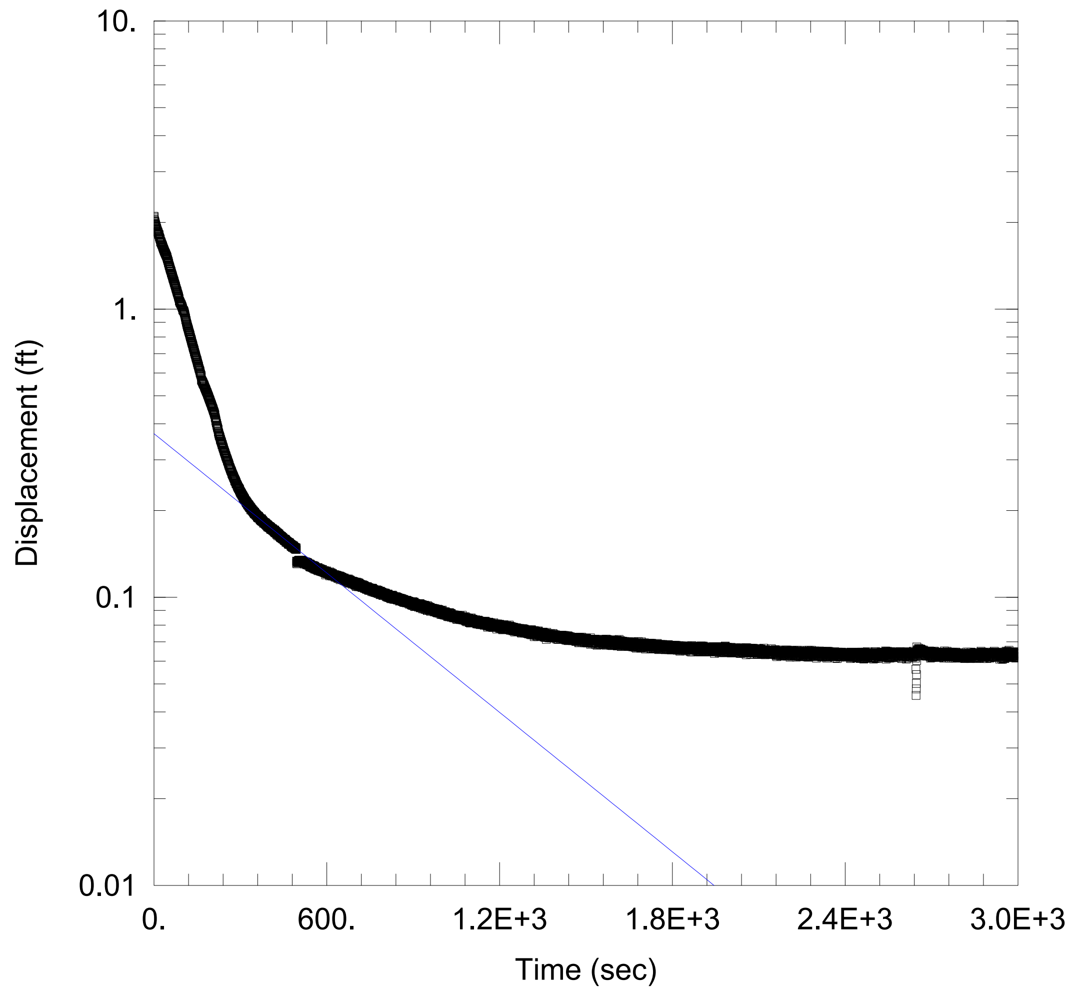
WELL DATA (LTW-01-T2)

Initial Displacement: 2.238 ft Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0001935 cm/sec y0 = 0.2922 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T3_br.aqt
Date: 08/14/19 Time: 13:19:28

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 0.1

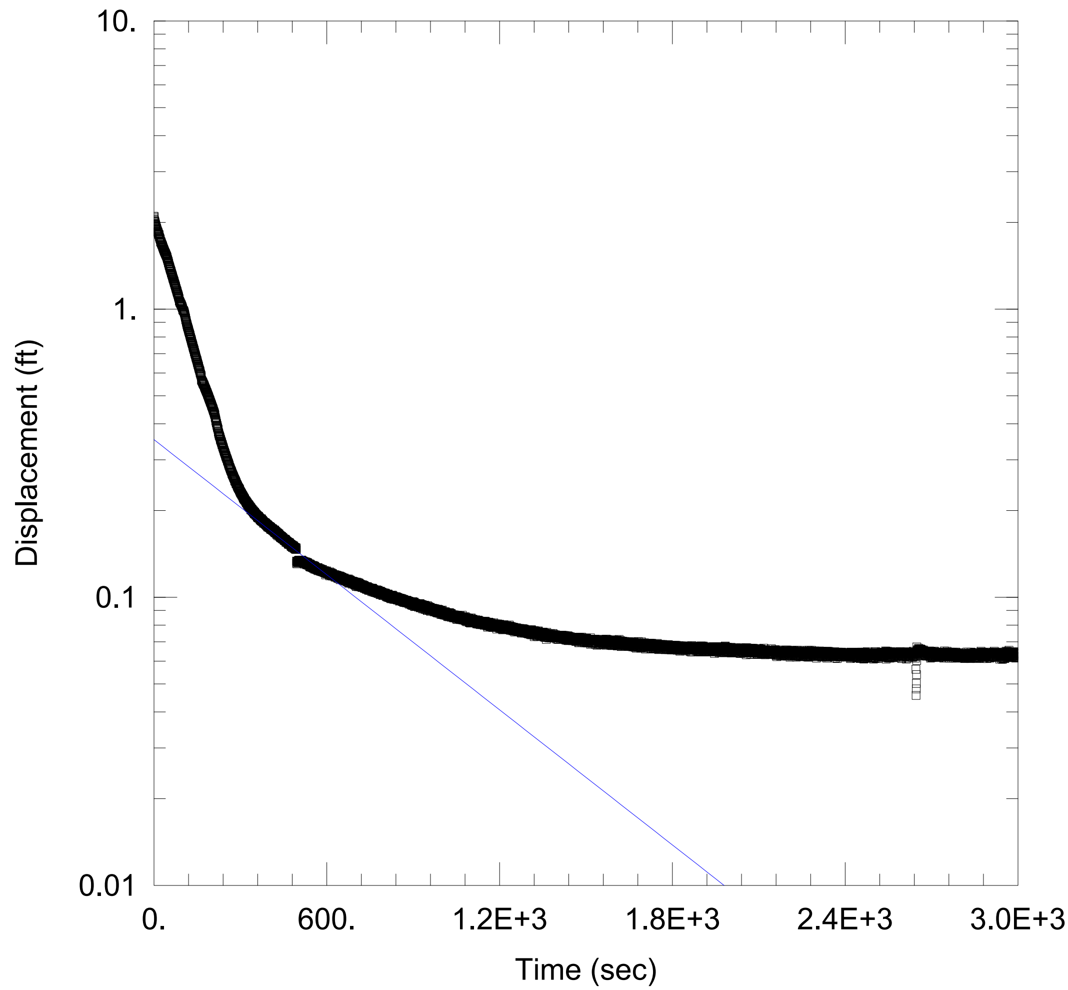
WELL DATA (LTW-01-T3)

Initial Displacement: 2.099 ft
Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001814 cm/sec
y0 = 0.3695 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T3_h.aqt
Date: 08/14/19 Time: 13:20:21

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 0.1

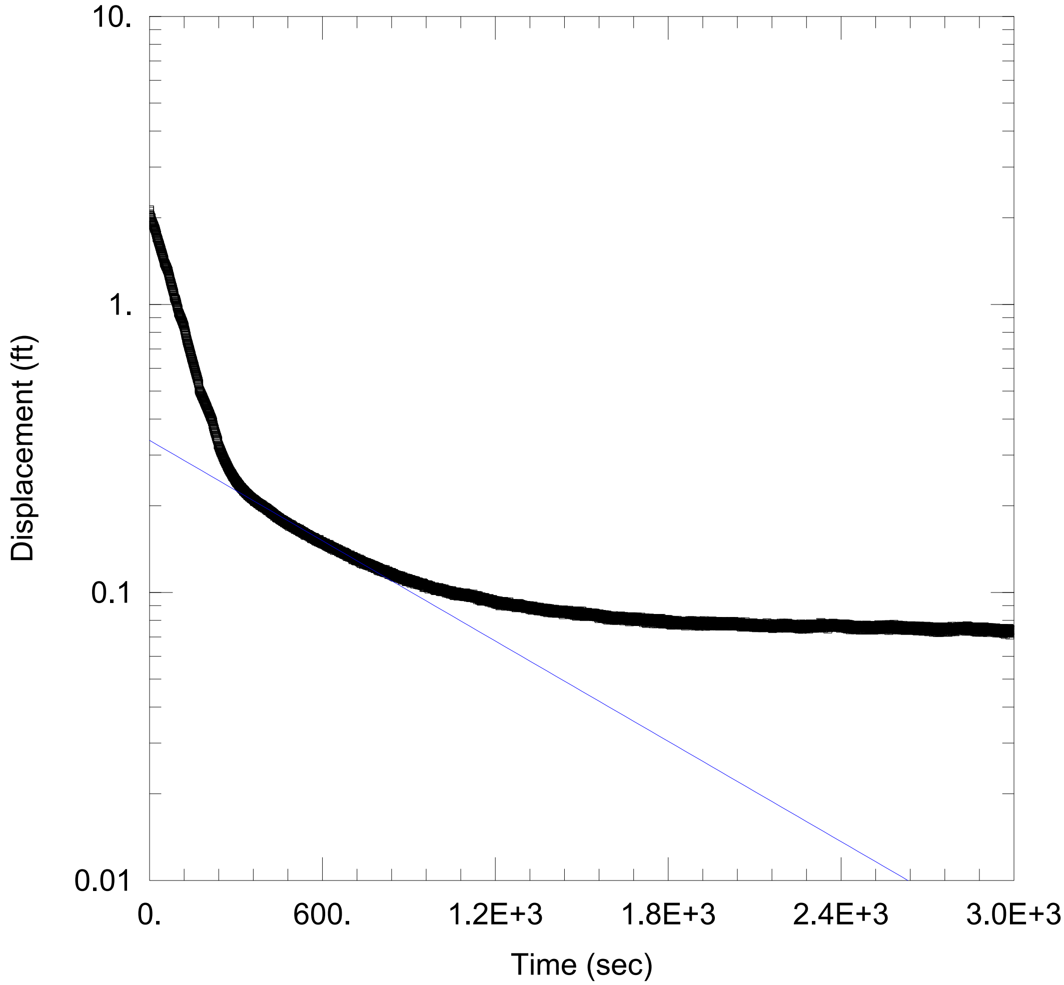
WELL DATA (LTW-01-T3)

Initial Displacement: 2.099 ft
Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0002405 cm/sec
y0 = 0.3523 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T4_br.aqt
Date: 08/14/19 Time: 13:23:01

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft Anisotropy Ratio (Kz/Kr): 0.1

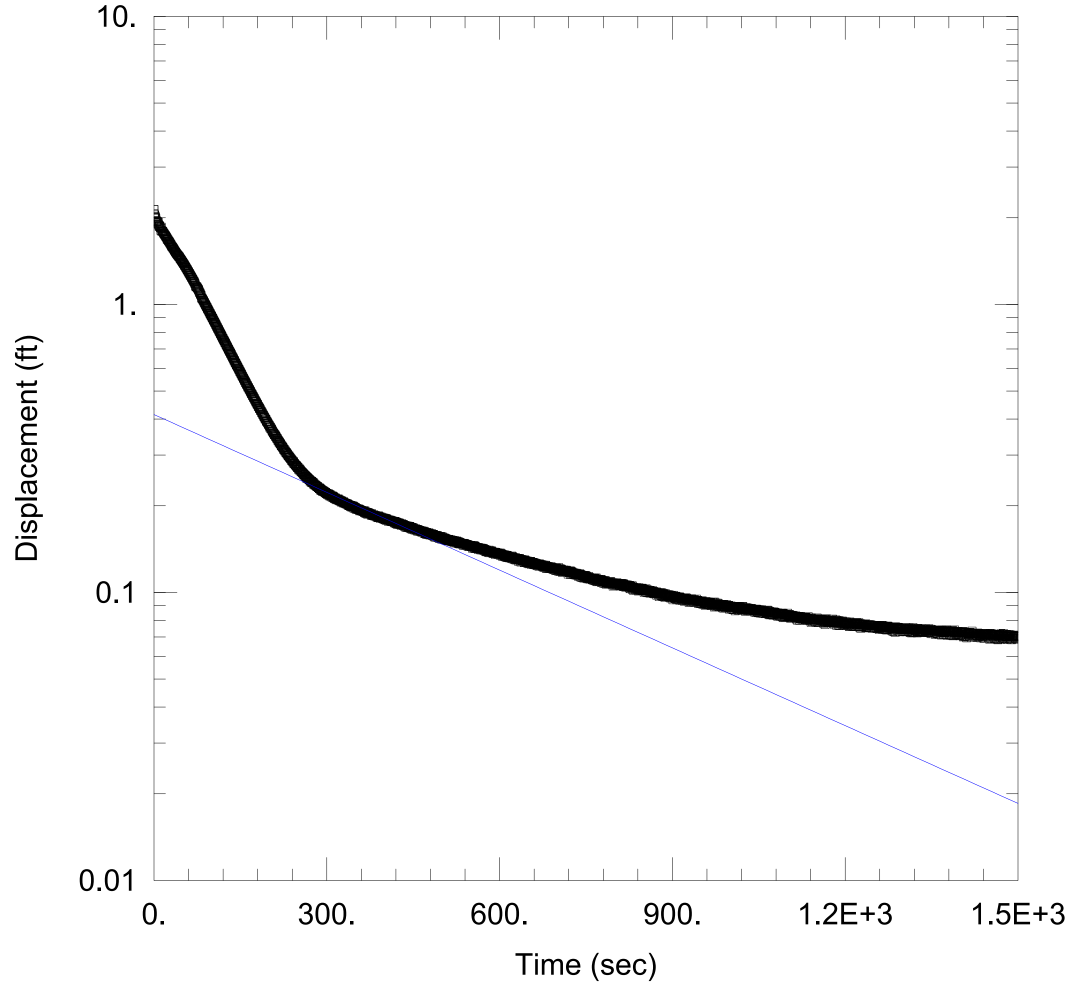
WELL DATA (LTW-01-T4)

Initial Displacement: 2.131 ft Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0001787 cm/sec y0 = 0.3372 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T5_br.aqt
Date: 08/14/19 Time: 13:31:12

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 0.1

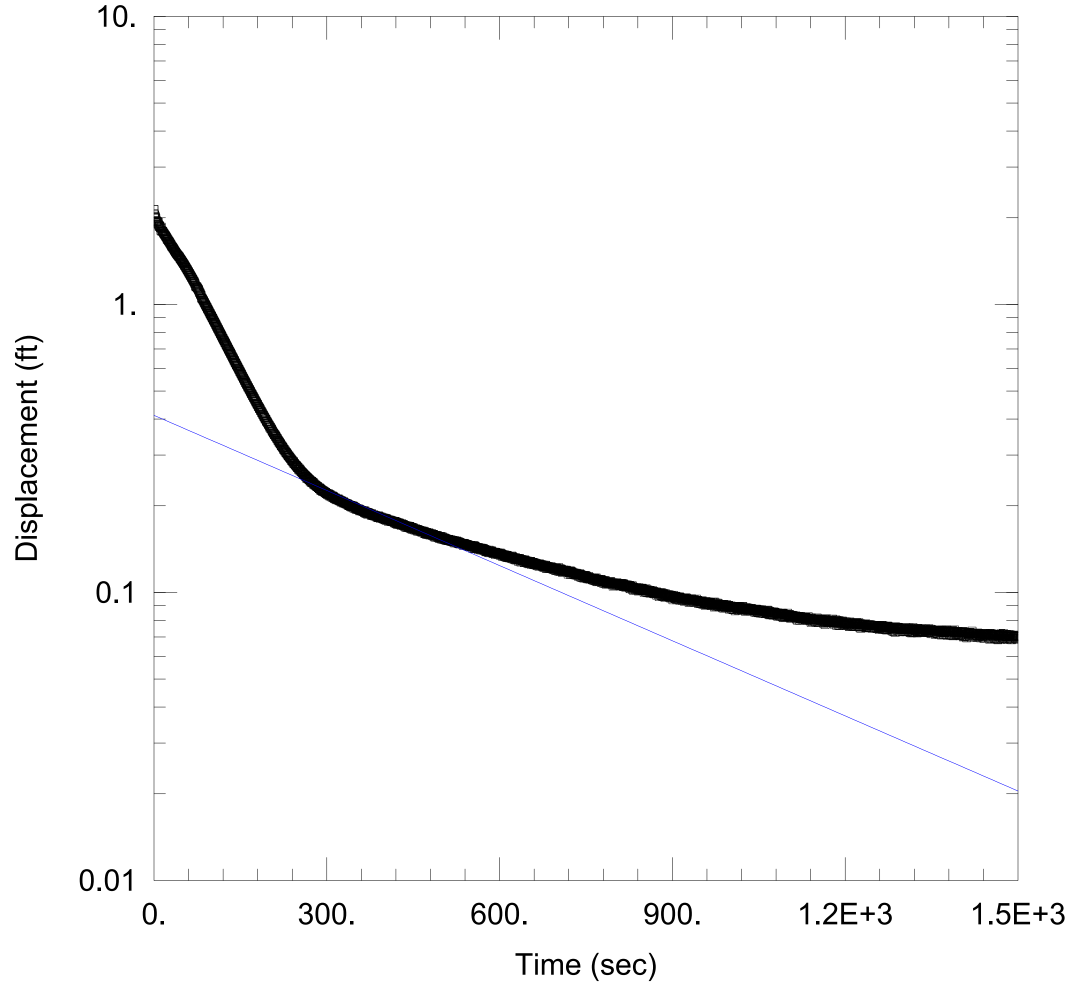
WELL DATA (LTW-01-T5)

Initial Displacement: 2.136 ft
Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0002025 cm/sec
y0 = 0.4146 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-01\LTW-01-T5_h.aqt
Date: 08/14/19 Time: 13:32:08

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-01
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 16. ft
Anisotropy Ratio (Kz/Kr): 0.1

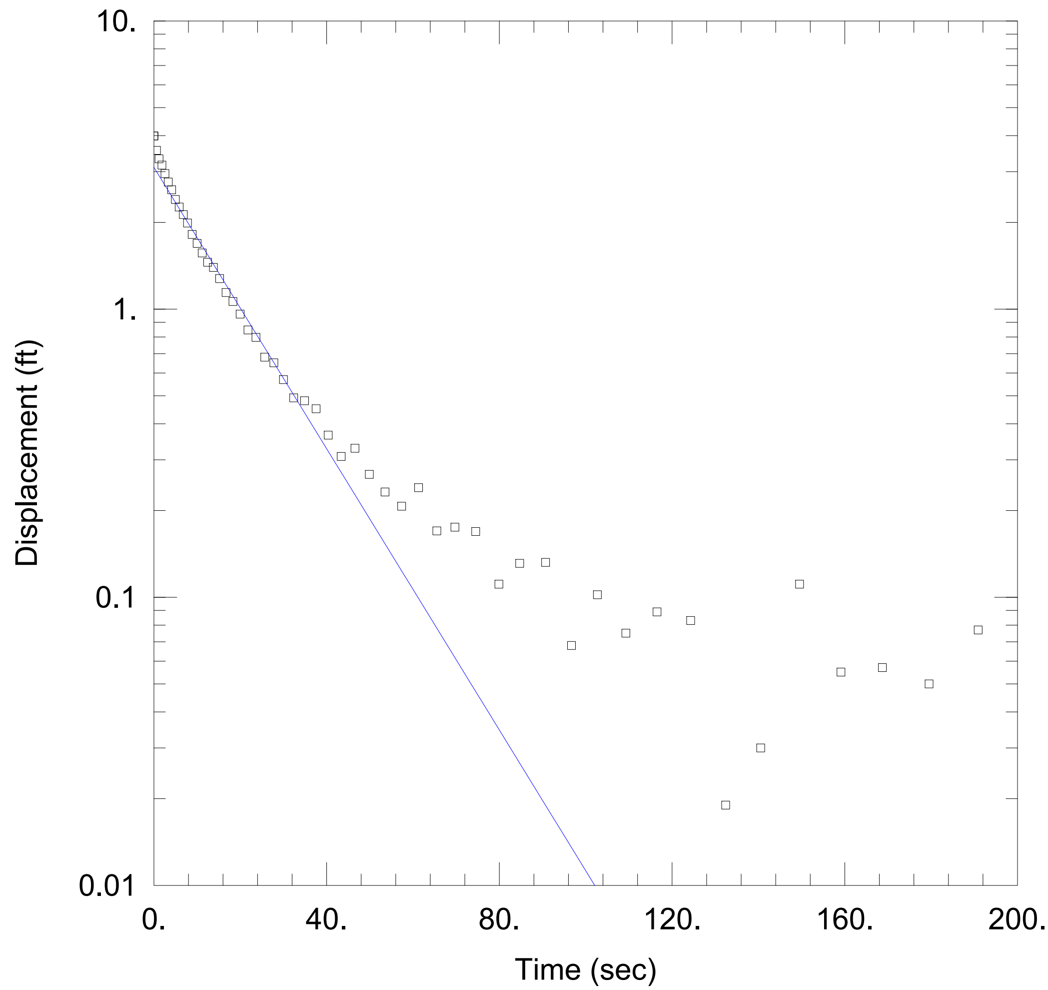
WELL DATA (LTW-01-T5)

Initial Displacement: 2.136 ft
Static Water Column Height: 9.76 ft
Total Well Penetration Depth: 15. ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0002677 cm/sec
y0 = 0.412 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T1_br.aqt
Date: 08/14/19 Time: 13:59:07

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

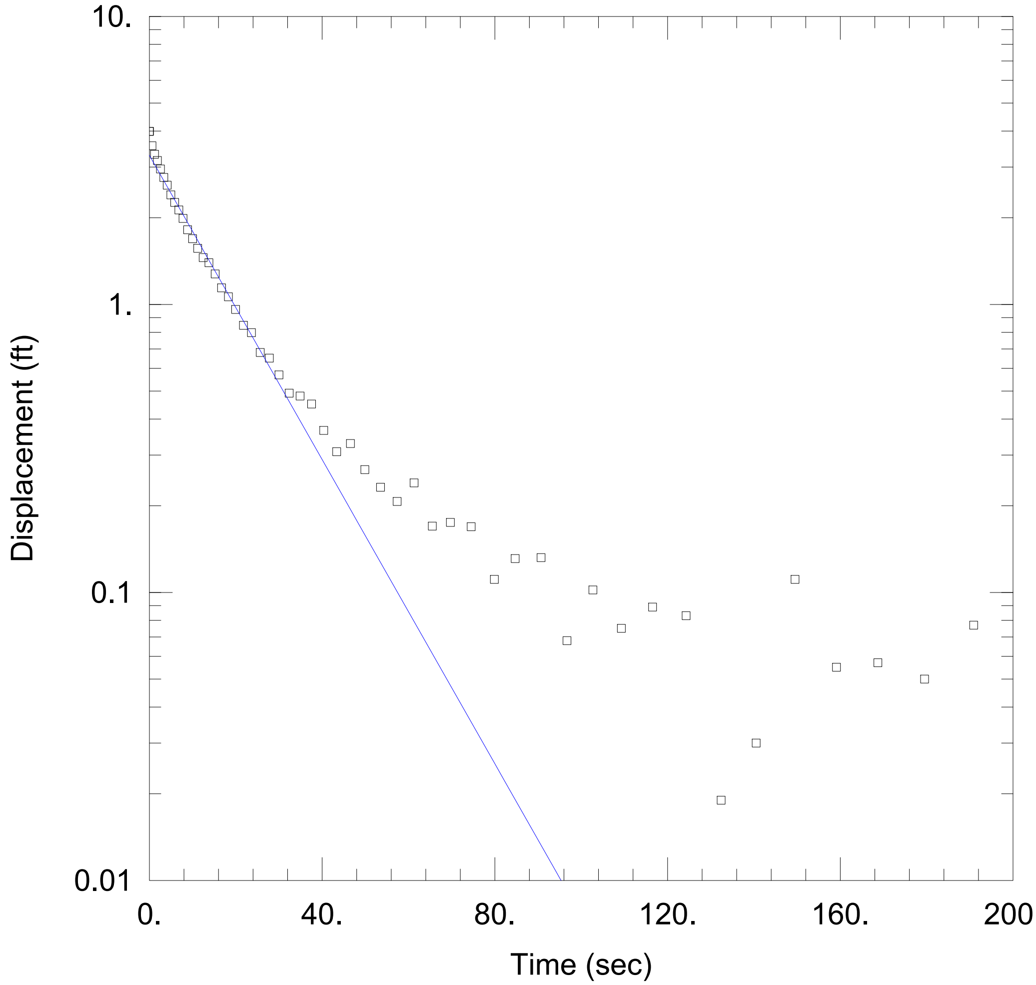
WELL DATA (LTW-02-T1)

Initial Displacement: 3.989 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.009449 cm/sec
y0 = 3.104 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T1_h.aqt
Date: 08/14/19 Time: 14:00:50

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 0.1

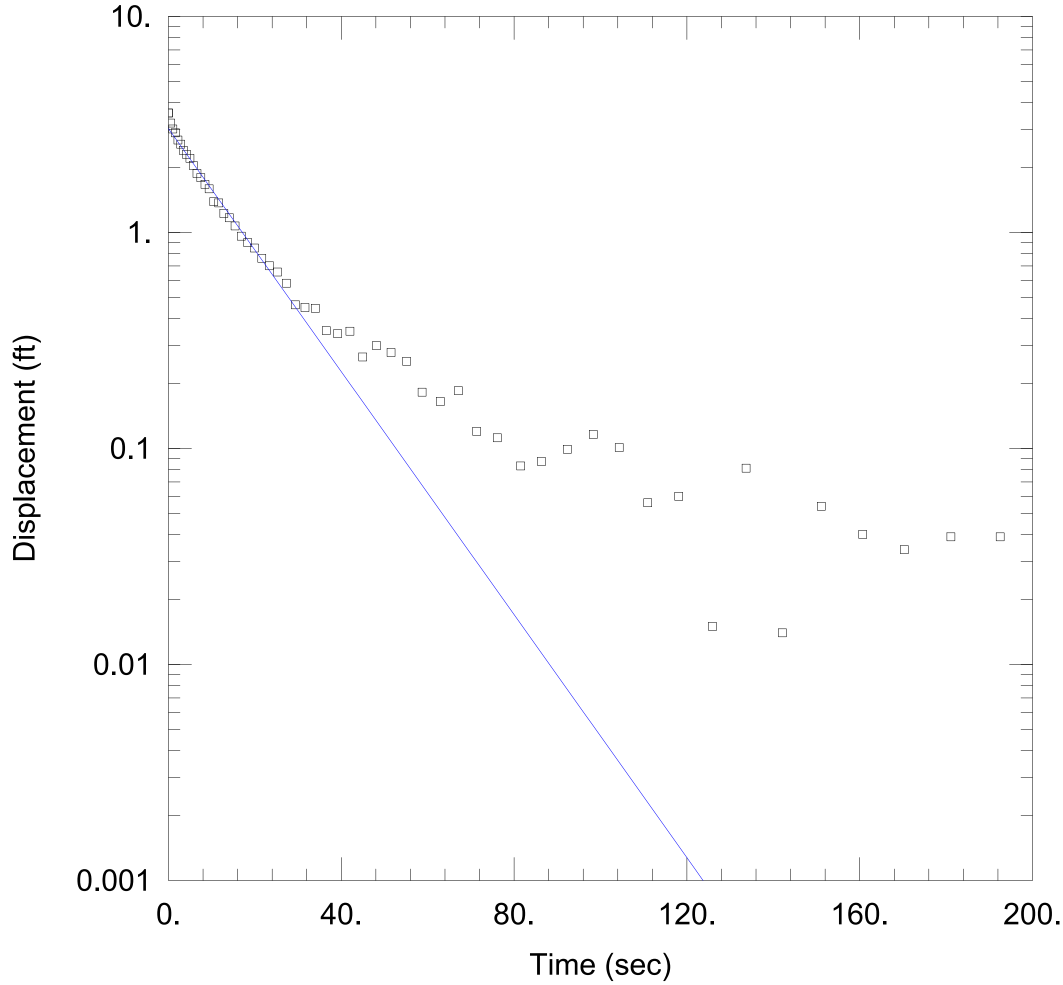
WELL DATA (LTW-02-T1)

Initial Displacement: 3.989 ft
Total Well Penetration Depth: 27.69 ft
Casing Radius: 0.17 ft
Static Water Column Height: 27.69 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.01296 cm/sec y0 = 3.292 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T2_br.aqt
Date: 08/14/19 Time: 14:10:14

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

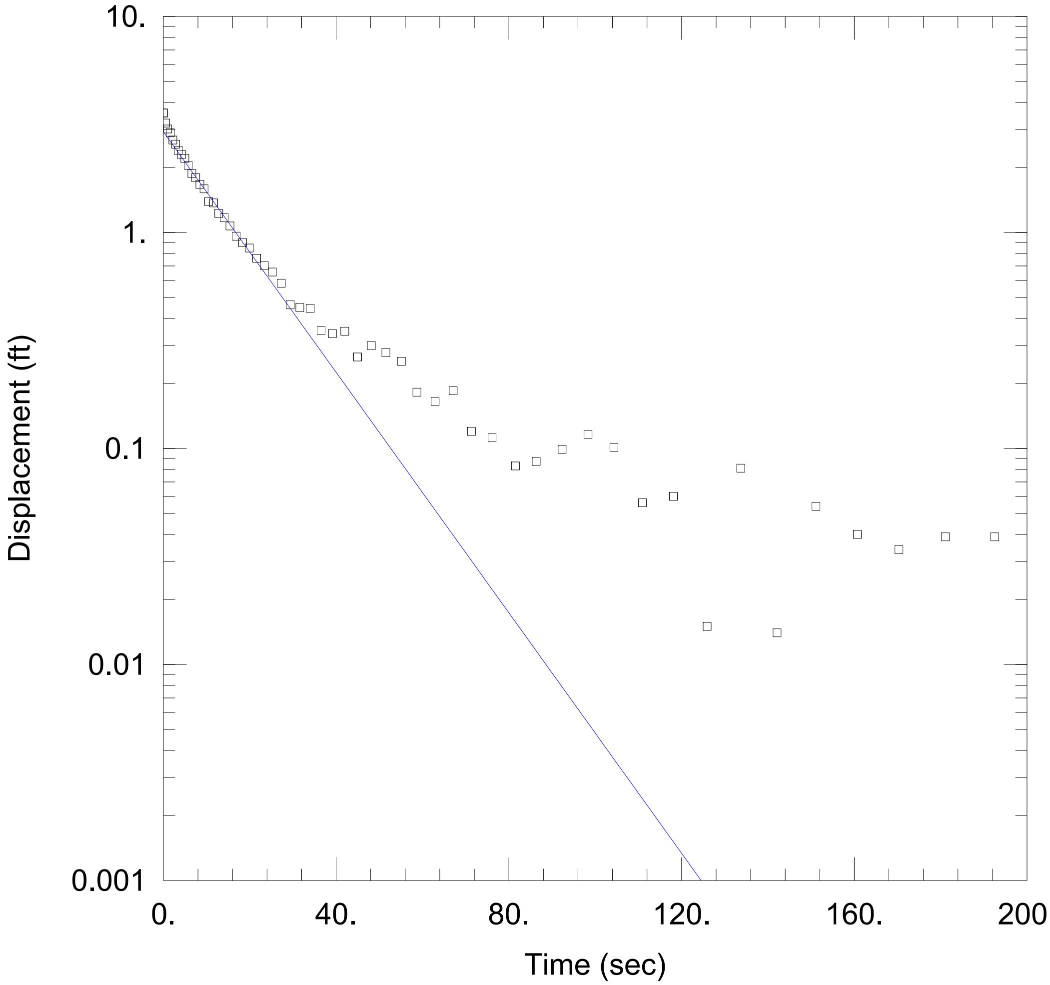
WELL DATA (LTW-02-T2)

Initial Displacement: 3.57 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.01088 cm/sec
y0 = 3.022 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T2_h.aqt
Date: 08/14/19 Time: 14:09:14

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 0.1

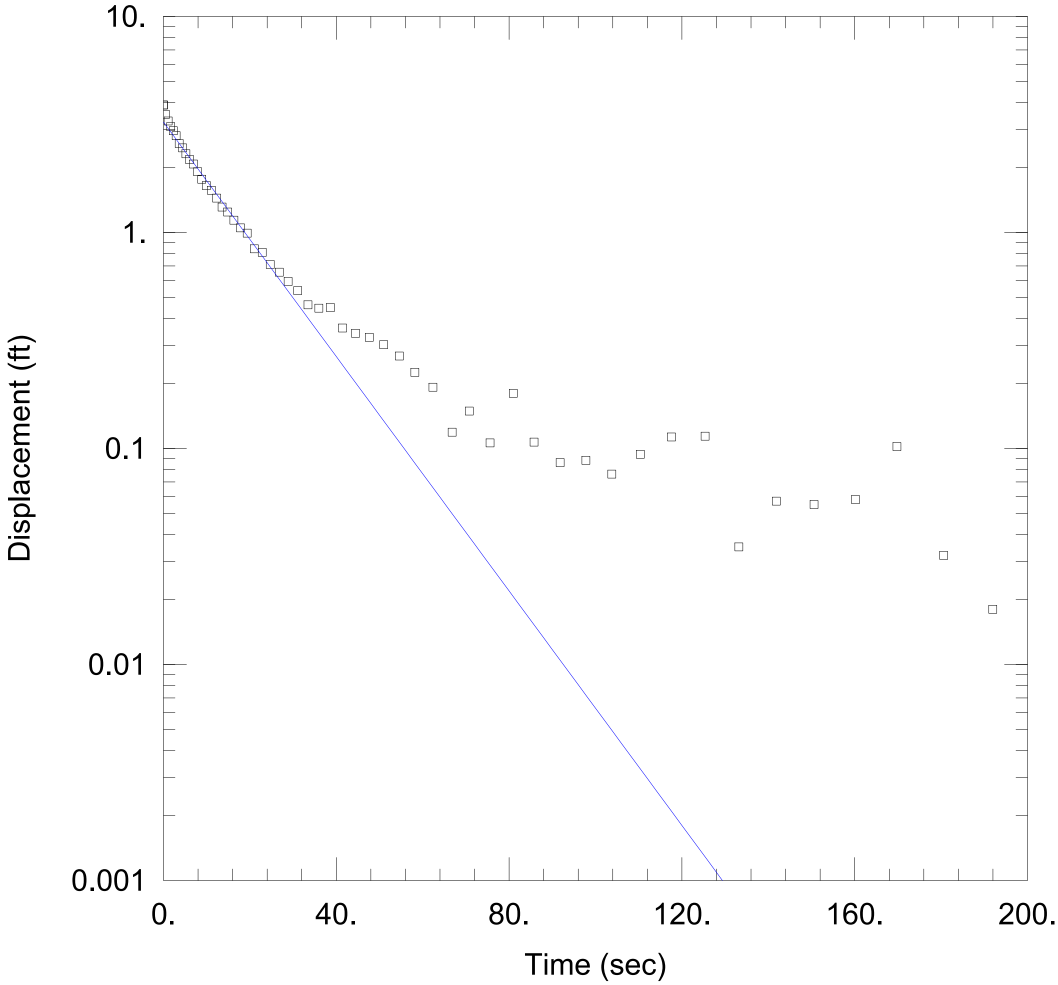
WELL DATA (LTW-02-T2)

Initial Displacement: 3.57 ft Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.01366 cm/sec y0 = 2.92 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T3_br.aqt
Date: 08/14/19 Time: 14:16:20

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

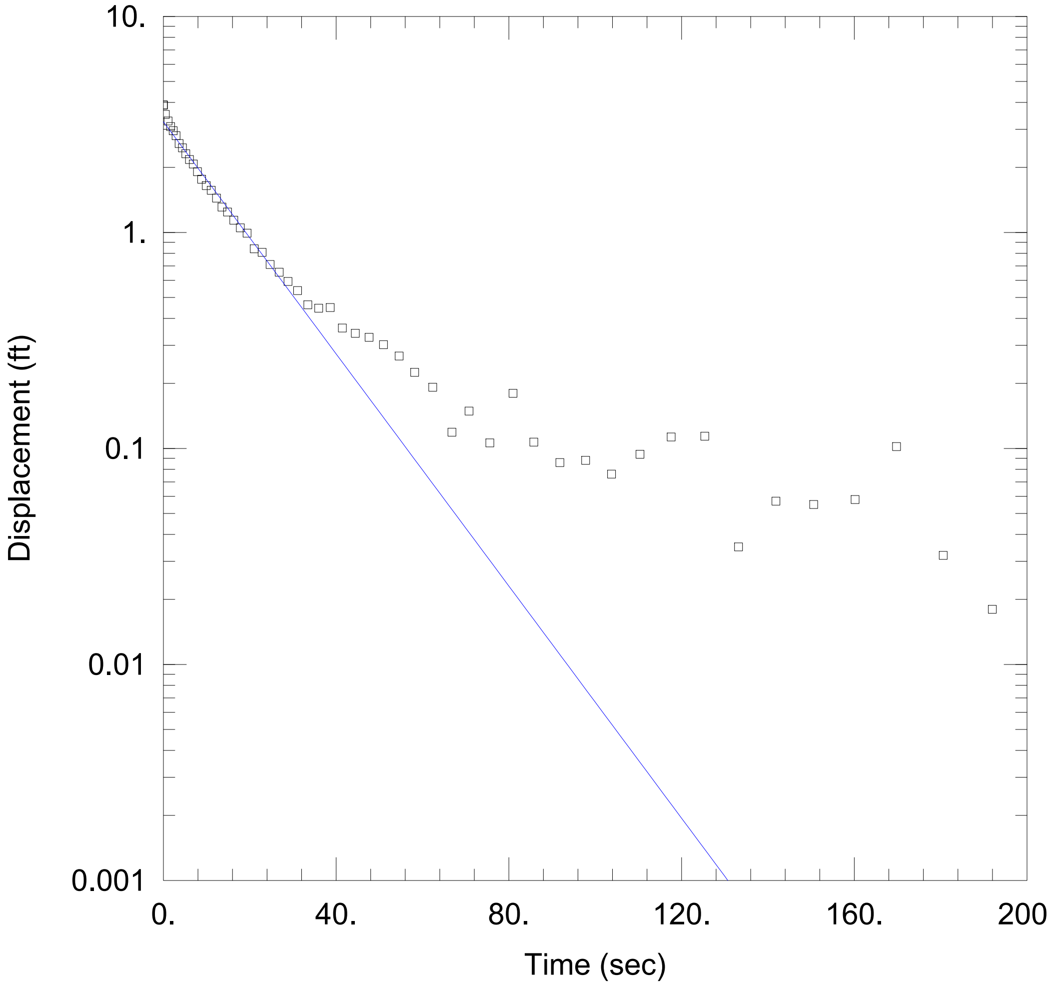
WELL DATA (LTW-02-T3)

Initial Displacement: 3.891 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.0105 cm/sec
y0 = 3.24 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T3_h.aqt
Date: 08/14/19 Time: 14:16:55

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

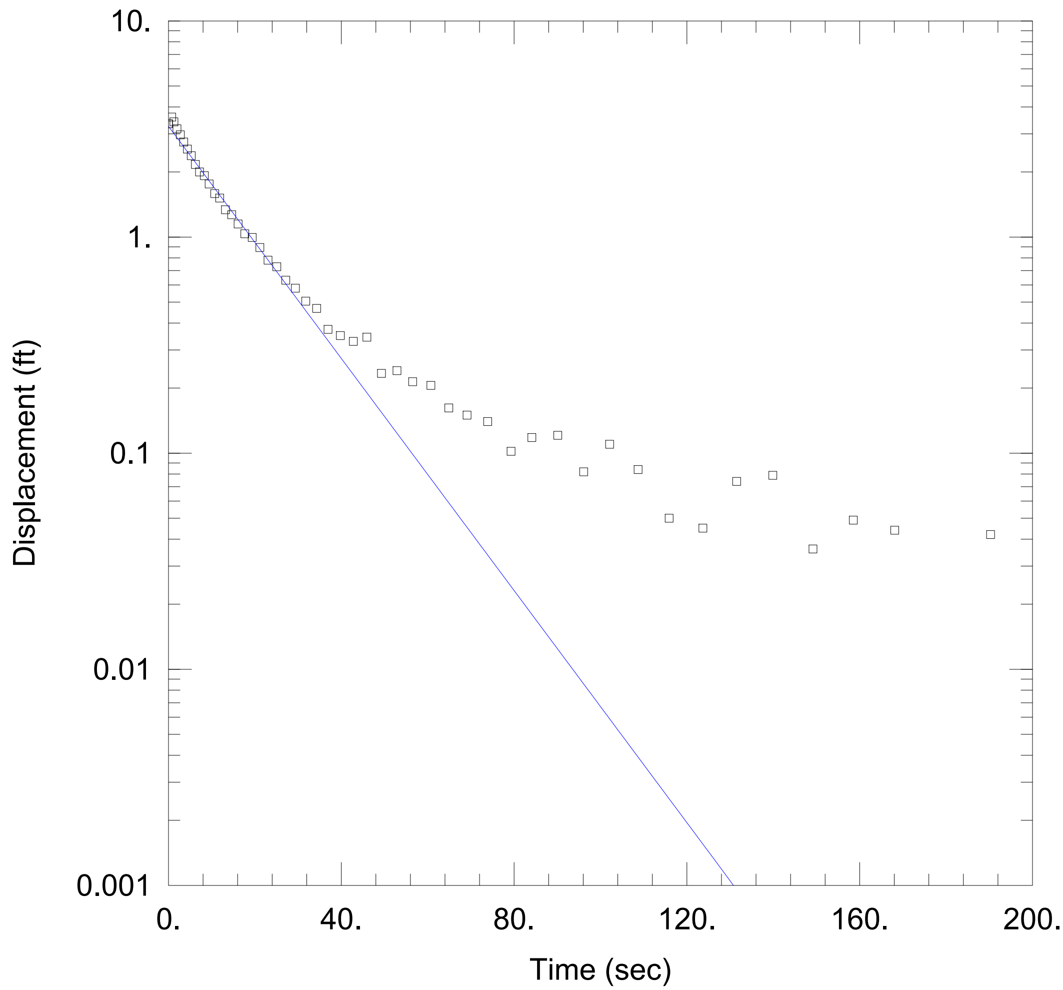
WELL DATA (LTW-02-T3)

Initial Displacement: 3.891 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.01319 cm/sec
y0 = 3.255 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T4_br.aqt
Date: 08/14/19 Time: 14:23:21

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

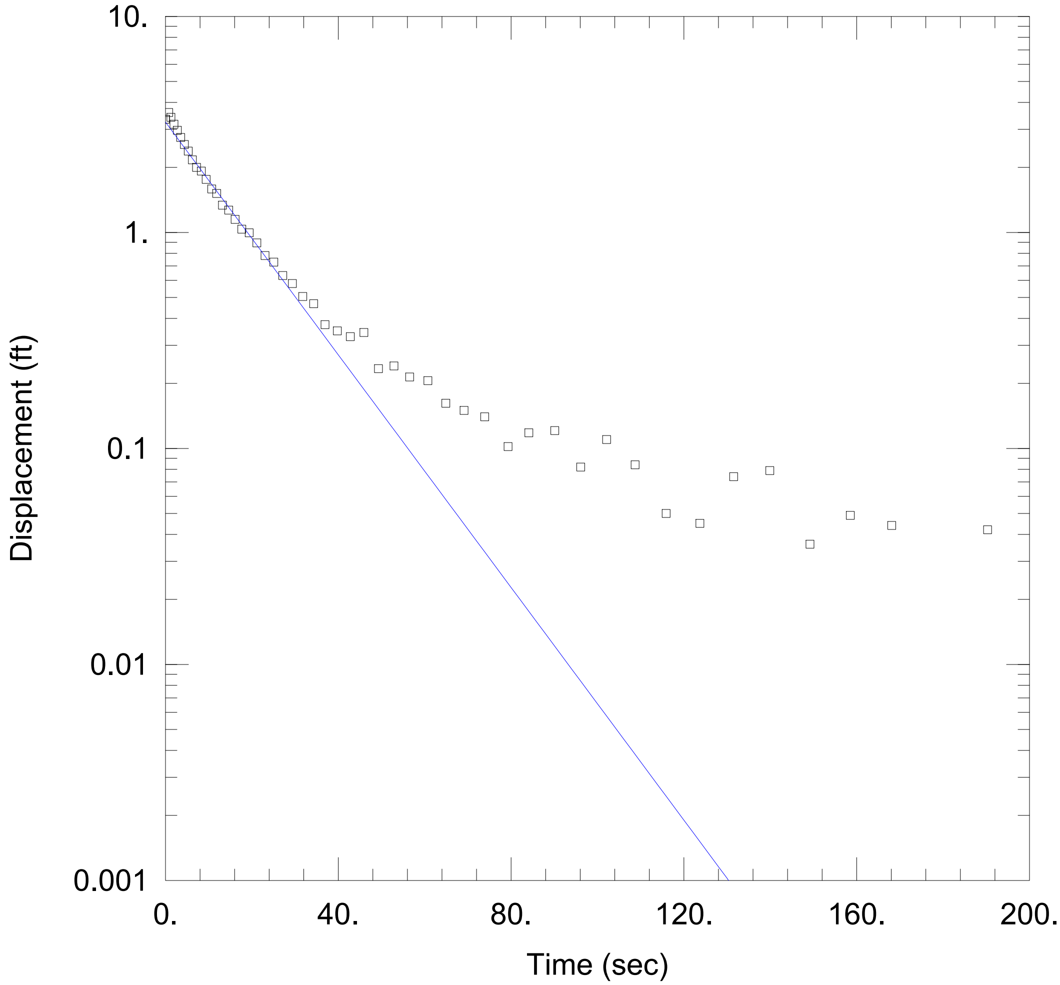
WELL DATA (LTW-02-T4)

Initial Displacement: 3.34 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.01039 cm/sec
y0 = 3.255 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T4_h.aqt
Date: 08/14/19 Time: 14:24:08

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 0.1

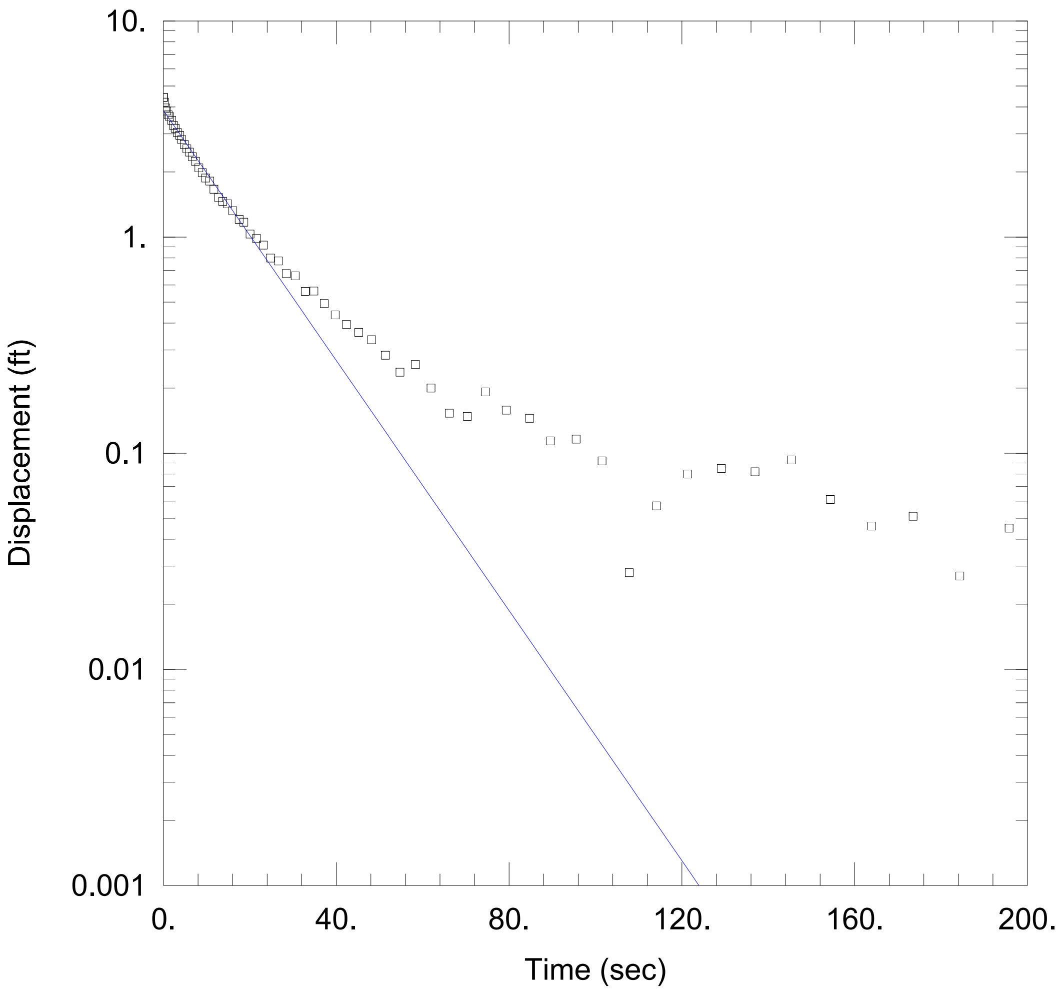
WELL DATA (LTW-02-T4)

Initial Displacement: 3.34 ft Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.01322 cm/sec y0 = 3.239 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T5_br.aqt
Date: 08/14/19 Time: 14:28:11

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft Anisotropy Ratio (Kz/Kr): 0.1

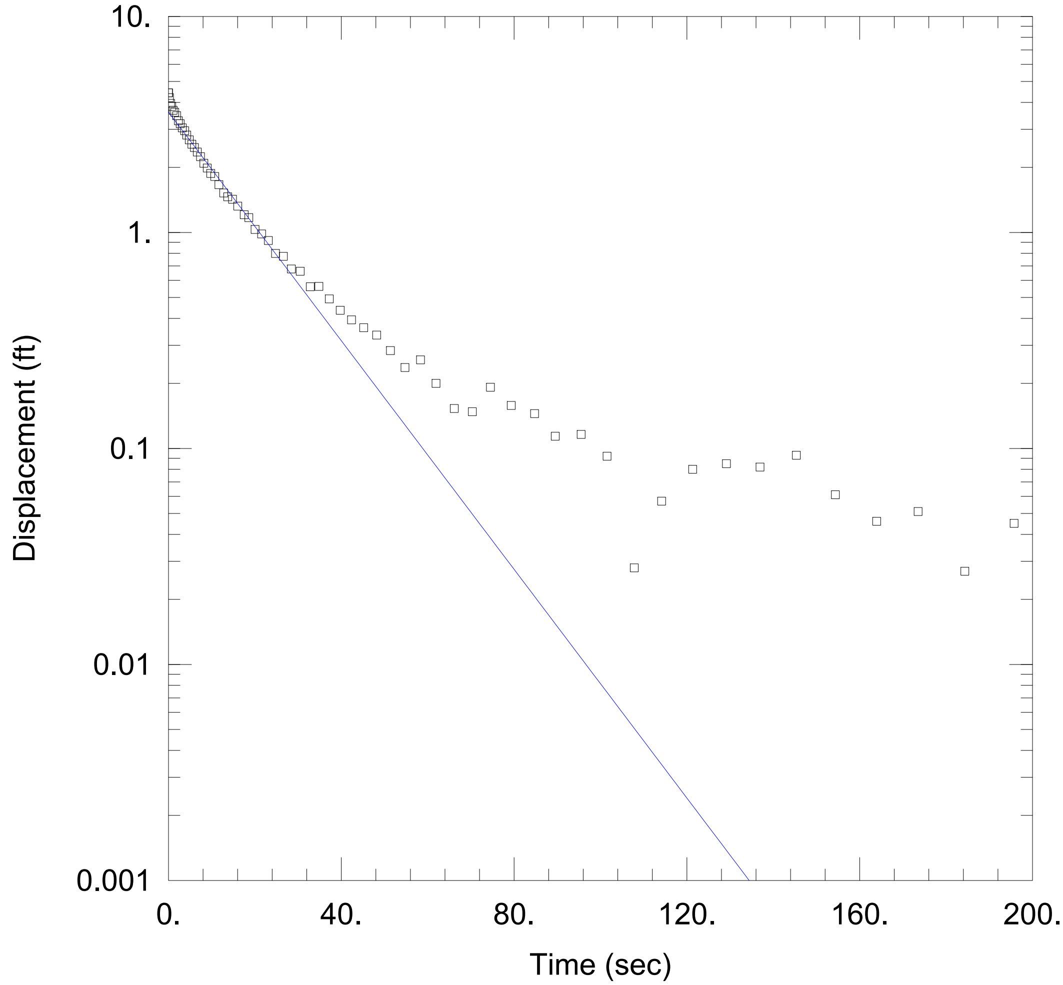
WELL DATA (LTW-02-T5)

Initial Displacement: 4.43 ft
Total Well Penetration Depth: 27.69 ft
Casing Radius: 0.17 ft
Static Water Column Height: 27.69 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.0112 cm/sec y0 = 3.853 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-02\LTW-02-T5_h.aqt
Date: 08/14/19 Time: 14:28:43

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-02
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 15. ft
Anisotropy Ratio (Kz/Kr): 0.1

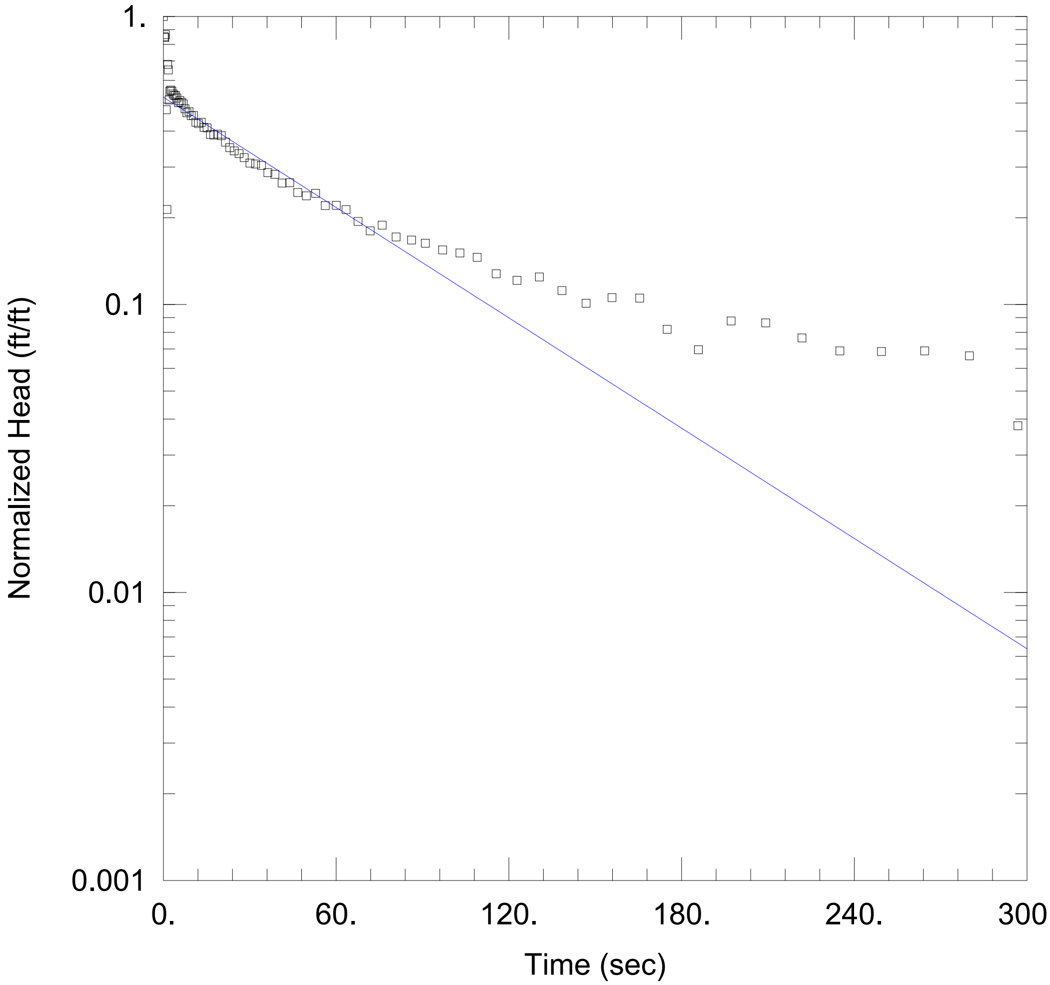
WELL DATA (LTW-02-T5)

Initial Displacement: 4.43 ft
Static Water Column Height: 27.69 ft
Total Well Penetration Depth: 27.69 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.01299 cm/sec
y0 = 3.609 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T1_br.aqt
Date: 08/14/19 Time: 14:38:58

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

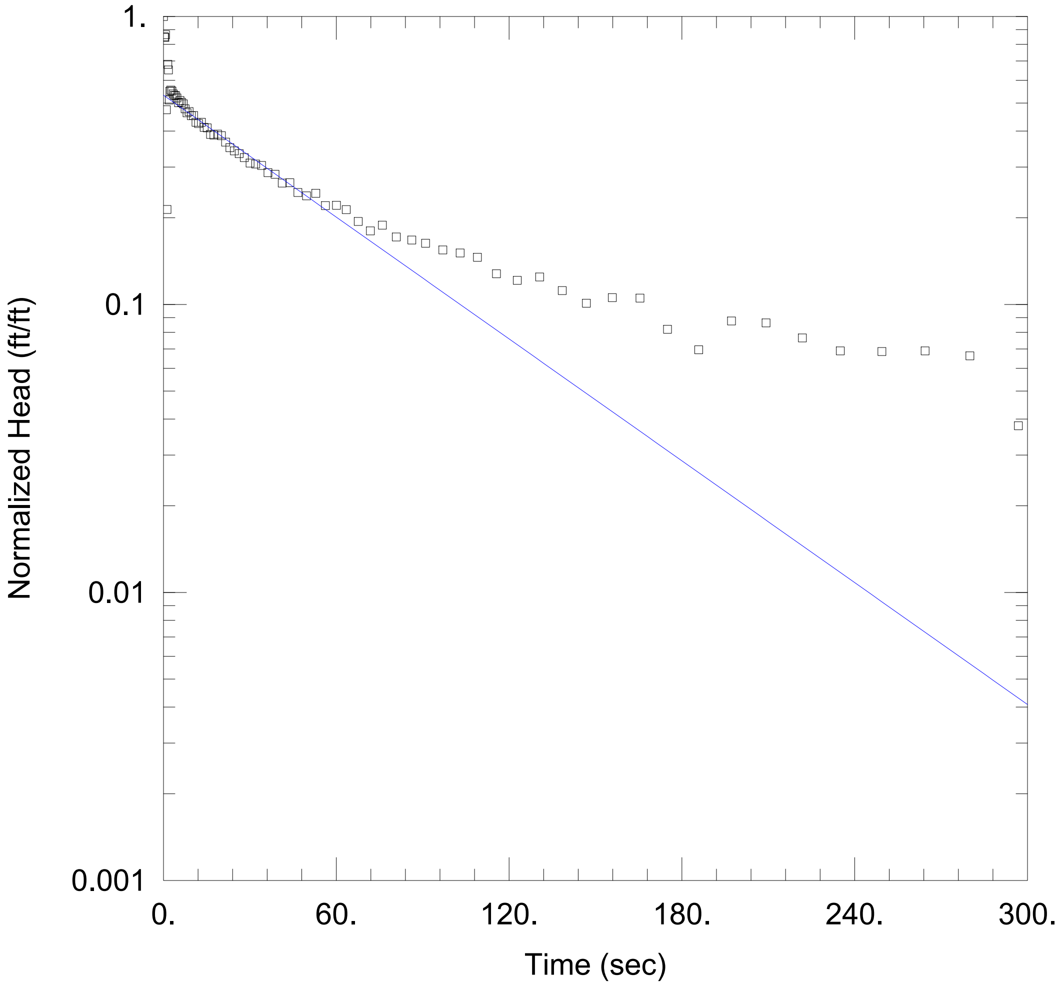
WELL DATA (LTW-03-T1)

Initial Displacement: -3.061 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.001303 cm/sec
y0 = -1.604 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T1_h.aqt
Date: 08/14/19 Time: 14:38:19

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

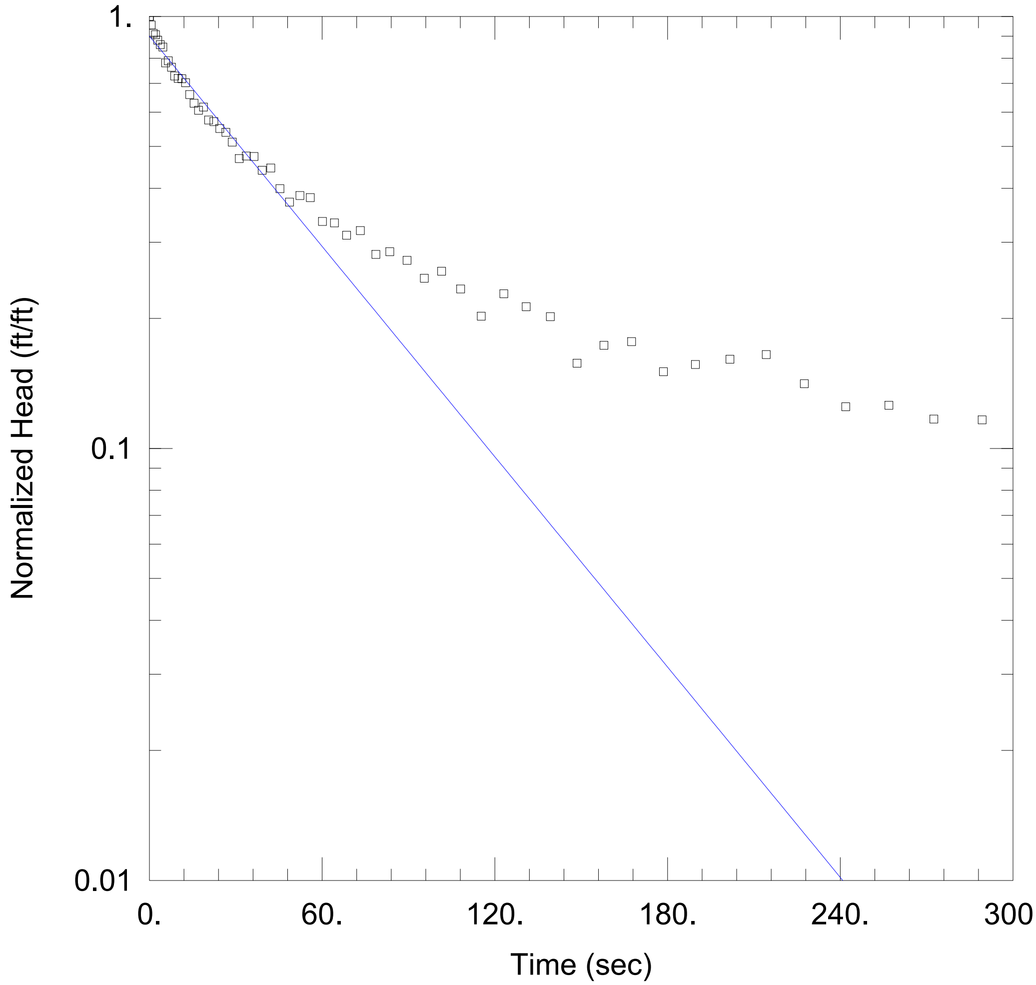
WELL DATA (LTW-03-T1)

Initial Displacement: -3.061 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.002914 cm/sec
y0 = -1.63 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T2_br.aqt
Date: 08/15/19 Time: 09:00:23

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

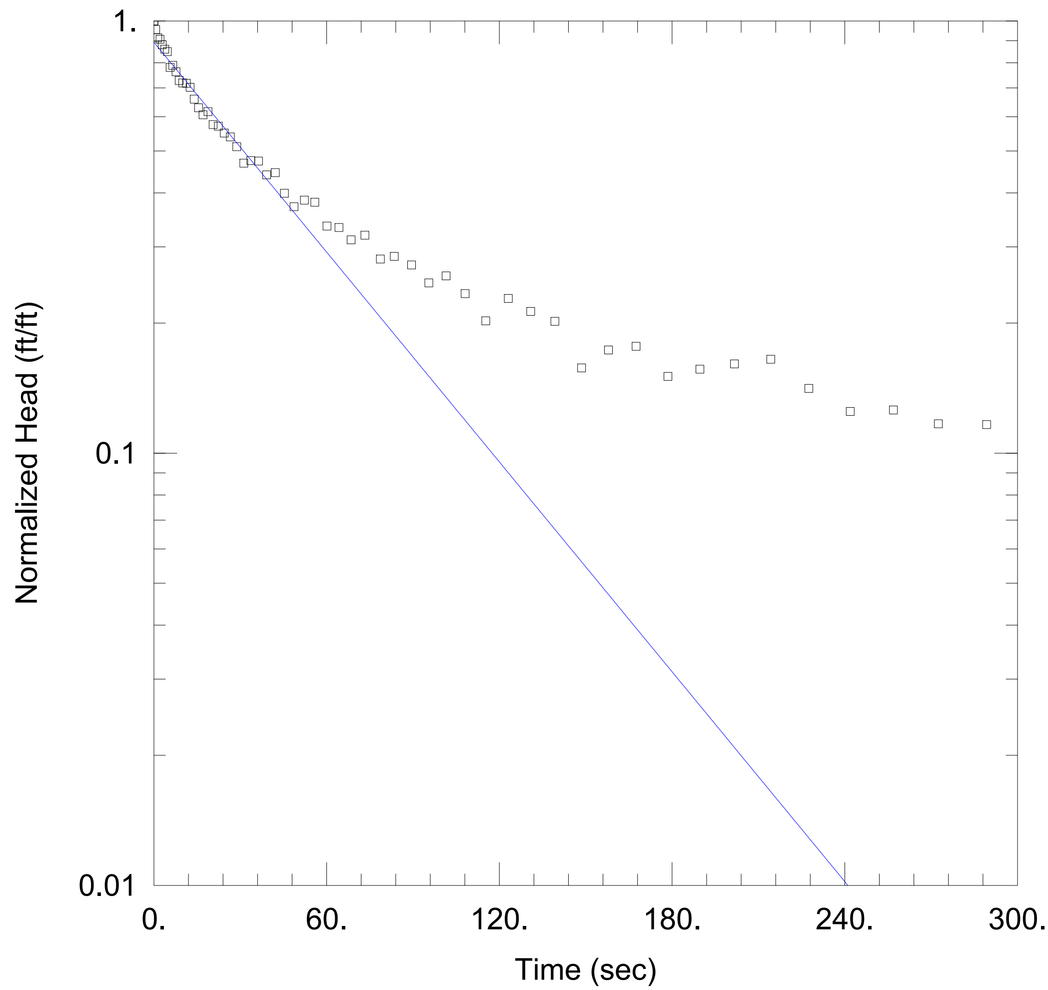
Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (LTW-03-T2)

Initial Displacement: 2.026 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice
K = 0.001657 cm/sec
y0 = 1.824 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T2_h.aqt
Date: 08/15/19 Time: 09:01:28

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft Anisotropy Ratio (Kz/Kr): 0.1

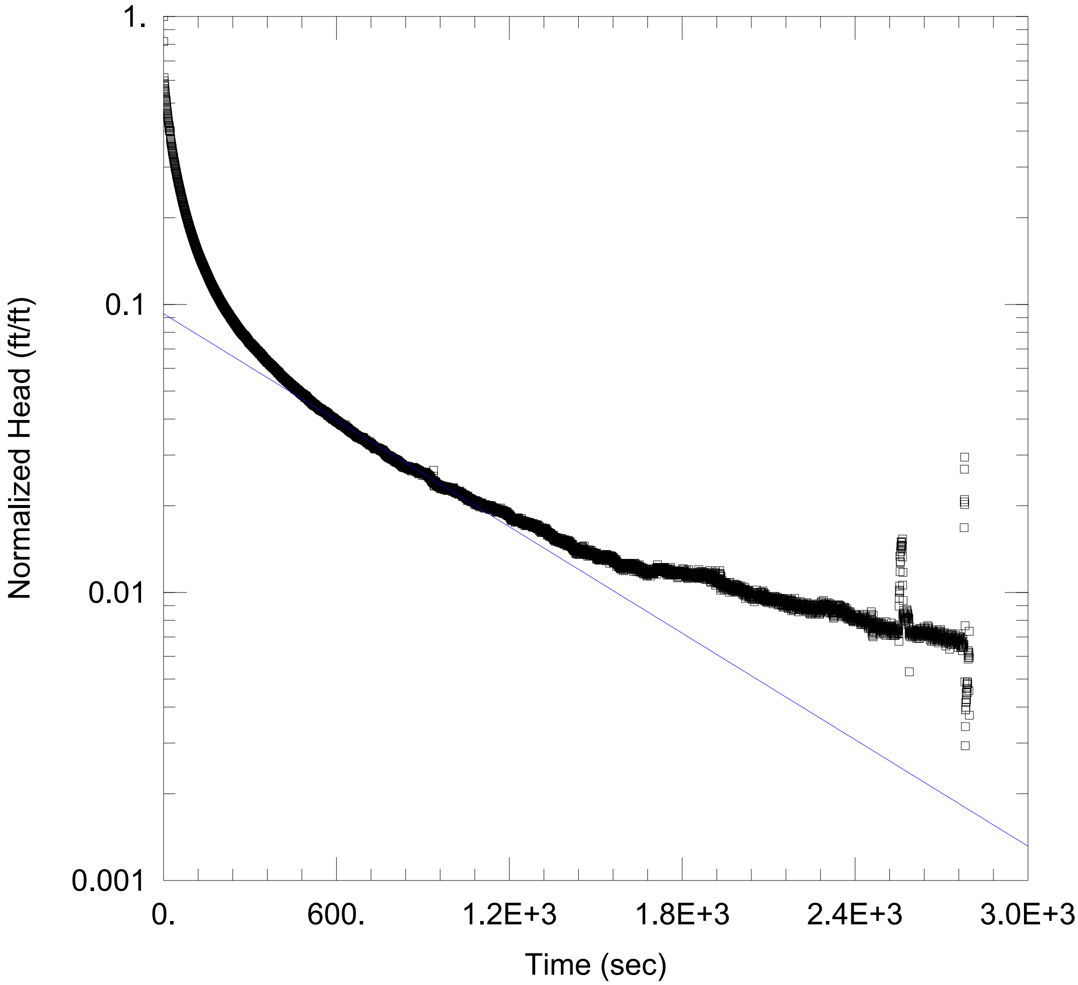
WELL DATA (LTW-03-T2)

Initial Displacement: 2.026 ft Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.003344 cm/sec y0 = 1.808 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-03-T3_BR_unc (4).aqt
Date: 09/18/19 Time: 12:00:34

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft Anisotropy Ratio (Kz/Kr): 0.1

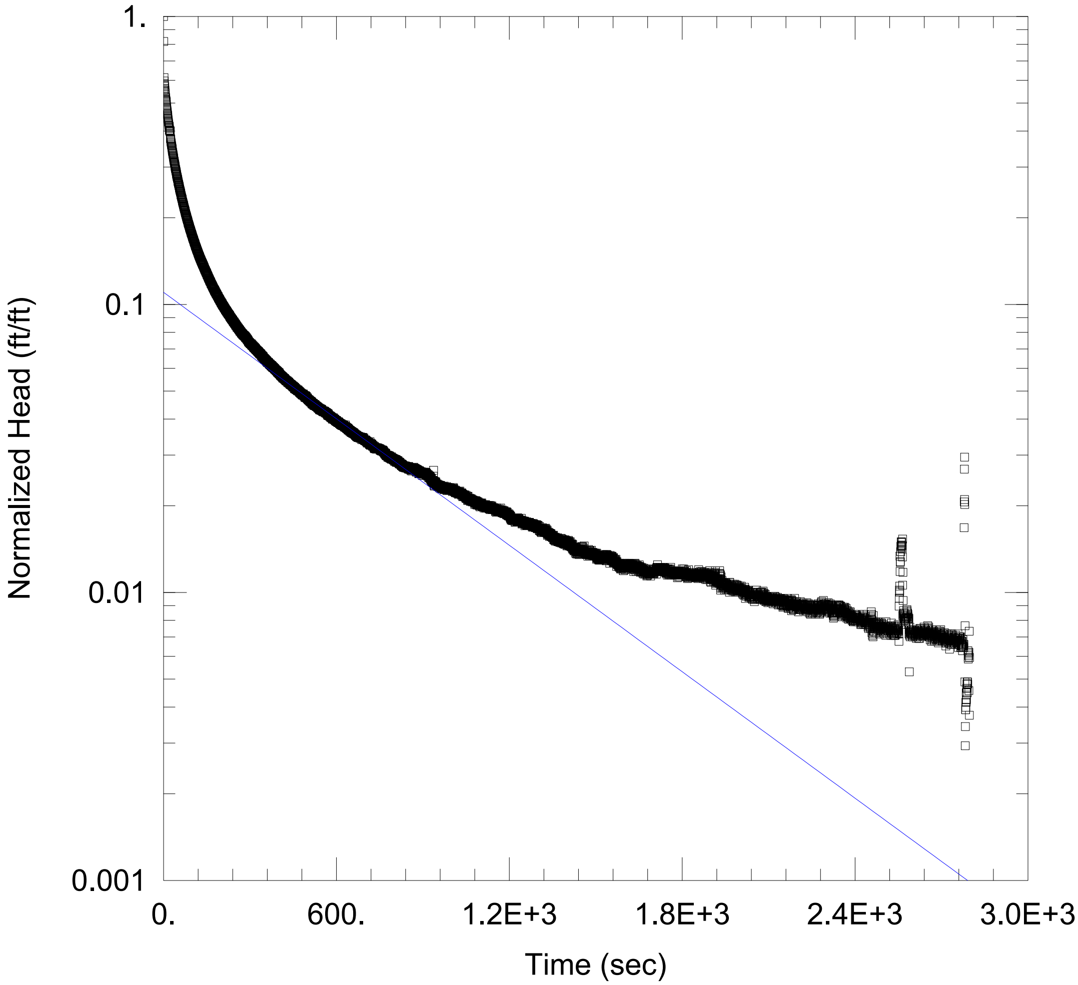
WELL DATA (LTW-03-T4)

Initial Displacement: -2.825 ft Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.128E-6 ft/sec y0 = -0.2622 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-03-T3_H_unc.aqt
Date: 09/18/19 Time: 12:00:00

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

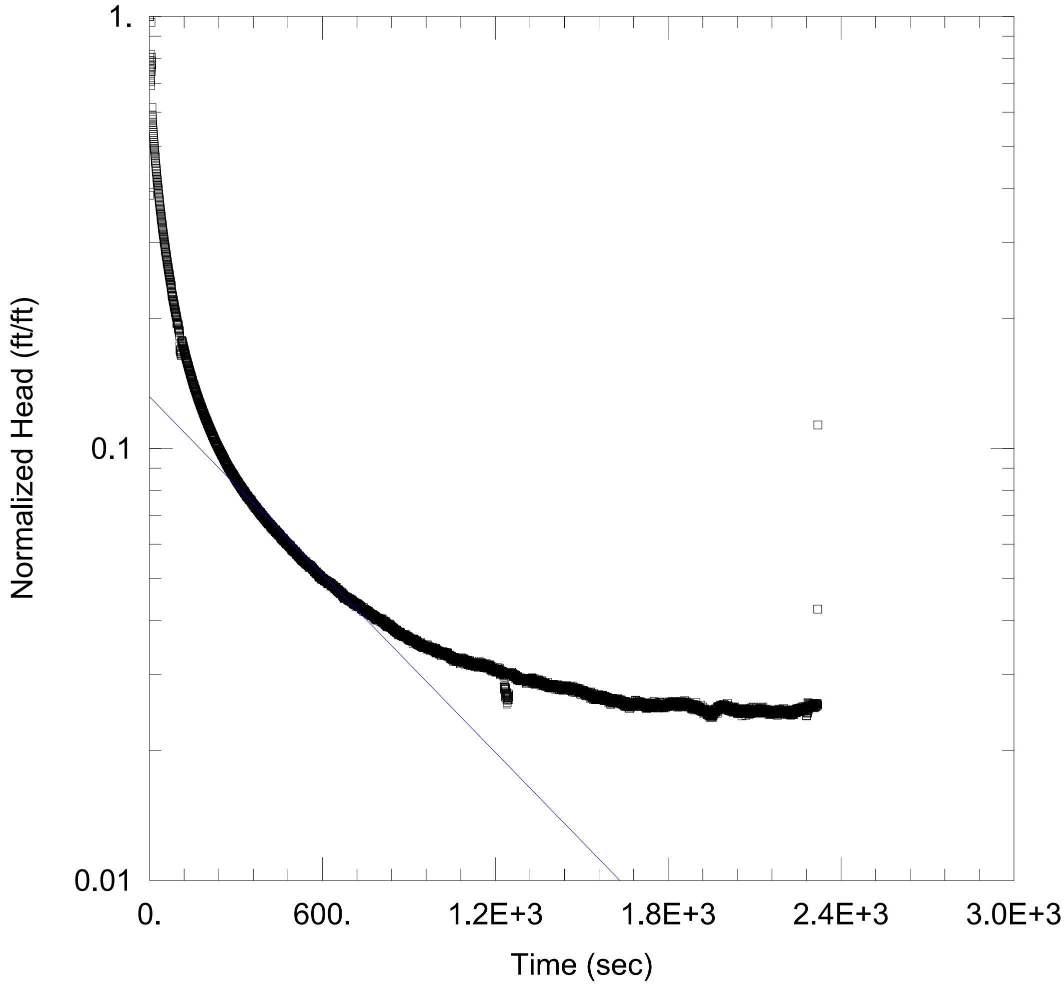
WELL DATA (LTW-03-T4)

Initial Displacement: -2.825 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 9.924E-6 ft/sec
y0 = -0.3112 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T4_br.aqt
Date: 08/14/19 Time: 15:10:45

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

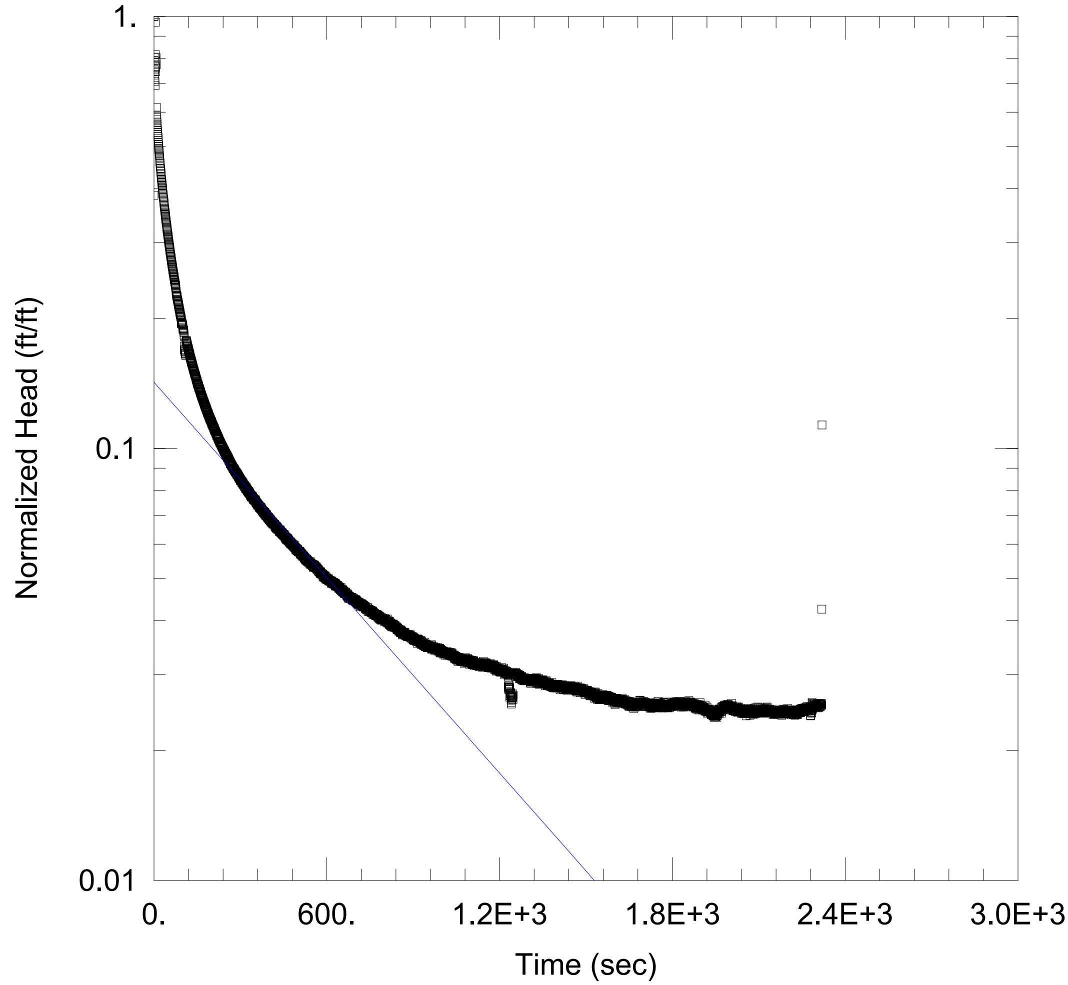
WELL DATA (LTW-03-T4)

Initial Displacement: 2.624 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 0.0001401 cm/sec
y0 = 0.3456 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T4_h.aqt
Date: 08/14/19 Time: 15:16:18

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

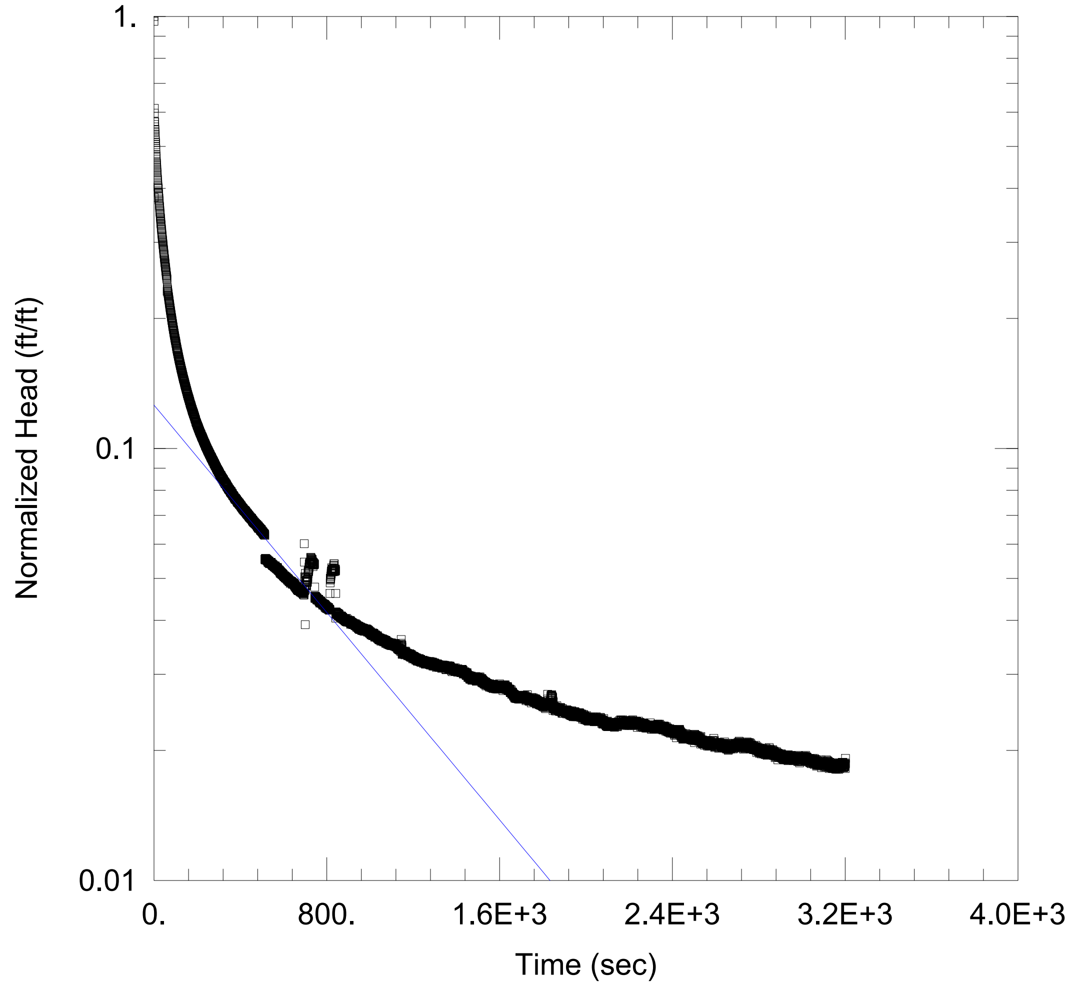
WELL DATA (LTW-03-T4)

Initial Displacement: 2.624 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0003117 cm/sec
y0 = 0.3735 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T5_br.aqt
Date: 08/14/19 Time: 15:21:11

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft Anisotropy Ratio (Kz/Kr): 0.1

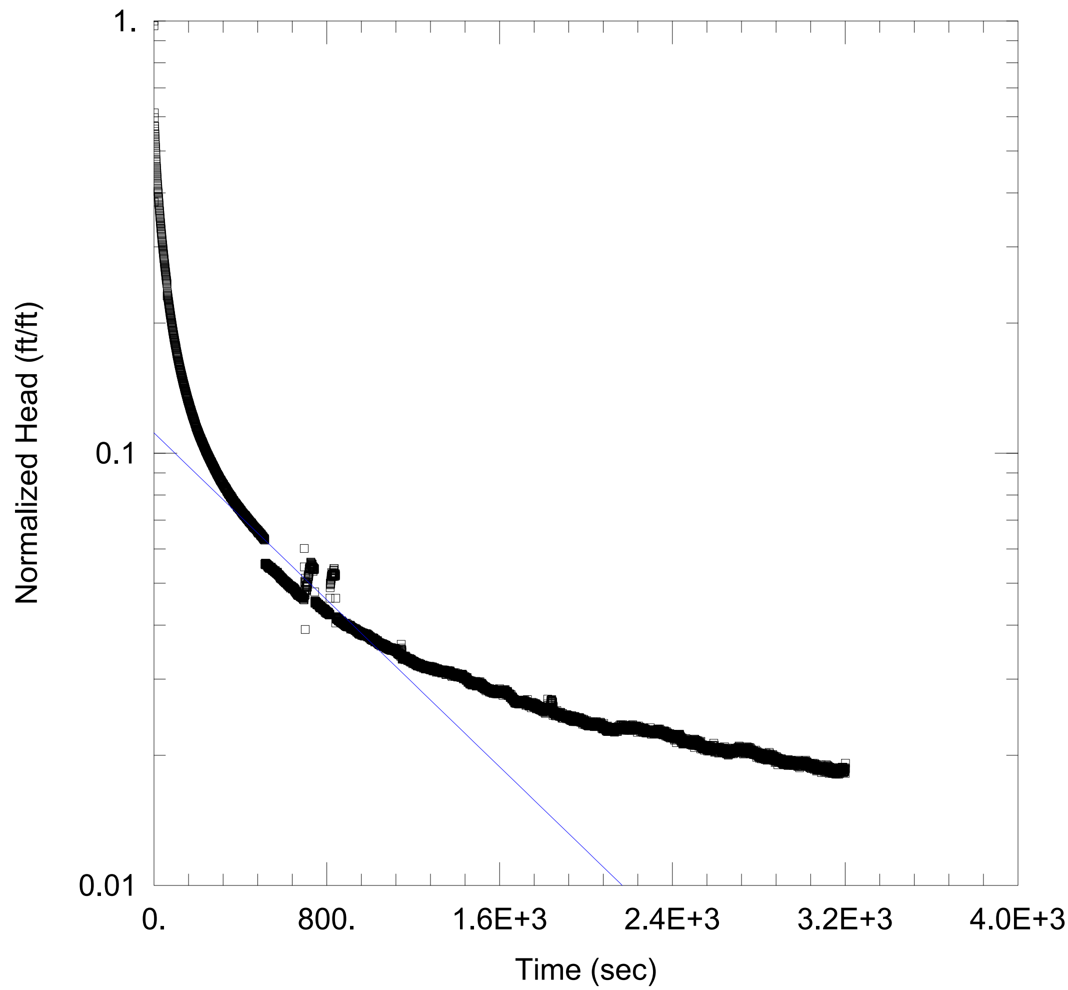
WELL DATA (LTW-03-T5)

Initial Displacement: -3.003 ft Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0001225 cm/sec y0 = -0.3784 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T5_h.aqt
Date: 08/14/19
Time: 15:22:05

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft
Anisotropy Ratio (Kz/Kr): 0.1

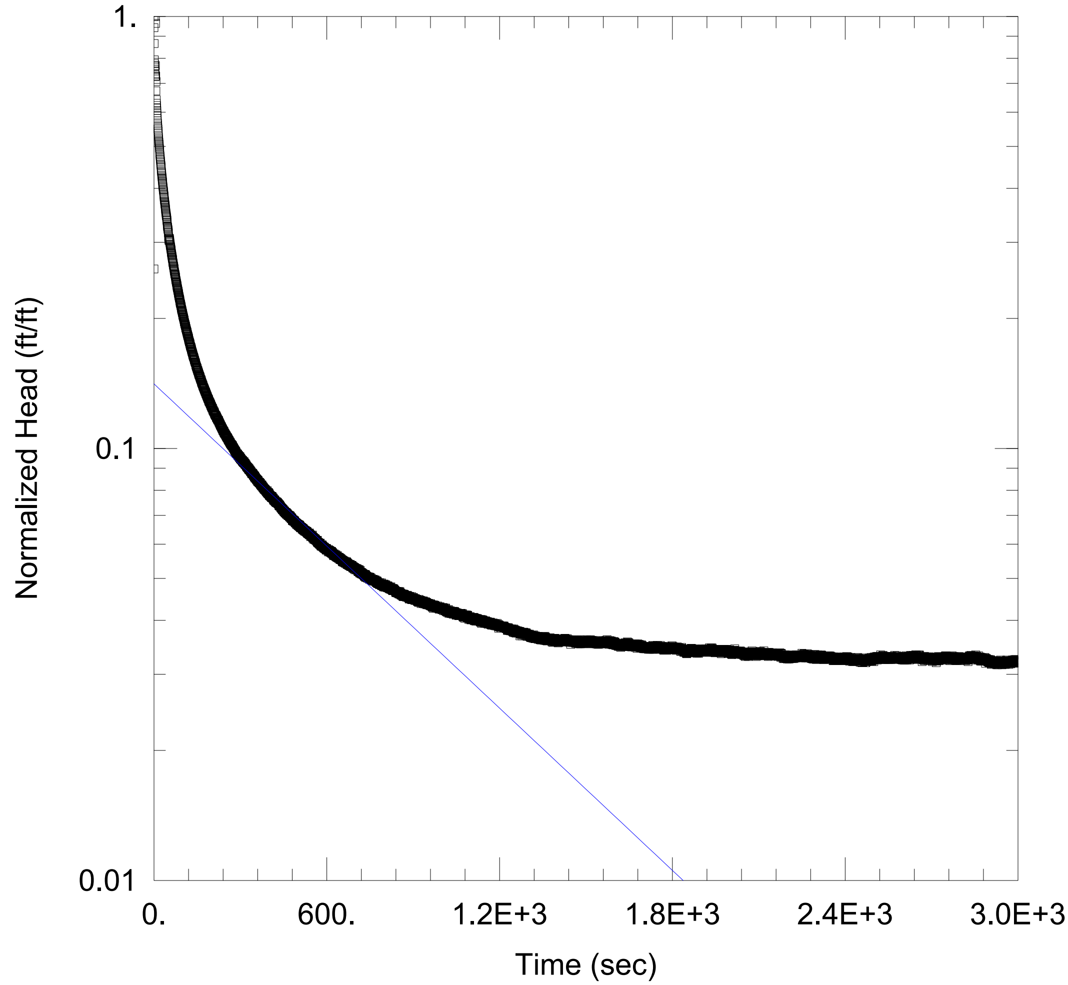
WELL DATA (LTW-03-T5)

Initial Displacement: -3.003 ft
Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0001996 cm/sec
y0 = -0.3345 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T6_br.aqt
Date: 08/14/19 Time: 15:26:22

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft Anisotropy Ratio (Kz/Kr): 0.1

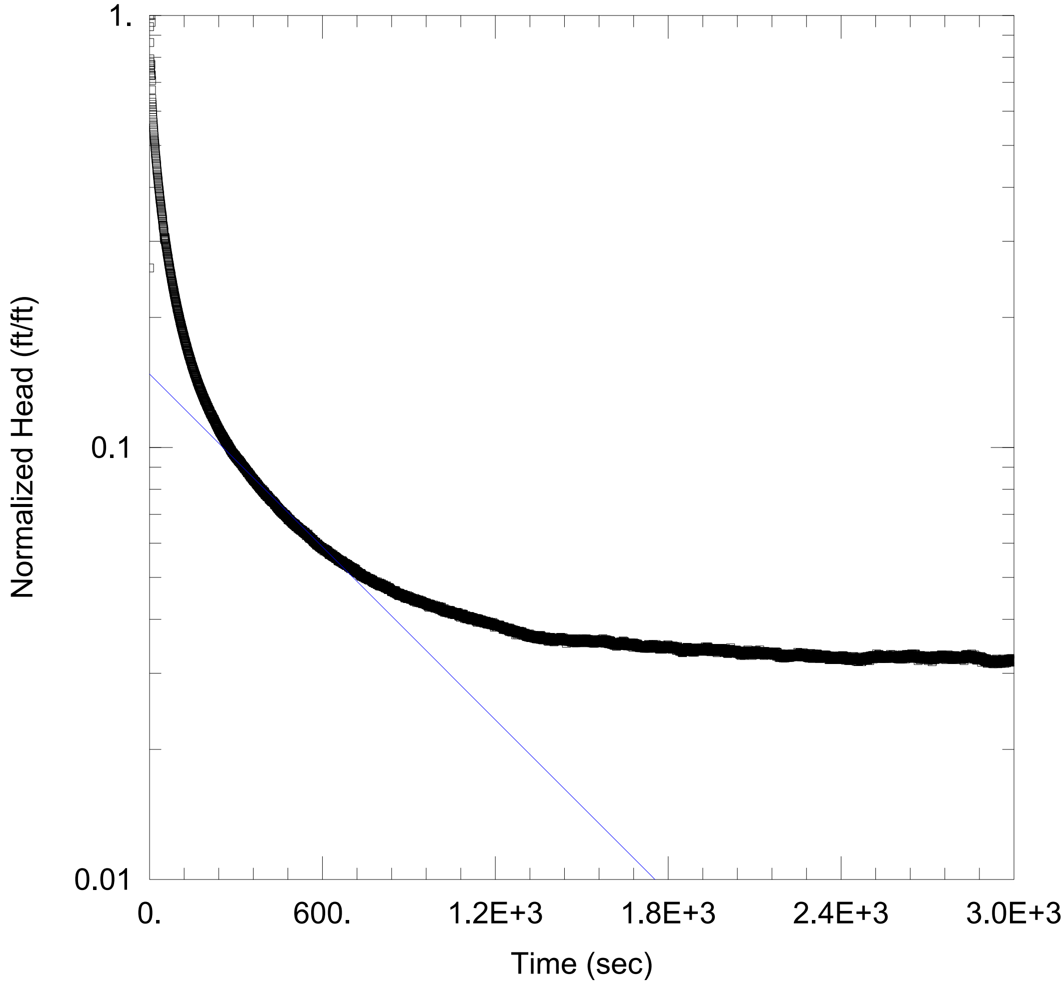
WELL DATA (LTW-03-T6)

Initial Displacement: 2.532 ft
Total Well Penetration Depth: 17.15 ft
Casing Radius: 0.17 ft
Static Water Column Height: 17.15 ft
Screen Length: 15. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0001277 cm/sec y0 = 0.3572 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-03\LTW-03-T6_h.aqt
Date: 08/14/19 Time: 15:29:39

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-03
Test Date: 07/18/2019

AQUIFER DATA

Saturated Thickness: 13. ft Anisotropy Ratio (Kz/Kr): 0.1

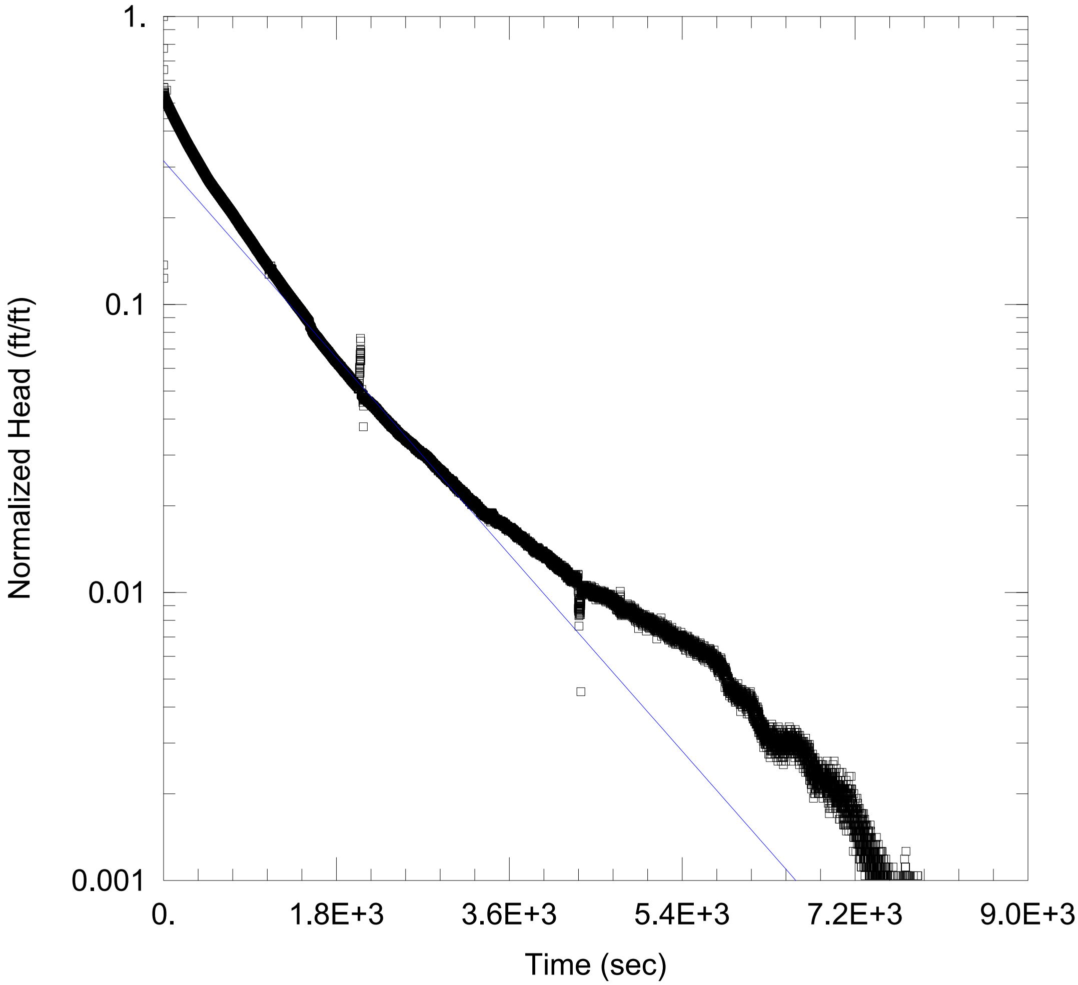
WELL DATA (LTW-03-T6)

Initial Displacement: 2.532 ft Static Water Column Height: 17.15 ft
Total Well Penetration Depth: 17.15 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0002756 cm/sec y0 = 0.3743 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T2_h.aqt
Date: 08/14/19 Time: 15:47:07

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 41. ft Anisotropy Ratio (Kz/Kr): 0.1

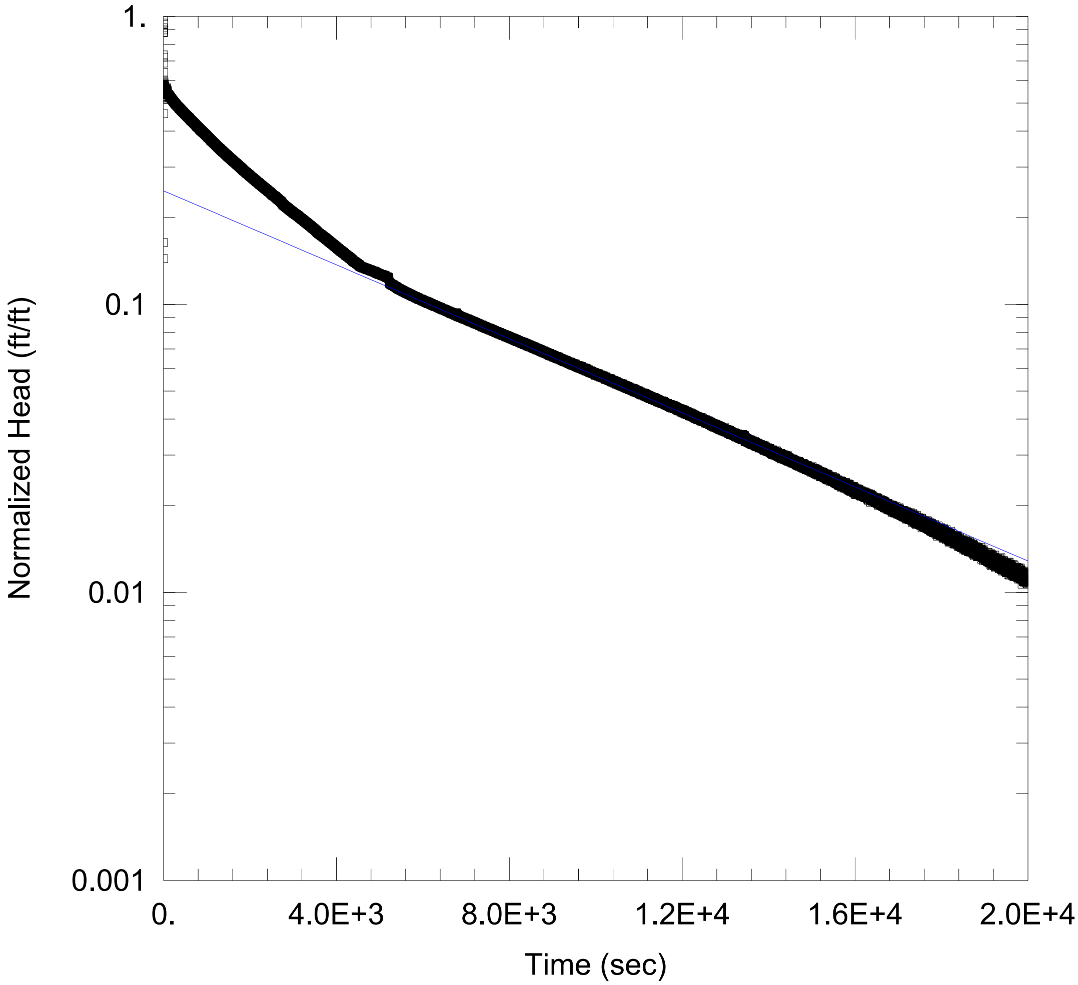
WELL DATA (LTW-04T2)

Initial Displacement: -3.104 ft Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0001168 cm/sec y0 = -0.9781 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T1_br.aqt
Date: 08/15/19 Time: 12:27:18

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/15/2019

AQUIFER DATA

Saturated Thickness: 41. ft
Anisotropy Ratio (Kz/Kr): 0.1

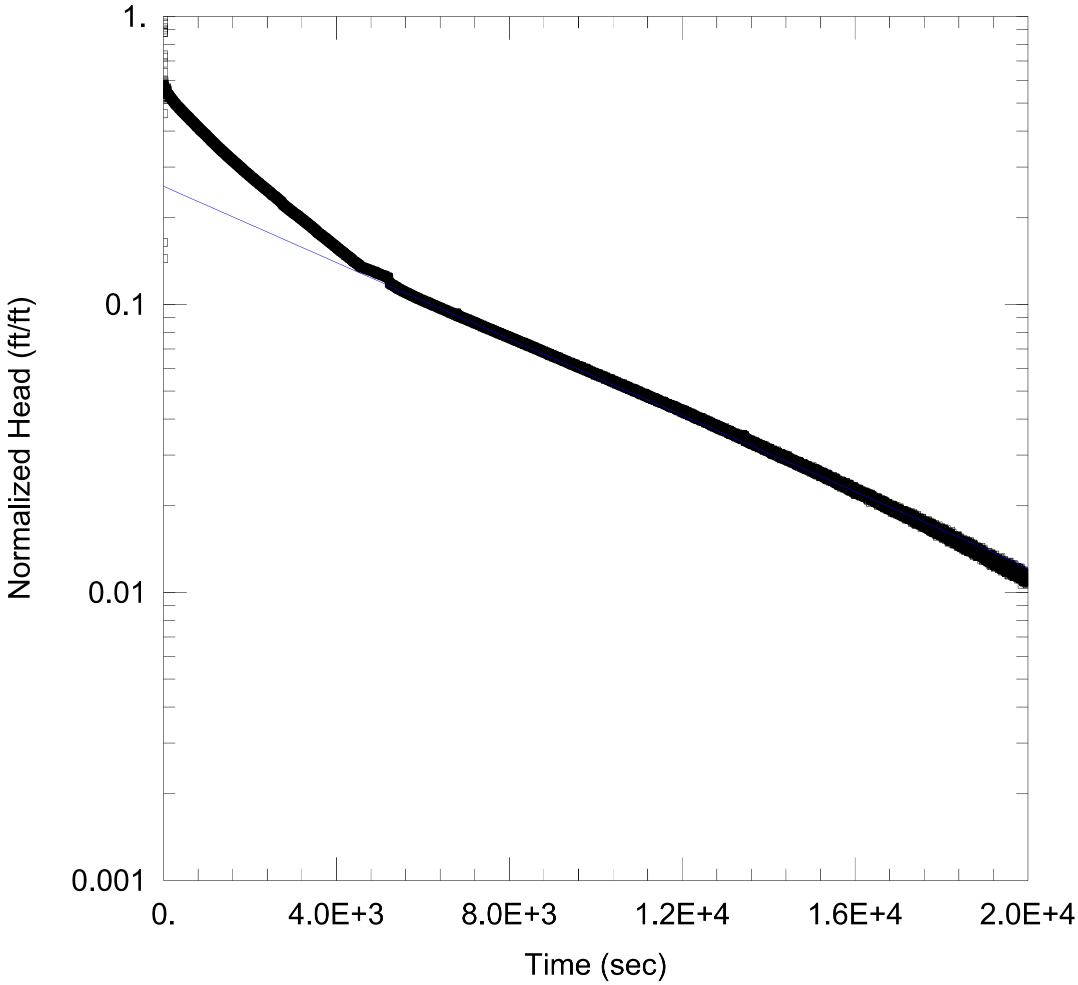
WELL DATA (LTW-04)

Initial Displacement: -3.126 ft
Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 1.387E-5 cm/sec
y0 = -0.7751 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T1_h.aqt
Date: 08/14/19 Time: 15:40:20

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/15/2019

AQUIFER DATA

Saturated Thickness: 41. ft Anisotropy Ratio (Kz/Kr): 0.1

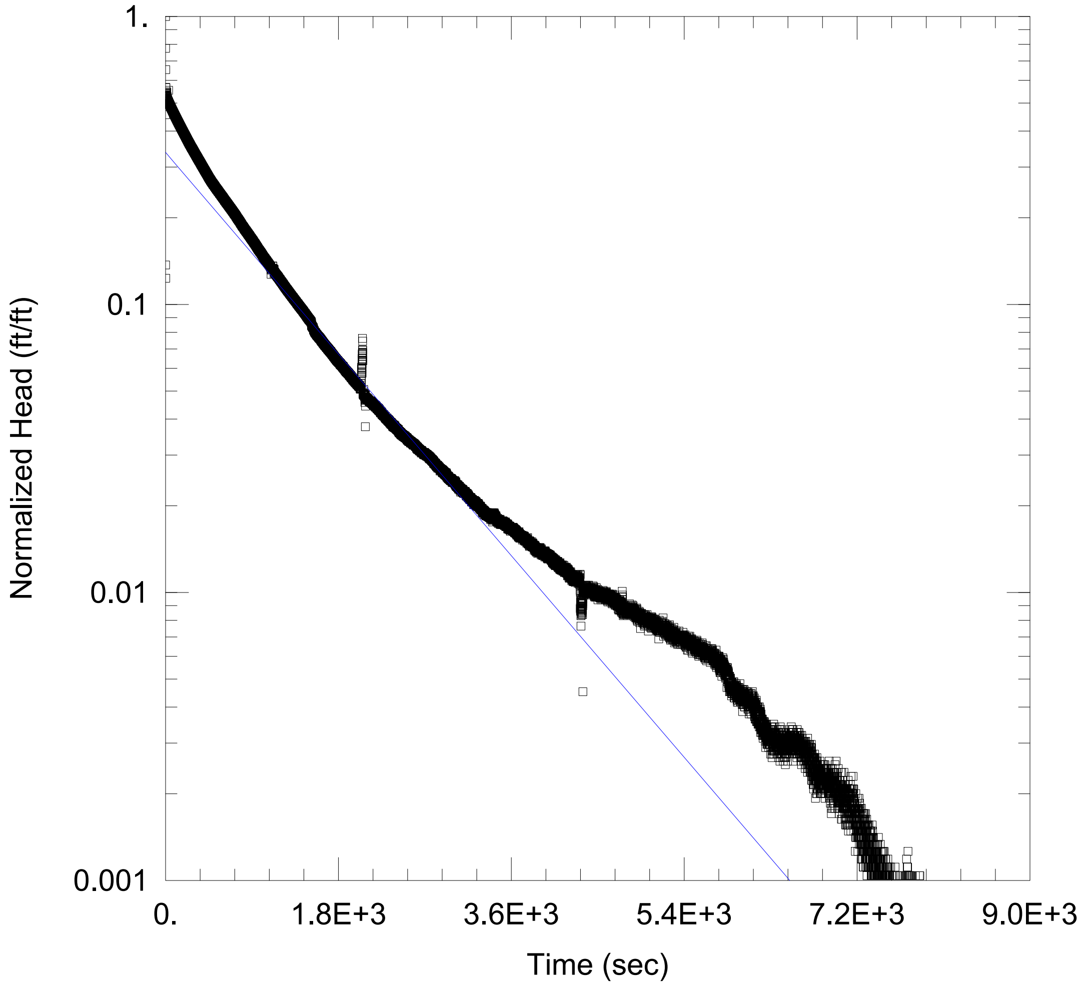
WELL DATA (LTW-04)

Initial Displacement: -3.126 ft Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 2.038E-5 cm/sec y0 = -0.8037 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-04-T2_BR_unc (1).aqt
Date: 08/14/19 Time: 15:44:24

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 41. ft
Anisotropy Ratio (Kz/Kr): 0.1

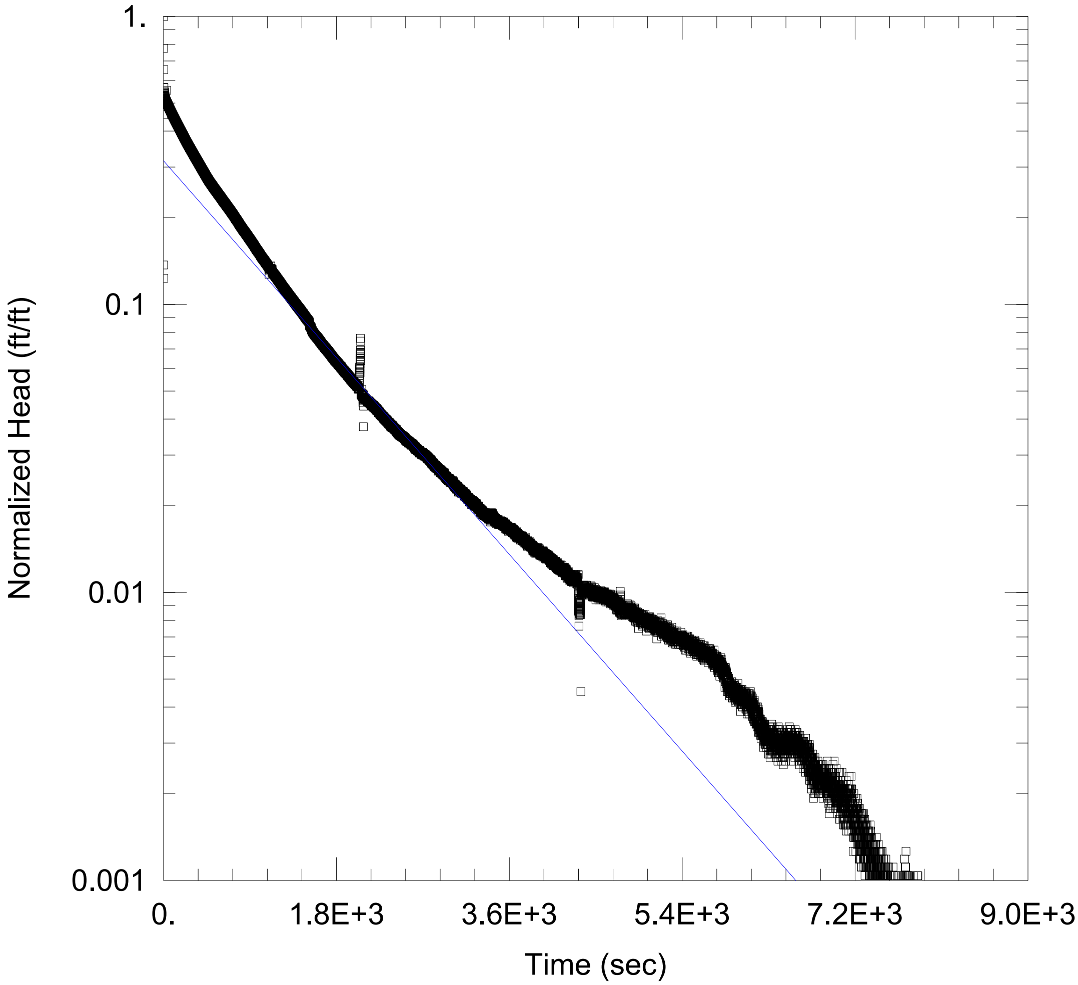
WELL DATA (LTW-04T2)

Initial Displacement: -3.104 ft
Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 8.393E-5 cm/sec
y0 = -1.046 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T2_h.aqt
Date: 08/14/19 Time: 15:56:04

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 41. ft
Anisotropy Ratio (Kz/Kr): 0.1

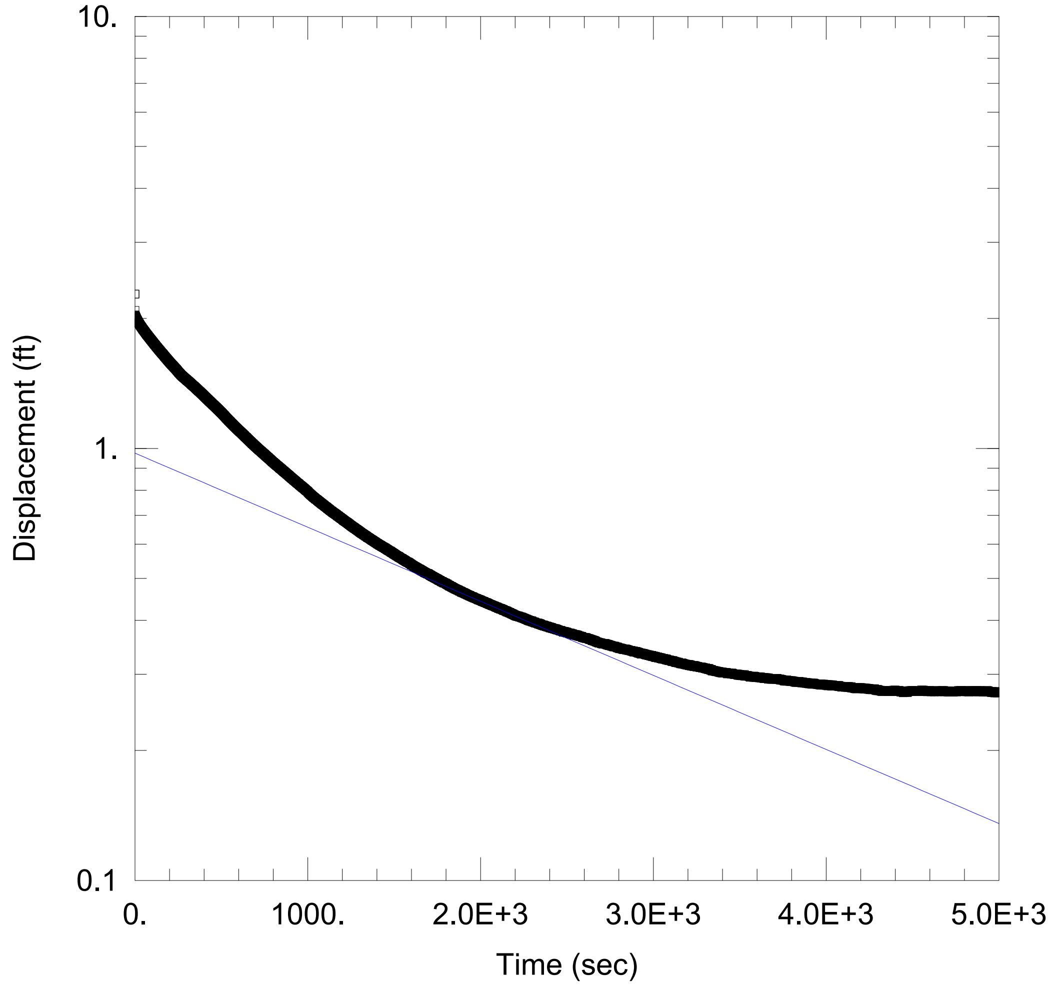
WELL DATA (LTW-04T2)

Initial Displacement: -3.104 ft
Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0001168 cm/sec
y0 = -0.9781 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T3_br.aqt
Date: 08/14/19 Time: 16:03:44

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 41. ft
Anisotropy Ratio (Kz/Kr): 0.1

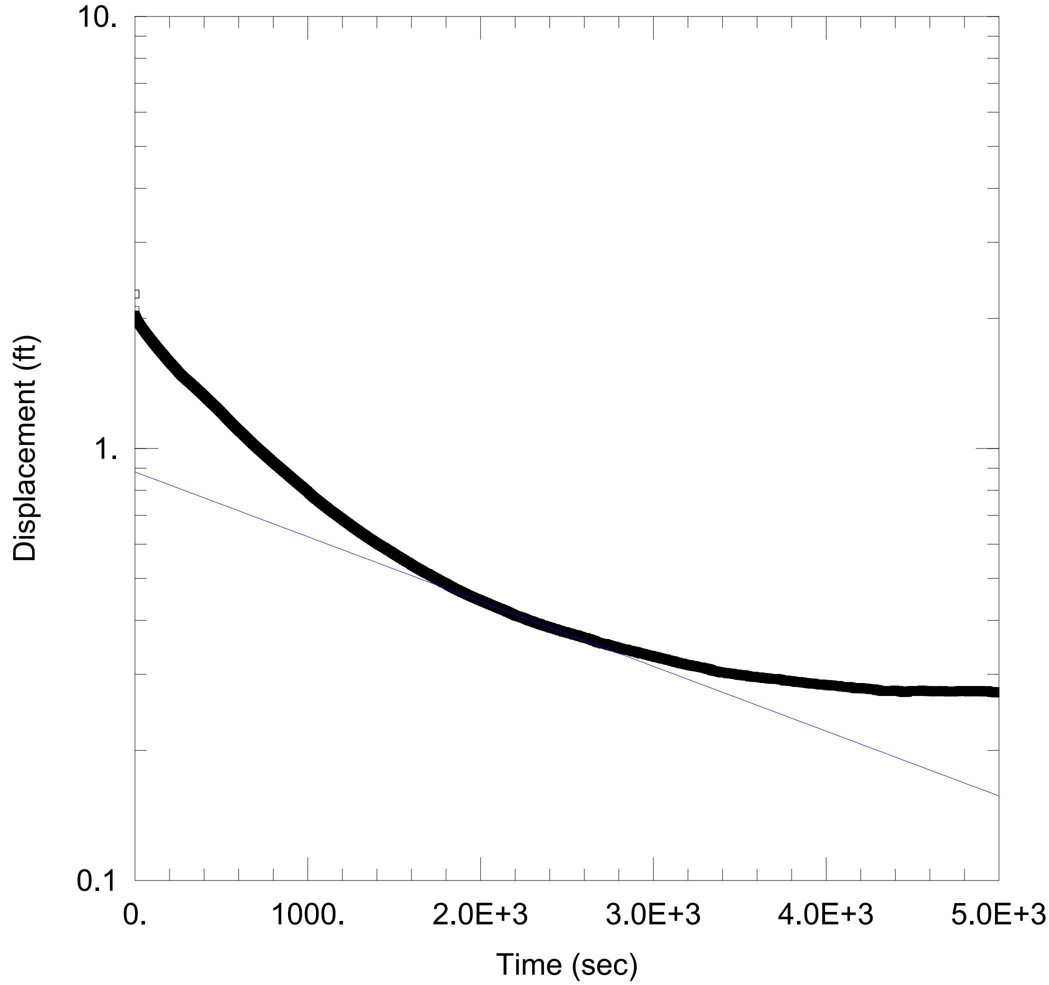
WELL DATA (LTW-04T3)

Initial Displacement: 2.276 ft
Total Well Penetration Depth: 18.29 ft
Casing Radius: 0.17 ft
Static Water Column Height: 18.29 ft
Screen Length: 15. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Bouwer-Rice

K = 3.7E-5 cm/sec
y0 = 0.9612 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T3_br.aqt
Date: 08/14/19 Time: 16:02:13

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 41. ft
Anisotropy Ratio (Kz/Kr): 0.1

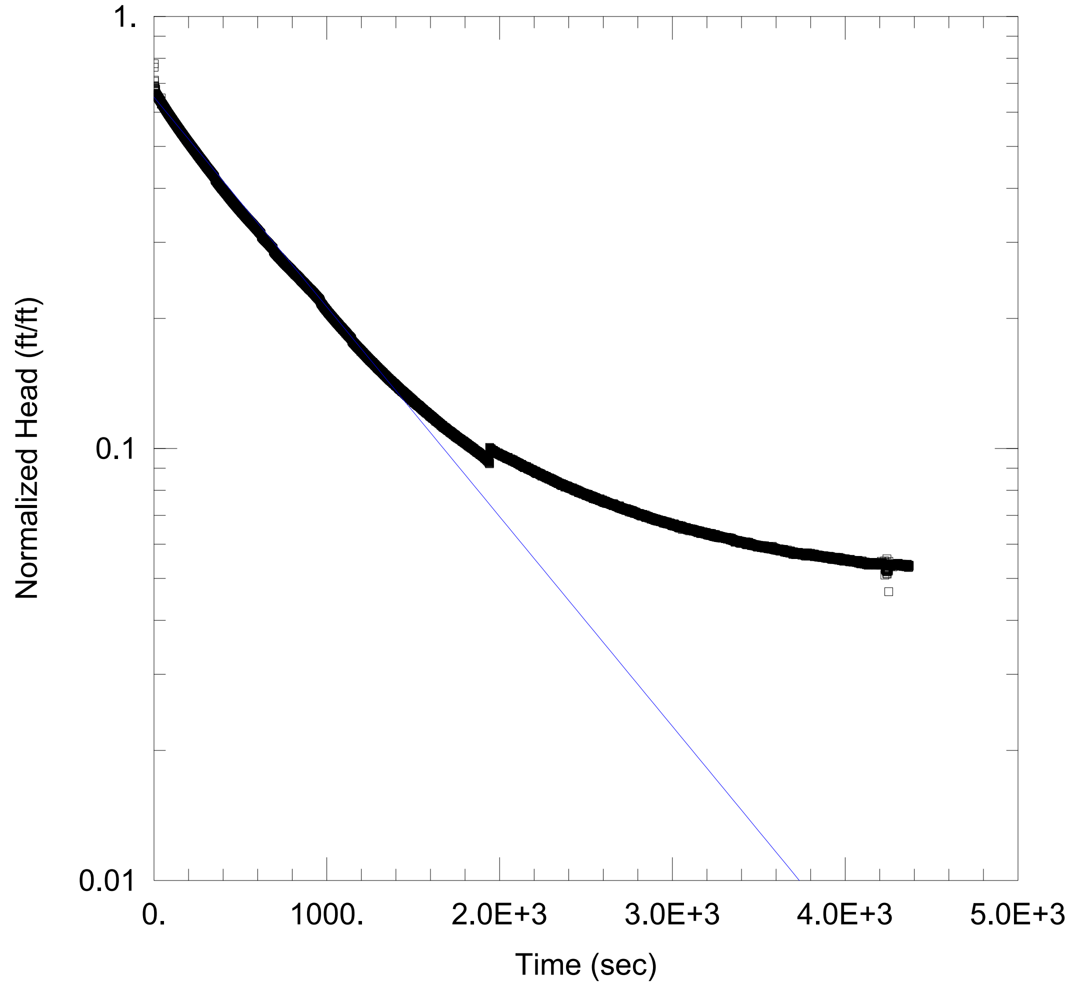
WELL DATA (LTW-04T3)

Initial Displacement: 2.276 ft
Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 4.618E-5 cm/sec
y0 = 0.8823 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T4_br.aqt
Date: 08/14/19 Time: 16:06:55

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 41. ft Anisotropy Ratio (Kz/Kr): 0.1

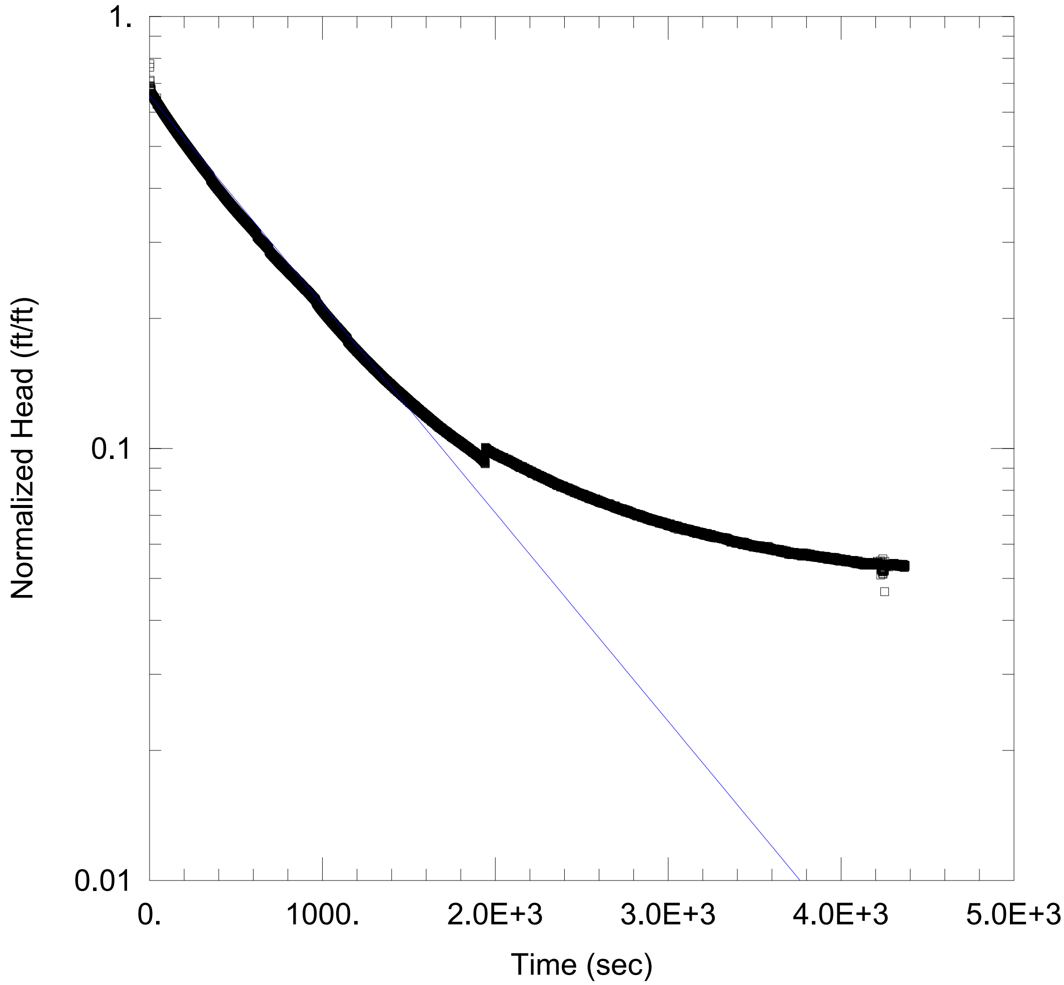
WELL DATA (LTW-04-T4)

Initial Displacement: -2.559 ft
Total Well Penetration Depth: 18.29 ft
Casing Radius: 0.17 ft
Static Water Column Height: 18.29 ft
Screen Length: 15. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0001048 cm/sec y0 = -1.664 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\LTW-04\LTW-04-T4_h.aqt
Date: 08/14/19 Time: 16:07:42

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-04
Test Date: 07/17/2019

AQUIFER DATA

Saturated Thickness: 41. ft Anisotropy Ratio (Kz/Kr): 0.1

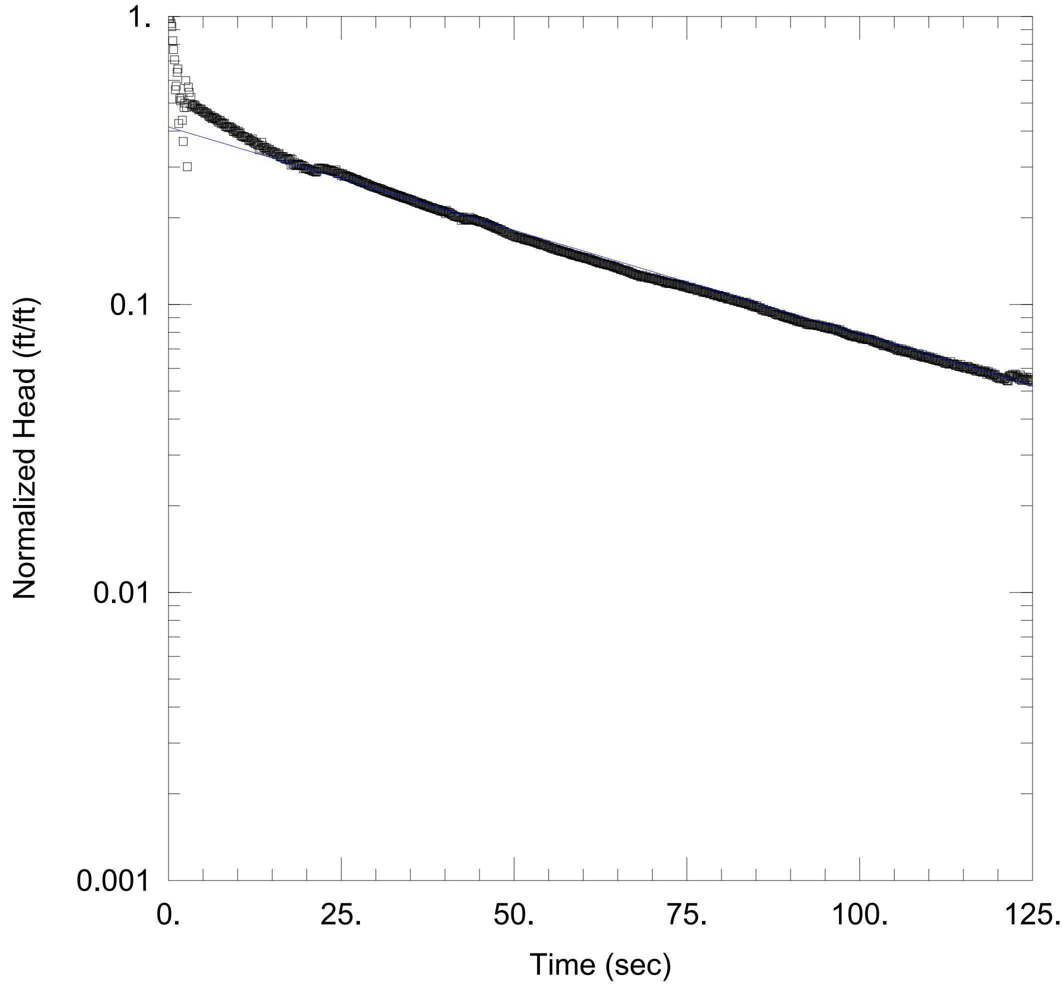
WELL DATA (LTW-04-T4)

Initial Displacement: -2.559 ft Static Water Column Height: 18.29 ft
Total Well Penetration Depth: 18.29 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 0.0001486 cm/sec y0 = -1.676 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T1_br.aqt
Date: 09/18/19 Time: 11:11:45

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

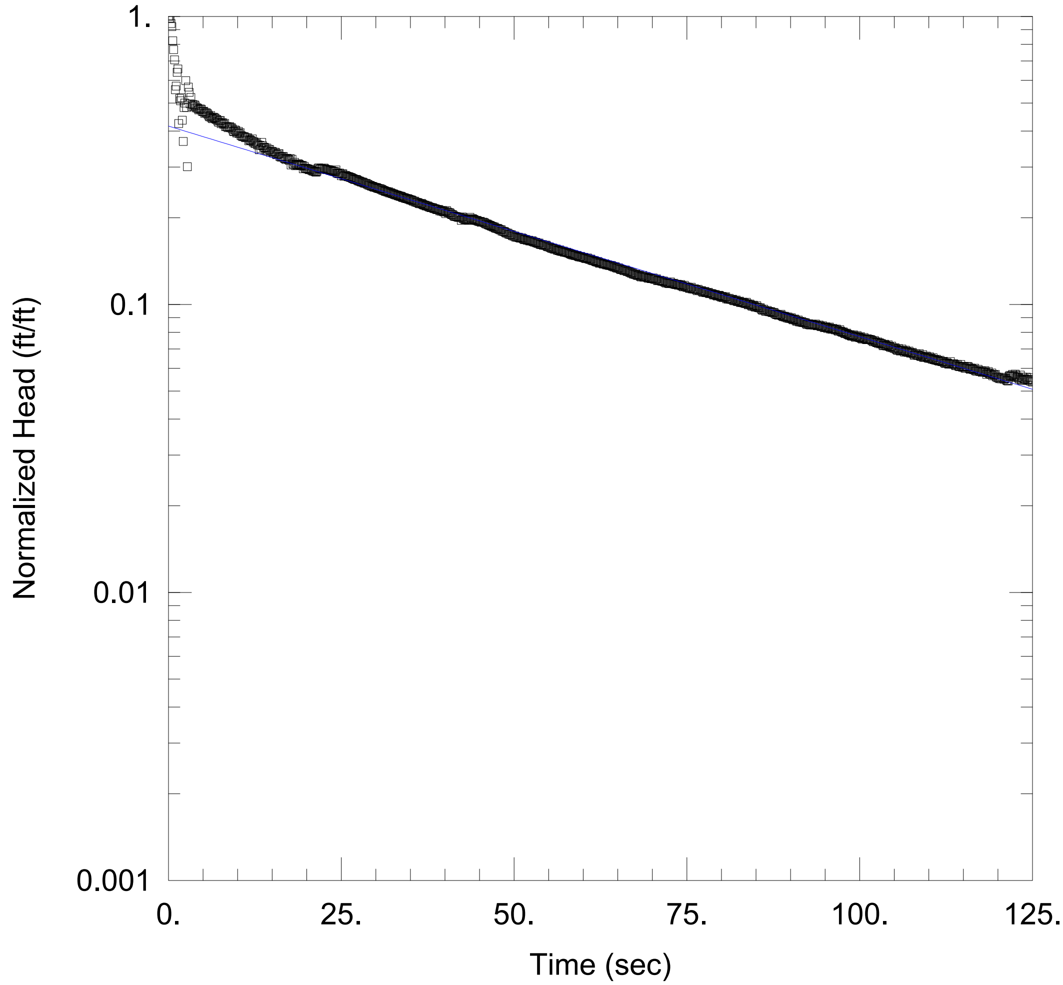
WELL DATA (LTW-05-T1)

Initial Displacement: -1.992 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.001779 cm/sec y0 = -0.8232 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T1_h.aqt
Date: 09/18/19 Time: 11:24:28

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

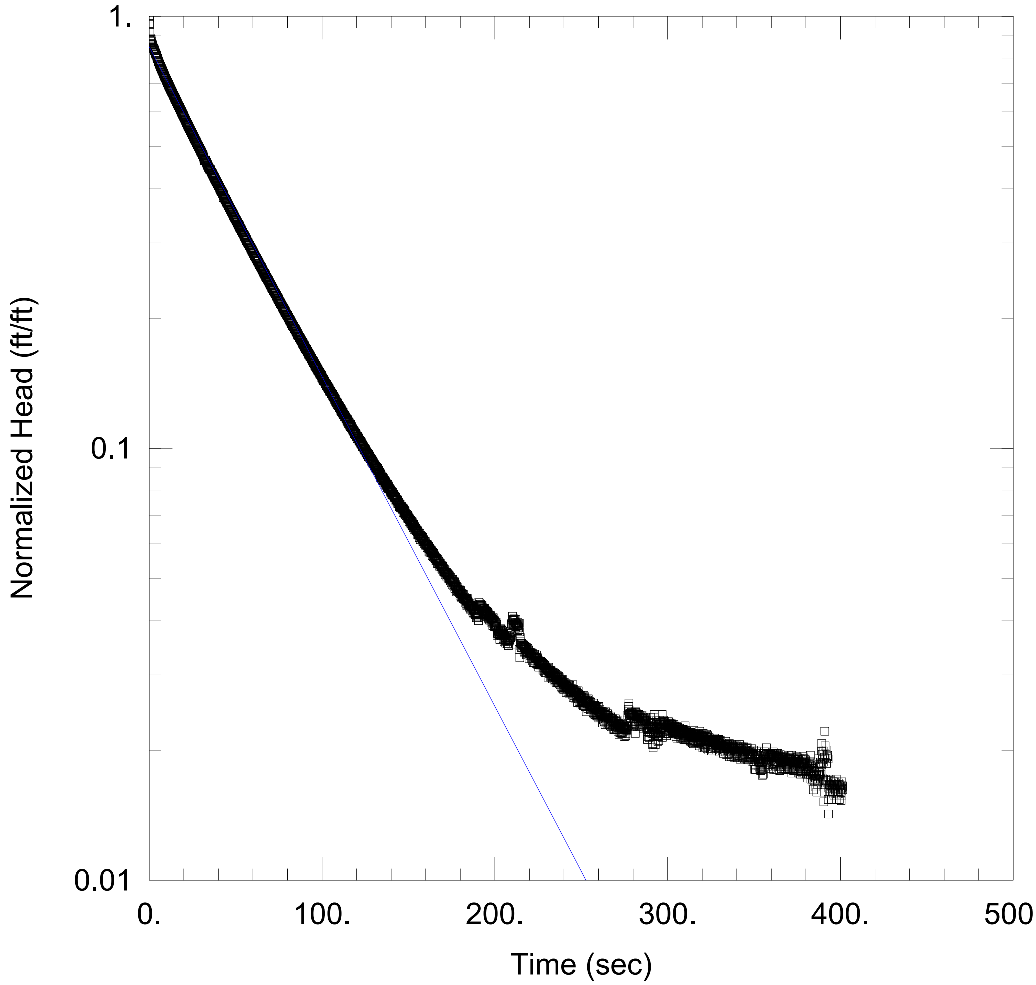
WELL DATA (LTW-05-T1)

Initial Displacement: -1.992 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.00225 cm/sec y0 = -0.8289 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T2_br.aqt
Date: 09/18/19 Time: 11:24:53

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

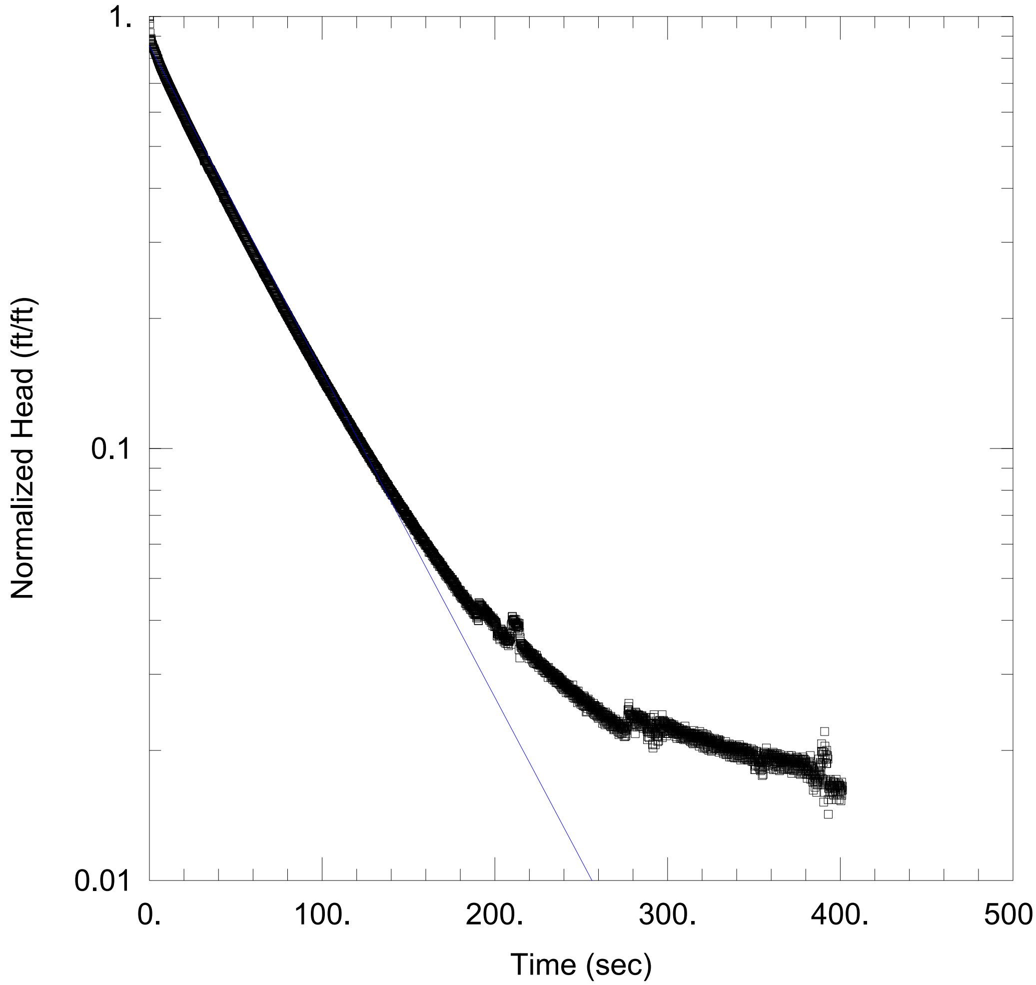
WELL DATA (LTW-05-T2)

Initial Displacement: 1.989 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.001892 cm/sec y0 = 1.689 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T2_h.aqt
Date: 09/18/19 Time: 11:25:26

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

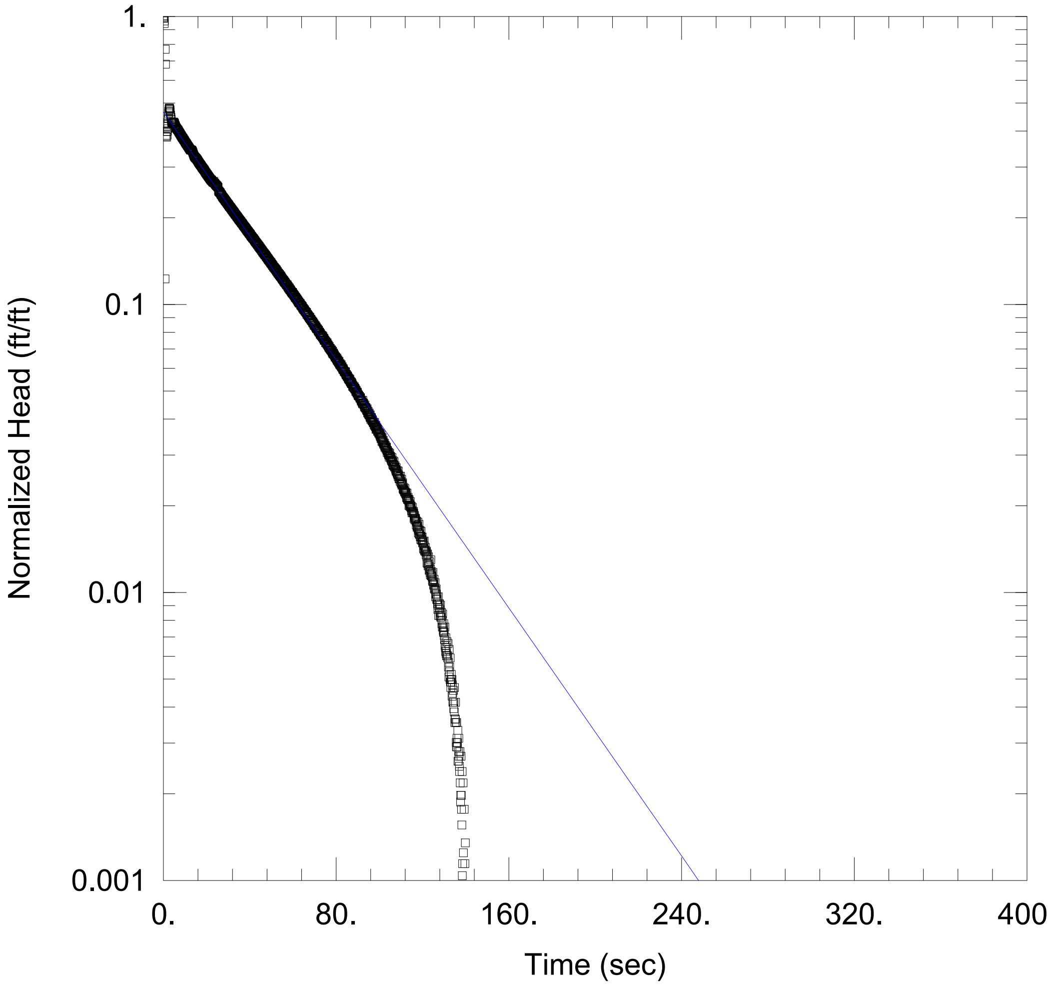
WELL DATA (LTW-05-T2)

Initial Displacement: 1.989 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002321 cm/sec
y0 = 1.7 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T3_br.aqt
Date: 09/18/19 Time: 11:26:04

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

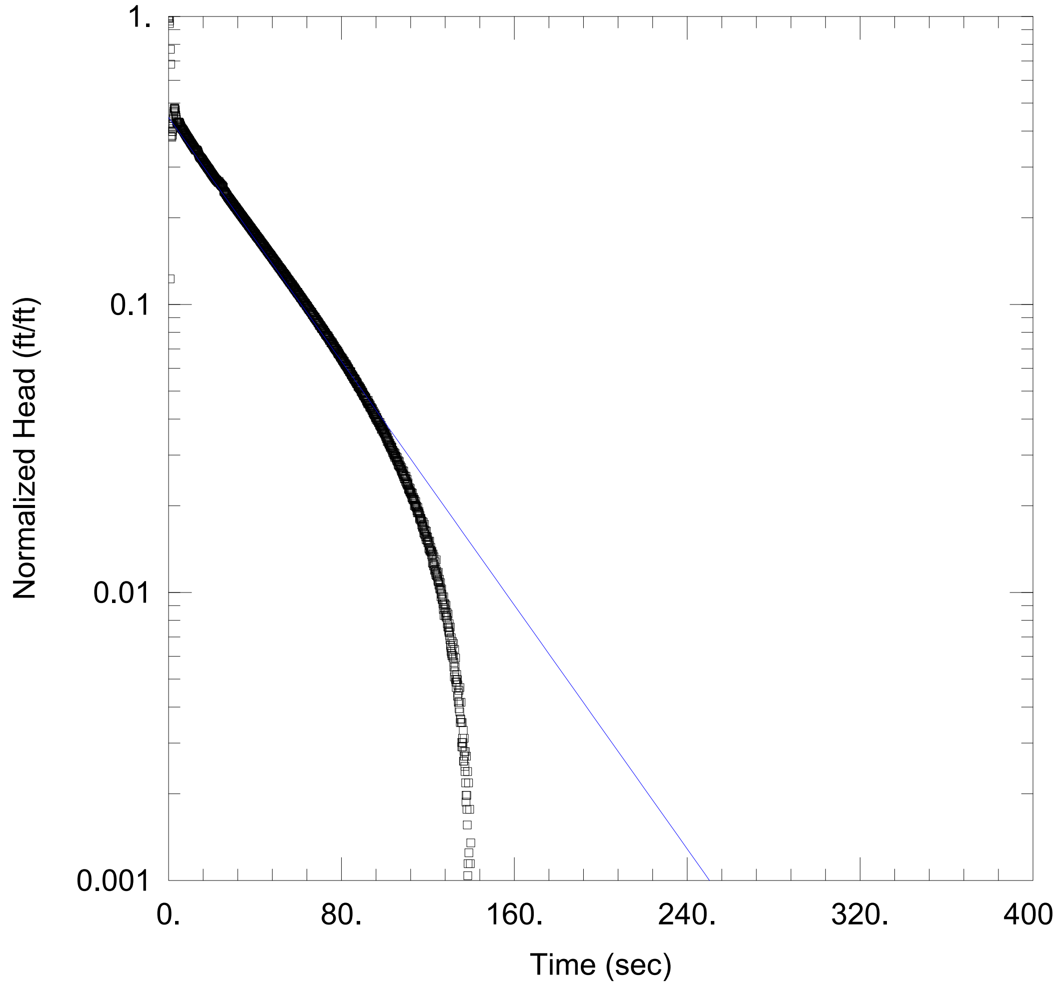
WELL DATA (LTW-05-T3)

Initial Displacement: -2.217 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.002668 cm/sec
y0 = -1.032 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T3_h.aqt
Date: 09/18/19 Time: 11:24:09

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

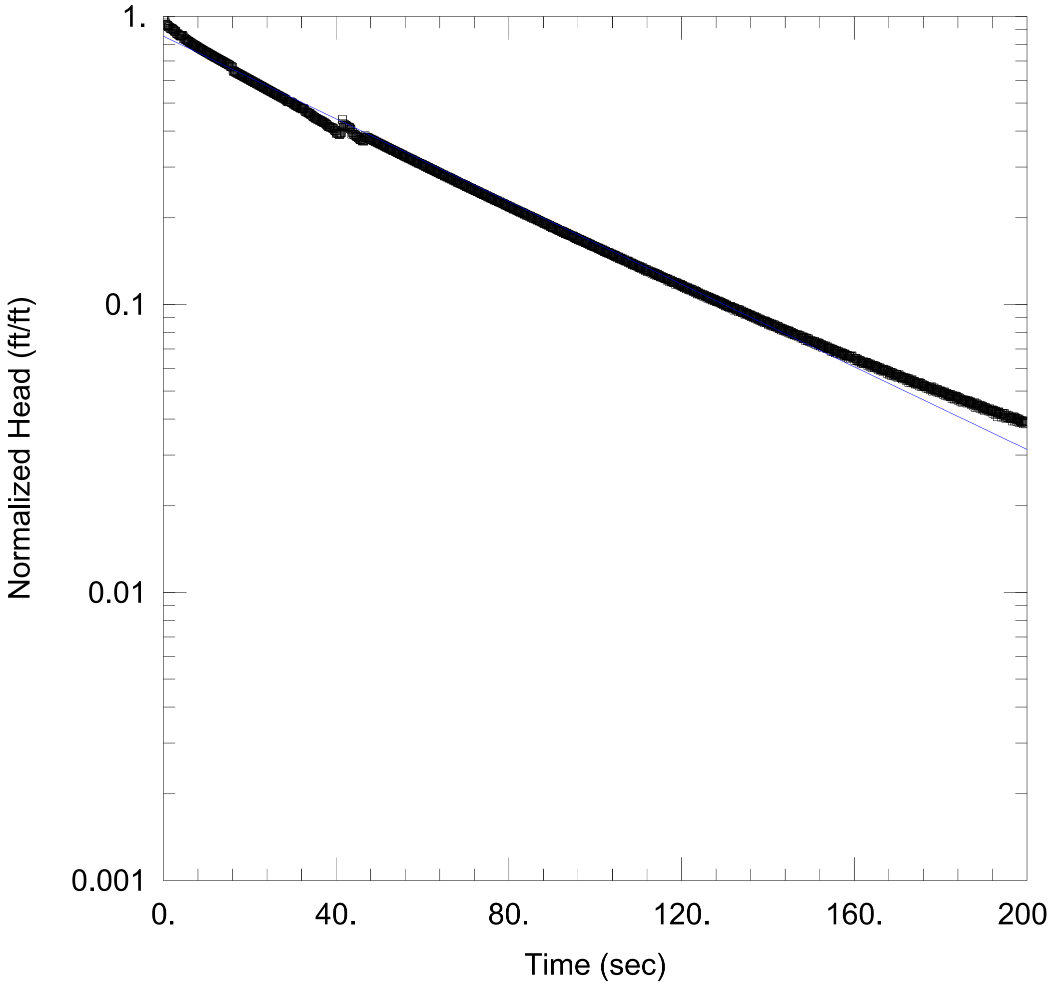
WELL DATA (LTW-05-T3)

Initial Displacement: -2.217 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.003257 cm/sec
y0 = -0.9884 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T4_br.aqt
Date: 09/18/19 Time: 11:23:05

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

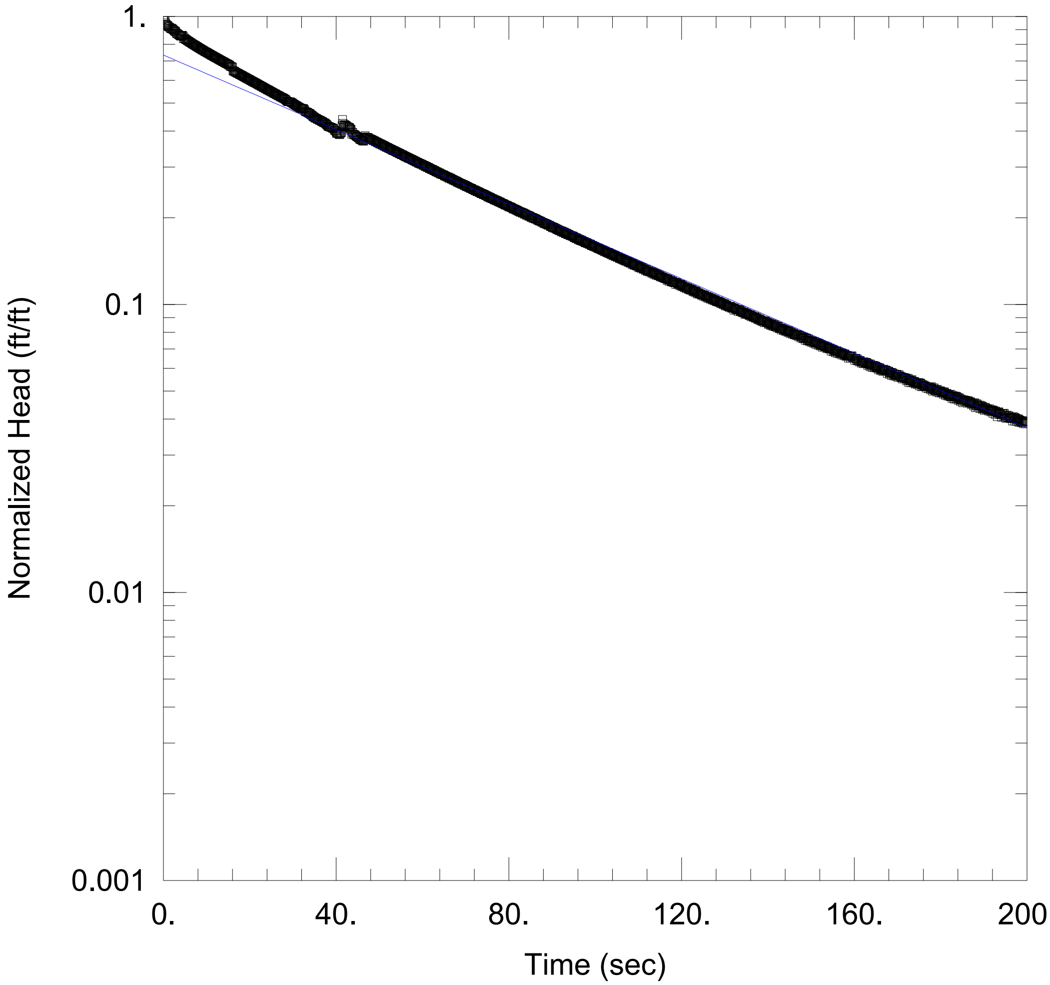
WELL DATA (LTW-05-T4)

Initial Displacement: 1.824 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001779 cm/sec
y0 = 1.558 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T4_h.aqt
Date: 09/18/19 Time: 11:22:47

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

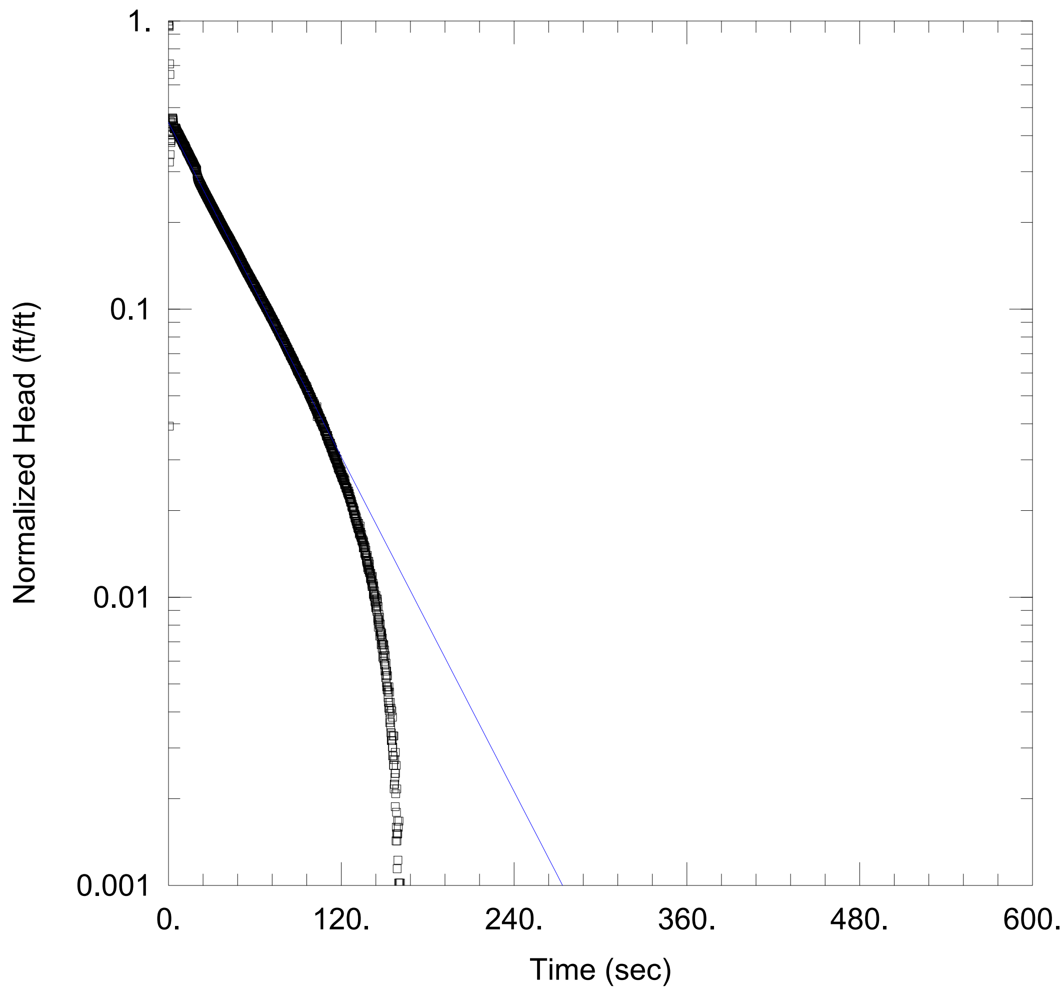
WELL DATA (LTW-05-T4)

Initial Displacement: 1.824 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.001991 cm/sec y0 = 1.339 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T5_br.aqt
Date: 09/18/19 Time: 11:22:22

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

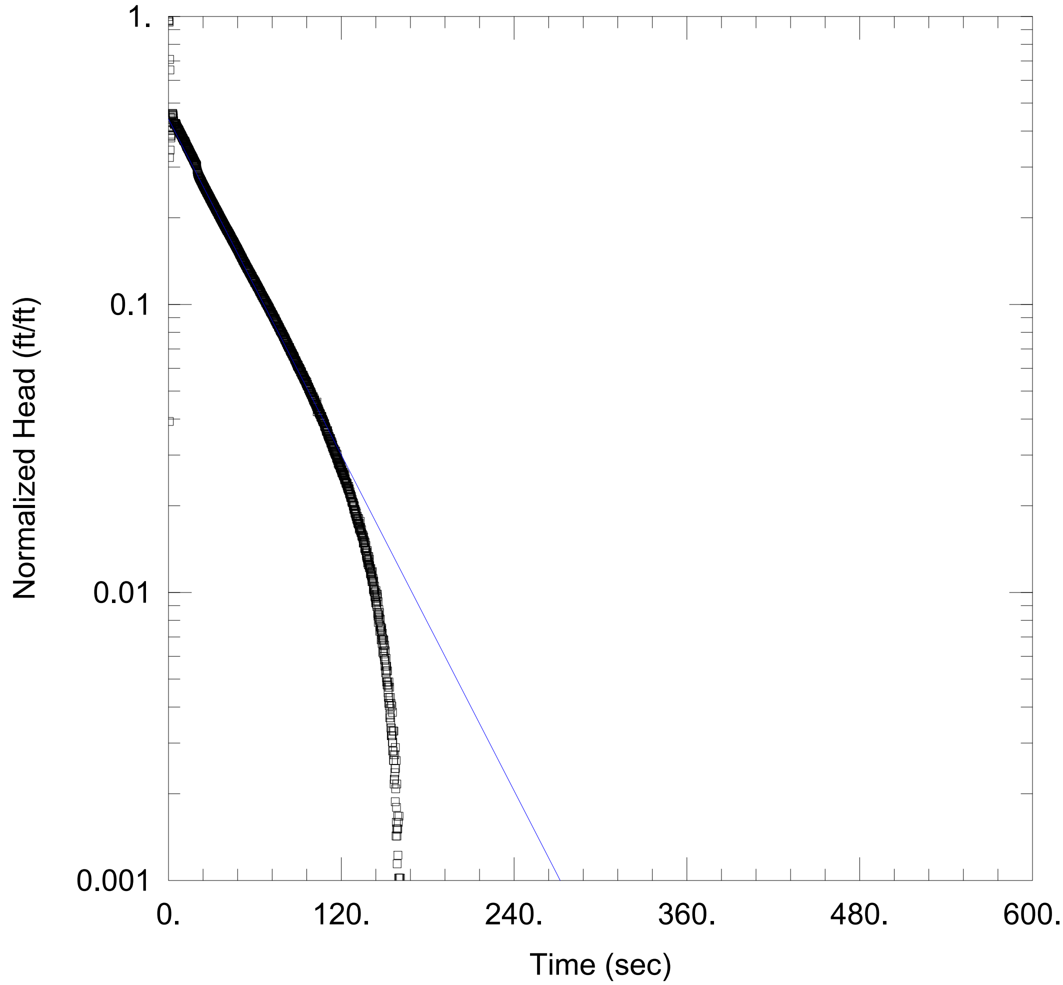
WELL DATA (LTW-05-T5)

Initial Displacement: -2.454 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.002398 cm/sec
y0 = -1.09 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T5_h.aqt
Date: 09/18/19 Time: 11:21:51

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

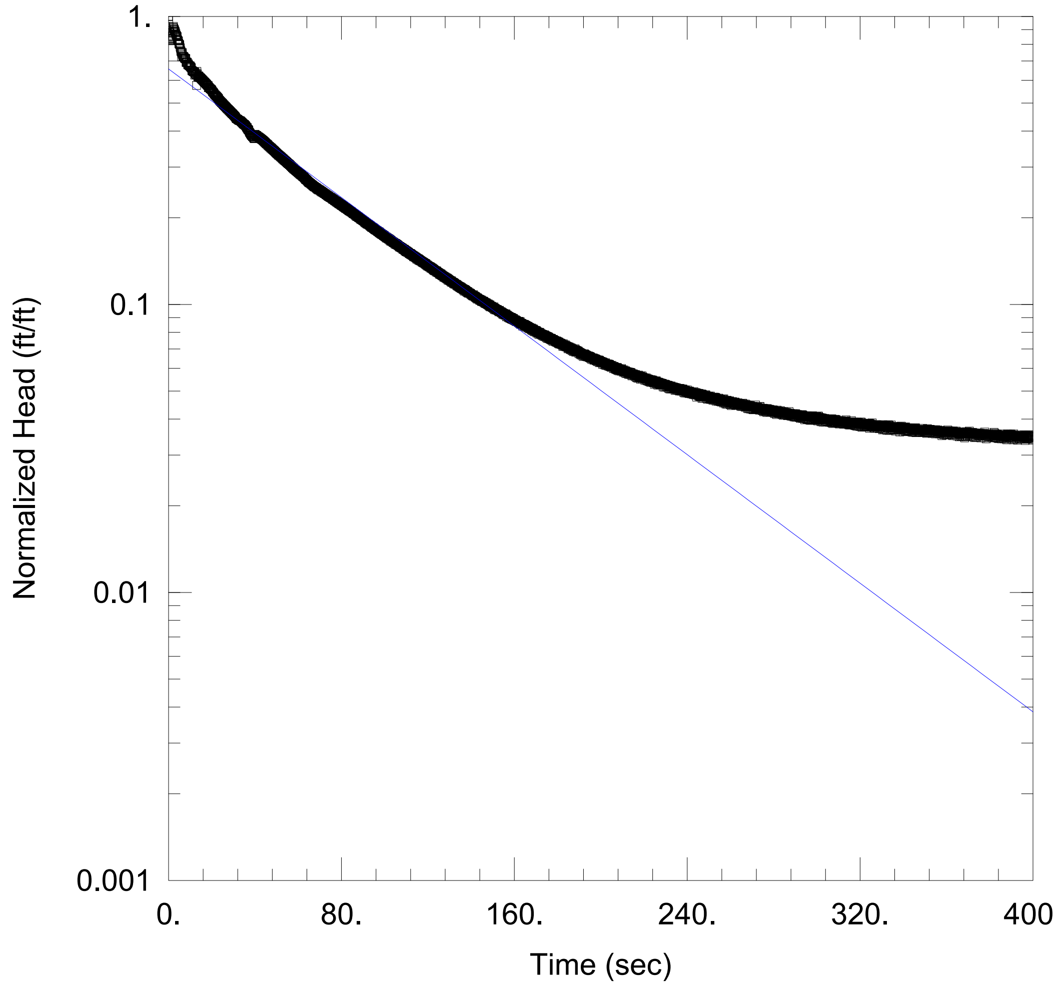
WELL DATA (LTW-05-T5)

Initial Displacement: -2.454 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002991 cm/sec
y0 = -1.08 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T6_br.aqt
Date: 09/18/19 Time: 11:18:35

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

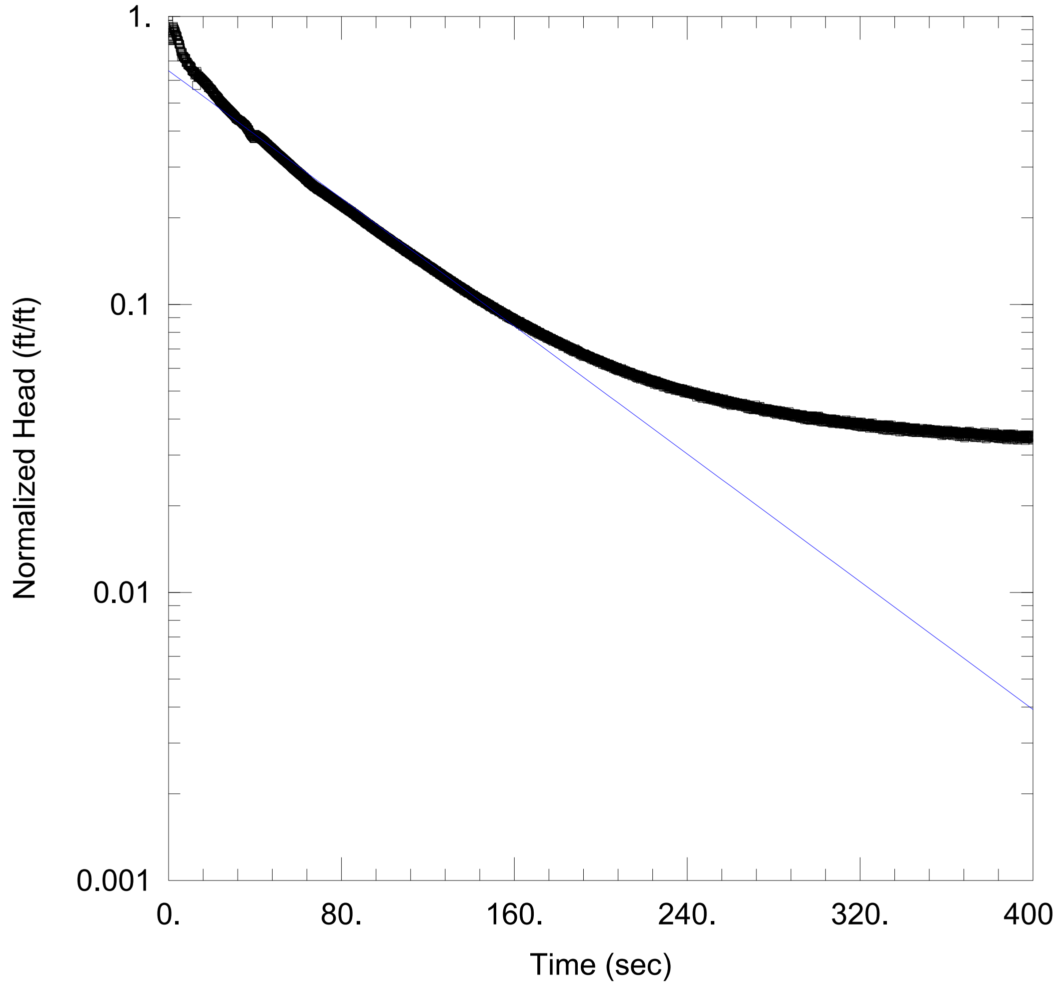
WELL DATA (LTW-05-T6)

Initial Displacement: 2.01 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.001384 cm/sec y0 = 1.321 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T6_h.aqt
Date: 09/18/19 Time: 11:16:26

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

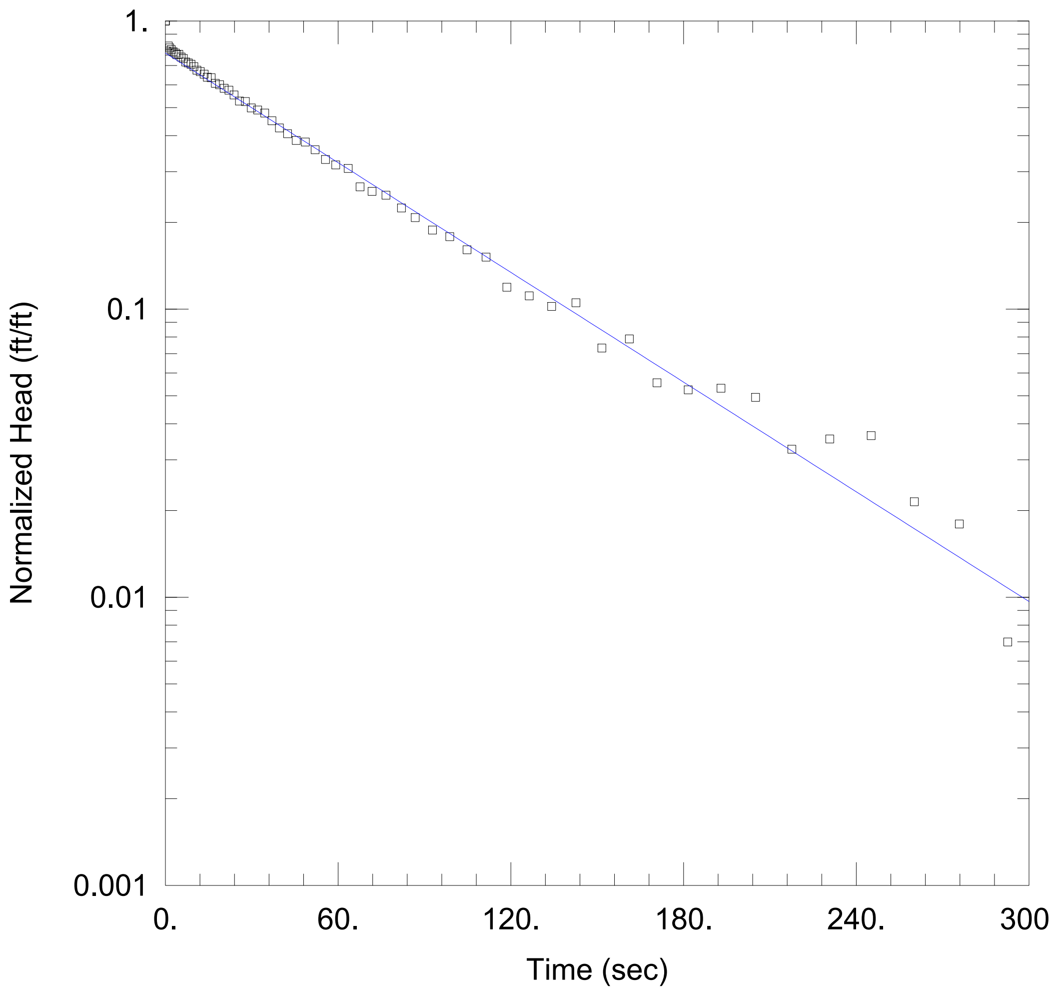
WELL DATA (LTW-05-T6)

Initial Displacement: 2.01 ft
Total Well Penetration Depth: 34.38 ft
Casing Radius: 0.17 ft
Static Water Column Height: 34.38 ft
Screen Length: 15. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.001707 cm/sec y0 = 1.303 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T7_br.aqt
Date: 09/18/19 Time: 11:14:43

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

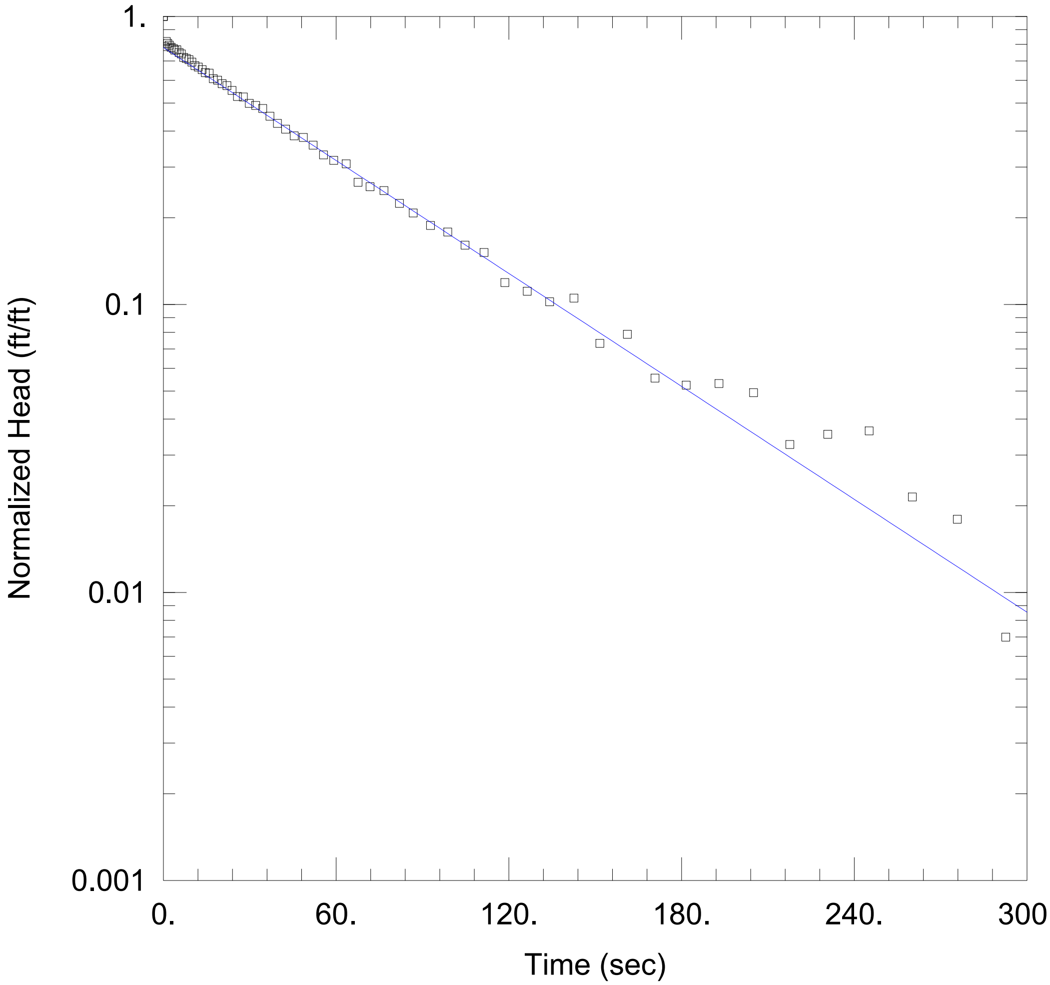
WELL DATA (LTW-05-T7)

Initial Displacement: 4.29 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001573 cm/sec
y0 = 3.322 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T7_h.aqt
Date: 09/18/19 Time: 11:15:39

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

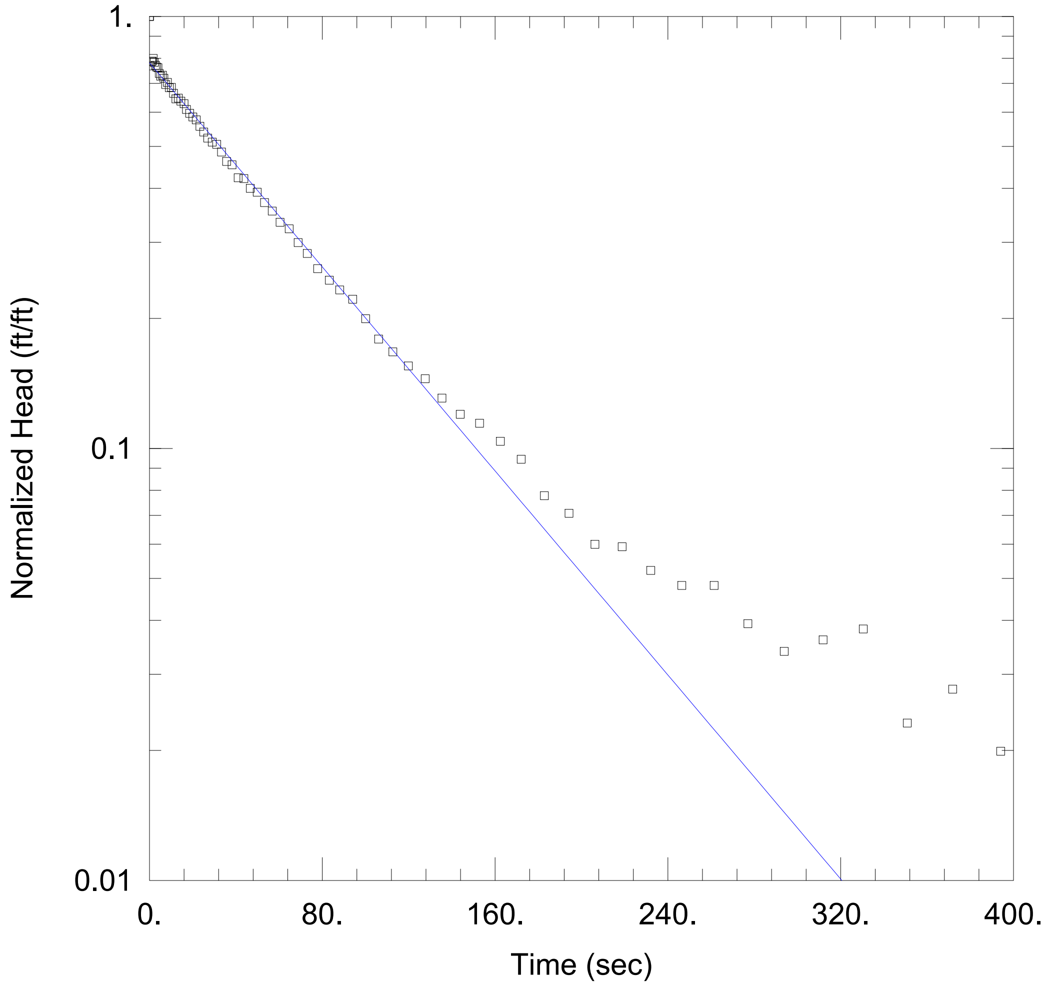
WELL DATA (LTW-05-T7)

Initial Displacement: 4.29 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.002012 cm/sec
y0 = 3.345 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T8_br.aqt
Date: 09/18/19 Time: 11:12:23

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft
Anisotropy Ratio (Kz/Kr): 0.1

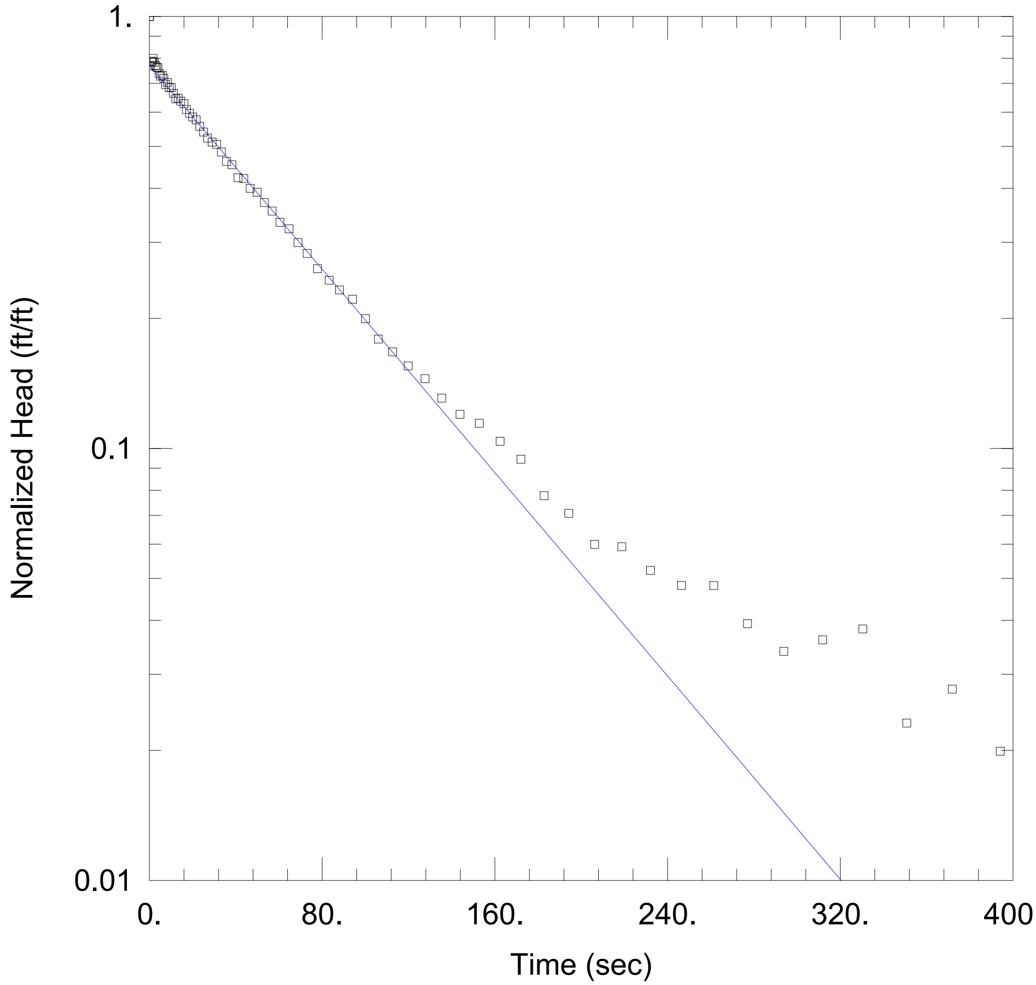
WELL DATA (LTW-05-T8)

Initial Displacement: 3.717 ft
Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft
Screen Length: 15. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.001464 cm/sec
y0 = 2.902 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Downloads\LTW-05-T8_h.aqt
Date: 09/18/19 Time: 11:12:57

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: LTW-05
Test Date: 07/16/2019

AQUIFER DATA

Saturated Thickness: 38. ft Anisotropy Ratio (Kz/Kr): 0.1

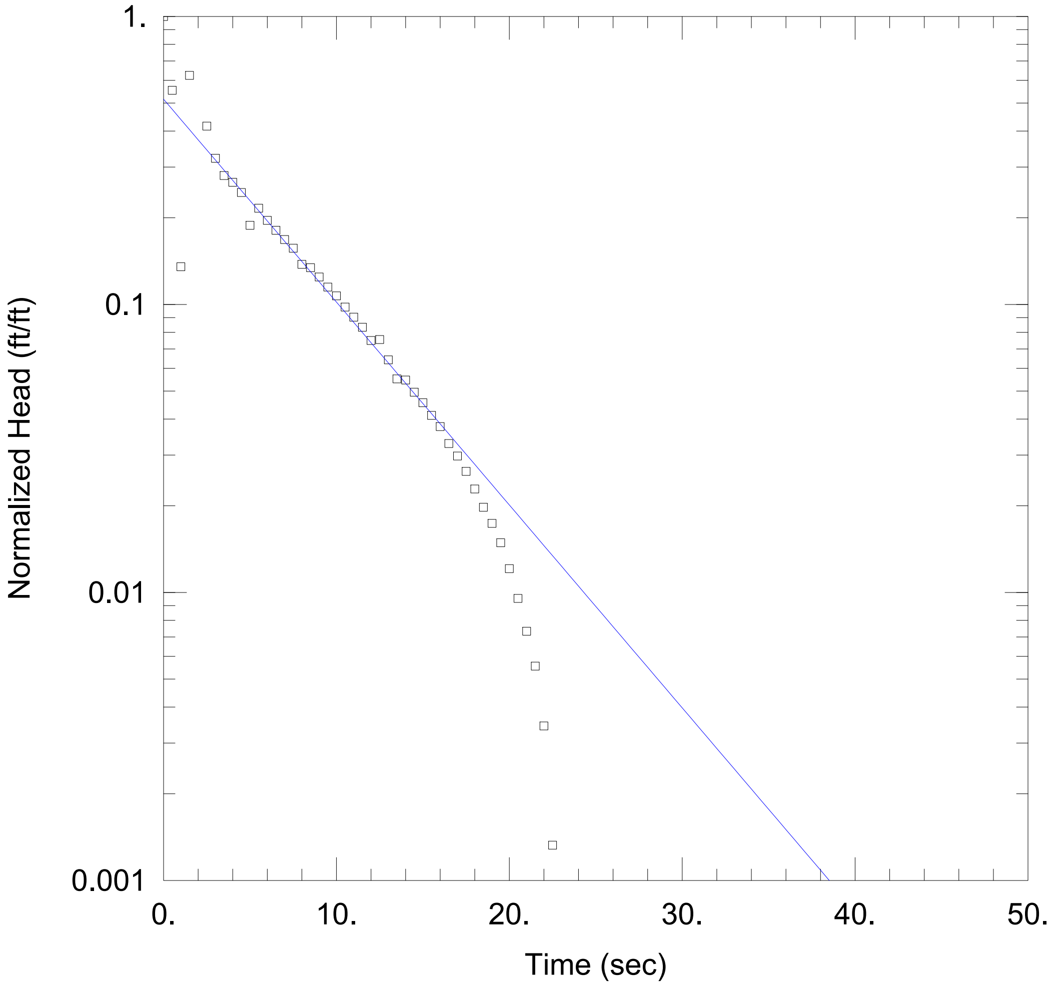
WELL DATA (LTW-05-T8)

Initial Displacement: 3.717 ft Static Water Column Height: 34.38 ft
Total Well Penetration Depth: 34.38 ft Screen Length: 15. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.001812 cm/sec y0 = 2.858 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T1_br.aqt
Date: 08/14/19 Time: 11:35:07

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

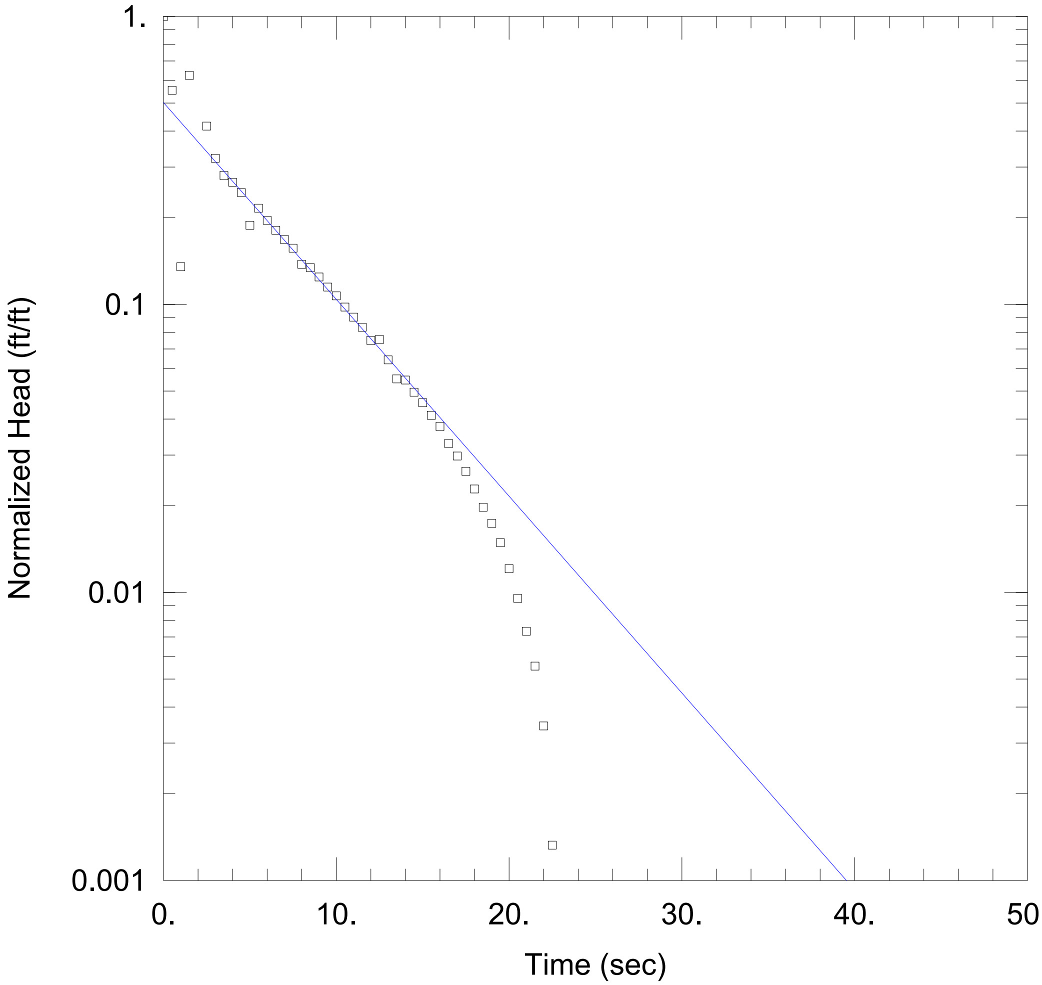
WELL DATA (SMW-12-T1)

Initial Displacement: -2.414 ft
Total Well Penetration Depth: 14.01 ft
Casing Radius: 0.17 ft
Static Water Column Height: 14.01 ft
Screen Length: 10. ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.02152 cm/sec
y0 = -1.245 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T1_h.aqt
Date: 08/14/19 Time: 11:35:43

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

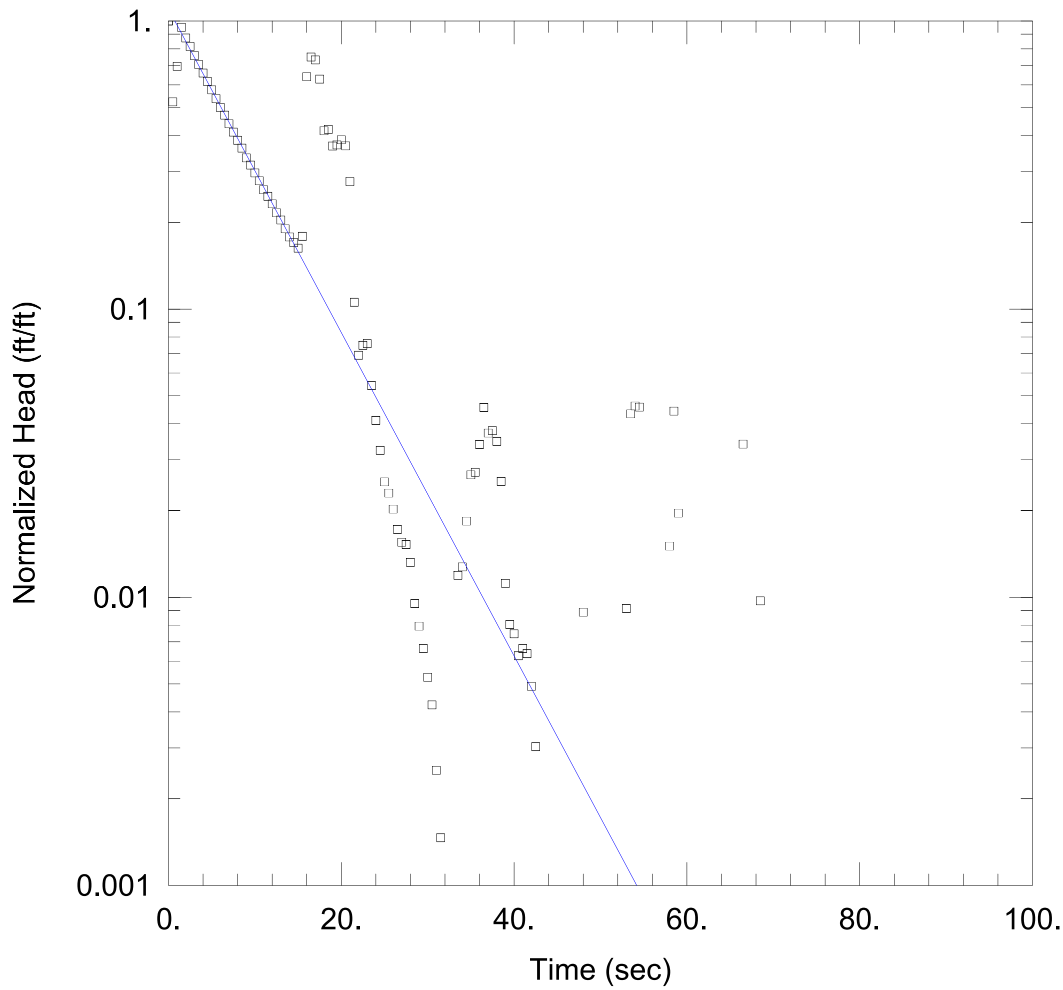
WELL DATA (SMW-12-T1)

Initial Displacement: -2.414 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.02875 cm/sec
y0 = -1.212 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T2_br.aqt
Date: 08/14/19 Time: 11:42:46

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

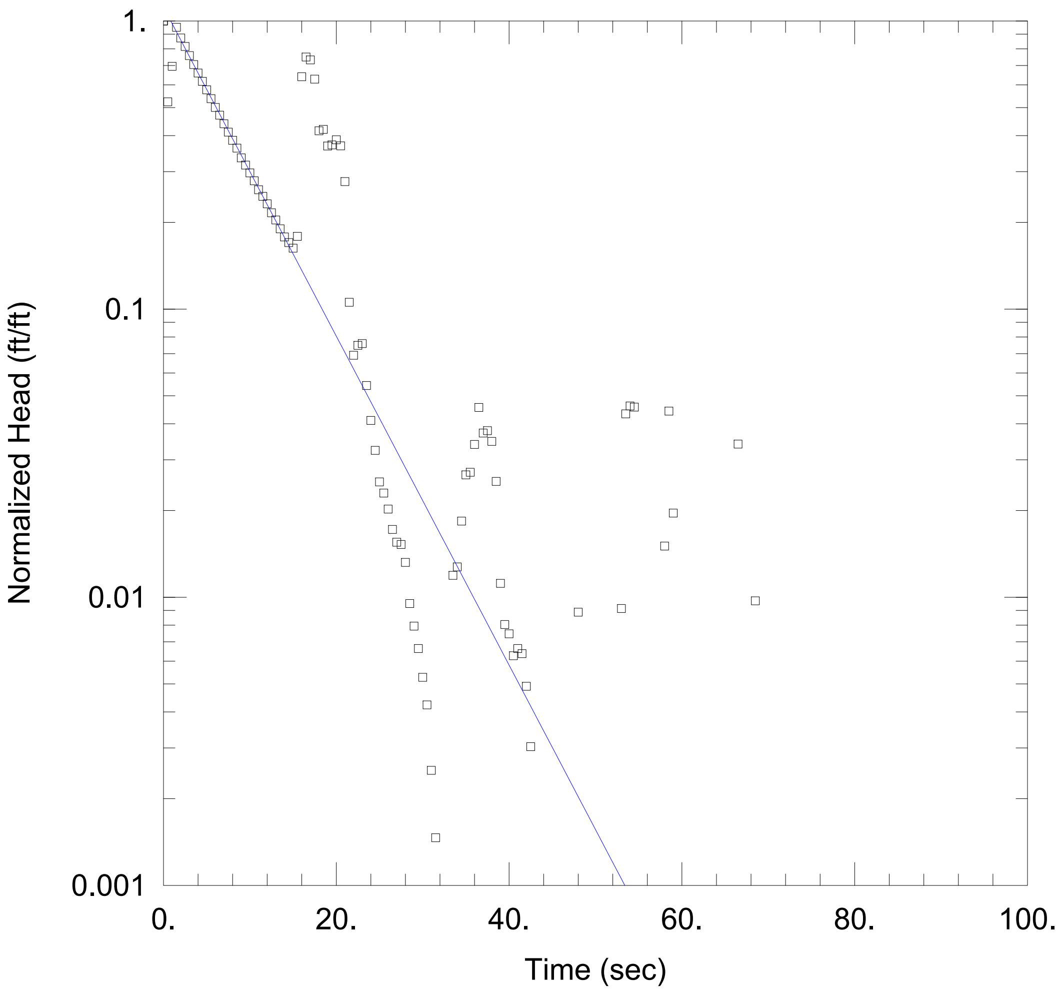
WELL DATA (SMW-12-T2)

Initial Displacement: 1.915 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.01714 cm/sec y0 = 2.105 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T2_h.aqt
Date: 08/14/19 Time: 11:43:31

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

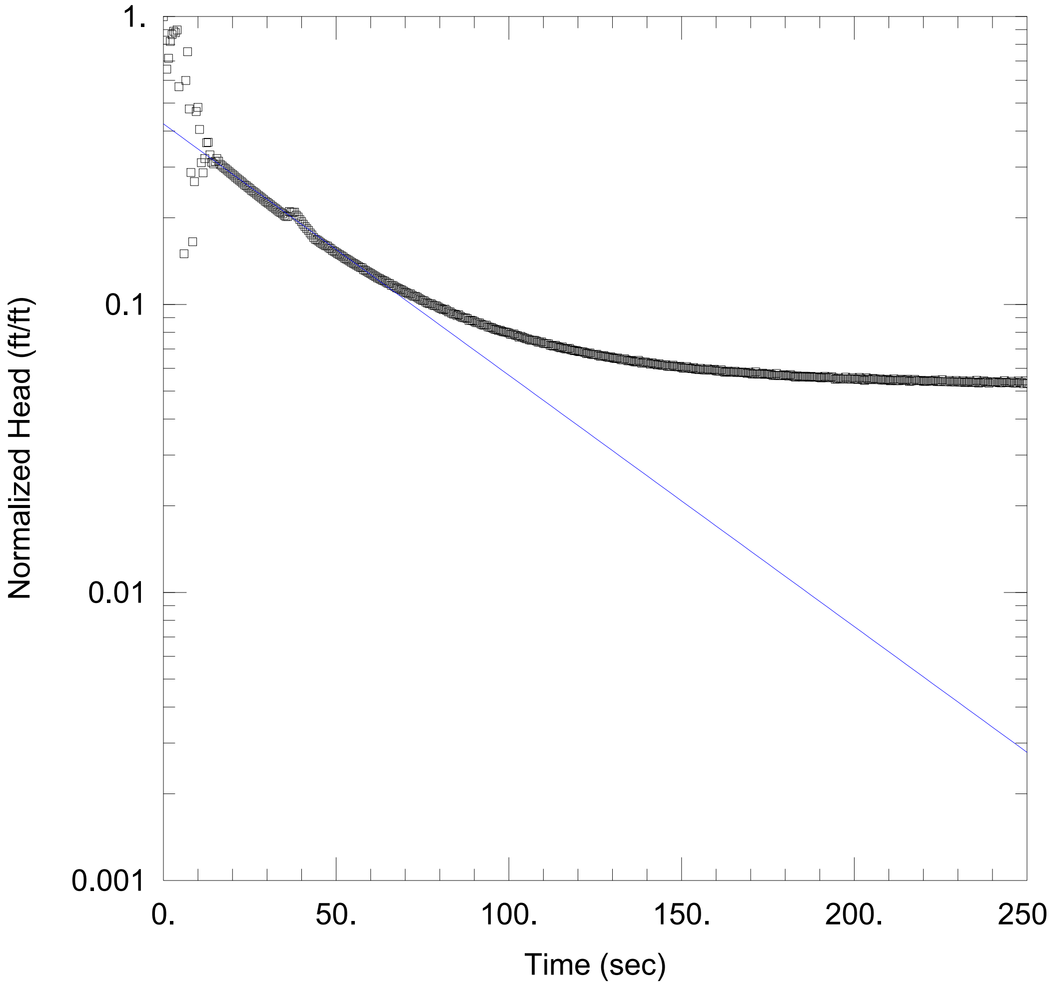
WELL DATA (SMW-12-T2)

Initial Displacement: 1.915 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02401 cm/sec y0 = 2.137 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T3_br.aqt
Date: 08/14/19 Time: 11:52:27

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

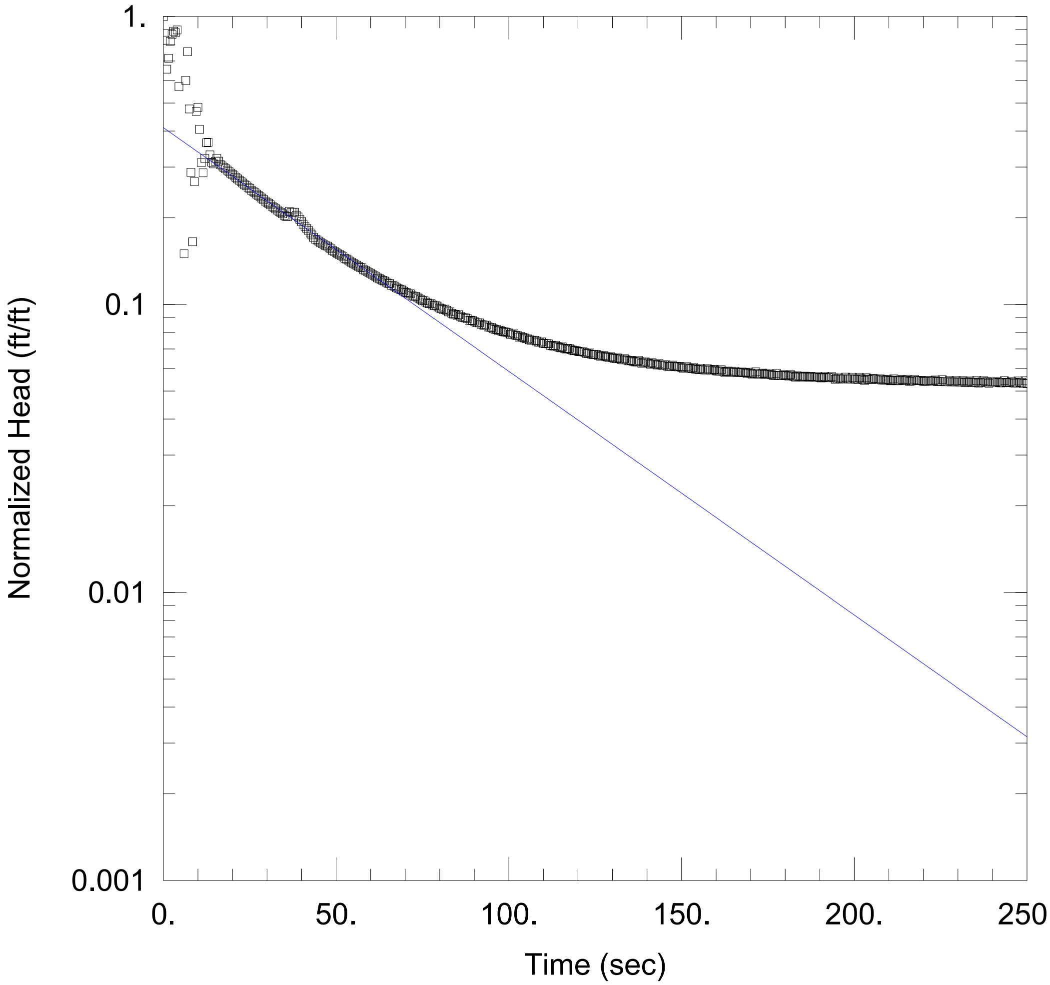
WELL DATA (SMW-12-T3)

Initial Displacement: -2.897 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.002666 cm/sec y0 = -1.228 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T3_h.aqt
Date: 08/14/19 Time: 11:52:04

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

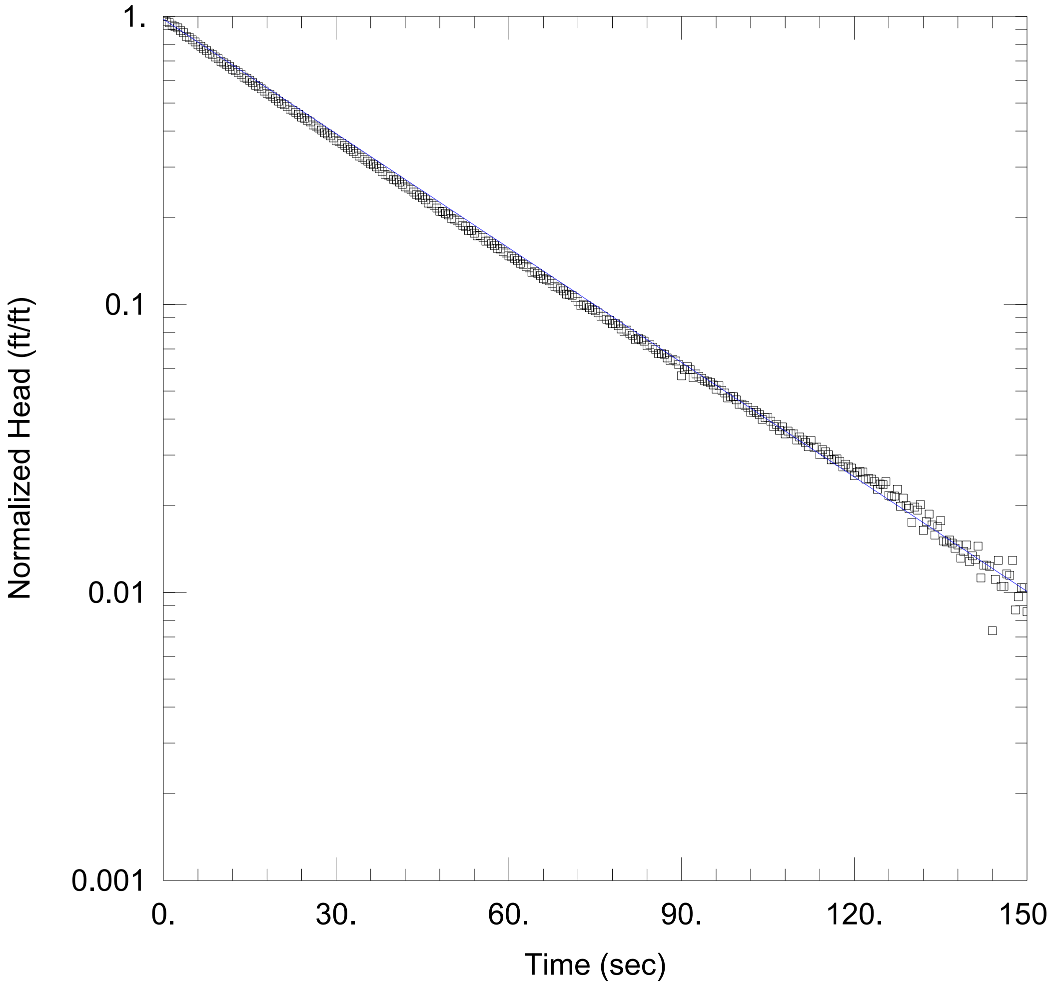
WELL DATA (SMW-12-T3)

Initial Displacement: -2.897 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.003558 cm/sec y0 = -1.19 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T4_br.aqt
Date: 08/14/19 Time: 11:59:35

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

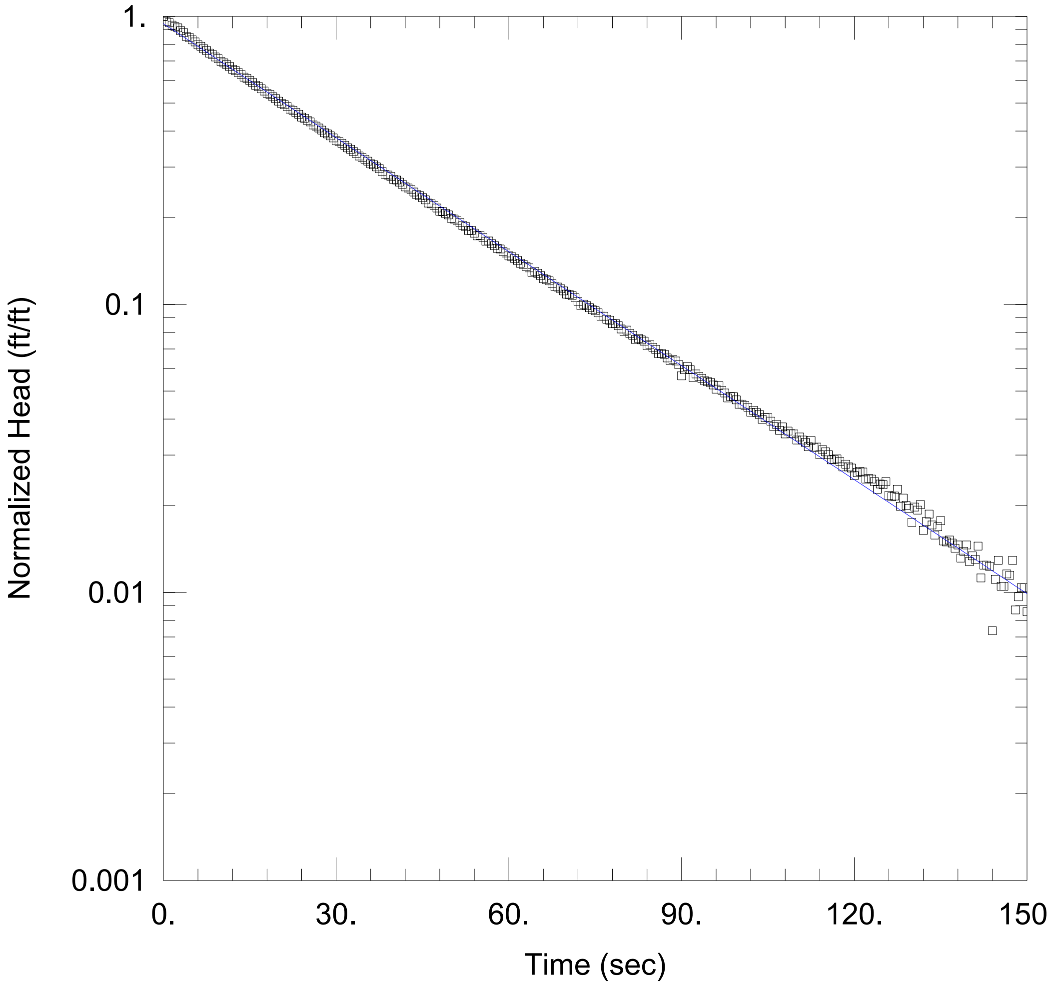
WELL DATA (SMW-12-T4)

Initial Displacement: 1.907 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.004046 cm/sec
y0 = 1.866 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T4_h.aqt
Date: 08/14/19 Time: 12:00:12

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

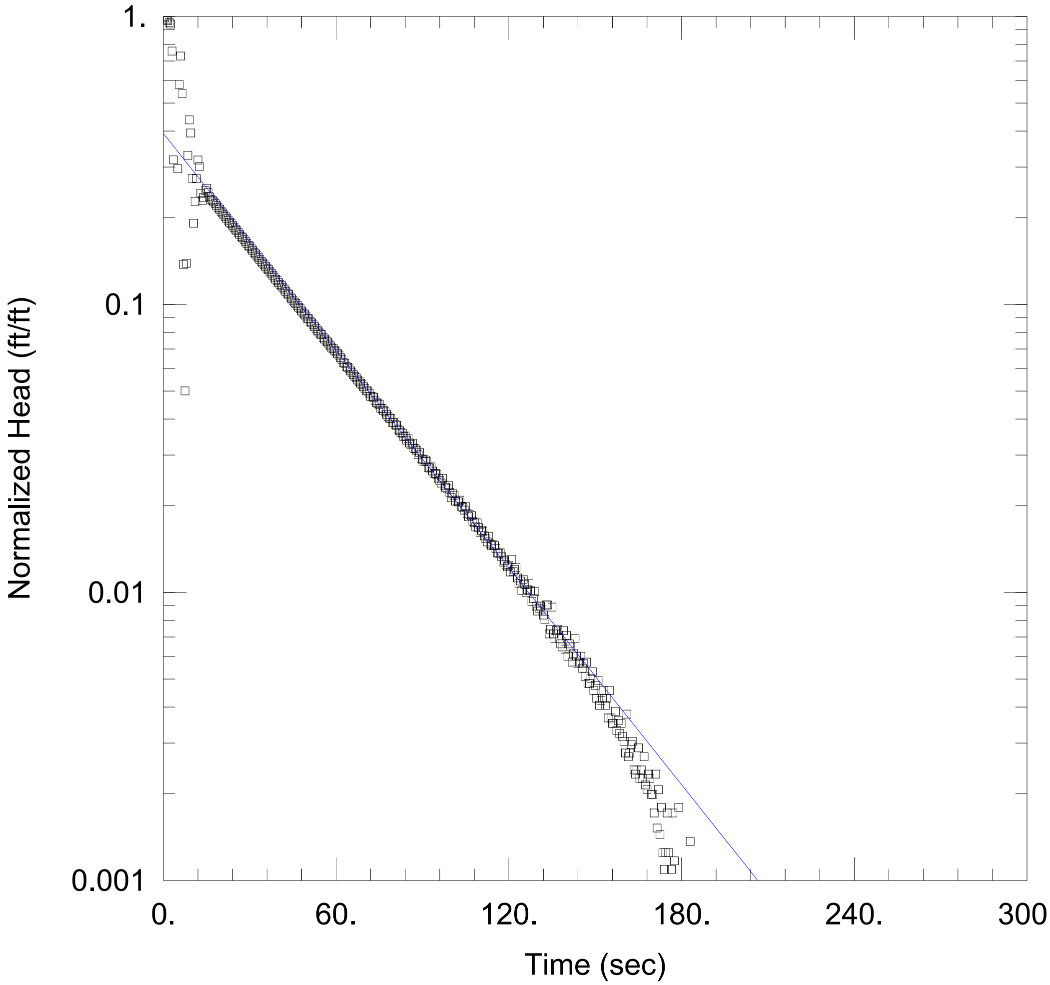
WELL DATA (SMW-12-T4)

Initial Displacement: 1.907 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.00555 cm/sec
y0 = 1.8 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T5_br.aqt
Date: 08/14/19 Time: 12:11:02

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

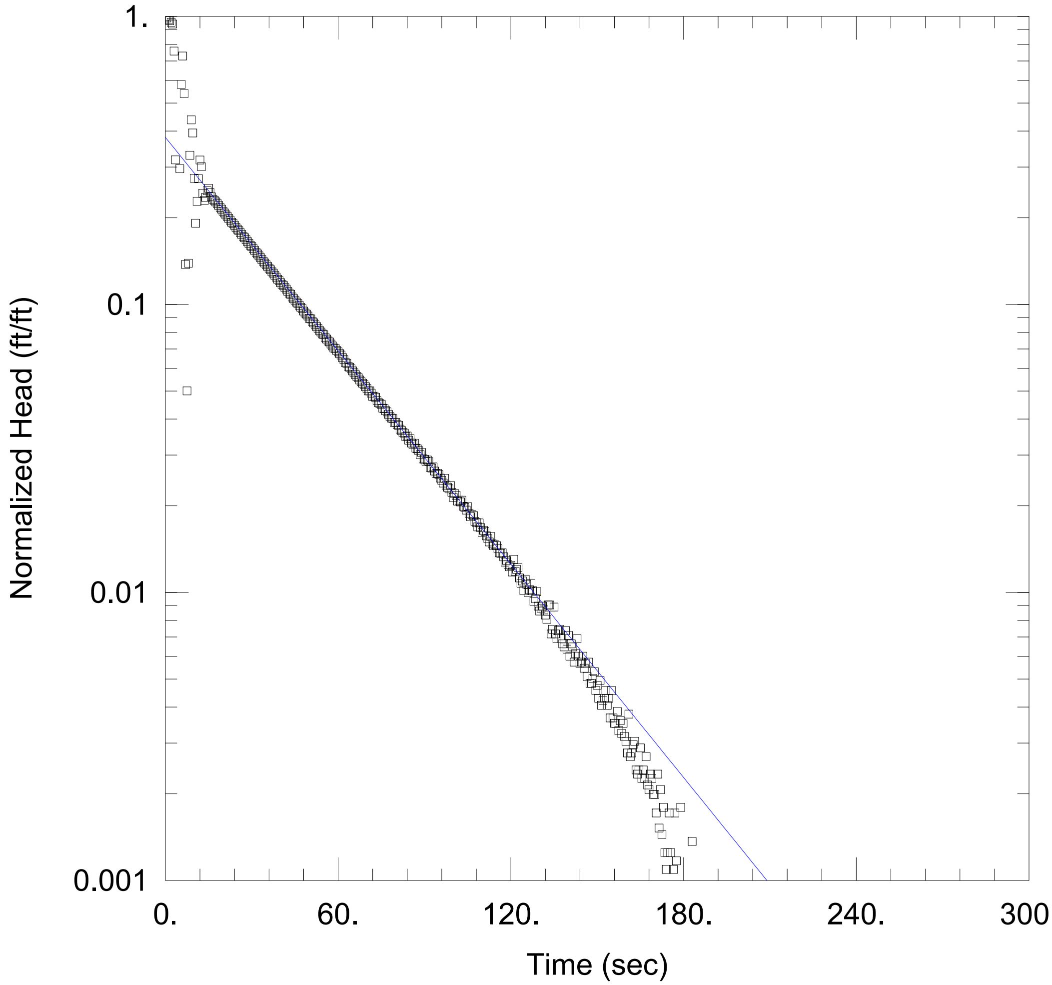
WELL DATA (SMW-12-T5)

Initial Displacement: -2.565 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.003837 cm/sec
y0 = -1.005 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T5_h.aqt
Date: 08/14/19 Time: 12:14:34

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

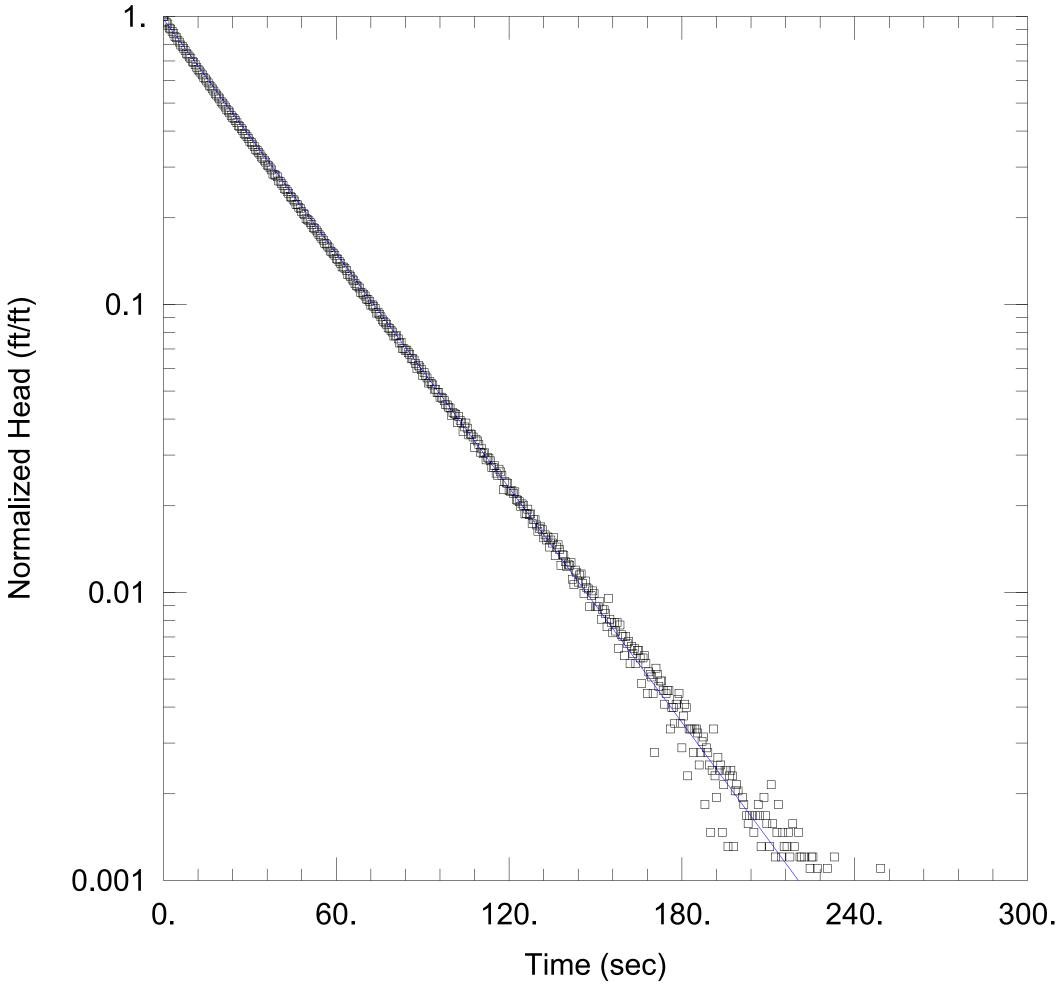
WELL DATA (SMW-12-T5)

Initial Displacement: -2.565 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.005193 cm/sec y0 = -0.9749 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T6_br.aqt
Date: 08/14/19 Time: 12:20:48

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

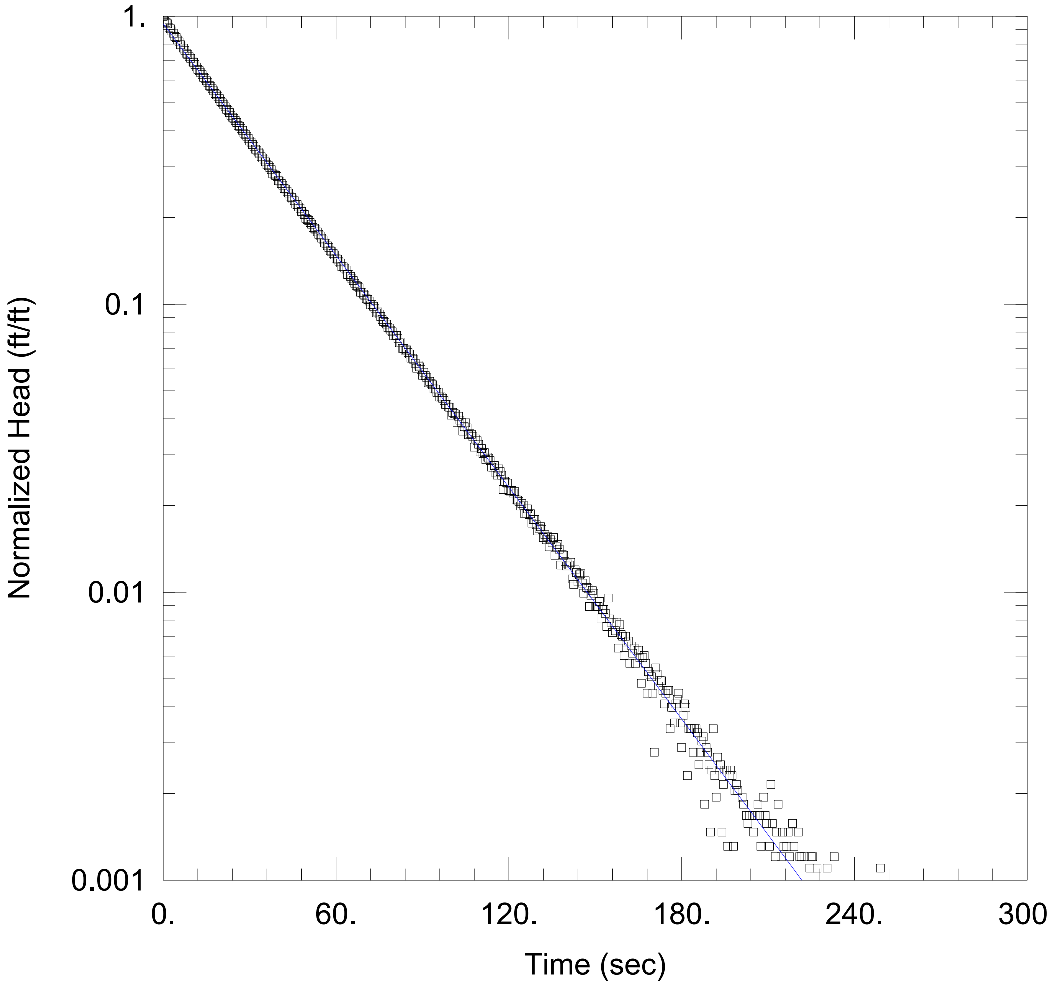
WELL DATA (SMW-12-T6)

Initial Displacement: 1.907 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.004144 cm/sec
y0 = 1.868 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T6_h.aqt
Date: 08/14/19 Time: 12:20:38

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

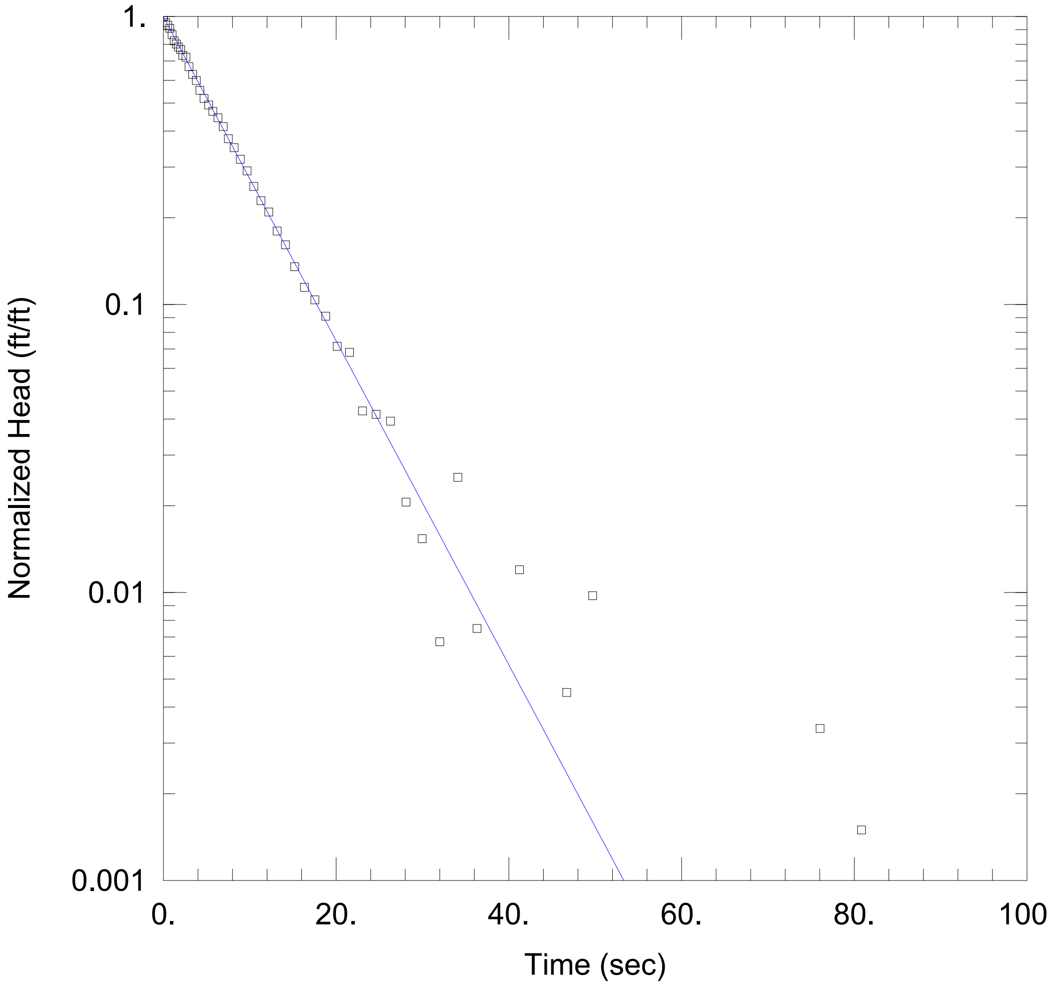
WELL DATA (SMW-12-T6)

Initial Displacement: 1.907 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.005641 cm/sec y0 = 1.795 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T7_br.aqt
Date: 08/14/19 Time: 10:17:22

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

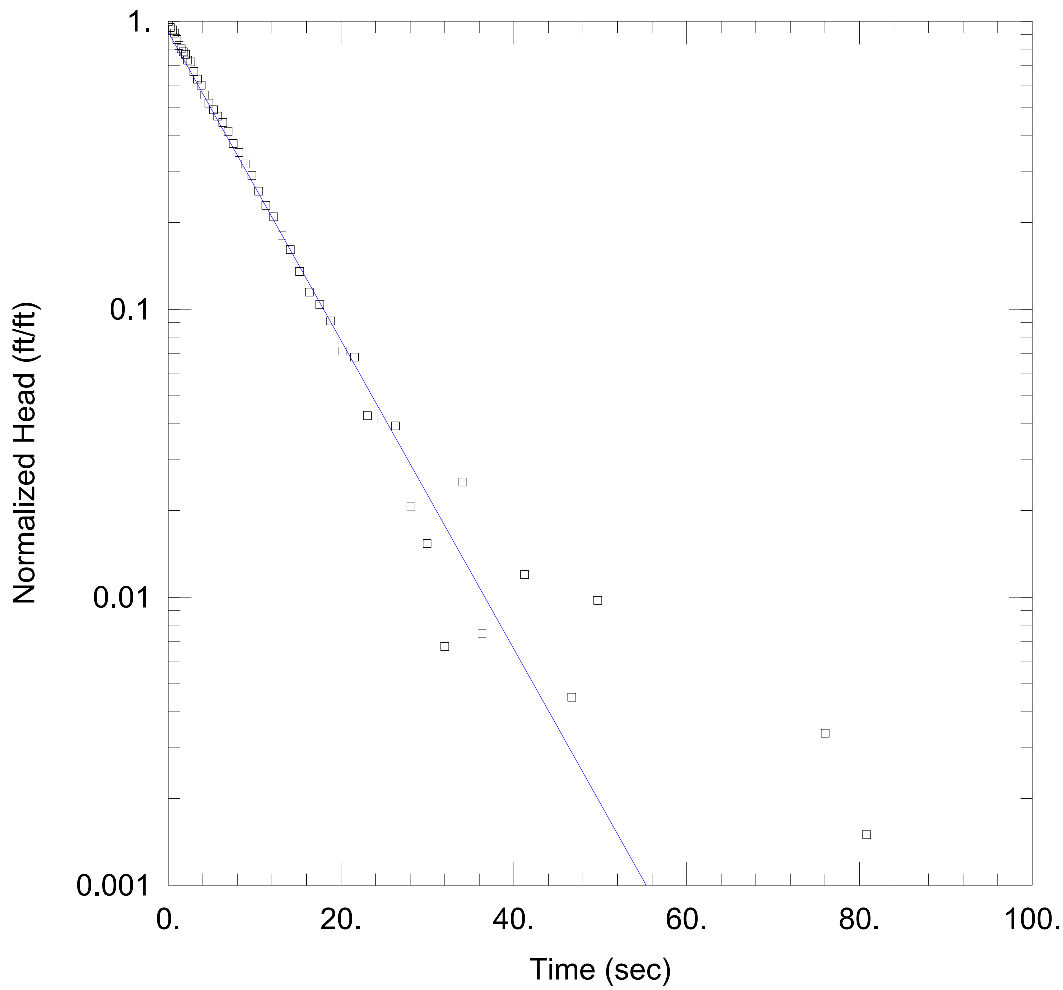
WELL DATA (SMW-12-T7)

Initial Displacement: 2.67 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.01718 cm/sec y0 = 2.659 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T7_h.aqt
Date: 08/14/19 Time: 10:17:48

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

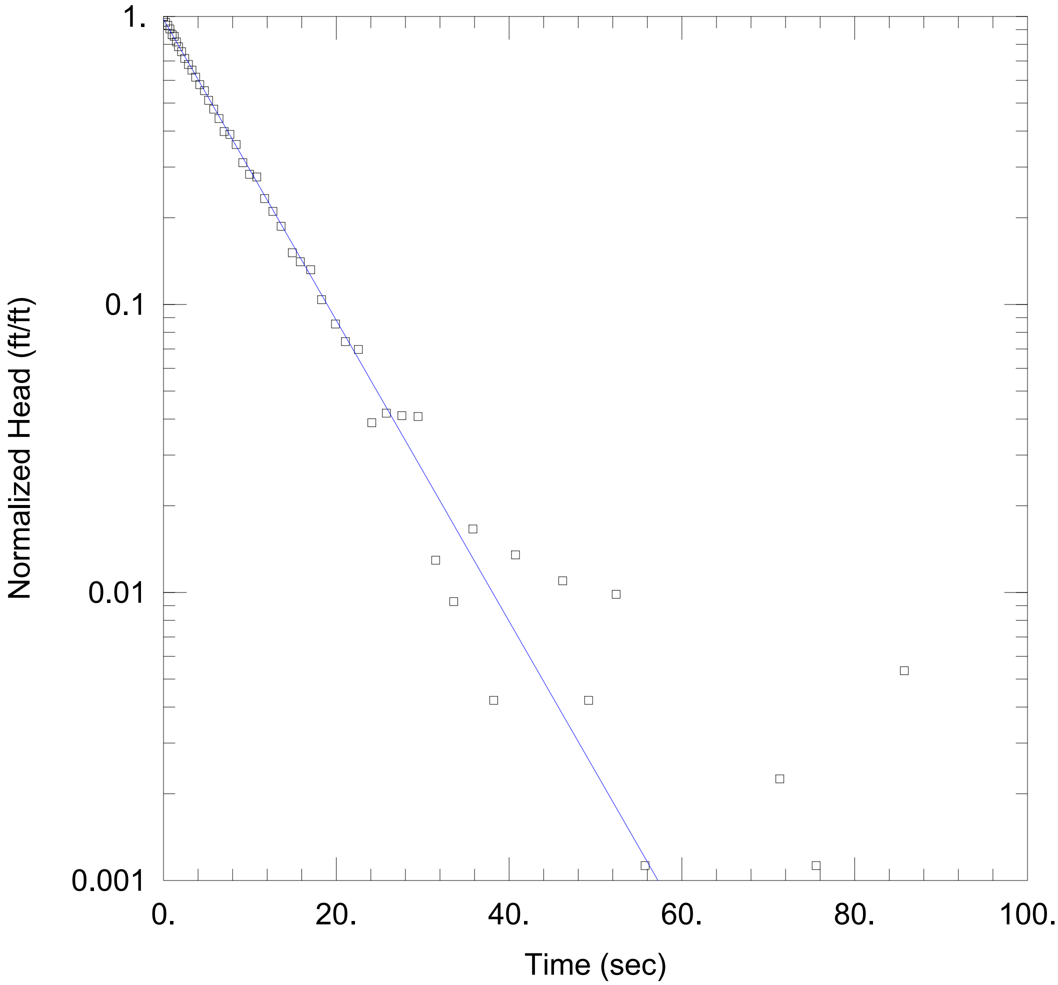
WELL DATA (SMW-12-T7)

Initial Displacement: 2.67 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02253 cm/sec y0 = 2.448 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T8_br.aqt
Date: 08/14/19 Time: 10:15:50

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

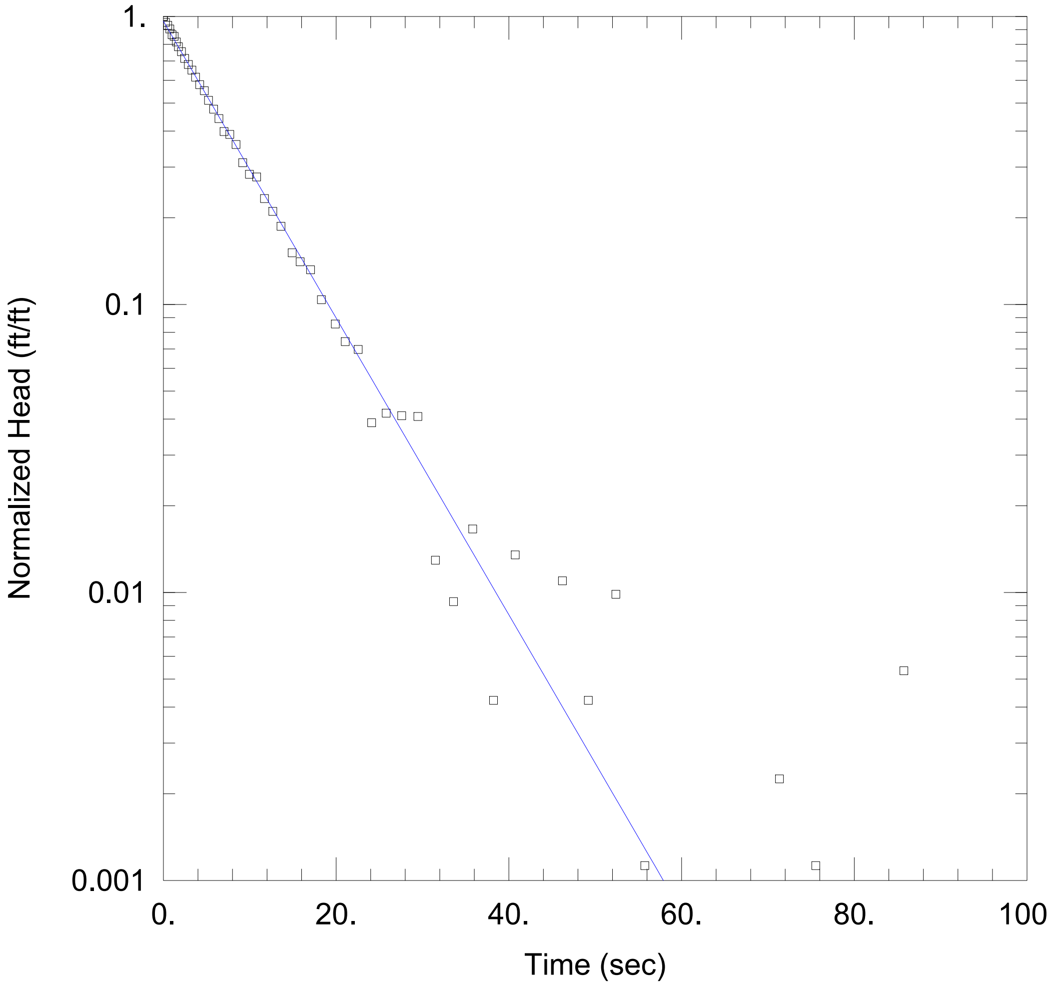
WELL DATA (SMW-12-T8)

Initial Displacement: 3.554 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Bouwer-Rice

K = 0.01596 cm/sec y0 = 3.469 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T8_h.aqt
Date: 08/14/19 Time: 10:15:38

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

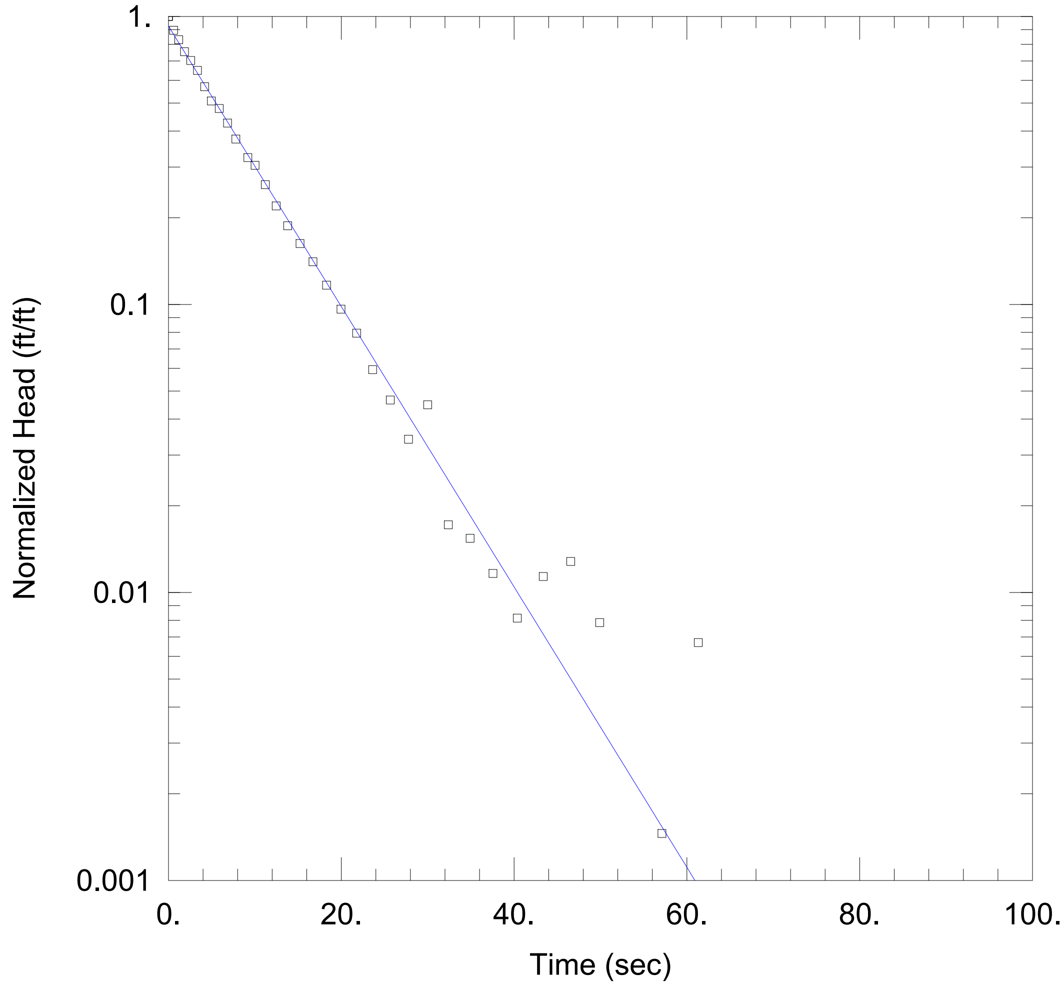
WELL DATA (SMW-12-T8)

Initial Displacement: 3.554 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02167 cm/sec y0 = 3.421 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T9_BR.aqt
Date: 08/14/19 Time: 10:24:58

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft
Anisotropy Ratio (Kz/Kr): 0.1

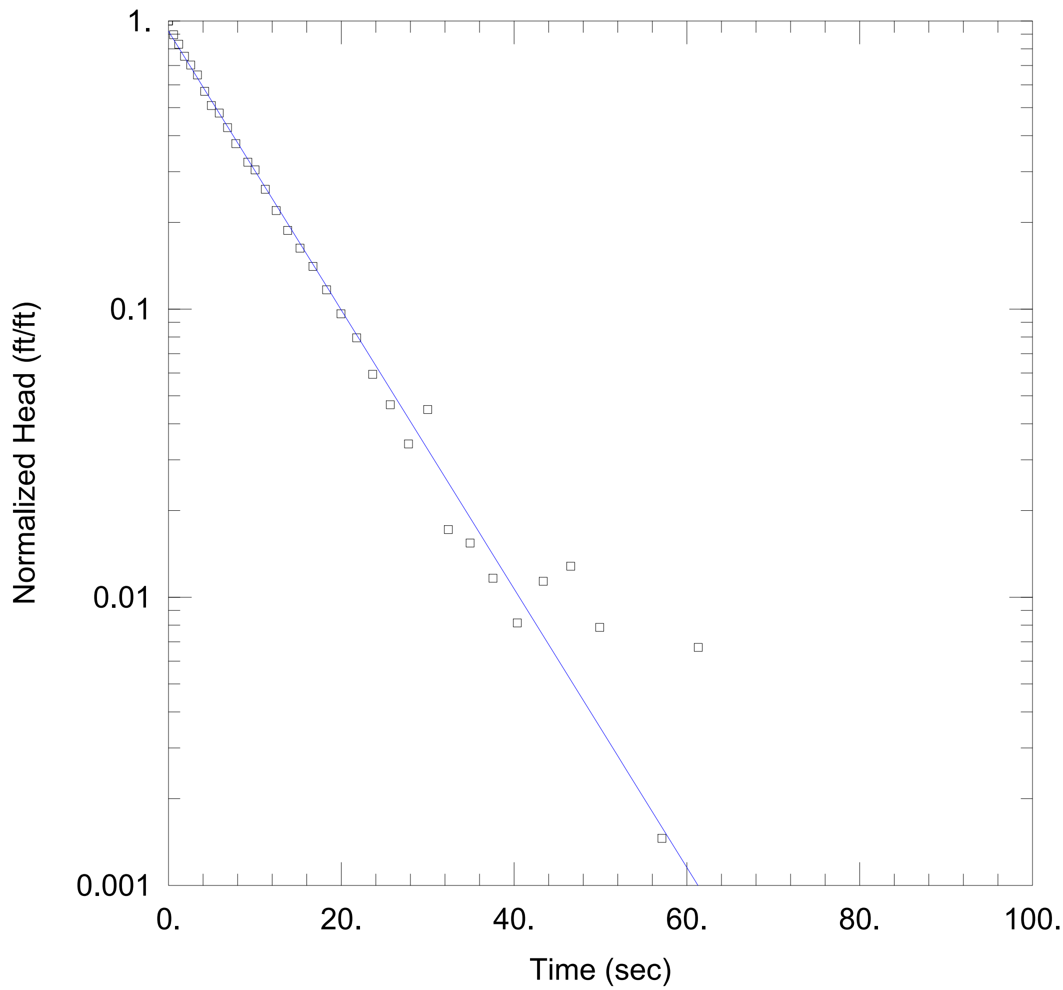
WELL DATA (SMW-12-T9)

Initial Displacement: 3.436 ft
Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft
Screen Length: 10. ft
Casing Radius: 0.17 ft
Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Bouwer-Rice

K = 0.01487 cm/sec
y0 = 3.18 ft



WELL TEST ANALYSIS

Data Set: C:\Users\cjoseph\Documents\Fayetteville\Aqtesolv\SMW-12\SMW-12-T9_BR.aqt
Date: 08/14/19 Time: 10:25:31

PROJECT INFORMATION

Company: Geosyntec
Client: Chemours
Project: TR0795
Location: Fayetteville, NC
Test Well: SMW-12
Test Date: 07/19/2019

AQUIFER DATA

Saturated Thickness: 20. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (SMW-12-T9)

Initial Displacement: 3.436 ft Static Water Column Height: 14.01 ft
Total Well Penetration Depth: 14.01 ft Screen Length: 10. ft
Casing Radius: 0.17 ft Well Radius: 0.5 ft

SOLUTION

Aquifer Model: Confined Solution Method: Hvorslev

K = 0.02034 cm/sec y0 = 3.163 ft

APPENDIX F
Well Permits and Certifications

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 19, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01122
Two (2) monitoring wells: NCDOT right-of-way Dean Rd. & NC Hwy 20
(34.797902 & -78.933058)
St. Pauls, Robeson County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 12 August 2019 and received in the Fayetteville Regional Office on 19 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01122 dated 19 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to River road at the intersection of Dean road and NC Hwy 20 in St. Pauls, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Robeson County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 20 at the intersection of NC Hwy 20 and Dean road in St. Pauls, Robeson County, North Carolina. This Permit is issued in accordance with the application received on 16 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 19th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01122

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 1, 2019

COUNTY: ROBESON

SUBJECT: Encroachment Contract **E061-078-19-00092 – The Chemours Company, FC LLC**

The Chemours Company, FC LLC
Christel E. Compton
22828 NC Highway 87 W
Fayetteville, NC 28306

Dear Ms. Compton:

Attached for your files is a copy of the above-referenced Right of Way Encroachment Contract, properly executed. This contract covers the following:

Installation of two groundwater monitoring wells approximately 50 feet east of the intersection of **SR 1919** (Dean Road) and **NC-20**.

APPROVED SUBJECT TO: Attached Special Provisions

G W Burns CAM

Greg. W. Burns, PE
Division Engineer

GWB/CSM/JF
Attachment

cc: Mr. Greg W. Burns, PE, Division Engineer (copy of contract)
Mr. Charles S. Miller, PE, District Engineer (copy of contract)
Ms. Sonya Vargas, (copy of contract)

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION 6, DISTRICT 1
P.O. BOX 2157
LUMBERTON, NC 28359

Telephone: (910) 618-5546
Fax: (910)618-5586
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
872 NC 711 HWY
LUMBERTON, NC 28360

WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personnel performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance /Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) inside the highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 814-4937 or skite@ncdot.gov or Roger Garrett at (919) 814-5045 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

1. **The encroaching party shall notify Brice Bell, PE, Maintenance Engineer at telephone (910) 618-5543 or email bricebell@ncdot.gov prior to beginning construction and after construction is complete. Written or email notification shall also be made to Phil Pittman, Assistant District Engineer at P.O. Box 2157 Lumberton, NC 28359 or at ppittman@ncdot.gov after construction is complete.**

2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.

4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.

5. Excavation within 1000 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.

6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.

7. The contractor shall not begin the construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.

8. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.

9. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

10. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

11. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer.

12. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.

13. All materials and workmanship shall conform to the *NCDOT Standards and Specifications for Roads and Structures*.

14. Strict compliance with the *Policies and Procedures for Accommodating Utilities on Highway Rights of Way* manual shall be required.

15. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

16. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

17. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

18. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.

19. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest *NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures* and amendments or supplements thereto. When there is no guidance provided in the *NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures*, comply with the *Manual on Uniform Traffic Control Devices for Streets and*

Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT Division Engineer.

20. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 6:00 P.M., **or as designated by the District Engineer**. Traffic shall be maintained at all times.

21. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.

22. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.

23. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

24. No parking or material storage shall be allowed along or from the roadway. No parking or material storage shall be allowed along the shoulders of any state- maintained roadway.

25. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.

26. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:

    a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring.**
    b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2012 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.
    c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.
    d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

27. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be

placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.

28. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. A listing of currently approved manholes and vaults is available at https://apps.dot.state.nc.us/vendor/approvedproducts. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.

29. No wells shall be installed that may interfere with the proper drainage structure. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

30. Only the well(s) shown on the attached plan is approved by this agreement. Additional wells at the site will require a revision to this agreement or a separate encroachment agreement.

31. Any and all costs for adjustments to the proposed wells due to NCDOT construction shall be the responsibility of the encroaching party.

32. NCDOT or its contractors shall not be held responsible for damage to monitoring wells due to roadway construction or maintenance activities.

33. Ground water monitoring wells shall not be allowed in pavement, medians, or traffic islands.

34. Well caps shall be flush mounted with the ground surface with the frames and covers of a NCDOT approved design for HS 20 loading when installed within clear recovery area or within routine mowing boundaries.

35. Wells proposed outside the clear recover area and outside of the boundaries of routine mowing shall be flush mounted but are not required to be designed for HS 20 loading.

36. Any conversion of a monitoring well to an extraction or remediation system will require a separate encroachment agreement requiring review by NCDOT's Project Services Unit.

37. Spoils from the well installation shall be disposed of outside NCDOT right of way at an approved site. Any contaminated soils encountered in construction as spoil from the well installation shall be removed from the NCDOT right of way **immediately** upon discovery and properly disposed of in accordance with the appropriate governing regulations.

38. A copy of all test results from the well(s) within the NCDOT right of way shall be made available to the NCDOT District Engineer's Office.

39. After the monitoring well(s) has served its intended purpose, the well(s) shall be filled in a manner approved by NCDENR and NCDOT. Any flush mounted or above ground obstructions shall be removed from the right of way and the site shall be returned to a condition satisfactory to the District Engineer.

40. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer.

41. Any utility marker required shall be as close to the Right of Way line as possible. If it is not feasible to install markers at or near right of way specific written approval shall be obtained from NCDOT prior to installation.

42. The minimum pavement design for pavement repair shall be:

    2.0" S9.5B Asphalt Concrete Surface Course
    3.0" I19.0B Asphalt Concrete Intermediate Course
    3.0" B25.0B Asphalt Concrete Base Course
    8.0" Aggregate Base Course

    *Overlay the existing pavement with 1.5" S9.5B

43. REVISIONS are marked in RED.

44. **No pavement cuts allowed under this encroachment**.

45. Note that this review is intended for the general conformance with the policies and procedures concerning the protection of current and potential future facilities located within the NCDOT rights of way and easements. This review and associated plan comments in no way construes any design, design change, or change in the intent of the design by the Owner, Design Engineer, or any of their representatives.

SEEDING AND MULCHING:

(East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		September 1 - February 28	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		September 1 - February 28	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

E061-078-19-00092

ROUTE NC 20 PROJECT ________ COUNTY OF STATE OF NORTH CAROLINA Robeson

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 1st day of August , 20 19 , by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC 20 , located In Robeson County Approximately 50 feet east of the intersection of Dean Road (SR-1919) and NC-20 with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: GW Burns cAM

Asst. Manager of Right of Way

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E. Compton

22828 NC Highway 87 W Fayetteville, NC 28306

Second Party

INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.

E061-078-19-00092

0 45 90 180 270 360
Feet

Legend

NC Robeson Parcel Boundary

Proposed Well Location

Proposed Location for Monitoring Well Installation

NC-20 and Dean Rd
Chemours Fayetteville Works, North Carolina

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Robeson County (http://data.nconemap.gov/downloads/vector/parcels/).

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Figure 1

Raleigh, NC

July 2019

Path: (Raleigh-01/Data) N:\TR0795\Encroachment Agreement\NC-20 and Dean Road\F1_NC 20 and Dean Rd.mxd 12 July 2019 RED

ENVIRONMENTAL PROTECTION
HAZARDOUS SITES RESPONSE PROGRAM

TYPICAL
FLUSH-MOUNT GROUNDWATER MONITORING WELL
CONSTRUCTION DIAGRAM

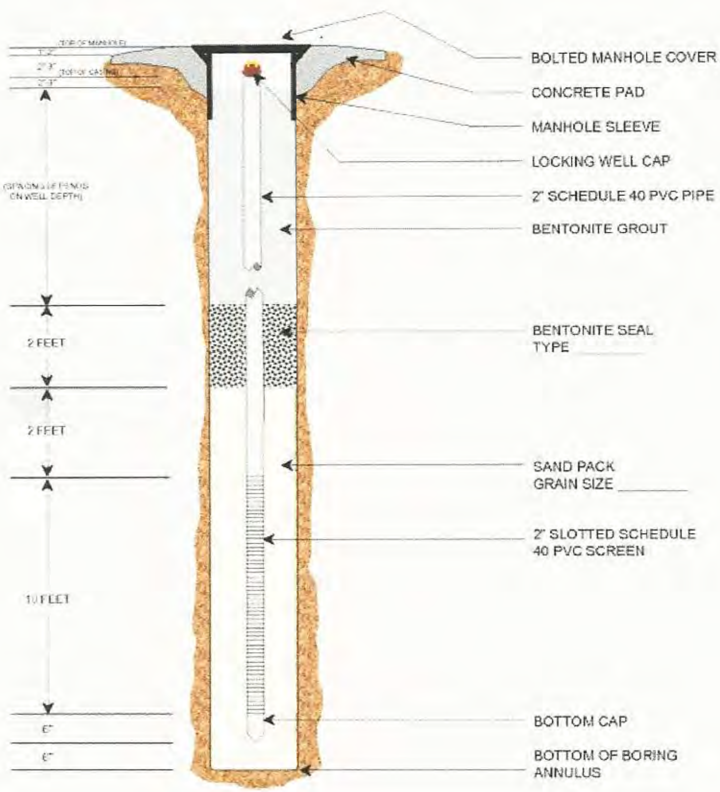


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of NC Highway 20 and Dean Road (SR 1919). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.
    - Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" **(Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

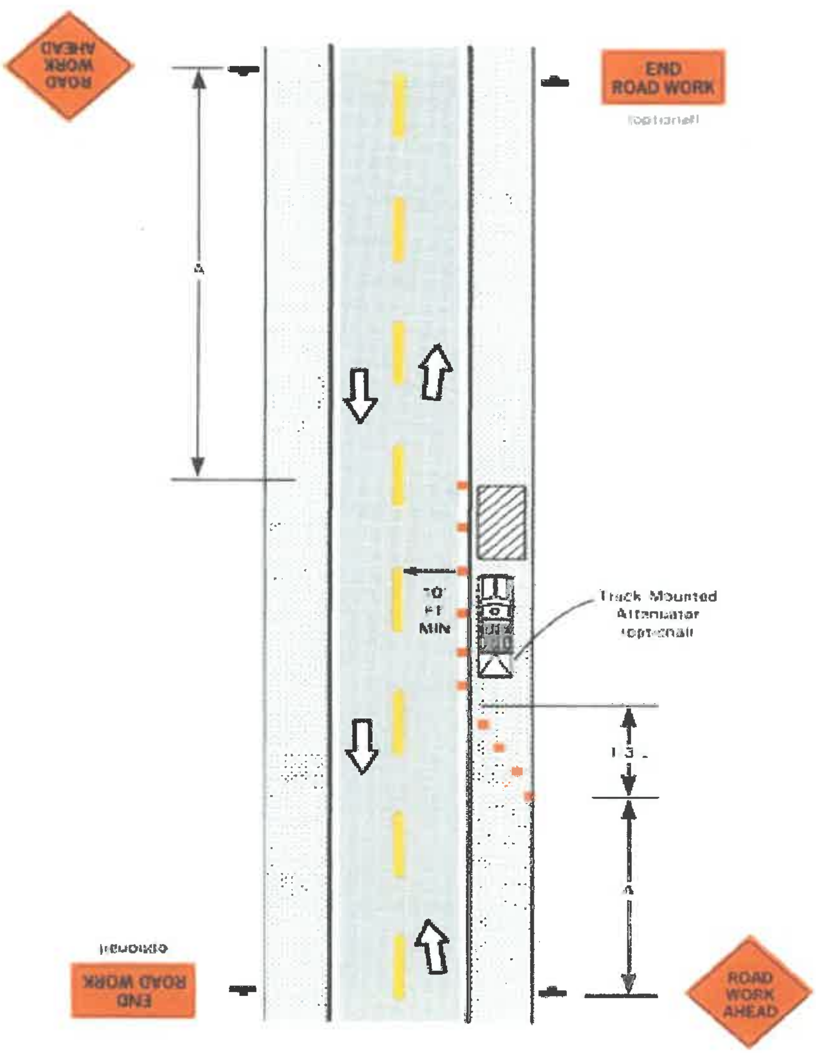


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

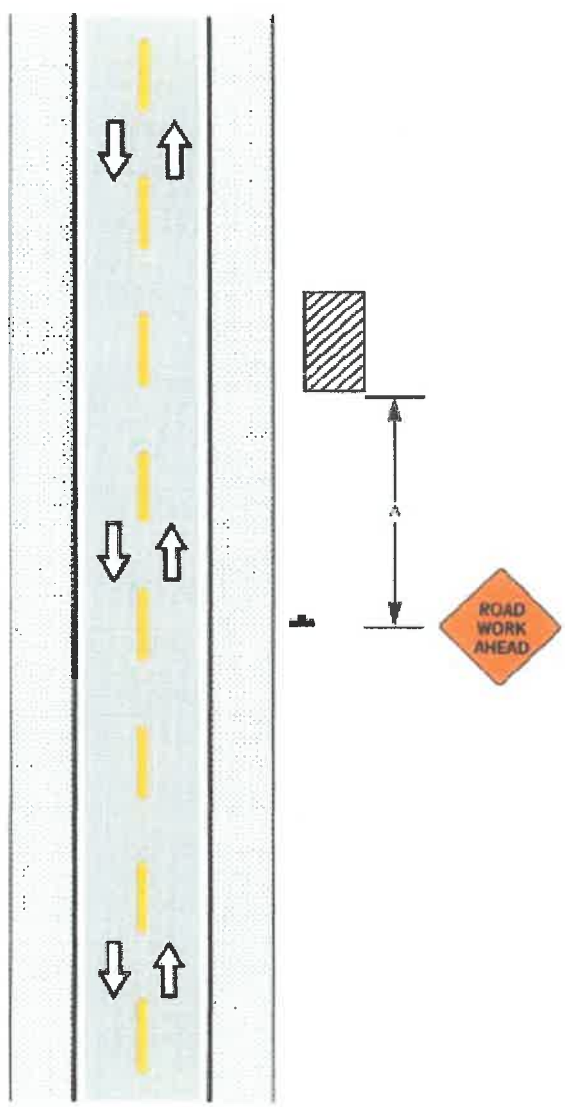


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Charles Miller
District Engineer
NCDOT
872 NC 711 Highway
Lumberton, NC 28360

Subject: Request for Right of Way Encroachment in Robeson County
NC-20 Near Intersection of Dean Road (SR 1919)
Geosyntec project # TR0795 NC20-SR1919

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981).

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW 50 feet east of the intersection of NC Highway 20 and Dean Road (SR 1919) in the City of St. Pauls in Robeson County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 5, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01118
Two (2) monitoring wells: NCDOT right-of-way Hwy 53 and River Road
(34.747507 & -78.708264)
White Oak, Bladen County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 1 August 2019 and received in the Fayetteville Regional Office on 2 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01118 dated 5 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 53 at the intersection of NC Hwy 53 and River road in White Oak, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Bladen County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 53 at the intersection of NC Hwy 53 and River road in White Oak, Bladen County, North Carolina. This Permit is issued in accordance with the application received on 1 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 5th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01118

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 22, 2019

COUNTY: Bladen County. N.C.
NCDOT # E063-009-19-00043

REFERENCE: Groundwater Monitoring Wells

Mr./Ms. Christel Compton
The Chemours Company FC LLC
Fayetteville Works
22828 N.C. Hwy. 87 W.
Fayetteville, N.C. 28306

Dear Mr./Ms. Compton,

Attached for your files is a copy of the Right of Way Encroachment Contract properly executed. This contract covers the following:

Proposed along Route N.C. 53 Approximately 75 LF North of the Intersection of N.C. 53 and S.R. 1318 (River Road) with the construction and or/erection of, two Environmental Groundwater Monitoring Wells in the Town of White Oak, N.C. as shown on Attached map, figure 1.

APPROVED SUBJECT TO: Attached Special Provisions

Sincerely,

Greg Burns

Greg Burns, PE,
DIVISION ENGINEER

GB/KLC/sln
Attachments

cc: Kenneth L. Clark, PE (District Engineer)
Nicky L. Garrell (County Maintenance Engineer)

SPECIAL PROVISIONS

R/W 16.1

THE CHEMOURS COMPANY FC LLC

1. **WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM**

Effective July 1, 2010, all flagging operations within NCDOT Right of Way require qualified and trained Work Zone Flaggers.

Effective July 1, 2011, qualified and trained Work Zone Traffic Control Supervisors will be required on Significant Projects.

Training for this certification is provided by NCDOT approved training sources and by private entities that have been pre-approved to train themselves. If you have questions, contact our web site at http://www.ncdot.org/doh/preconstruct/wztc/WZTCTrainingProgram/default.html, or contact Stuart Bourne, P.E. with NCDOT Work Zone Traffic Control Unit at (919) 662-4338 or sbourne@ncdot.gov .

1. The encroaching party shall notify the District Engineer's office at telephone number (910) 642-3760) prior to beginning construction and after construction is complete.

2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.

4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.

5. Excavation within 500 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 486-1452. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.

6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.

7. The contractor shall not begin construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.

8. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.

9. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

10. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

11. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer or an approved Erosion Control Plan.

12. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.

13. All materials and workmanship shall conform to the N. C. Department of Transportation's Standards and Specifications Manuals.

14. Strict compliance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way manual shall be required.

15. The attached plans reflect the corrections and revisions as coordinated with the NCDOT District Office.

16. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the District Engineer.

17. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

18. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

19. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

20. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

21. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.

22. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures and amendments or supplements thereto. When there is no guidance provided in the NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures, comply with the Manual on Uniform Traffic Control Devices for Streets and Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT District Engineer.

23. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 7:00 P.M., or as designated by the District Engineer. Traffic shall be maintained at all times.

24. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.

25. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.

26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

27. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.

28. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:

    a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring**.

    b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2006 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.

    c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.

    d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

    e. No roadway crossing for a pipeline greater than 2 inches in diameter shall be made in Columbus or Bladen Counties by the method known as driving or thumping, where an air compressor and a pilot shoe are used to compress material and create a bore hole, unless approved by the District Engineer.

29. Directional drilling methods have not been given statewide approval for use on NCDOT right of way. Under no condition shall jetting alone or wet boring with water of utility pipelines be allowed. Directional boring using jetting with a Bentonite (or equivalent material) slurry is approved at a minimum depth of ten (10) feet below the pavement surface [fifteen (15') feet below the surface of partial and/or full control of access roads] and two (2) feet below any ditch line. Directional boring is not allowed in embankment material. Directional boring is allowed beneath embankment material in naturally occurring soil. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of three (3') feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway. All directional bores shall maintain ten (10) feet minimum (clear) horizontal distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. All directional bores shall maintain ten (10) feet minimum (clear) vertical and horizontal distance from the nearest part of pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings or retaining walls. The tip of the drill string shall have a cutter head. Detection wire shall be installed with non-ferrous material. Any changes shall be submitted to the District Engineer for approval prior to construction. For multiple conduit installations (including perpendicular & parallel installations), install conduits with five (5) feet minimum (clear) horizontal separation between each conduit or install multiple conduits within a single duct. An overbore shall not be more than two (2") inches greater than the diameter of the pipe or encasement. An overbore exceeding two (2") inches greater than the diameter of the pipe or encasement will be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of two (2") inches of the diameter of the pipe or encasement will arch and no damage will be done to the pavement or sub-grade. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

30. Alignment of directional bores at bridges and 48-inch culverts or larger should be (1) one foot off Right of Way. After completion of bore, encroaching party shall provide NCDOT with a certified bore log.

31. All 6" or smaller in diameter plastic gas mains shall meet current NCDOT standards (Polyethylene SDR-11) or the plans shall be sealed, signed and dated by a licensed North Carolina Professional Engineer. All plastic gas mains 8" or greater in diameter shall be sealed, signed, and dated by a licensed North Carolina Professional Engineer.

32. Regulator stations, metering stations, cathodic test stations and anode beds are not permitted within the NCDOT right of way. Header wires are permitted.

33. A performance and indemnity bond in the amount of $500.00 shall be posted with the NCDOT District Engineer's Office by the encroaching party prior to beginning any work within the NCDOT right of way. The bond shall be held for a minimum period of one year after completion of the installation and released only upon a final satisfactory inspection by NCDOT.

34. Upon completion of the installation of this encroachment, please summit one hard copy of the As Built plans (noted with any changes) sealed, signed, and dated by a licensed North Carolina Professional Engineer to the District Engineer within 30 days.

35. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18' for crossings over NCDOT roadways and 15'-6" for parallel installations.

36. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.

37. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.

38. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer

39. All temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number (910) 486-1452 for review and approval prior to installation.

40. Any utility marker required shall be as close to the right of way line as possible. If it is not feasible to install markers at or near the right of way line, written approval specific to the site shall be obtained from the District Engineer prior to installation.

41. Detection tape shall be buried in the trench approximately 1 foot above the fiber optic cable. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

42. Transportation Improvement Project (T.I.P.) ******* is scheduled for construction in the future. Any encroachment determined to be in conflict with the construction of this project shall be removed and/or relocated at the owner's expense. (Continue per spec.)

43. The encroaching party shall submit a letter from the Highway Contractor on NCDOT Project ***** to the NCDOT State Utility Agent stating that this encroachment will not be the basis of a claim for delay or additional cost against the Board of Transportation.

44. The work depicted on the plans and specifications submitted with the encroachment package appears to be an engineering design held out to the public. The engineering work appears to affect public safety and health. As such, the engineering drawings and specifications are required by GS-89C to be properly certified by a licensed North Carolina Professional Engineer. The plans and specifications have not been properly certified by a licensed North Carolina Professional Engineer and the encroaching party may be in violation of GS-89C.

45. In the Future Should NCDOT need to Remove or Replace the Existing Cross Line Pipe as Shown On Plan Drawing Sheet Page 1 of 8, Columbus County Utility Department Agrees to shut off and Remove Temporarily the 20 LF Section of 8" Ductile Iron Water Main at Approx. Station 9+50. Following Replacement of The Storm Drain, NCDOT will give Instructions to Columbus County Utility Department as to where, in Relationship to the Replaced Storm Drain, the 8" Ductile Iron Water Main will be Re-Installed.

SEEDING AND MULCHING: **(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE NC-53 PROJECT Monitoring Wells COUNTY OF STATE OF NORTH CAROLINA Bladen

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 22 day of July, 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC-53 and SR 1318, located In Bladen County Approximately 75 feet north of the intersection of NC-53 and River Road (SR 1318) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: Greg Burns KC

~~Asst. Manager of Right of Way~~ DIVISION ENGINEER

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E. Compton

Christel E Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.

0 37.5 75 150 225 300 Feet

Legend

- NC Bladen Parcel Boundary
- Propsed Well Location

Proposed Location for Monitoring Well Installation

NC-53 and River Rd
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | July 2019

Figure 1

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Bladen County (http://data.nconemap.gov/downloads/vector/parcels/).

ENVIRONMENTAL PROTECTION
HAZARDOUS SITES RESPONSE PROGRAM

TYPICAL
FLUSH-MOUNT GROUNDWATER MONITORING WELL
CONSTRUCTION DIAGRAM

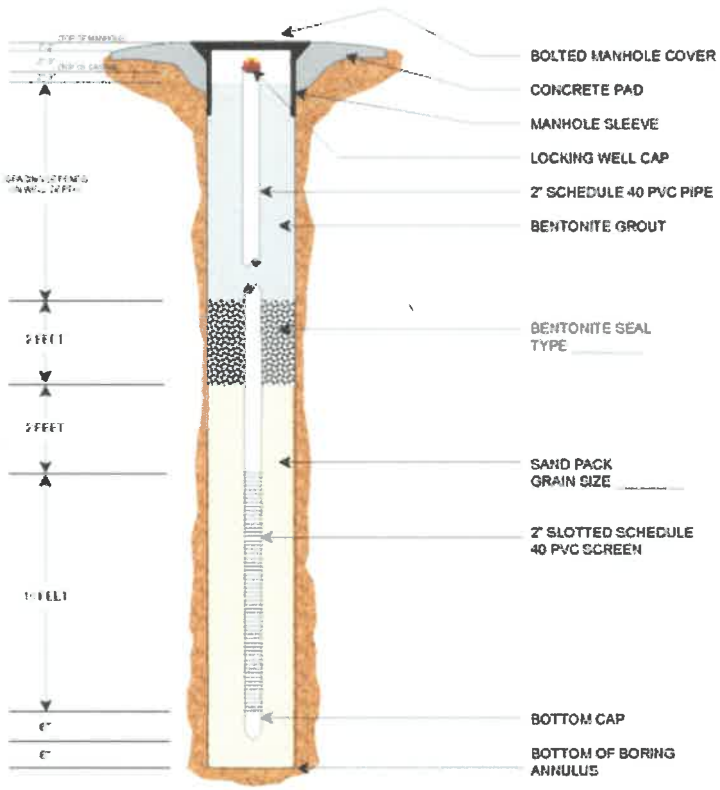


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of NC Highway 53 and River Road (SR 1318). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.
    - Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" (**Figure 4**).
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

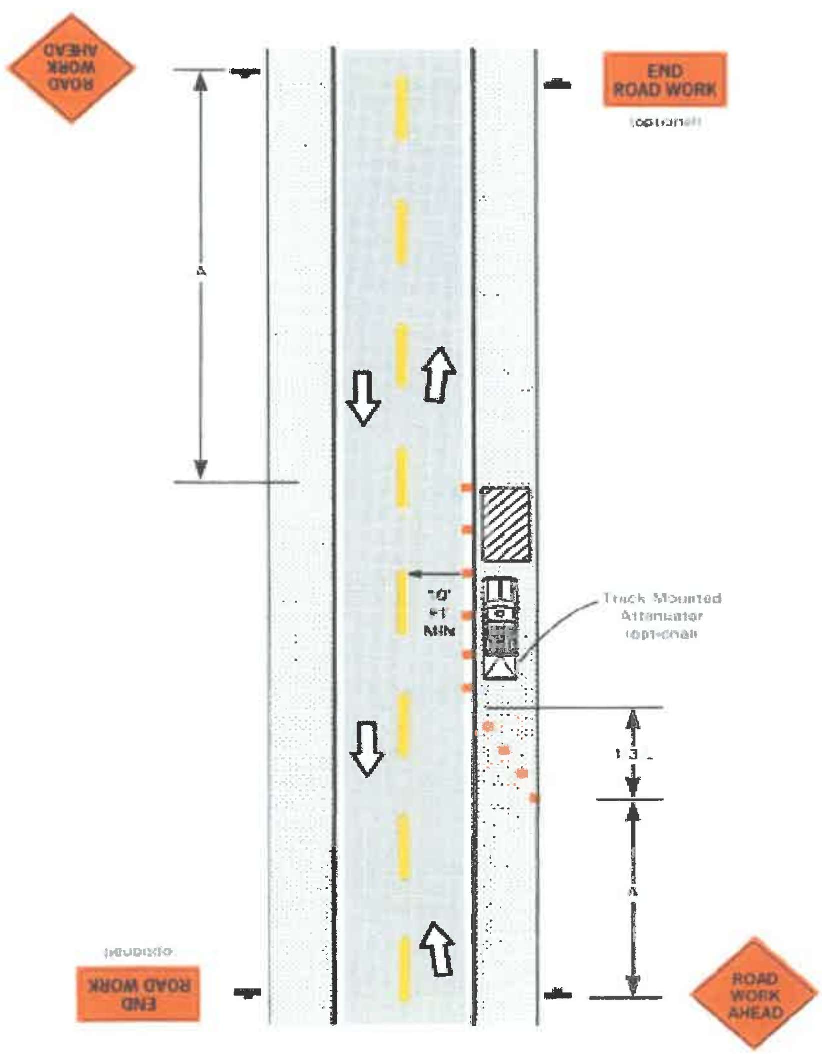


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

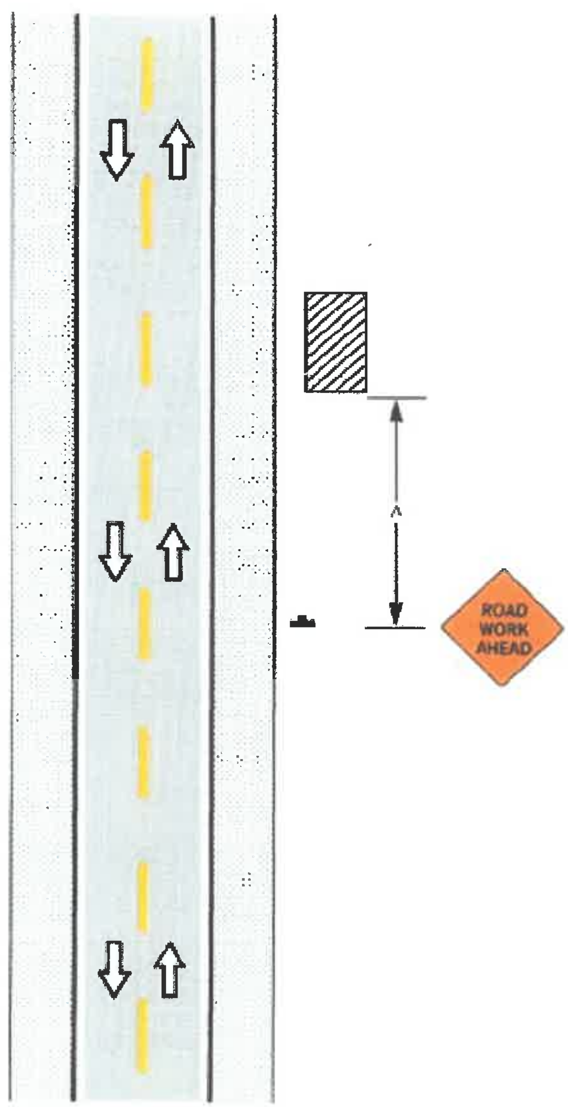


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

Geosyntec Consultants of NC, PC

18 July 2019

Mr. Kenneth Clark
District Engineer
NCDOT
1194 Prison Camp Road
Whiteville, NC 28472

Subject: Request for Right of Way Encroachment in Bladen County
NC Highway 53 and River Road (SR 1318)
Geosyntec project # TR0795 NC53-SR1318

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of four ROW encroachment requests in Bladen County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of NC Highway 53 and River Road (SR 1318) in the Town of White Oak in Bladen County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 5, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01120
Two (2) monitoring wells: NCDOT right-of-way Chickfoot & Purdie Hall Road
(34.763416 & -78.857056)
Tar Heel, Bladen County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 1 August 2019 and received in the Fayetteville Regional Office on 2 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01120 dated 5 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to Chickenfoot road at the intersection of Purdie Hall road and Chickenfoot road in Tar Heel, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Bladen County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to Chickenfoot road at the intersection of Purdie Hall road and Chickenfoot road in Tar Heel, Bladen County, North Carolina. This Permit is issued in accordance with the application received on 1 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 5th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01120

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 22, 2019

COUNTY: Bladen County. N.C.
NCDOT # E063-009-19-00044

REFERENCE: Groundwater Monitoring Wells

Mr./Ms. Christel Compton
The Chemours Company FC LLC
Fayetteville Works
22828 N.C. Hwy. 87 W.
Fayetteville, N.C. 28306

Dear Mr./Ms. Compton,

Attached for your files is a copy of the Right of Way Encroachment Contract properly executed. This contract covers the following:

Proposed along Route 1300 (Chicken Foot Road) Approximately 50 LF Southeast of the Intersection of S.R. 1300 (Chicken Foot Road) and S.R. 1005 (Purdie-Hall Road) with the construction and or/erection of, two Environmental Groundwater Monitoring Wells in the City of Hollow, N.C. as shown on Attached map, figure 1.

APPROVED SUBJECT TO: Attached Special Provisions

Sincerely,

Greg Burns

Greg Burns, PE,
DIVISION ENGINEER

GB/KLC/sln
Attachments

cc: Kenneth L. Clark, PE (District Engineer)
Nicky L. Garrell (County Maintenance Engineer)

SPECIAL PROVISIONS

R/W 16.1

THE CHEMOURS COMPANY FC LLC

1. **WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM**

Effective July 1, 2010, all flagging operations within NCDOT Right of Way require qualified and trained Work Zone Flaggers.

Effective July 1, 2011, qualified and trained Work Zone Traffic Control Supervisors will be required on Significant Projects.

Training for this certification is provided by NCDOT approved training sources and by private entities that have been pre-approved to train themselves. If you have questions, contact our web site at http://www.ncdot.org/doh/preconstruct/wztc/WZTCTrainingProgram/default.html, or contact Stuart Bourne, P.E. with NCDOT Work Zone Traffic Control Unit at (919) 662-4338 or sbourne@ncdot.gov .

1. The encroaching party shall notify the District Engineer's office at telephone number (910) 642-3760) prior to beginning construction and after construction is complete.
2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.
4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.
5. Excavation within 500 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 486-1452. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.
6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.
7. The contractor shall not begin construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.
8. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.
9. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

10. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

11. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer or an approved Erosion Control Plan.

12. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.

13. All materials and workmanship shall conform to the N. C. Department of Transportation's Standards and Specifications Manuals.

14. Strict compliance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way manual shall be required.

15. The attached plans reflect the corrections and revisions as coordinated with the NCDOT District Office.

16. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the District Engineer.

17. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

18. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

19. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

20. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

21. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.

22. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures and amendments or supplements thereto. When there is no guidance provided in the NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures, comply with the Manual on Uniform Traffic Control Devices for Streets and Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT District Engineer.

23. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 7:00 P.M., or as designated by the District Engineer. Traffic shall be maintained at all times.

24. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.

25. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.

26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

27. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.

28. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:

    a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring.**

    b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2006 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.

    c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.

    d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

    e. No roadway crossing for a pipeline greater than 2 inches in diameter shall be made in Columbus or Bladen Counties by the method known as driving or thumping, where an air compressor and a pilot shoe are used to compress material and create a bore hole, unless approved by the District Engineer.

29. Directional drilling methods have not been given statewide approval for use on NCDOT right of way. Under no condition shall jetting alone or wet boring with water of utility pipelines be allowed. Directional boring using jetting with a Bentonite (or equivalent material) slurry is approved at a minimum depth of ten (10) feet below the pavement surface [fifteen (15') feet below the surface of partial and/or full control of access roads] and two (2) feet below any ditch line. Directional boring is not allowed in embankment material. Directional boring is allowed beneath embankment material in naturally occurring soil. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of three (3') feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway. All directional bores shall maintain ten (10) feet minimum (clear) horizontal distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. All directional bores shall maintain ten (10) feet minimum (clear) vertical and horizontal distance from the nearest part of pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings or retaining walls. The tip of the drill string shall have a cutter head. Detection wire shall be installed with non-ferrous material. Any changes shall be submitted to the District Engineer for approval prior to construction. For multiple conduit installations (including perpendicular & parallel installations), install conduits with five (5) feet minimum (clear) horizontal separation between each conduit or install multiple conduits within a single duct. An overbore shall not be more than two (2") inches greater than the diameter of the pipe or encasement. An overbore exceeding two (2") inches greater than the diameter of the pipe or encasement will be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of two (2") inches of the diameter of the pipe or encasement will arch and no damage will be done to the pavement or sub-grade. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

30. Alignment of directional bores at bridges and 48-inch culverts or larger should be (1) one foot off Right of Way. After completion of bore, encroaching party shall provide NCDOT with a certified bore log.

31. All 6" or smaller in diameter plastic gas mains shall meet current NCDOT standards (Polyethylene SDR-11) or the plans shall be sealed, signed and dated by a licensed North Carolina Professional Engineer. All plastic gas mains 8" or greater in diameter shall be sealed, signed, and dated by a licensed North Carolina Professional Engineer.

32. Regulator stations, metering stations, cathodic test stations and anode beds are not permitted within the NCDOT right of way. Header wires are permitted.

33. A performance and indemnity bond in the amount of $500.00 shall be posted with the NCDOT District Engineer's Office by the encroaching party prior to beginning any work within the NCDOT right of way. The bond shall be held for a minimum period of one year after completion of the installation and released only upon a final satisfactory inspection by NCDOT.

34. Upon completion of the installation of this encroachment, please summit one hard copy of the As Built plans (noted with any changes) sealed, signed, and dated by a licensed North Carolina Professional Engineer to the District Engineer within 30 days.

35. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18' for crossings over NCDOT roadways and 15'-6" for parallel installations.

36. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.

37. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.

38. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer

39. All temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number (910) 486-1452 for review and approval prior to installation.

40. Any utility marker required shall be as close to the right of way line as possible. If it is not feasible to install markers at or near the right of way line, written approval specific to the site shall be obtained from the District Engineer prior to installation.

41. Detection tape shall be buried in the trench approximately 1 foot above the fiber optic cable. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

42. Transportation Improvement Project (T.I.P.) ******* is scheduled for construction in the future. Any encroachment determined to be in conflict with the construction of this project shall be removed and/or relocated at the owner's expense. (Continue per spec.)

43. The encroaching party shall submit a letter from the Highway Contractor on NCDOT Project ***** to the NCDOT State Utility Agent stating that this encroachment will not be the basis of a claim for delay or additional cost against the Board of Transportation.

44. The work depicted on the plans and specifications submitted with the encroachment package appears to be an engineering design held out to the public. The engineering work appears to affect public safety and health. As such, the engineering drawings and specifications are required by GS-89C to be properly certified by a licensed North Carolina Professional Engineer. The plans and specifications have not been properly certified by a licensed North Carolina Professional Engineer and the encroaching party may be in violation of GS-89C.

45. In the Future Should NCDOT need to Remove or Replace the Existing Cross Line Pipe as Shown On Plan Drawing Sheet Page 1 of 8, Columbus County Utility Department Agrees to shut off and Remove Temporarily the 20 LF Section of 8" Ductile Iron Water Main at Approx. Station 9+50. Following Replacement of The Storm Drain, NCDOT will give Instructions to Columbus County Utility Department as to where, in Relationship to the Replaced Storm Drain, the 8" Ductile Iron Water Main will be Re-Installed.

SEEDING AND MULCHING: (East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE SR 1300 PROJECT Monitoring Wells COUNTY OF Bladen STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 22 day of July, 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 1300 and SR 1005, located In Bladen County Approximately 50 feet southeast of the intersection of Chicken Foot Road (SR 1300) and Purdie-Hall Road (SR 1005) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: Greg Burk

~~Asst. Manager of Right of Way~~ Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

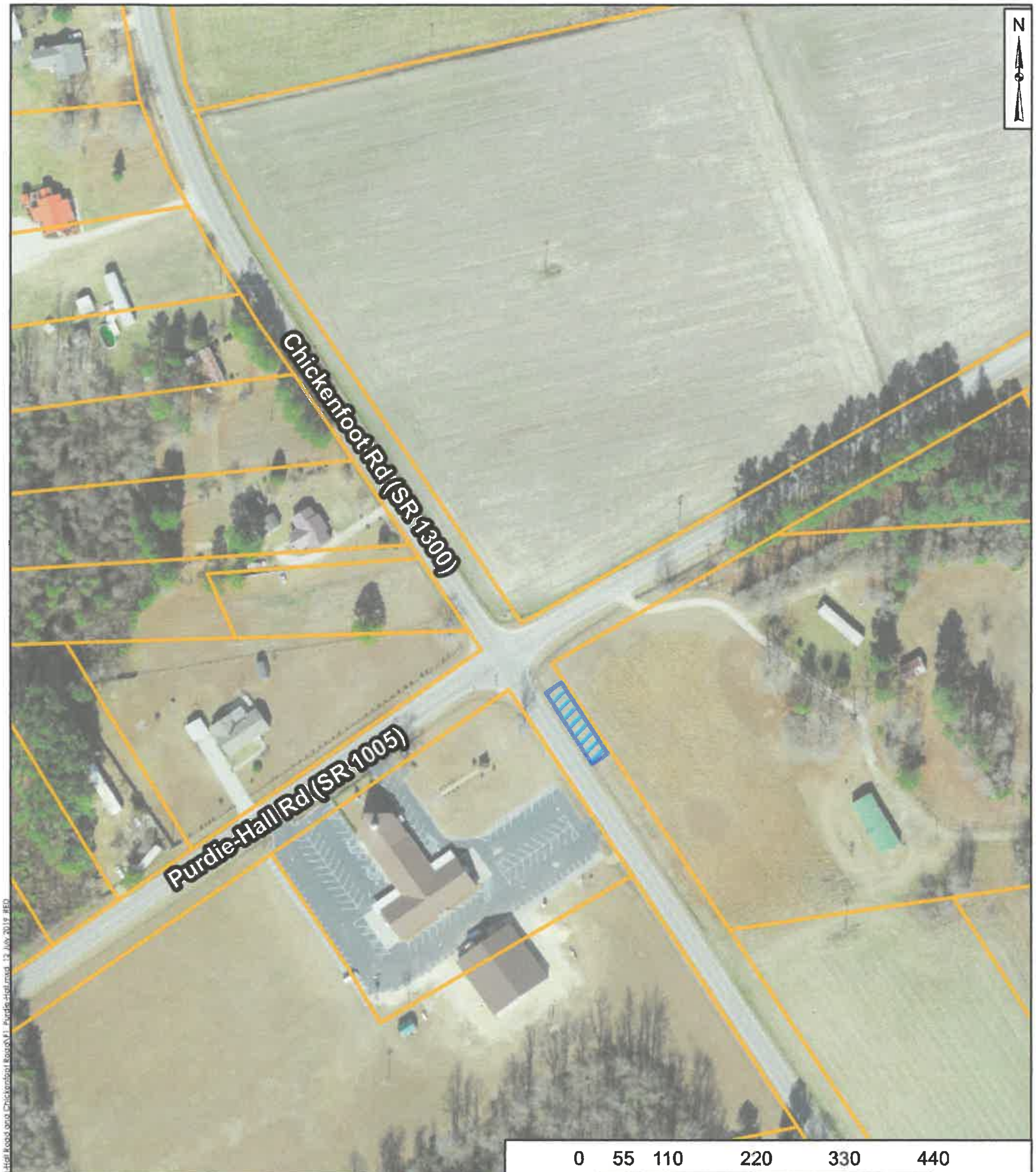
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



0 55 110 220 330 440
Feet

Legend

- NC Bladen Parcel Boundary
- Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Bladen County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

Purdie-Hall Rd. & Chickenfoot Rd.
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC	July 2019	Figure 1

ENVIRONMENTAL PROTECTION
HAZARDOUS SITES RESPONSE PROGRAM

TYPICAL
FLUSH-MOUNT GROUNDWATER MONITORING WELL
CONSTRUCTION DIAGRAM

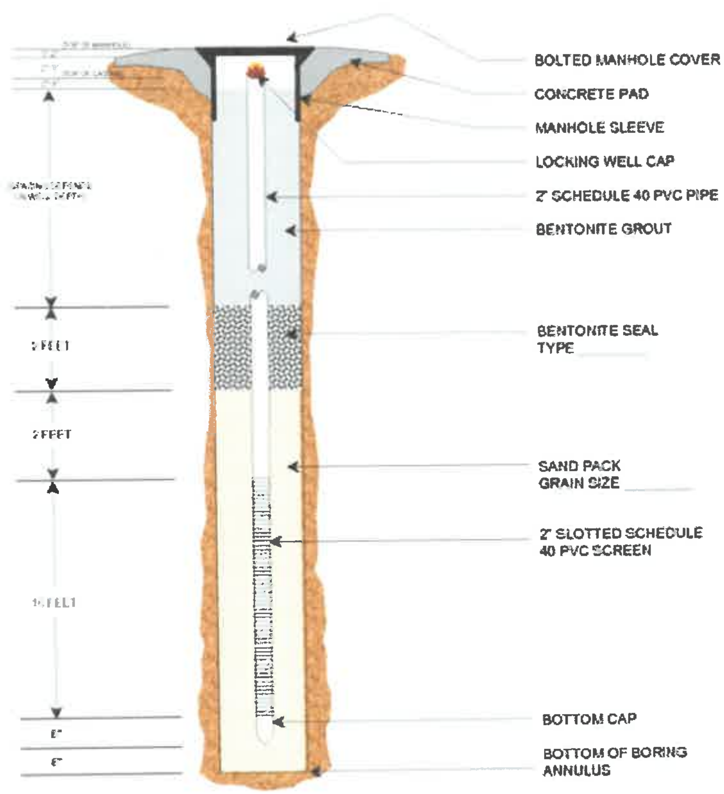


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of Chicken Foot Road (SR1300) and Purdie-Hall Road (SR1005). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" **(Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

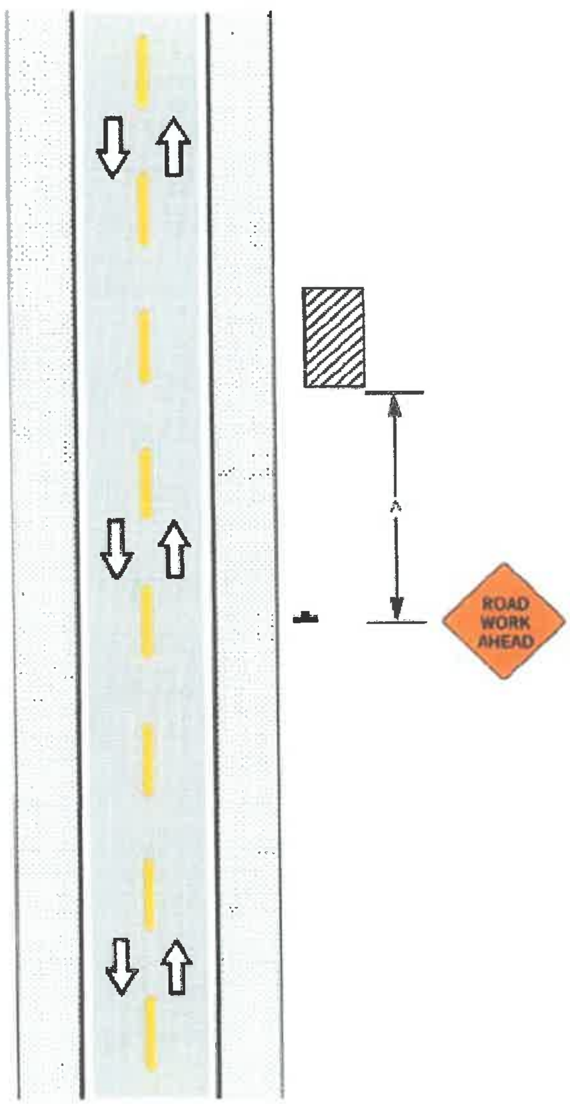


Figure TA-1

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

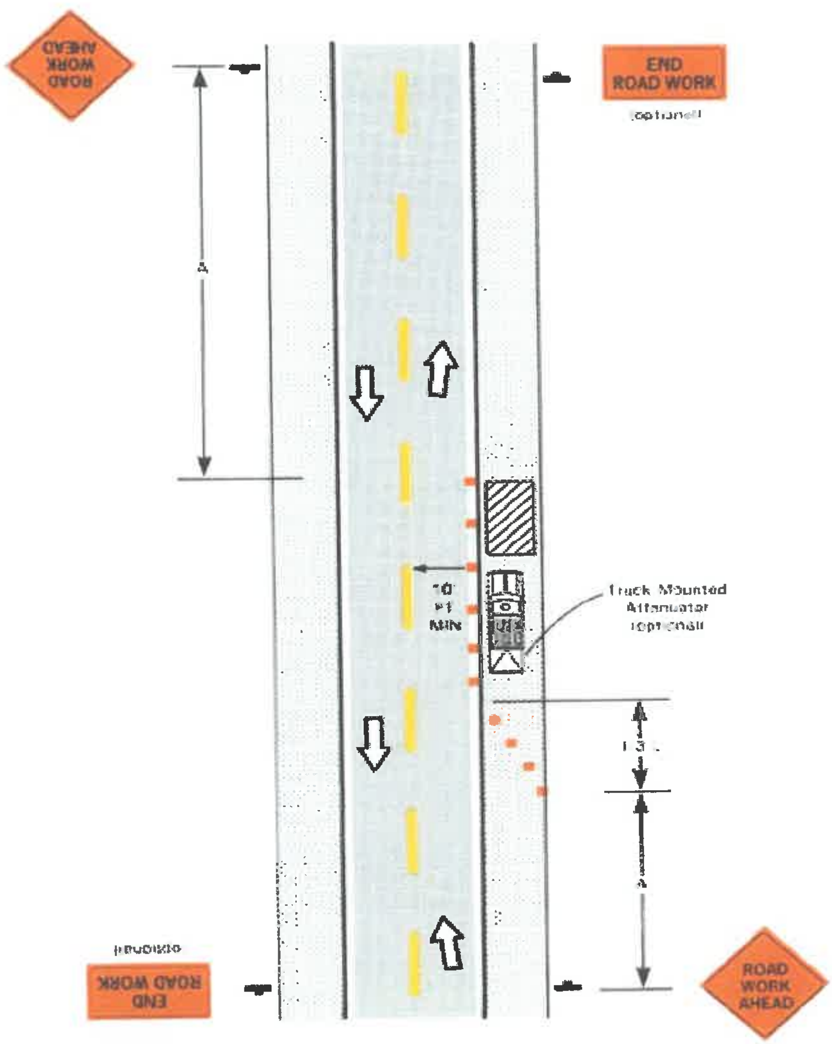


Figure TA-6

Geosyntec consultants

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

Geosyntec Consultants of NC, PC

18 July 2019

Mr. Kenneth Clark
District Engineer
NCDOT
1194 Prison Camp Road
Whiteville, NC 28472

**Subject: Request for Right of Way Encroachment in Bladen County
Chicken Foot Road (SR 1300) and Purdie-Hall Road (SR 1005)
Geosyntec project # TR0795 SR1300-SR1005**

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of four ROW encroachment requests in Bladen County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of Chicken Foot Road (SR 1300) and Purdie-Hall Road (SR-1005) in the City of Hollow in Bladen County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 5, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01121
Two (2) monitoring wells: NCDOT right-of-way River Rd. & Big Island Rd.
(34.840145 & -78.803401)
White Oak, Bladen County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 1 August 2019 and received in the Fayetteville Regional Office on 2 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01121 dated 5 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to River road at the intersection of Big Island road and River road in White Oak, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Bladen County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to River road at the intersection of Big Island road and River road in White Oak, Bladen County, North Carolina. This Permit is issued in accordance with the application received on 1 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 5th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01121

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 22, 2019

COUNTY: Bladen County. N.C.
NCDOT #: E063-009-19-00045

REFERENCE: Groundwater Monitoring Wells

Mr./Ms. Christel E. Compton
The Chemours Company FC LLC
Fayetteville Works
22828 N.C. Hwy. 87 W.
Fayetteville, N.C. 28306

Dear Mr./Ms. Compton,

Attached for your files is a copy of the Right of Way Encroachment Contract properly executed. This contract covers the following:

Proposed along Route S.R. 1318 (River Road) Approximately 75 LF South of the Intersection of S.R. 1318 (River Road) and S.R. 1349 (Big Island Road) with the construction and or/erection of, two Environmental Groundwater Monitoring Wells in the Town of White Oak, N.C. as shown on Attached map, figure 1.

APPROVED SUBJECT TO: Attached Special Provisions

Sincerely,

Greg Burns

Greg Burns, PE,
DIVISION ENGINEER

GB/KLC/sln
Attachments

cc: Kenneth L. Clark, PE (District Engineer)
Nicky L. Garrell (County Maintenance Engineer)

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
1194 PRISON CAMP ROAD
WHITEVILLE, NC 28472

Telephone: (910) 642-3760
Fax: (910) 642-2984
Website: www.ncdot.gov

Location:
1194 PRISON CAMP ROAD
WHITEVILLE, NC 28472

SPECIAL PROVISIONS

R/W 16.1

THE CHEMOURS COMPANY FC LLC

1. **WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM**

   Effective July 1, 2010, all flagging operations within NCDOT Right of Way require qualified and trained Work Zone Flaggers.

   Effective July 1, 2011, qualified and trained Work Zone Traffic Control Supervisors will be required on Significant Projects.

   Training for this certification is provided by NCDOT approved training sources and by private entities that have been pre-approved to train themselves. If you have questions, contact our web site at http://www.ncdot.org/doh/preconstruct/wztc/WZTCTrainingProgram/default.html, or contact Stuart Bourne, P.E. with NCDOT Work Zone Traffic Control Unit at (919) 662-4338 or sbourne@ncdot.gov .

1. The encroaching party shall notify the District Engineer's office at telephone number (910) 642-3760) prior to beginning construction and after construction is complete.

2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.

4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.

5. Excavation within 500 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 486-1452. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.

6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.

7. The contractor shall not begin construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.

8. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.

9. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

10. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

11. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer or an approved Erosion Control Plan.

12. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.

13. All materials and workmanship shall conform to the N. C. Department of Transportation's Standards and Specifications Manuals.

14. Strict compliance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way manual shall be required.

15. The attached plans reflect the corrections and revisions as coordinated with the NCDOT District Office.

16. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the District Engineer.

17. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

18. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

19. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

20. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

21. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.

22. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures and amendments or supplements thereto. When there is no guidance provided in the NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures, comply with the Manual on Uniform Traffic Control Devices for Streets and Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT District Engineer.

23. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 7:00 P.M., or as designated by the District Engineer. Traffic shall be maintained at all times.

24. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.

25. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.

26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

27. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.

28. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:

    a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring.**

    b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2006 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.

    c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.

    d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

    e. No roadway crossing for a pipeline greater than 2 inches in diameter shall be made in Columbus or Bladen Counties by the method known as driving or thumping, where an air compressor and a pilot shoe are used to compress material and create a bore hole, unless approved by the District Engineer.

29. Directional drilling methods have not been given statewide approval for use on NCDOT right of way. Under no condition shall jetting alone or wet boring with water of utility pipelines be allowed. Directional boring using jetting with a Bentonite (or equivalent material) slurry is approved at a minimum depth of ten (10) feet below the pavement surface [fifteen (15') feet below the surface of partial and/or full control of access roads] and two (2) feet below any ditch line. Directional boring is not allowed in embankment material. Directional boring is allowed beneath embankment material in naturally occurring soil. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of three (3') feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway. All directional bores shall maintain ten (10) feet minimum (clear) horizontal distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. All directional bores shall maintain ten (10) feet minimum (clear) vertical and horizontal distance from the nearest part of pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings or retaining walls. The tip of the drill string shall have a cutter head. Detection wire shall be installed with non-ferrous material. Any changes shall be submitted to the District Engineer for approval prior to construction. For multiple conduit installations (including perpendicular & parallel installations), install conduits with five (5) feet minimum (clear) horizontal separation between each conduit or install multiple conduits within a single duct. An overbore shall not be more than two (2") inches greater than the diameter of the pipe or encasement. An overbore exceeding two (2") inches greater than the diameter of the pipe or encasement will be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of two (2") inches of the diameter of the pipe or encasement will arch and no damage will be done to the pavement or sub-grade. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

30. Alignment of directional bores at bridges and 48-inch culverts or larger should be (1) one foot off Right of Way. After completion of bore, encroaching party shall provide NCDOT with a certified bore log.

31. All 6" or smaller in diameter plastic gas mains shall meet current NCDOT standards (Polyethylene SDR-11) or the plans shall be sealed, signed and dated by a licensed North Carolina Professional Engineer. All plastic gas mains 8" or greater in diameter shall be sealed, signed, and dated by a licensed North Carolina Professional Engineer.

32. Regulator stations, metering stations, cathodic test stations and anode beds are not permitted within the NCDOT right of way. Header wires are permitted.

33. A performance and indemnity bond in the amount of $500.00 shall be posted with the NCDOT District Engineer's Office by the encroaching party prior to beginning any work within the NCDOT right of way. The bond shall be held for a minimum period of one year after completion of the installation and released only upon a final satisfactory inspection by NCDOT.

34. Upon completion of the installation of this encroachment, please summit one hard copy of the As Built plans (noted with any changes) sealed, signed, and dated by a licensed North Carolina Professional Engineer to the District Engineer within 30 days.

35. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18' for crossings over NCDOT roadways and 15'-6" for parallel installations.

36. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.

37. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.

38. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer

39. All temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number (910) 486-1452 for review and approval prior to installation.

40. Any utility marker required shall be as close to the right of way line as possible. If it is not feasible to install markers at or near the right of way line, written approval specific to the site shall be obtained from the District Engineer prior to installation.

41. Detection tape shall be buried in the trench approximately 1 foot above the fiber optic cable. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

42. Transportation Improvement Project (T.I.P.) ******* is scheduled for construction in the future. Any encroachment determined to be in conflict with the construction of this project shall be removed and/or relocated at the owner's expense. (Continue per spec.)

43. The encroaching party shall submit a letter from the Highway Contractor on NCDOT Project ***** to the NCDOT State Utility Agent stating that this encroachment will not be the basis of a claim for delay or additional cost against the Board of Transportation.

44. The work depicted on the plans and specifications submitted with the encroachment package appears to be an engineering design held out to the public. The engineering work appears to affect public safety and health. As such, the engineering drawings and specifications are required by GS-89C to be properly certified by a licensed North Carolina Professional Engineer. The plans and specifications have not been properly certified by a licensed North Carolina Professional Engineer and the encroaching party may be in violation of GS-89C.

45. In the Future Should NCDOT need to Remove or Replace the Existing Cross Line Pipe as Shown On Plan Drawing Sheet Page 1 of 8, Columbus County Utility Department Agrees to shut off and Remove Temporarily the 20 LF Section of 8" Ductile Iron Water Main at Approx. Station 9+50. Following Replacement of The Storm Drain, NCDOT will give Instructions to Columbus County Utility Department as to where, in Relationship to the Replaced Storm Drain, the 8" Ductile Iron Water Main will be Re-Installed.

SEEDING AND MULCHING:

(East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE SR 1318 PROJECT Monitoring Wells COUNTY OF STATE OF NORTH CAROLINA Bladen

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 22 day of July, 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 1318, located In Bladen County Approximately 75 feet south of the intersection of River Road (SR-1318) and Big Island (SR-1349) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: F. Greg Burns

~~Asst. Manager of Right of Way~~ Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

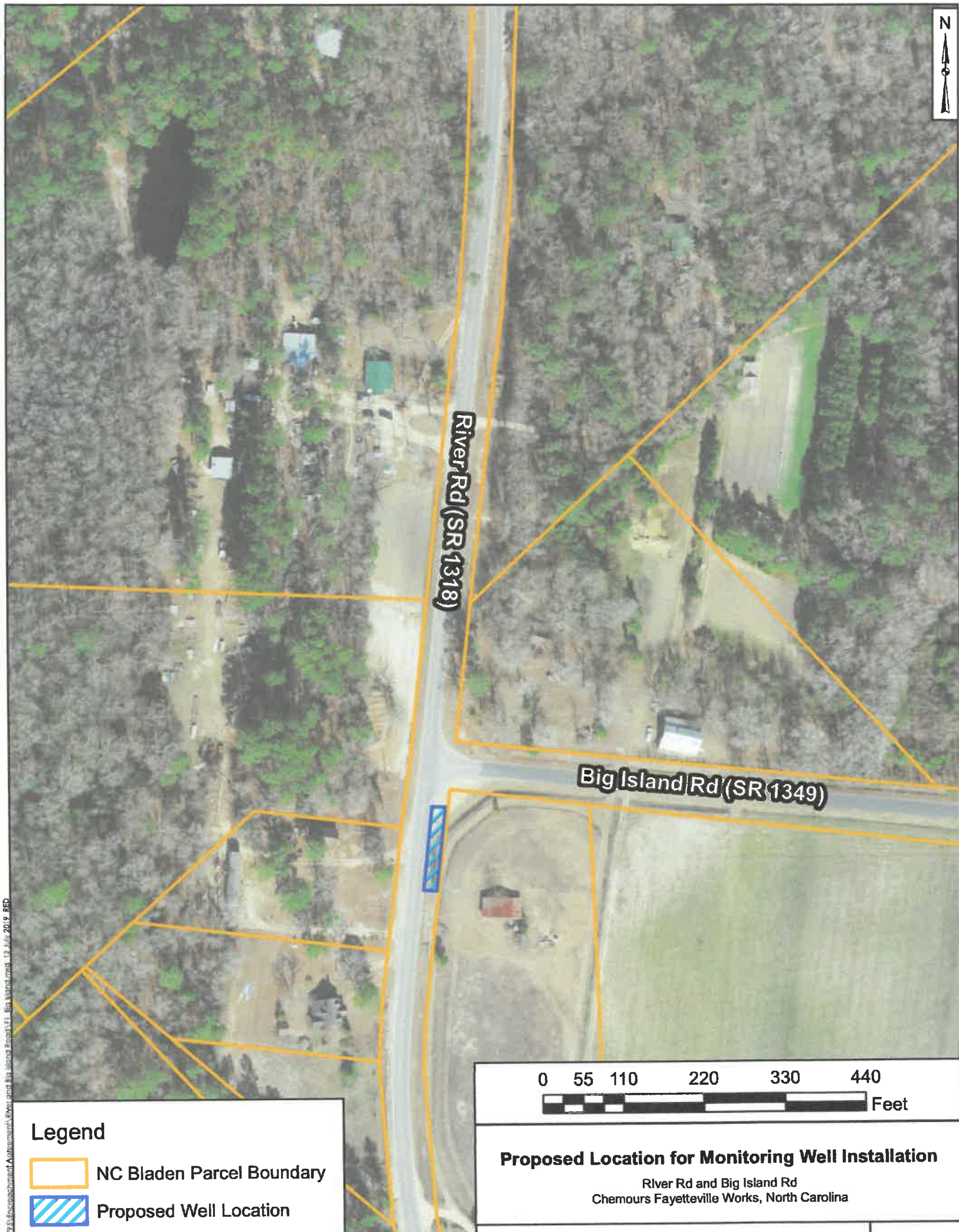
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

- NC Bladen Parcel Boundary
- Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Bladen County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

River Rd and Big Island Rd
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC	July 2019	Figure 1

ENVIRONMENTAL PROTECTION
HAZARDOUS SITES RESPONSE PROGRAM

TYPICAL
FLUSH-MOUNT GROUNDWATER MONITORING WELL
CONSTRUCTION DIAGRAM

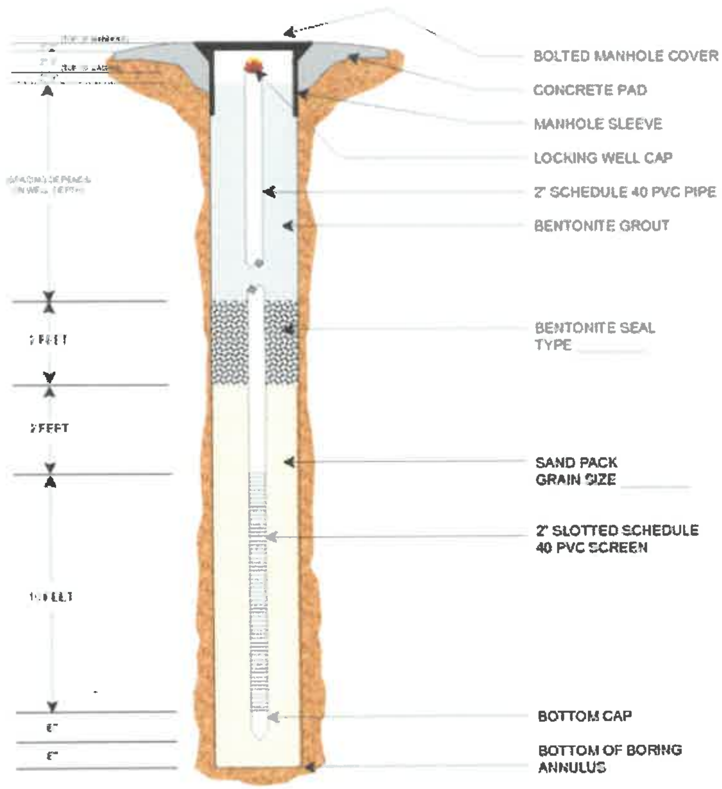


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

Agreement Checklist

1. All roadways and ramps.
   - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
   - See **Figure 1**
   - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
   - See **Figure 1**
   - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
   - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
   - 8" manhole covers, H-20 rated, bolted down
   - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
   - Monitoring well locations will be located within the ROW at / near the intersection of Big Island Road (SR 1349) and River Road (SR 1318). (see **Figure 1**).
   - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
   - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
   - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
   - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
   - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" **(Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

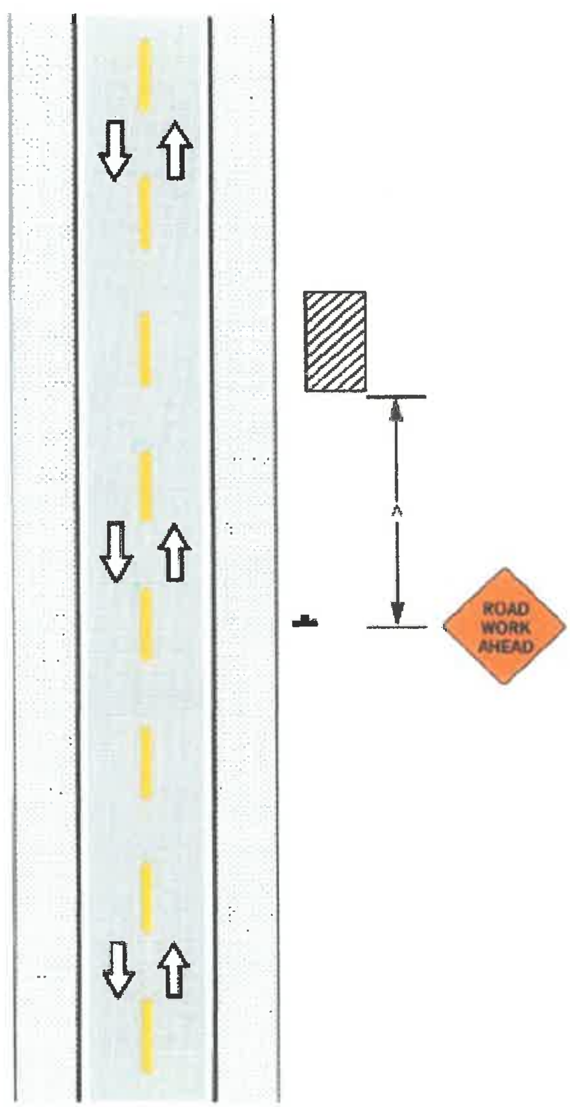


Figure TA-1

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

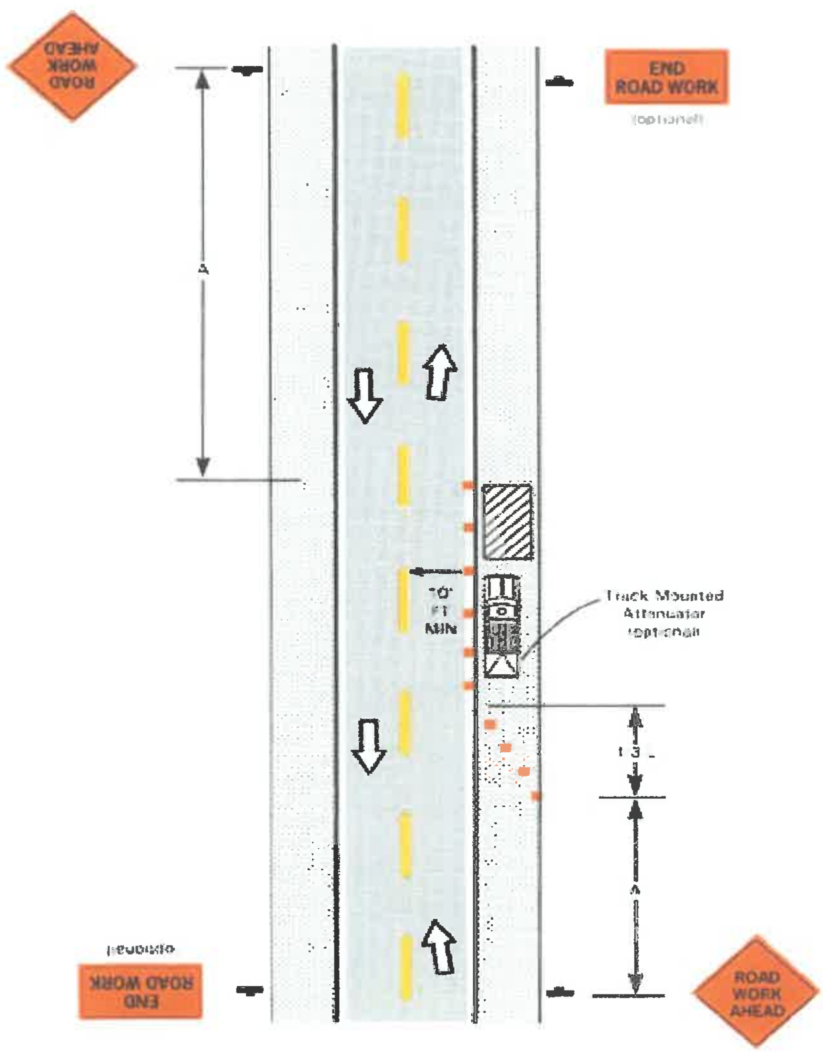


Figure TA-6

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Kenneth Clark
District Engineer
NCDOT
1194 Prison Camp Road
Whiteville, NC 28472

**Subject: Request for Right of Way Encroachment in Bladen County
River Road (SR 1318) near Big Island Road (SR 1349)
Geosyntec project #TR0795 SR1318-SR1349**

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of four ROW encroachment requests in Bladen County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW near the intersection of Big Island Road (SR 1349) and River Road (SR 1318) in the Town of White Oak in Bladen County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 5, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01119
Two (2) monitoring wells: NCDOT right-of-way Glengerry Road
(34.814672 & -78.832572)
Between Fayetteville and Tar Heel, Bladen County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 1 August 2019 and received in the Fayetteville Regional Office on 2 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01119 dated 5 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to Glengerry road off of NC Hwy 87 between Fayetteville and Tar Heel, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Bladen County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to Glengerry road off of NC Hwy 87 between Fayetteville and Tar Heel, Bladen County, North Carolina. This Permit is issued in accordance with the application received on 1 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 5th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01119

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 22, 2019

COUNTY: Bladen County. N.C.
NCDOT # E063-009-19-00046

REFERENCE: Groundwater Monitoring Wells

Mr./Ms. Christel Compton
The Chemours Company FC LLC
Fayetteville Works
22828 N.C. Hwy. 87 W.
Fayetteville, N.C. 28306

Dear Mr./Ms. Compton,

Attached for your files is a copy of the Right of Way Encroachment Contract properly executed. This contract covers the following:

Proposed along Route S.R. 1302 (Glengerry Hill Road) At or Near Extension/Intersection of S.R. 1355 (Glengerry Hill Road) and S.R. 1302 (both referred to as Glengerry Hill Road) with the construction and or/erection of, two Environmental Groundwater Monitoring Wells as shown on Attached map, figure 1.

APPROVED SUBJECT TO: Attached Special Provisions

Sincerely,

Greg Burns, PE,
DIVISION ENGINEER

GB/KLC/sln
Attachments

cc: Kenneth L. Clark, PE (District Engineer)
Nicky L. Garrell (County Maintenance Engineer)

SPECIAL PROVISIONS

R/W 16.1

THE CHEMOURS COMPANY FC LLC

1. WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

Effective July 1, 2010, all flagging operations within NCDOT Right of Way require qualified and trained Work Zone Flaggers.

Effective July 1, 2011, qualified and trained Work Zone Traffic Control Supervisors will be required on Significant Projects.

Training for this certification is provided by NCDOT approved training sources and by private entities that have been pre-approved to train themselves. If you have questions, contact our web site at http://www.ncdot.org/doh/preconstruct/wztc/WZTCTrainingProgram/default.html, or contact Stuart Bourne, P.E. with NCDOT Work Zone Traffic Control Unit at (919) 662-4338 or sbourne@ncdot.gov .

1. The encroaching party shall notify the District Engineer's office at telephone number (910) 642-3760) prior to beginning construction and after construction is complete.
2. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
3. NCDOT does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought about by any property owner by reason of this installation.
4. The encroaching party is required to contact the appropriate Utility Companies involved and make satisfactory arrangements to adjust the utilities in conflict with the proposed work prior to beginning construction.
5. Excavation within 500 feet of a signalized intersection will require notification by the encroaching party to the Division Traffic Engineer at telephone number (910) 486-1452. All traffic signal or detection cables must be located prior to excavation. Cost to replace or repair NCDOT signs, signals, or associated equipment shall be the responsibility of the encroaching party.
6. The encroaching party shall comply with all applicable Federal, State and local environmental regulations and shall obtain all necessary Federal, State and local environmental permits, including but not limited to, those related to sediment control, stormwater, wetland, streams, endangered species and historical sites.
7. The contractor shall not begin construction until after the traffic control and erosion control devices have been installed to the satisfaction of the District Engineer.
8. Trenching, bore pits and/or other excavations shall not be left open or unsafe overnight.
9. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.

10. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the NCDOT. All material to a depth of 8 inches below the finished surface of the subgrade shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the Department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade.

11. Vegetative cover shall be established on all disturbed areas in accordance with the recommendations of the Division Roadside Environmental Engineer or an approved Erosion Control Plan.

12. Proper temporary and permanent measures shall be used to control erosion and sedimentation in accordance with all local, State and Federal regulations.

13. All materials and workmanship shall conform to the N. C. Department of Transportation's Standards and Specifications Manuals.

14. Strict compliance with the Policies and Procedures for Accommodating Utilities on Highway Rights of Way manual shall be required.

15. The attached plans reflect the corrections and revisions as coordinated with the NCDOT District Office.

16. The resetting of the Control of Access fence shall be in accordance with the applicable NCDOT standard and as directed by the District Engineer.

17. Excavation material shall not be placed on pavement. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

18. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

19. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

20. Right of Way monuments disturbed during construction shall be referenced by a registered Land Surveyor and reset after construction.

21. All roadway signs that are removed due to construction shall be reinstalled as soon as possible.

22. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of road users during construction and subsequent maintenance. This shall be performed in conformance with the latest NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures and amendments or supplements thereto. When there is no guidance provided in the NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures, comply with the Manual on Uniform Traffic Control Devices for Streets and Highways and amendments or supplements thereto. Information as to the above rules and regulations may be obtained from the NCDOT District Engineer.

23. All lanes of traffic are to be open during the hours of 6:00 A.M. to 9:00 A.M. and from 4:00 P.M. to 7:00 P.M., or as designated by the District Engineer. Traffic shall be maintained at all times.

24. Ingress and egress shall be maintained to all businesses and dwellings affected by the project. Special attention shall be paid to police and fire stations, fire hydrants and hospitals.

25. Any work requiring equipment or personnel within 5' of the edge of any travel lane of an undivided facility and within 10' of the edge of any travel lane of a divided facility shall require a lane closure with appropriate tapers.

26. Work requiring lane or shoulder closures shall not be performed on both sides of the road simultaneously within the same area.

27. During non-working hours, equipment shall be parked as close to the right of way line as possible and be properly barricaded in order not to have any equipment obstruction within the Clear Recovery Area.

28. The utility shall be installed within 5 feet of the right of way line and outside the theoretical 1:1 slope from the edge of pavement to the bottom of the nearest excavation wall. When this is not possible, excavation inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall shall be made in accordance with the following conditions:

    a. Positive excavation shoring, such as sheet piling, shall be installed. The design of the shoring shall include the effects of traffic loads. The shoring system shall be designed and sealed by a licensed North Carolina Professional Engineer. Shoring plans and design calculations shall be submitted to the Division Engineer for review and approval prior to construction. **Trench boxes shall not be accepted as positive shoring.**

    b. The trench backfill material shall meet the Statewide Borrow Criteria. The trench shall be backfilled in accordance with Section 300-7 of the 2006 NCDOT Standard Specifications for Roads and Structures, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted to at least 95% of the density obtained by compacting a sample in accordance with ASSHTO T99 as modified by DOT.

    c. A qualified NCDOT inspector shall be on the site at all times during construction. The encroaching party shall reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector, under the supervision of a licensed North Carolina Professional Engineer, on the site at all times. The Professional Registered Engineer shall certify that the utility was installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.

    d. All trench excavation inside the limits of the theoretical one-to-one slope, as defined by the policy, shall be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

    e. No roadway crossing for a pipeline greater than 2 inches in diameter shall be made in Columbus or Bladen Counties by the method known as driving or thumping, where an air compressor and a pilot shoe are used to compress material and create a bore hole, unless approved by the District Engineer.

29. Directional drilling methods have not been given statewide approval for use on NCDOT right of way. Under no condition shall jetting alone or wet boring with water of utility pipelines be allowed. Directional boring using jetting with a Bentonite (or equivalent material) slurry is approved at a minimum depth of ten (10) feet below the pavement surface [fifteen (15') feet below the surface of partial and/or full control of access roads] and two (2) feet below any ditch line. Directional boring is not allowed in embankment material. Directional boring is allowed beneath embankment material in naturally occurring soil. Any parallel installation utilizing the directional boring method shall be made at a minimum depth of three (3') feet (cover) below the ground surface and outside the theoretical 1:1 slope from the existing edge of pavement except where the parallel installation crosses a paved roadway. All directional bores shall maintain ten (10) feet minimum (clear) horizontal distance from the nearest part of any structure, including but not limited to bridges, footings, pipe culverts or box culverts. All directional bores shall maintain ten (10) feet minimum (clear) vertical and horizontal distance from the nearest part of pipe culverts or box culverts. Directional bores are not allowed beneath bridge footings, culvert wingwall footings or retaining walls. The tip of the drill string shall have a cutter head. Detection wire shall be installed with non-ferrous material. Any changes shall be submitted to the District Engineer for approval prior to construction. For multiple conduit installations (including perpendicular & parallel installations), install conduits with five (5) feet minimum (clear) horizontal separation between each conduit or install multiple conduits within a single duct. An overbore shall not be more than two (2") inches greater than the diameter of the pipe or encasement. An overbore exceeding two (2") inches greater than the diameter of the pipe or encasement will be considered if the encroachment agreement includes a statement signed and sealed by a licensed North Carolina Professional Engineer indicating that an overbore in excess of two (2") inches of the diameter of the pipe or encasement will arch and no damage will be done to the pavement or sub-grade. HDPE pipe installed by directional boring shall not be connected to existing pipe or fittings for one (1) week from the time of installation to allow tensional stresses to relax.

30. Alignment of directional bores at bridges and 48-inch culverts or larger should be (1) one foot off Right of Way. After completion of bore, encroaching party shall provide NCDOT with a certified bore log.

31. All 6" or smaller in diameter plastic gas mains shall meet current NCDOT standards (Polyethylene SDR-11) or the plans shall be sealed, signed and dated by a licensed North Carolina Professional Engineer. All plastic gas mains 8" or greater in diameter shall be sealed, signed, and dated by a licensed North Carolina Professional Engineer.

32. Regulator stations, metering stations, cathodic test stations and anode beds are not permitted within the NCDOT right of way. Header wires are permitted.

33. A performance and indemnity bond in the amount of $500.00 shall be posted with the NCDOT District Engineer's Office by the encroaching party prior to beginning any work within the NCDOT right of way. The bond shall be held for a minimum period of one year after completion of the installation and released only upon a final satisfactory inspection by NCDOT.

34. Upon completion of the installation of this encroachment, please summit one hard copy of the As Built plans (noted with any changes) sealed, signed, and dated by a licensed North Carolina Professional Engineer to the District Engineer within 30 days.

35. Vertical clearance of overhead power and communication lines shall meet the National Electrical Safety Code requirements except the minimum vertical clearance shall be 18' for crossings over NCDOT roadways and 15'-6" for parallel installations.

36. All utility access points, such as manholes, splice boxes and junction boxes shall be located at or outside the right of way line. Manholes, splice boxes, junction boxes and vaults shall not be placed in the ditch line, side slopes of the ditches or in the pavement. All manholes, splice boxes, junction boxes and vaults and covers shall be flush with the ground when located within the vehicle recovery area.

37. All utility facilities, including manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults and access covers, within NCDOT right of way shall have been designed for HS-20 loading rated for continuous traffic. If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and design calculations signed and sealed by a Professional Engineer for approval prior to construction.

38. Any pavement replacement or repair required due to this installation shall be the responsibility of the encroaching party. Pavement repair or replacement shall be in accordance with the requirements of and to the satisfaction of the District Engineer

39. All temporary and final pavement markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number (910) 486-1452 for review and approval prior to installation.

40. Any utility marker required shall be as close to the right of way line as possible. If it is not feasible to install markers at or near the right of way line, written approval specific to the site shall be obtained from the District Engineer prior to installation.

41. Detection tape shall be buried in the trench approximately 1 foot above the fiber optic cable. Where conduit is installed in the right of way and is not of ferrous material, locating tape or detection wire shall be installed with the conduit.

42. Transportation Improvement Project (T.I.P.) ******* is scheduled for construction in the future. Any encroachment determined to be in conflict with the construction of this project shall be removed and/or relocated at the owner's expense. (Continue per spec.)

43. The encroaching party shall submit a letter from the Highway Contractor on NCDOT Project ***** to the NCDOT State Utility Agent stating that this encroachment will not be the basis of a claim for delay or additional cost against the Board of Transportation.

44. The work depicted on the plans and specifications submitted with the encroachment package appears to be an engineering design held out to the public. The engineering work appears to affect public safety and health. As such, the engineering drawings and specifications are required by GS-89C to be properly certified by a licensed North Carolina Professional Engineer. The plans and specifications have not been properly certified by a licensed North Carolina Professional Engineer and the encroaching party may be in violation of GS-89C.

45. In the Future Should NCDOT need to Remove or Replace the Existing Cross Line Pipe as Shown On Plan Drawing Sheet Page 1 of 8, Columbus County Utility Department Agrees to shut off and Remove Temporarily the 20 LF Section of 8" Ductile Iron Water Main at Approx. Station 9+50. Following Replacement of The Storm Drain, NCDOT will give Instructions to Columbus County Utility Department as to where, in Relationship to the Replaced Storm Drain, the 8" Ductile Iron Water Main will be Re-Installed.

SEEDING AND MULCHING:

(East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		September 1 - February 28	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		September 1 - February 28	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE SR 1302 PROJECT Monitoring Well COUNTY OF STATE OF NORTH CAROLINA Bladen

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 22 day of July, 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

WITNESSETH

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 1302 and SR 1355, located In Bladen County At or near extension / intersection of SR 1355 and SR 1302 (both referred to as Glengerry Hill Road) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: Greg Burns

~~Asst. Manager of Right of Way~~ Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E Compton

22828 NC Highway 87 W. Fayetteville, NC 28306

Second Party

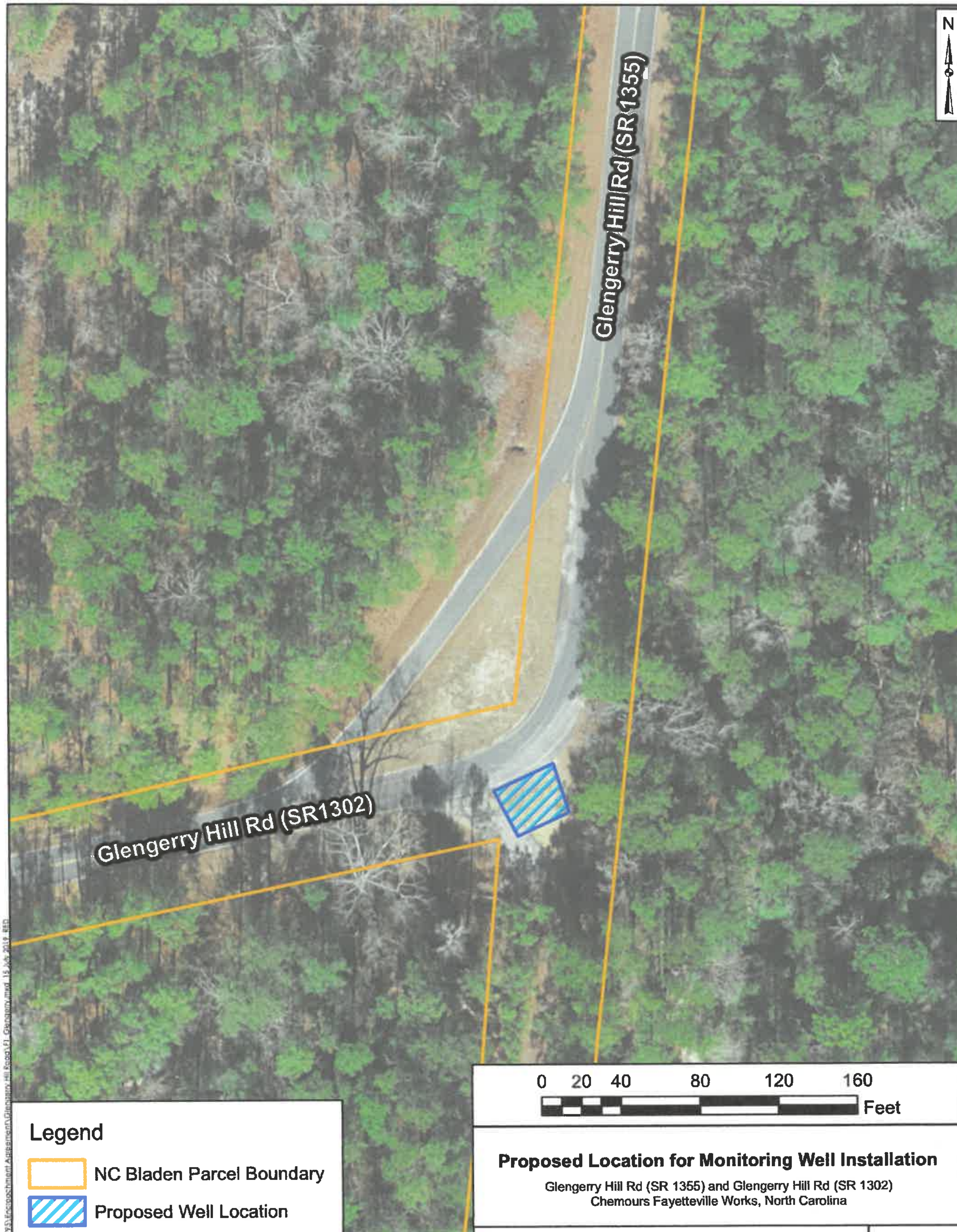
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

- NC Bladen Parcel Boundary
- Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Bladen County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

Glengerry Hill Rd (SR 1355) and Glengerry Hill Rd (SR 1302)
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC	July 2019	Figure 1

ENVIRONMENTAL PROTECTION
HAZARDOUS SITES RESPONSE PROGRAM

TYPICAL
FLUSH-MOUNT GROUNDWATER MONITORING WELL
CONSTRUCTION DIAGRAM

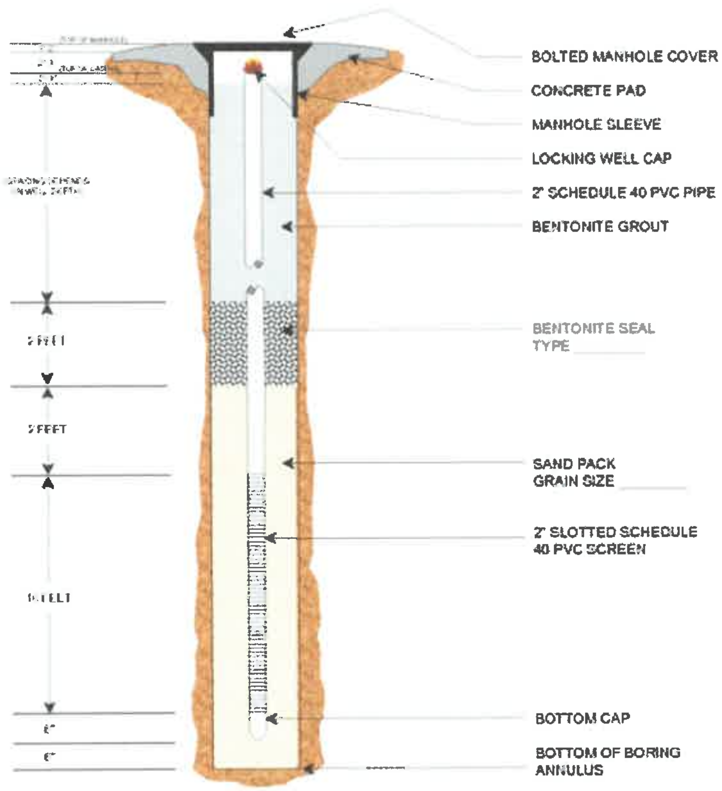


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at the extension or intersection of SR 1355 and SR1302 (both referred to as Glengerry Hill Road). See **Figure 1**.
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" **(Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

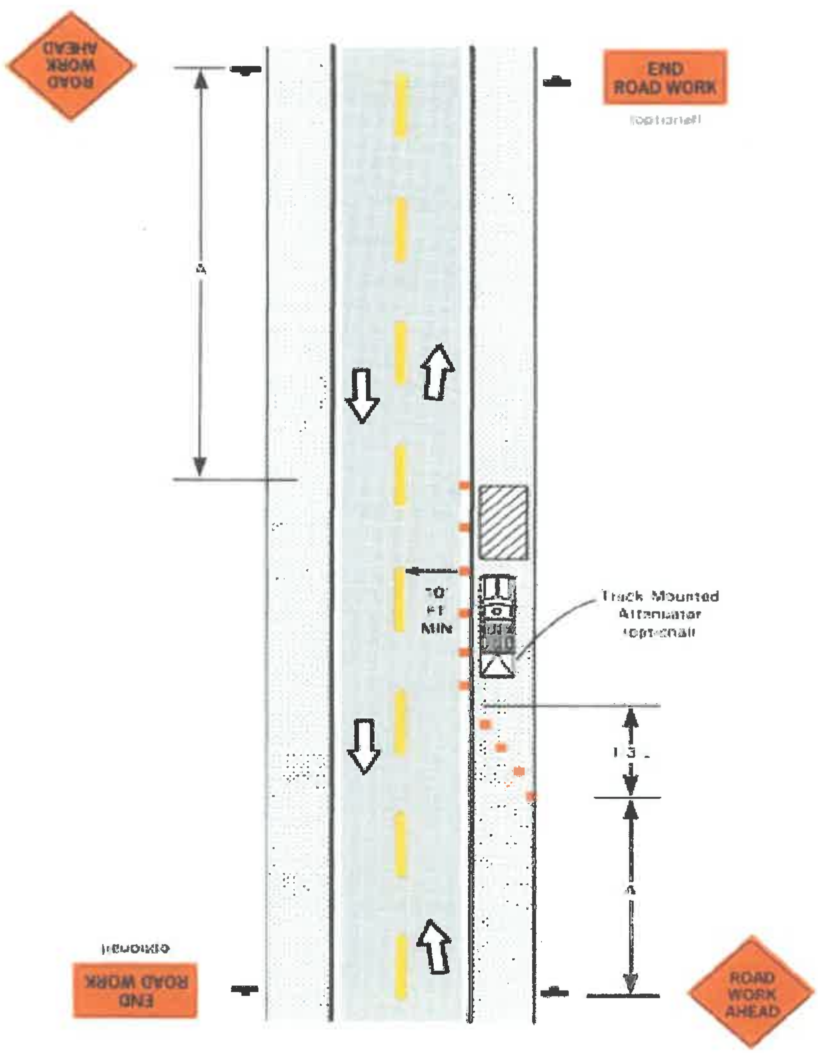


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

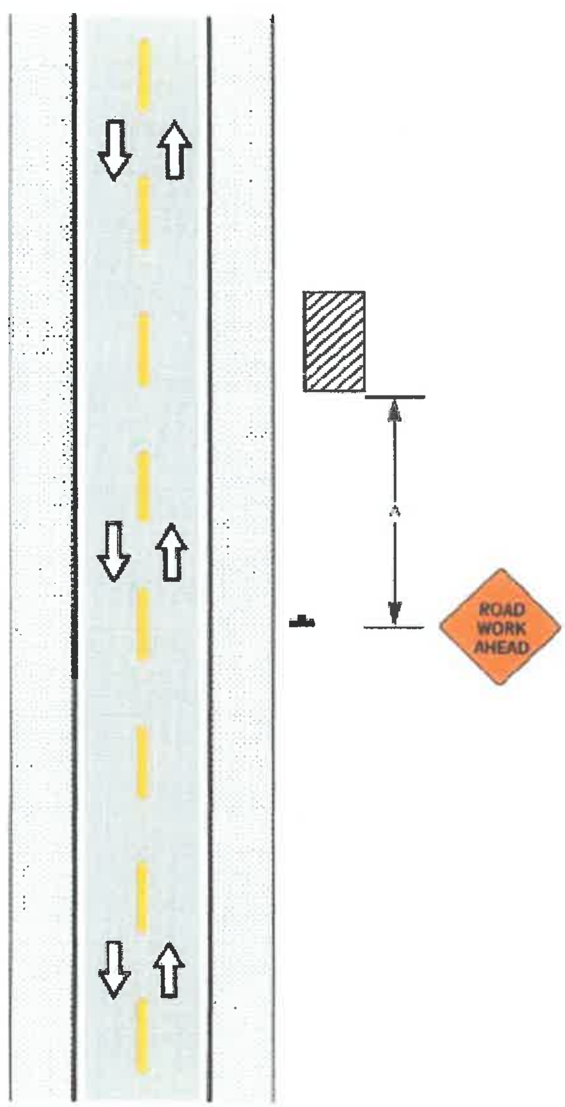


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

Geosyntec Consultants of NC, PC

18 July 2019

Mr. Kenneth Clark
District Engineer
NCDOT
1194 Prison Camp Road
Whiteville, NC 28472

Subject: Request for Right of Way Encroachment in Bladen County
On Glengerry Hill Road (SR 1355 and SR 1302)
Geosyntec project # TR0795 SR1355-SR1302

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of four ROW encroachment requests in Bladen County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1.** A pair of monitoring wells is proposed within the ROW at the extension or intersection of SR 1355 and SR 1302 (both referred to as Glengerry Hill Road) in Bladen County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 27, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01125
Two (2) monitoring wells: NCDOT right-of-way Matt Hair Rd & Chislehurst St.
(34.912430 & -78.798669)
Fayetteville, Cumberland County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 26 August 2019 and received in the Fayetteville Regional Office on 27 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01125 dated 27 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to Matt Hair road at the intersection of Matt Hair road and Chislehurst street in Fayetteville, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Cumberland County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to Matt Hair road at the intersection of Matt Hair road and Chislehurst street in Fayetteville, Cumberland County, North Carolina. This Permit is issued in accordance with the application received on 27 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 27th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01125

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 23, 2019

Mr. Christel E. Compton
The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

SUBJECT: Encroachment Agreement on SR 2229 (Matt Hair Road) for the installation of two (2) groundwater monitoring wells in Cumberland County (E062-026-19-00211).

Dear Sir:

Attached is an approved R/W form 16.1A and plans for the installation of two (2) co-located flush mount environmental groundwater monitoring wells on SR 2229 (Matt Hair Road) as associated with the Chemours Fayetteville Works project in Cumberland County as shown on the attached plans (Geosyntec project #TR0795 SR2229).

Location:

Route	**At a point**	**Towards**
SR 2229	3,609'± southwest the intersection of SR 2229 (Matt Hair Road) and SR 2023 (Tabor Church Road)	SR 2230

This encroachment is approved subject to the following:

1. **Within ninety (90) days of the completion of the proposed utility installation, an As-Built drawing(s) and a executed <u>Contractor Certification Memo</u> shall be submitted to the District Office (online encroachment database). The As-Built drawing(s) shall depict the horizontal and vertical locations of all utilities and associated appurtenances.**
2. The Cumberland County Maintenance Engineer at (910) 364-0602 and Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601 shall be notified a minimum of three (3) days before construction is to begin.
3. Traffic will be maintained and proper signs, signal lights, flagmen and other warning devices will be provided for the protection of traffic, in conformance with the latest **<u>Manual on Uniform Traffic Control Devices for Streets and Highways</u>**. All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.
4. **All lanes of traffic on SR 2229 (Matt Hair Road) are to be open during the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM <u>unless otherwise directed by the Engineer</u>. No lane of traffic shall be closed on holidays, special events, or as directed by the engineer. Traffic shall be maintained at all times.**

5. **Any flush-mount groundwater monitoring well(s) shall be constructed at grade with the existing ground surface as not to interfere with the positive drainage of the roadway, roadway shoulder, drainage ditch and routine maintenance within departmental rights of way.**

6. **The proposed groundwater monitoring well(s) and other associated appurtenances are to be placed 5' or closer off of the right-of- way lines of SR 2229 (Matt Hair Road). All associated appurtenances must be placed behind the ditch line. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.**

7. Luminaire and utility poles shall be outside the Clear Recovery Area in accordance with the latest version of the AASHTO Roadside Design Guide or made breakaway in accordance with the requirements of NCHRP Report 350. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.

8. **All concrete installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.**

9. All concrete sidewalk installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01 and 848.01) and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

10. All ADA compliant curb ramps shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 848.06) and Amendments or Supplementals thereto including but not limited to the Alternate Curb Ramp Designs (Curb Ramp Details - Parallel Ramps). All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

11. All 30" curb and gutter within NCDOT rights of way shall be constructed with Class B concrete in accordance with Section 846 of the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01) and Amendment or Supplemental thereto or as directed by the engineer. All concrete testing results shall be provided to the District Engineer's office at time of project completion.

12. **Open cuts are not permitted on SR 2229 (Matt Hair Road).**

13. Any asphalt that is damaged as a result of construction shall be repaired at the encroaching party's expense. An NCDOT approved asphalt mix shall be used for all repairs within NCDOT rights of way. Contact Mr. Troy L. Baker, Senior Assistant District Engineer for acceptance of asphalt mix designs.

14. All open cuts (if permitted) on primary routes will require full depth patching with 5.0" of B 25.0 B (ACBC) Asphalt Concrete Base Course, 3.0" of I 19.0 B (ACIC) Asphalt Concrete Intermediate Course and 2.0" of S 9.5 B (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 2.0" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

15. All open cuts (if permitted) on secondary routes will require full depth patching with 4.0" of B 25.0 C (ACBC) Asphalt Concrete Base Course and 3.0" of S 9.5 C (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 1.5" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

16. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the North Carolina Department of Transportation. All material to a depth of 8 inches below the finished surface shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The trench backfill material shall meet the Statewide Borrow criteria. The trench should be backfilled in accordance with Section 300-7 of the latest NCDOT Standard Specifications for Roads and Structures and Amendments or Supplementals thereto.

17. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of motorists and workers during construction and any subsequent maintenance. This shall be performed in conformance with the latest **NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures** and Amendments or Supplementals thereto. When there is no guidance provided in the Roadway Standard Drawings or Specifications, comply with the **Manual on Uniform Traffic Control Devices for Streets and Highways** and Amendment or Supplemental thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part. **All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.**

18. Disturbed areas shall have an established stand of vegetation according to the attached specifications for erosion control.

19. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

20. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.

21. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.

22. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
23. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
24. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
25. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.
26. **Trenching, bore pits and/or other excavations shall not be left overnight. The contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.**
27. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
28. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
29. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.
30. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
31. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
32. No material storage shall be allowed along the shoulders of the roadway, and during non-working hours, equipment shall be parked as close to the right of way line as possible and shall be properly barricaded so that no equipment obstruction shall be within the Clear Recovery Area. No parking or material storage shall be allowed along the shoulders of any state maintained roadway.
33. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
34. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.

35. Excavations inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall should be made in accordance with the following conditions:
    - The trench backfill material should meet the Statewide Borrow Criteria. The trench should be backfilled in accordance with Section 300-7 of the latest **NCDOT Standard Specifications for Roads and Structures**, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by the NCDOT.
    - All trench excavation inside the limits of the theoretical 1:1 slope, as defined by the policy, should be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.
36. **When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within five (5) feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within fifteen (15) feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.**
37. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.
38. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.
39. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.
40. All roadway signs which are removed which are removed due to construction shall be reinstalled as soon as possible.
41. Any proposed driveway connections onto NCDOT roadways will require an approved driveway permit. The approval of this Two Party encroachment (RW 16.1A) does not constitute approval of any proposed driveway connections. For further information, contact Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601.
42. Excavated areas adjacent to pavement having more than a 2” drop shall be safed up at a 6:1 or flatter slope and designated by appropriate delineation during periods of inactivity, including, but not limited to, night and weekend hours. Excavated material shall not be placed on the roadway at any time.

43. **NCDOT reserves the right to further limit, restrict, or suspend operations within the Right of Way if, in the opinion of NCDOT, safety or traffic conditions warrant such action.**

44. It shall be the responsibility of the encroaching party to determine the location of other utilities within the encroachment area. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and to maintain accessibility to existing utilities.

45. **A qualified NCDOT inspector should be on site at all times during construction. The encroaching party should be required to reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector under the supervision of a Professional Engineer registered in North Carolina, on site at all times. The Registered Engineer should be required to certify that the structures have been installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.**

46. Excavation within 1000 feet of a signalized intersection will require notification by the party of the second part to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation.

47. All temporary and final paving markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number 910-364-0606 for review and approval.

48. The pavement marking contractor is required to have at least one member of every pavement marking crew that is working on the project, preferably the Crew Supervisor, be certified through the NCDOT Pavement Marking Technician Certification Process. For more information please contact the Work Zone Traffic Control Unit at (919) 773-2800 or **http://www.ncdot.org/doh/preconstruct/wztc/**".

49. Prior to installing pavement markings, contact Mr. Frank West with the NCDOT Division Six Traffic Services Unit at 910-364-0606 to review the proposed pavement-marking layout. This notification should take place a minimum of 48 hours in advance of the pavement marking installation.

50. Failure to contact the Traffic Services Unit to review the pavement-marking layout prior to installation may result in the removal and reinstallation of the markings at the expense of the Permittee.

51. All utility facilities, including but not limited to manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults, and covers within NCDOT right of way shall have been designed for HS-20 loading. A listing of currently approved manholes, valve boxes, and vaults is available at the following site: https://apps.dot.state.ns.us.vendor/approvedproducts . If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and calculations designed by a Professional Engineer registered in North Carolina for approval prior to construction.

52. All utility access points, including but not limited to manholes, splice boxes, junction boxes, and vaults shall be located outside of the right of way line. Manholes, splice boxes, junction boxes, and vaults shall not be placed in the ditch line, side slopes of the ditches, or in the pavement. All manholes, splice boxes, junction boxes, vaults, and covers shall be flush with the ground when located within the vehicle recovery area.

NCDOT WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personal performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance / Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) insidethe highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 662-4339 or skite@ncdot.gov or Roger Garrett at (919) 662-4383 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

If further information or assistance is needed in reference to this project, please feel free to call Mr. Lee R. Hines, Jr. (Richie), PE, District Engineer at (910) 364-0601.

Sincerely,

DS
TLB

DocuSigned by:
Greg W. Burns
3C2629BD929294E9

Greg W. Burns, PE
Division Engineer

GWB:tlb

cc: https://connect.ncdot.gov/site/Permits/Pages/All-Submissions.aspx

SEEDING AND MULCHING: **(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE SR 2229 PROJECT ______ COUNTY OF STATE OF NORTH CAROLINA Cumberland

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 23 day of Aug., 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 2229, located In Cumberland County At / near intersection of Matt Hair Road (SR 2229) and Chislehurst Street with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

BY: DocuSigned by: Greg W. Burns TLB

~~Asst. Manager of Right of Way~~
Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E. Compton

Christel E. Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

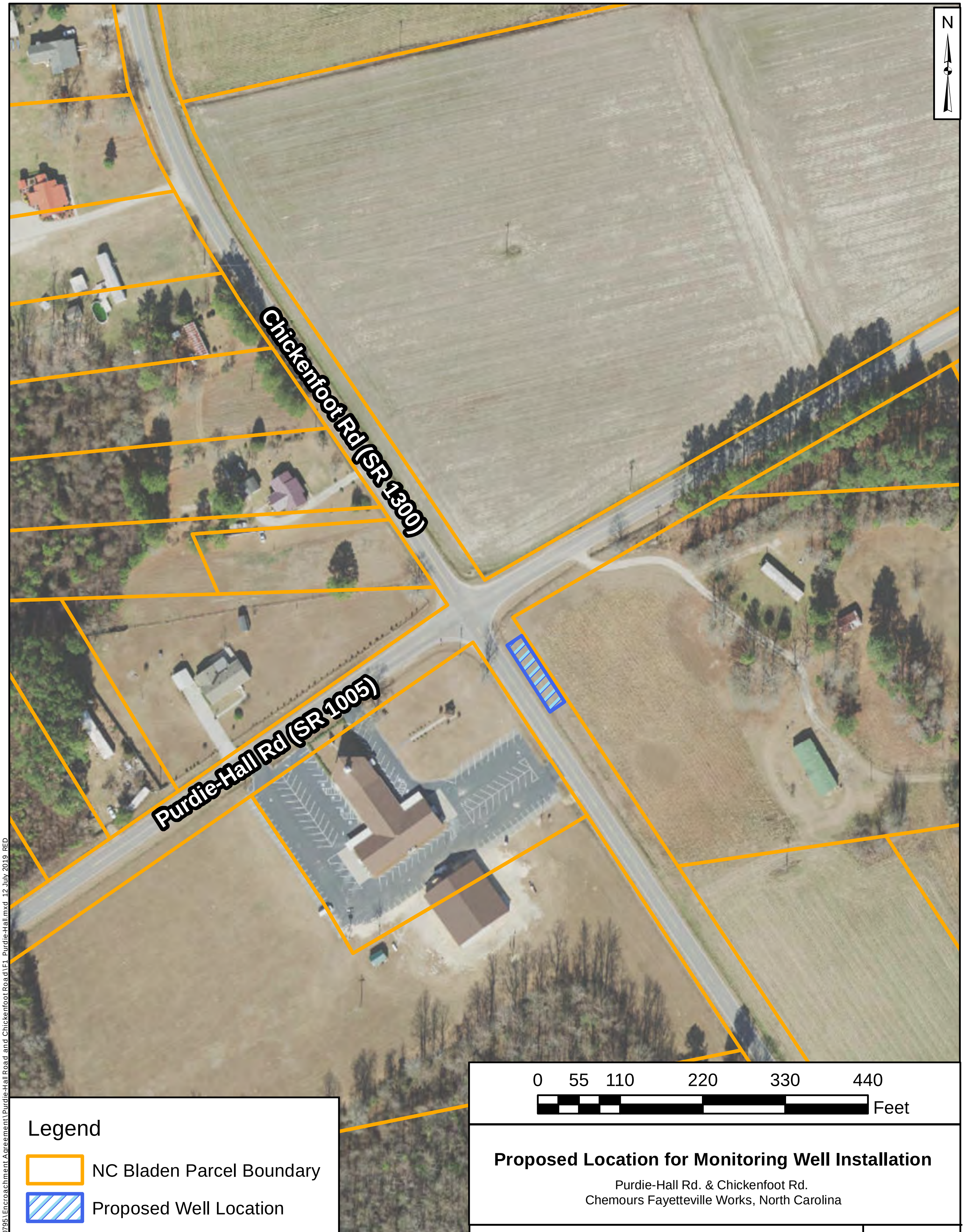
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

NC Bladen Parcel Boundary

Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Bladen County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

Purdie-Hall Rd. & Chickenfoot Rd.
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | July 2019

Figure

1

Path: \\Raleigh-01\Data\N\TR0795\Encroachment Agreement\Purdie-Hall Road and Chickenfoot Road\F1_Purdie-Hall.mxd 12 July 2019 RED

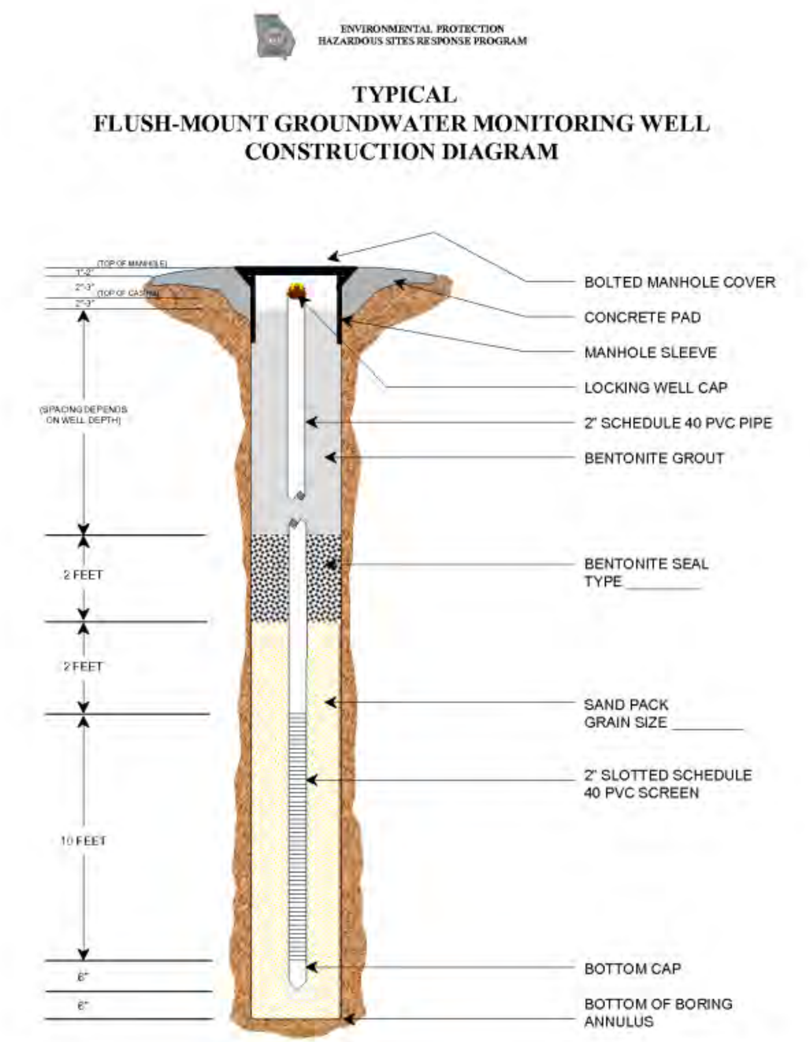


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

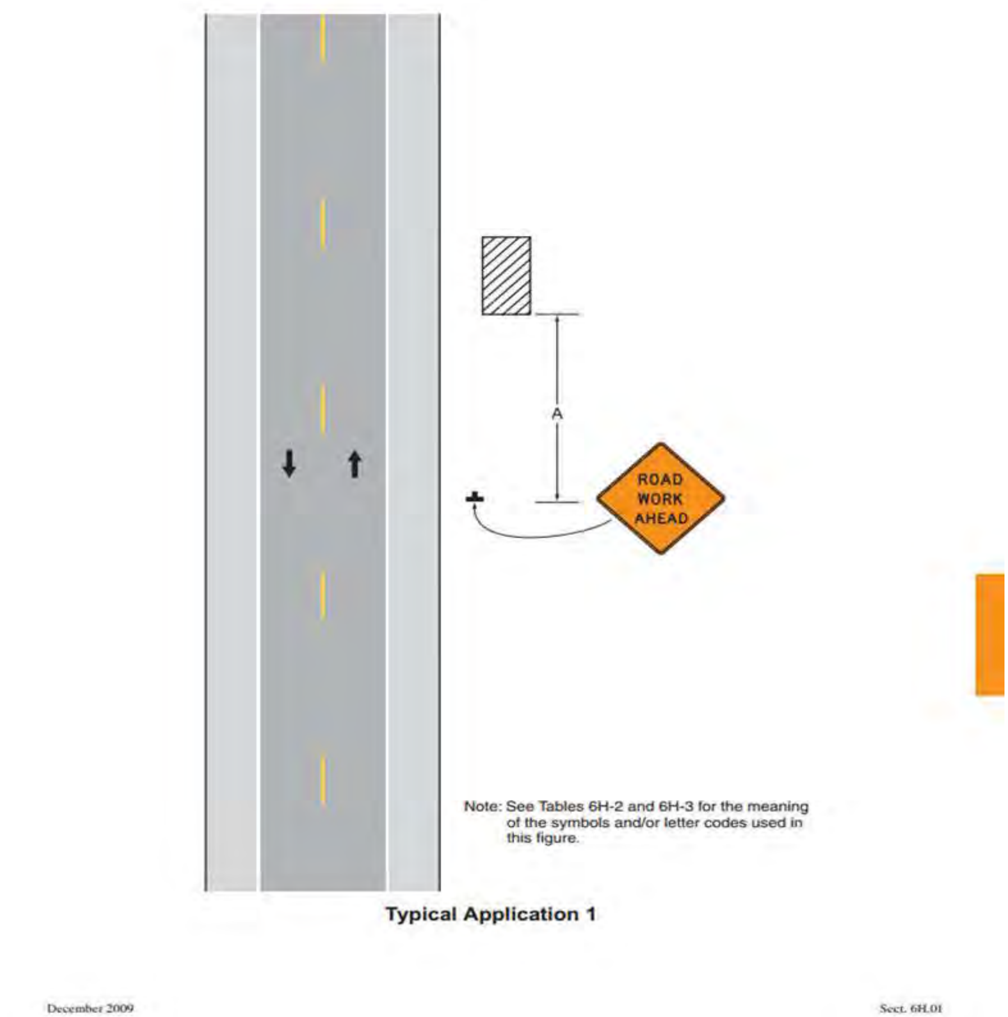


Figure 4: Temporary traffic control method as found from the *Manual on Uniform Traffic Control Devices.*

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of Chicken Foot Road (SR1300) and Purdie-Hall Road (SR1005). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" (**Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

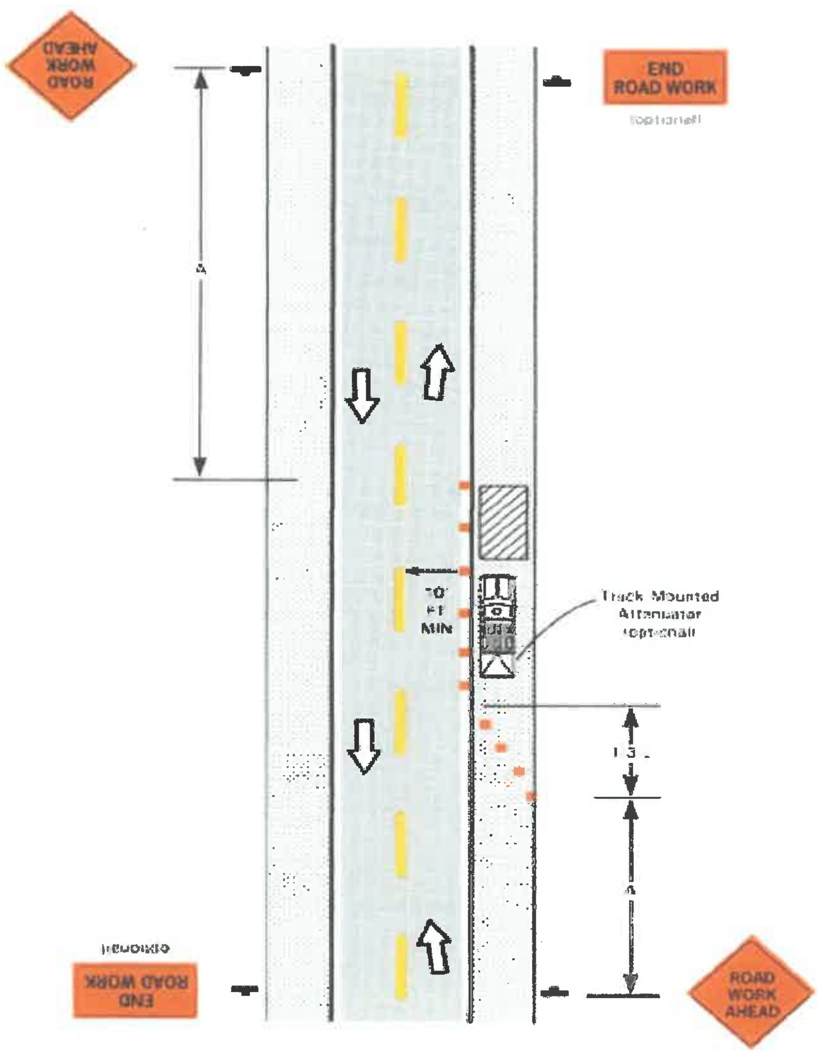


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

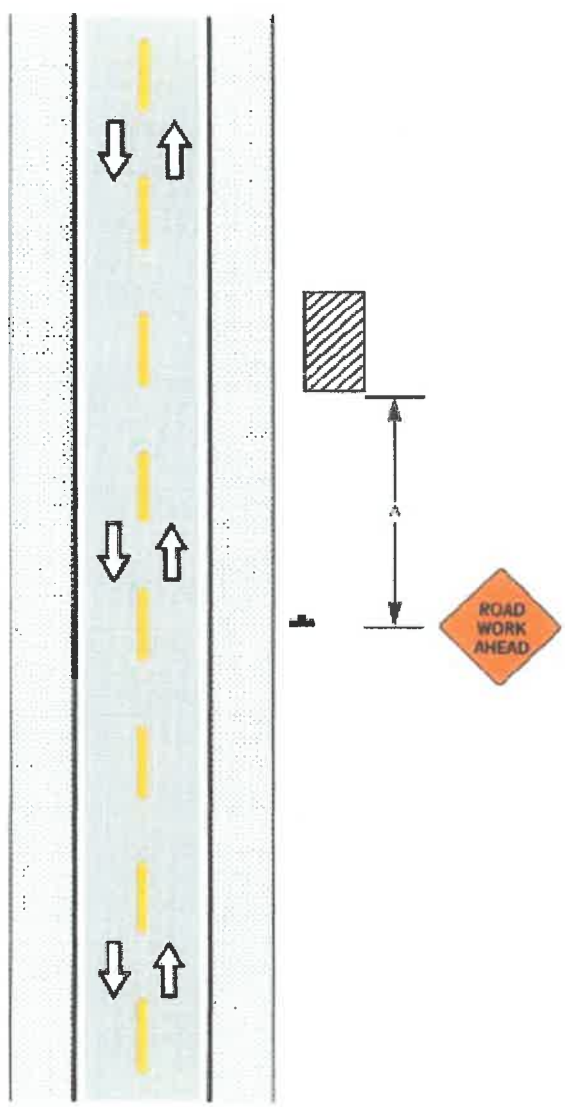


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Lee Hines
District Engineer
NCDOT
600 Southern Ave.
Fayetteville, NC 28306-1524

Subject: Request for Right of Way Encroachment in Cumberland County
Matt Hair Road (SR 2229) and Chislehurst Street
Geosyntec project # TR0795 SR2229

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of five ROW encroachment requests in Cumberland County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two co-located environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of Matt Hair Road (SR 2229) and Chislehurst Street in Cumberland County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 27, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01126
Two (2) monitoring wells: NCDOT right-of-way NC 53 & Johnson Rd.
(34.884765 & -78.739095)
Fayetteville, Cumberland County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 26 August 2019 and received in the Fayetteville Regional Office on 27 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01126 dated 27 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 53 at the intersection of NC Hwy 53 and Johnson road in Fayetteville, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Cumberland County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 53 at the intersection of NC Hwy 53 and Johnson road in Fayetteville, Cumberland County, North Carolina. This Permit is issued in accordance with the application received on 27 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 27th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01126

August 22, 2019

Mr. Christel E. Compton
The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

SUBJECT: Encroachment Agreement on NC Highway 53 (Cedar Creek Road) for the installation of two (2) groundwater monitoring wells in Cumberland County (E062-026-19-00206).

Dear Sir:

Attached is an approved R/W form 16.1A and plans for the installation of two (2) co-located flush mount environmental groundwater monitoring wells on NC Highway 53 (Cedar Creek Road) as associated with the Chemours Fayetteville Works project in Cumberland County as shown on the attached plans (Geosyntec project #TR0795 NC53-SR2228).

Location:

Route	**At a point**	**Towards**
NC 53	50'± south the intersection of NC Highway 53 (Cedar Creek Road) and SR 2228 (Johnson Road)	Bladen County

This encroachment is approved subject to the following:

1. **Within ninety (90) days of the completion of the proposed utility installation, an As-Built drawing(s) and a executed Contractor Certification Memo shall be submitted to the District Office (online encroachment database). The As-Built drawing(s) shall depict the horizontal and vertical locations of all utilities and associated appurtenances.**
2. The Cumberland County Maintenance Engineer at (910) 364-0602 and Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601 shall be notified a minimum of three (3) days before construction is to begin.
3. Traffic will be maintained and proper signs, signal lights, flagmen and other warning devices will be provided for the protection of traffic, in conformance with the latest **Manual on Uniform Traffic Control Devices for Streets and Highways**. All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.
4. **All lanes of traffic on NC Highway 53 (Cedar Creek Road) are to be open during the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless otherwise directed by the Engineer. No lane of traffic shall be closed on holidays, special events, or as directed by the engineer. Traffic shall be maintained at all times.**

5. **Any flush-mount groundwater monitoring well(s) shall be constructed at grade with the existing ground surface as not to interfere with the positive drainage of the roadway, roadway shoulder, drainage ditch and routine maintenance within departmental rights of way.**

6. **The proposed groundwater monitoring well(s) and other associated appurtenances are to be placed 5' or closer off of the right-of- way lines of NC Highway 53 (Cedar Creek Road). All associated appurtenances must be placed behind the ditch line. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.**

7. Luminaire and utility poles shall be outside the Clear Recovery Area in accordance with the latest version of the AASHTO Roadside Design Guide or made breakaway in accordance with the requirements of NCHRP Report 350. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.

8. **All concrete installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.**

9. All concrete sidewalk installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01 and 848.01) and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

10. All ADA compliant curb ramps shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 848.06) and Amendments or Supplementals thereto including but not limited to the Alternate Curb Ramp Designs (Curb Ramp Details - Parallel Ramps). All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

11. All 30" curb and gutter within NCDOT rights of way shall be constructed with Class B concrete in accordance with Section 846 of the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01) and Amendment or Supplemental thereto or as directed by the engineer. All concrete testing results shall be provided to the District Engineer's office at time of project completion.

12. **Open cuts are not permitted on NC Highway 53 (Cedar Creek Road).**

13. Any asphalt that is damaged as a result of construction shall be repaired at the encroaching party's expense. An NCDOT approved asphalt mix shall be used for all repairs within NCDOT rights of way. Contact Mr. Troy L. Baker, Senior Assistant District Engineer for acceptance of asphalt mix designs.

14. All open cuts (if permitted) on primary routes will require full depth patching with 5.0" of B 25.0 B (ACBC) Asphalt Concrete Base Course, 3.0" of I 19.0 B (ACIC) Asphalt Concrete Intermediate Course and 2.0" of S 9.5 B (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 2.0" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.
15. All open cuts (if permitted) on secondary routes will require full depth patching with 4.0" of B 25.0 C (ACBC) Asphalt Concrete Base Course and 3.0" of S 9.5 C (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 1.5" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.
16. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the North Carolina Department of Transportation. All material to a depth of 8 inches below the finished surface shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The trench backfill material shall meet the Statewide Borrow criteria. The trench should be backfilled in accordance with Section 300-7 of the latest NCDOT Standard Specifications for Roads and Structures and Amendments or Supplementals thereto.
17. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of motorists and workers during construction and any subsequent maintenance. This shall be performed in conformance with the latest **NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures** and Amendments or Supplementals thereto. When there is no guidance provided in the Roadway Standard Drawings or Specifications, comply with the **Manual on Uniform Traffic Control Devices for Streets and Highways** and Amendment or Supplemental thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part. **All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.**
18. Disturbed areas shall have an established stand of vegetation according to the attached specifications for erosion control.
19. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
20. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
21. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.

22. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
23. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
24. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
25. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.
26. **Trenching, bore pits and/or other excavations shall not be left overnight. The contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.**
27. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
28. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
29. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.
30. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
31. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
32. No material storage shall be allowed along the shoulders of the roadway, and during non-working hours, equipment shall be parked as close to the right of way line as possible and shall be properly barricaded so that no equipment obstruction shall be within the Clear Recovery Area. No parking or material storage shall be allowed along the shoulders of any state maintained roadway.
33. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
34. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.

35. Excavations inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall should be made in accordance with the following conditions:
    - The trench backfill material should meet the Statewide Borrow Criteria. The trench should be backfilled in accordance with Section 300-7 of the latest **NCDOT Standard Specifications for Roads and Structures**, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by the NCDOT.
    - All trench excavation inside the limits of the theoretical 1:1 slope, as defined by the policy, should be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.
36. **When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within five (5) feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within fifteen (15) feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.**
37. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.
38. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.
39. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.
40. All roadway signs which are removed which are removed due to construction shall be reinstalled as soon as possible.
41. Any proposed driveway connections onto NCDOT roadways will require an approved driveway permit. The approval of this Two Party encroachment (RW 16.1A) does not constitute approval of any proposed driveway connections. For further information, contact Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601.
42. Excavated areas adjacent to pavement having more than a 2" drop shall be safed up at a 6:1 or flatter slope and designated by appropriate delineation during periods of inactivity, including, but not limited to, night and weekend hours. Excavated material shall not be placed on the roadway at any time.

43. **NCDOT reserves the right to further limit, restrict, or suspend operations within the Right of Way if, in the opinion of NCDOT, safety or traffic conditions warrant such action.**

44. It shall be the responsibility of the encroaching party to determine the location of other utilities within the encroachment area. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and to maintain accessibility to existing utilities.

45. **A qualified NCDOT inspector should be on site at all times during construction. The encroaching party should be required to reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector under the supervision of a Professional Engineer registered in North Carolina, on site at all times. The Registered Engineer should be required to certify that the structures have been installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.**

46. Excavation within 1000 feet of a signalized intersection will require notification by the party of the second part to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation.

47. All temporary and final paving markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number 910-364-0606 for review and approval.

48. The pavement marking contractor is required to have at least one member of every pavement marking crew that is working on the project, preferably the Crew Supervisor, be certified through the NCDOT Pavement Marking Technician Certification Process. For more information please contact the Work Zone Traffic Control Unit at (919) 773-2800 or **http://www.ncdot.org/doh/preconstruct/wztc/**".

49. Prior to installing pavement markings, contact Mr. Frank West with the NCDOT Division Six Traffic Services Unit at 910-364-0606 to review the proposed pavement-marking layout. This notification should take place a minimum of 48 hours in advance of the pavement marking installation.

50. Failure to contact the Traffic Services Unit to review the pavement-marking layout prior to installation may result in the removal and reinstallation of the markings at the expense of the Permittee.

51. All utility facilities, including but not limited to manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults, and covers within NCDOT right of way shall have been designed for HS-20 loading. A listing of currently approved manholes, valve boxes, and vaults is available at the following site: https://apps.dot.state.ns.us.vendor/approvedproducts . If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and calculations designed by a Professional Engineer registered in North Carolina for approval prior to construction.

52. All utility access points, including but not limited to manholes, splice boxes, junction boxes, and vaults shall be located outside of the right of way line. Manholes, splice boxes, junction boxes, and vaults shall not be placed in the ditch line, side slopes of the ditches, or in the pavement. All manholes, splice boxes, junction boxes, vaults, and covers shall be flush with the ground when located within the vehicle recovery area.

NCDOT WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personal performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance / Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) insidethe highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 662-4339 or skite@ncdot.gov or Roger Garrett at (919) 662-4383 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

If further information or assistance is needed in reference to this project, please feel free to call Mr. Lee R. Hines, Jr. (Richie), PE, District Engineer at (910) 364-0601.

Sincerely,

DS
TLB

DocuSigned by:
Greg W. Burns

Greg W. Burns, PE
Division Engineer

GWB:tlb

cc: https://connect.ncdot.gov/site/Permits/Pages/All-Submissions.aspx

SEEDING AND MULCHING: **(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		September 1 - February 28	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		September 1 - February 28	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE NC-53 PROJECT ________ COUNTY OF STATE OF NORTH CAROLINA Cumberland

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 22 day of Aug., 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC-53, located In Cumberland County Approximately 50 feet south Johnson Road (SR 2228) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

DS TLB

DocuSigned by:

BY: Greg W. Burns

~~Asst. Manager of Right of Way~~

Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E. Compton

Christel E. Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

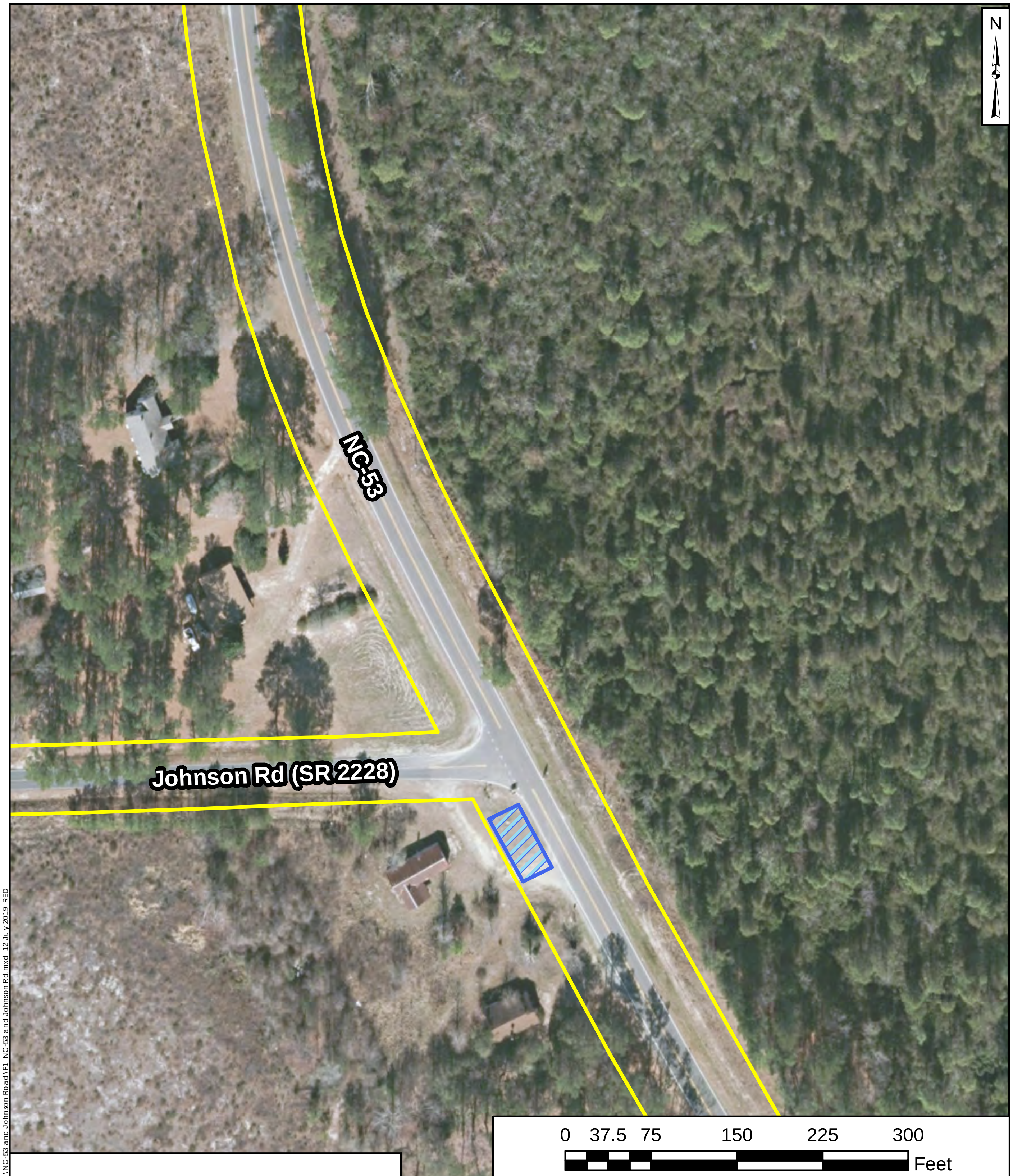
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

NC Cumberland Parcel Boundary

Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Cumberland County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

NC-53 and Johnson Rd
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Figure **1**

Raleigh, NC | July 2019

Path: (Raleigh-01/Data) N:\TR0795\Encroachment Agreement\NC-53 and Johnson Road\F1_NC-53 and Johnson Rd.mxd 12 July 2019 RED

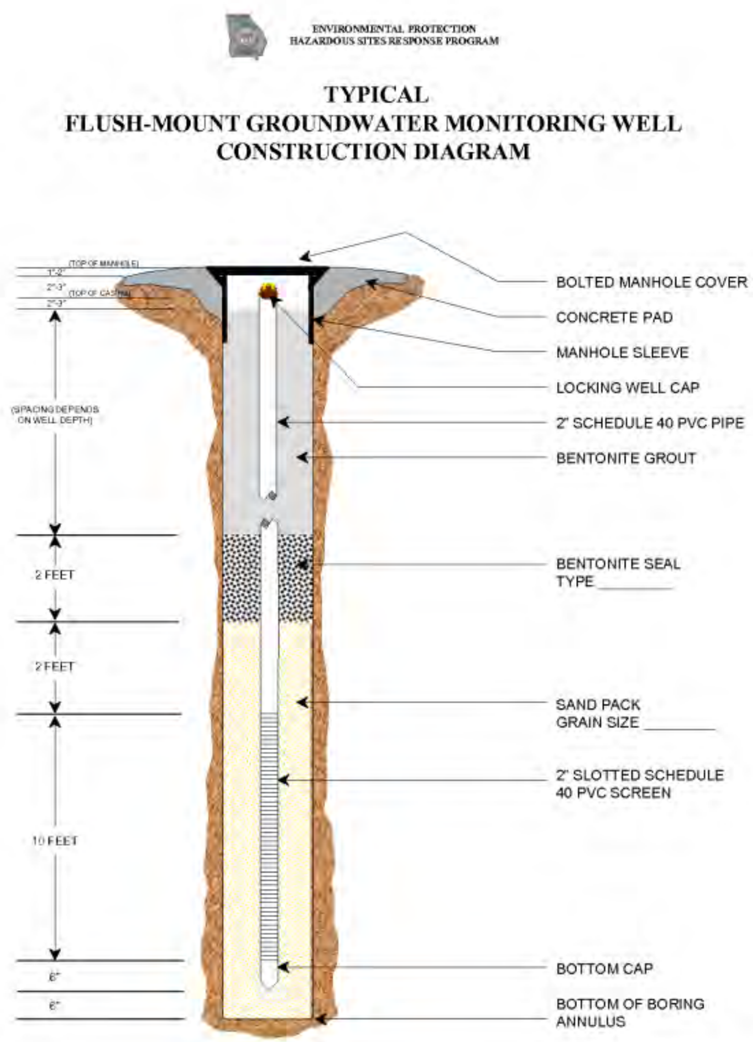


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

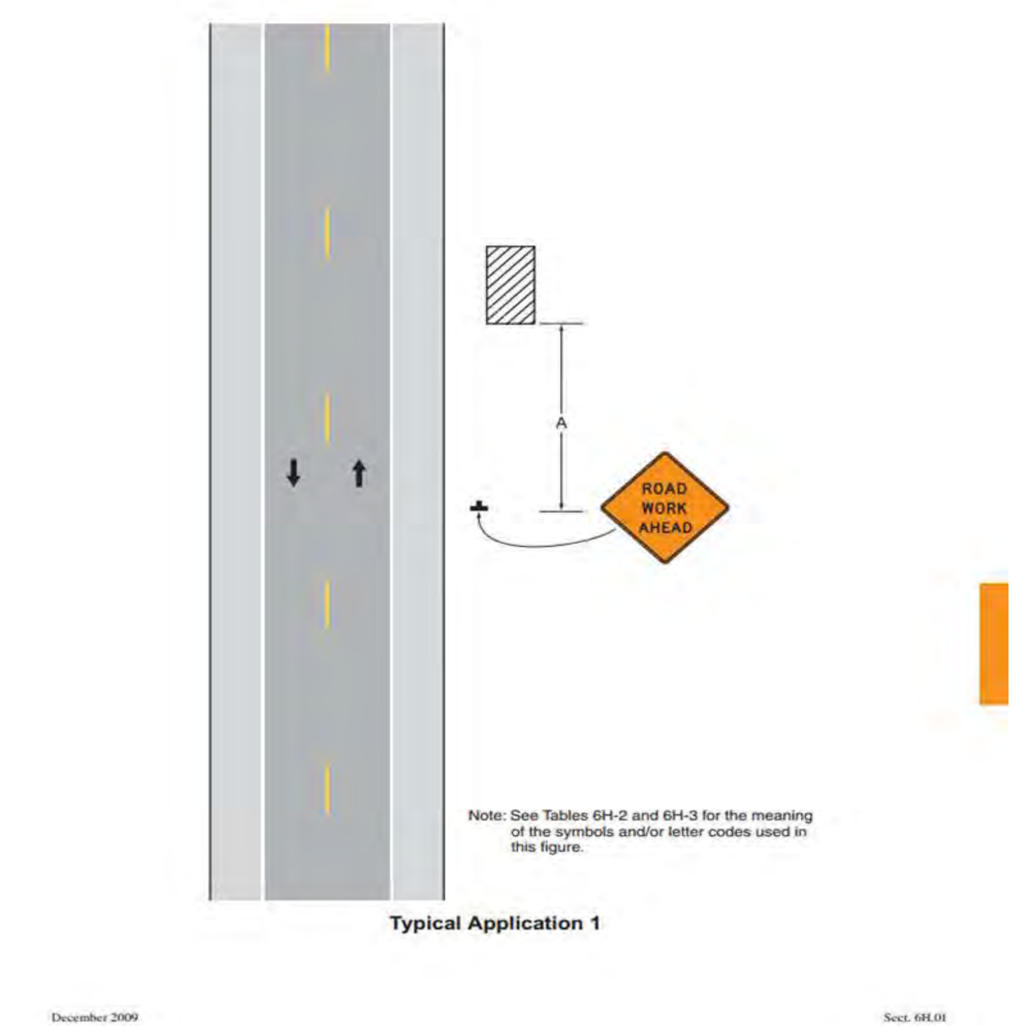


Figure 4: Temporary traffic control method as found from the *Manual on Uniform Traffic Control Devices.*

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2’ x 2’ concrete pad (**Figures 2 and 3**)
    - 8” manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40’-90’ below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department’s roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of NC Highway 53 and Johnson Road (SR 2228). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" (**Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

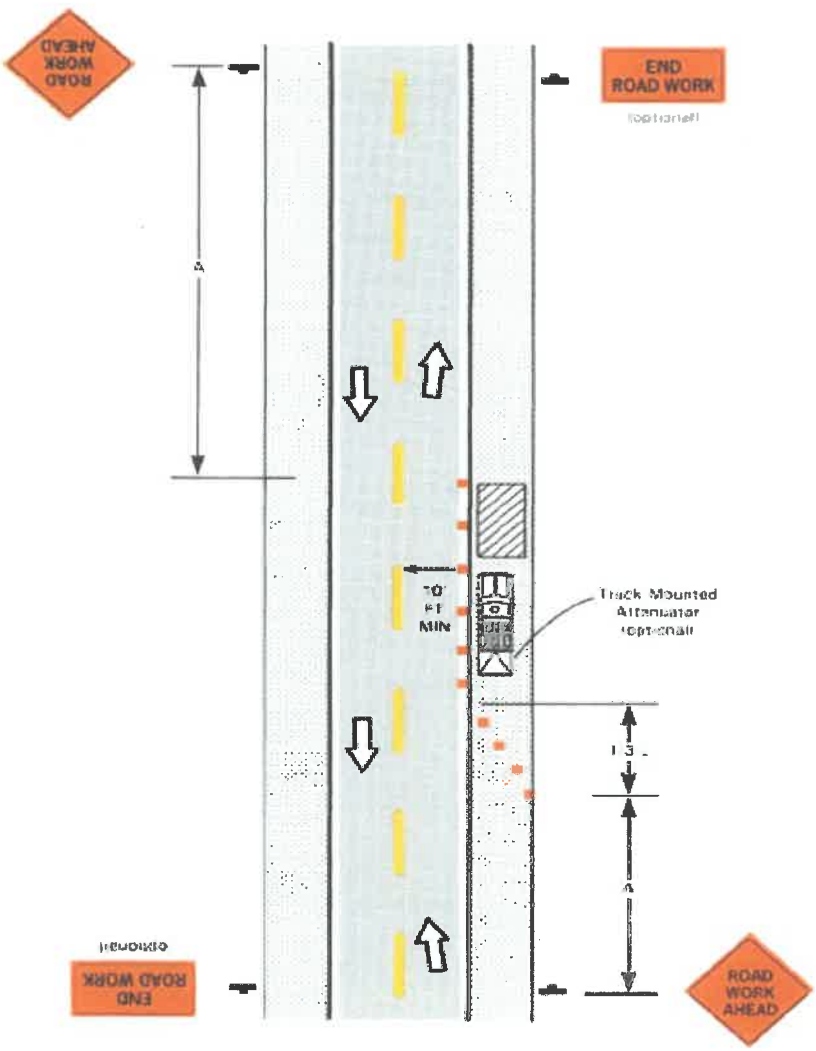


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

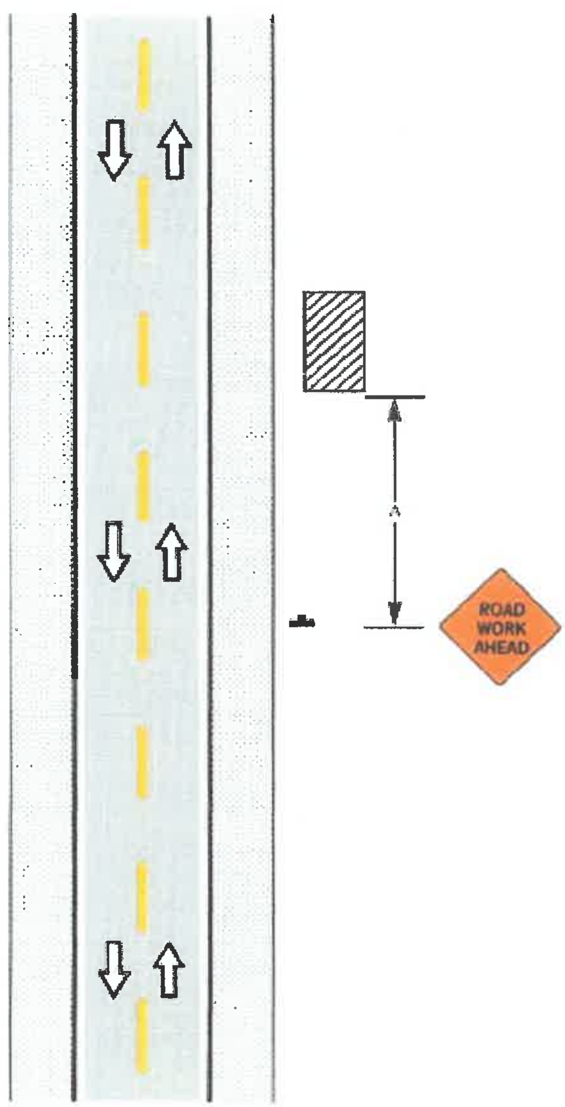


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Lee Hines
District Engineer
NCDOT
600 Southern Ave.
Fayetteville, NC 28306-1524

Subject: Request for Right of Way Encroachment in Cumberland County
NC Highway 53 near Johnson Road (SR 2228)
Geosyntec project # TR0795 NC53-SR2228

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of five ROW encroachment requests in Cumberland County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two co-located environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of NC Highway 53 and Johnson Road (SR 2228) in Cumberland County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 27, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01127
Two (2) monitoring wells: NCDOT right-of-way NC Hwy 210 & NC Hwy 242
(34.864212 & -78.539211)
Fayetteville, Cumberland County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 26 August 2019 and received in the Fayetteville Regional Office on 27 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01126 dated 27 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 242 at the intersection of NC Hwy 242 and NC Hwy 210 in Fayetteville, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Cumberland County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 242 at the intersection of NC Hwy 242 and NC Hwy 210 in Fayetteville, Cumberland County, North Carolina. This Permit is issued in accordance with the application received on 27 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 27th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01127

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 23, 2019

Mr. Christel E. Compton
The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

SUBJECT: Encroachment Agreement on NC Highway 242 for the installation of two (2) groundwater monitoring wells in Cumberland County (E062-026-19-00207).

Dear Sir:

Attached is an approved R/W form 16.1A and plans for the installation of two (2) co-located flush mount environmental groundwater monitoring wells on NC Highway 242 as associated with the Chemours Fayetteville Works project in Cumberland County as shown on the attached plans (Geosyntec project #TR0795 NC210-NC242).

Location:

Route	**At a point**	**Towards**
NC 242	75'± north the intersection of NC Highway 242 and NC 210 (Fayetteville-Wilmington Road)	SR 2038

This encroachment is approved subject to the following:

1. **Within ninety (90) days of the completion of the proposed utility installation, an As-Built drawing(s) and a executed Contractor Certification Memo shall be submitted to the District Office (online encroachment database). The As-Built drawing(s) shall depict the horizontal and vertical locations of all utilities and associated appurtenances.**
2. The Cumberland County Maintenance Engineer at (910) 364-0602 and Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601 shall be notified a minimum of three (3) days before construction is to begin.
3. Traffic will be maintained and proper signs, signal lights, flagmen and other warning devices will be provided for the protection of traffic, in conformance with the latest **Manual on Uniform Traffic Control Devices for Streets and Highways.** All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.
4. **All lanes of traffic on NC Highway 242 are to be open during the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless otherwise directed by the Engineer. No lane of traffic shall be closed on holidays, special events, or as directed by the engineer. Traffic shall be maintained at all times.**

5. **Any flush-mount groundwater monitoring well(s) shall be constructed at grade with the existing ground surface as not to interfere with the positive drainage of the roadway, roadway shoulder, drainage ditch and routine maintenance within departmental rights of way.**

6. **The proposed groundwater monitoring well(s) and other associated appurtenances are to be placed 5' or closer off of the right-of- way lines of NC Highway 242. All associated appurtenances must be placed behind the ditch line. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.**

7. Luminaire and utility poles shall be outside the Clear Recovery Area in accordance with the latest version of the AASHTO Roadside Design Guide or made breakaway in accordance with the requirements of NCHRP Report 350. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.

8. **All concrete installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.**

9. All concrete sidewalk installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01 and 848.01) and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

10. All ADA compliant curb ramps shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 848.06) and Amendments or Supplementals thereto including but not limited to the Alternate Curb Ramp Designs (Curb Ramp Details - Parallel Ramps). All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

11. All 30" curb and gutter within NCDOT rights of way shall be constructed with Class B concrete in accordance with Section 846 of the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01) and Amendment or Supplemental thereto or as directed by the engineer. All concrete testing results shall be provided to the District Engineer's office at time of project completion.

12. **Open cuts are not permitted on NC Highway 242.**

13. Any asphalt that is damaged as a result of construction shall be repaired at the encroaching party's expense. An NCDOT approved asphalt mix shall be used for all repairs within NCDOT rights of way. Contact Mr. Troy L. Baker, Senior Assistant District Engineer for acceptance of asphalt mix designs.

14. All open cuts (if permitted) on primary routes will require full depth patching with 5.0” of B 25.0 B (ACBC) Asphalt Concrete Base Course, 3.0” of I 19.0 B (ACIC) Asphalt Concrete Intermediate Course and 2.0” of S 9.5 B (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 2.0” and a width of 1.0’ on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

15. All open cuts (if permitted) on secondary routes will require full depth patching with 4.0” of B 25.0 C (ACBC) Asphalt Concrete Base Course and 3.0” of S 9.5 C (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 1.5” and a width of 1.0’ on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

16. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the North Carolina Department of Transportation. All material to a depth of 8 inches below the finished surface shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The trench backfill material shall meet the Statewide Borrow criteria. The trench should be backfilled in accordance with Section 300-7 of the latest NCDOT Standard Specifications for Roads and Structures and Amendments or Supplementals thereto.

17. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of motorists and workers during construction and any subsequent maintenance. This shall be performed in conformance with the latest **NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures** and Amendments or Supplementals thereto. When there is no guidance provided in the Roadway Standard Drawings or Specifications, comply with the **Manual on Uniform Traffic Control Devices for Streets and Highways** and Amendment or Supplemental thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part. **All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.**

18. Disturbed areas shall have an established stand of vegetation according to the attached specifications for erosion control.

19. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

20. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.

21. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.

22. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
23. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
24. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
25. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.
26. **Trenching, bore pits and/or other excavations shall not be left overnight. The contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.**
27. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
28. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
29. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.
30. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
31. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
32. No material storage shall be allowed along the shoulders of the roadway, and during non-working hours, equipment shall be parked as close to the right of way line as possible and shall be properly barricaded so that no equipment obstruction shall be within the Clear Recovery Area. No parking or material storage shall be allowed along the shoulders of any state maintained roadway.
33. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
34. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.

35. Excavations inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall should be made in accordance with the following conditions:
    - The trench backfill material should meet the Statewide Borrow Criteria. The trench should be backfilled in accordance with Section 300-7 of the latest **NCDOT Standard Specifications for Roads and Structures**, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by the NCDOT.
    - All trench excavation inside the limits of the theoretical 1:1 slope, as defined by the policy, should be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

36. **When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within five (5) feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within fifteen (15) feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.**

37. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

38. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

39. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

40. All roadway signs which are removed which are removed due to construction shall be reinstalled as soon as possible.

41. Any proposed driveway connections onto NCDOT roadways will require an approved driveway permit. The approval of this Two Party encroachment (RW 16.1A) does not constitute approval of any proposed driveway connections. For further information, contact Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601.

42. Excavated areas adjacent to pavement having more than a 2” drop shall be safed up at a 6:1 or flatter slope and designated by appropriate delineation during periods of inactivity, including, but not limited to, night and weekend hours. Excavated material shall not be placed on the roadway at any time.

43. **NCDOT reserves the right to further limit, restrict, or suspend operations within the Right of Way if, in the opinion of NCDOT, safety or traffic conditions warrant such action.**

44. It shall be the responsibility of the encroaching party to determine the location of other utilities within the encroachment area. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and to maintain accessibility to existing utilities.

45. **A qualified NCDOT inspector should be on site at all times during construction. The encroaching party should be required to reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector under the supervision of a Professional Engineer registered in North Carolina, on site at all times. The Registered Engineer should be required to certify that the structures have been installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.**

46. Excavation within 1000 feet of a signalized intersection will require notification by the party of the second part to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation.

47. All temporary and final paving markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number 910-364-0606 for review and approval.

48. The pavement marking contractor is required to have at least one member of every pavement marking crew that is working on the project, preferably the Crew Supervisor, be certified through the NCDOT Pavement Marking Technician Certification Process. For more information please contact the Work Zone Traffic Control Unit at (919) 773-2800 or **http://www.ncdot.org/doh/preconstruct/wztc/**".

49. Prior to installing pavement markings, contact Mr. Frank West with the NCDOT Division Six Traffic Services Unit at 910-364-0606 to review the proposed pavement-marking layout. This notification should take place a minimum of 48 hours in advance of the pavement marking installation.

50. Failure to contact the Traffic Services Unit to review the pavement-marking layout prior to installation may result in the removal and reinstallation of the markings at the expense of the Permittee.

51. All utility facilities, including but not limited to manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults, and covers within NCDOT right of way shall have been designed for HS-20 loading. A listing of currently approved manholes, valve boxes, and vaults is available at the following site: https://apps.dot.state.ns.us.vendor/approvedproducts . If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and calculations designed by a Professional Engineer registered in North Carolina for approval prior to construction.

52. All utility access points, including but not limited to manholes, splice boxes, junction boxes, and vaults shall be located outside of the right of way line. Manholes, splice boxes, junction boxes, and vaults shall not be placed in the ditch line, side slopes of the ditches, or in the pavement. All manholes, splice boxes, junction boxes, vaults, and covers shall be flush with the ground when located within the vehicle recovery area.

NCDOT WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personal performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance / Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) insidethe highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 662-4339 or skite@ncdot.gov or Roger Garrett at (919) 662-4383 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

If further information or assistance is needed in reference to this project, please feel free to call Mr. Lee R. Hines, Jr. (Richie), PE, District Engineer at (910) 364-0601.

Sincerely,

DocuSigned by:
Greg W. Burns

DS
TLB

Greg W. Burns, PE
Division Engineer

GWB:tlb

cc: https://connect.ncdot.gov/site/Permits/Pages/All-Submissions.aspx

SEEDING AND MULCHING: (East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		September 1 - February 28	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		September 1 - February 28	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

STATE OF NORTH CAROLINA

ROUTE NC-242 PROJECT ______ COUNTY OF Cumberland

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 23 day of Aug., 20 19, by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC-242 and NC-210, located In Cumberland County Approximately 75 feet north of the intersection of NC-242 and NC-210 with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

DocuSigned by:

BY: Greg W. Burns TLB

C2649BD929294B9...

~~Asst. Manager of Right of Way~~
Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

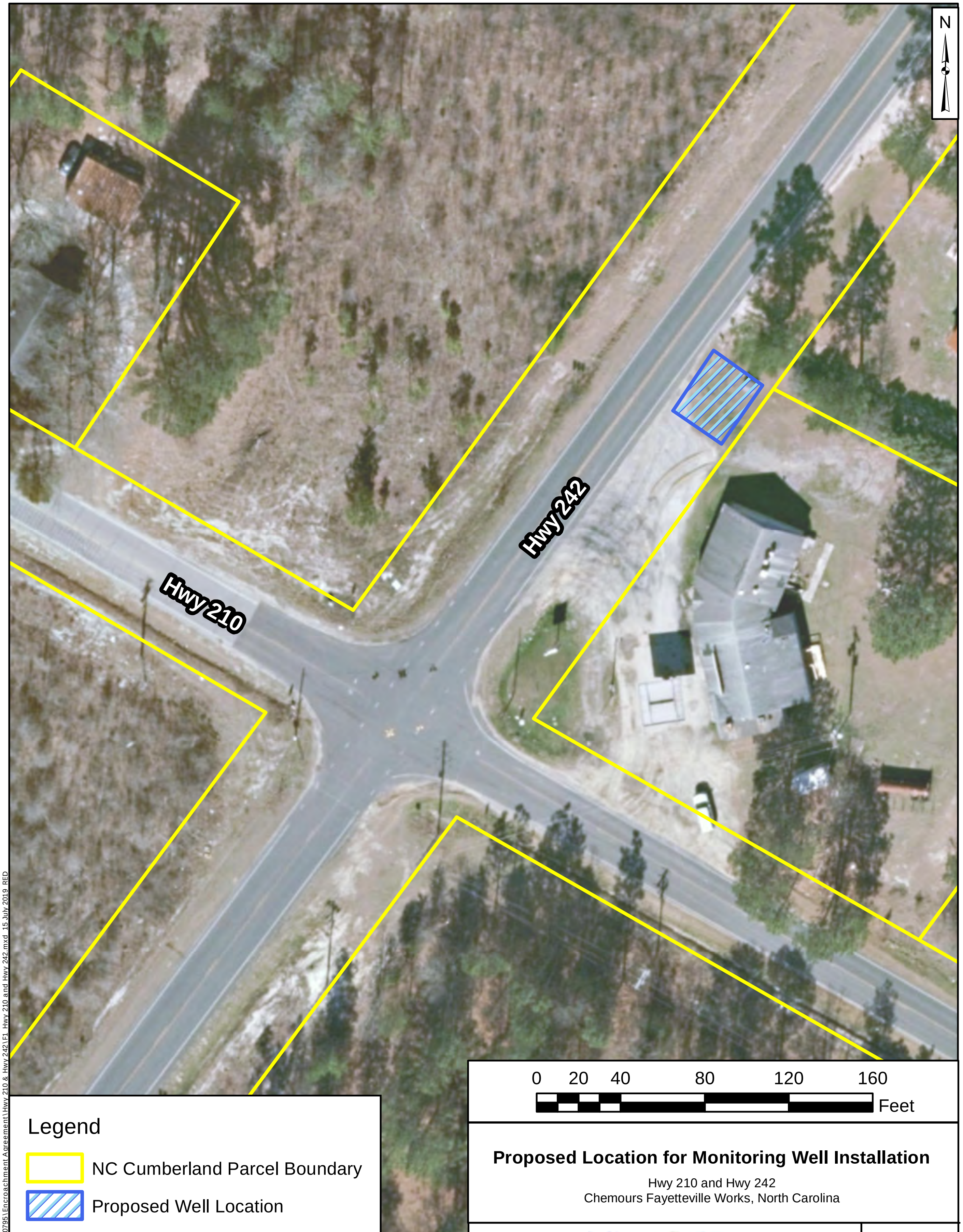
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

NC Cumberland Parcel Boundary

Proposed Well Location

Proposed Location for Monitoring Well Installation

Hwy 210 and Hwy 242
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Figure 1

Raleigh, NC | July 2019

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Cumberland County (http://data.nconemap.gov/downloads/vector/parcels/).

Path: (Raleigh-01/Data) N:\TR0795\Encroachment Agreement\Hwy 210 & Hwy 242\F1_Hwy 210 and Hwy 242.mxd 15 July 2019 RED

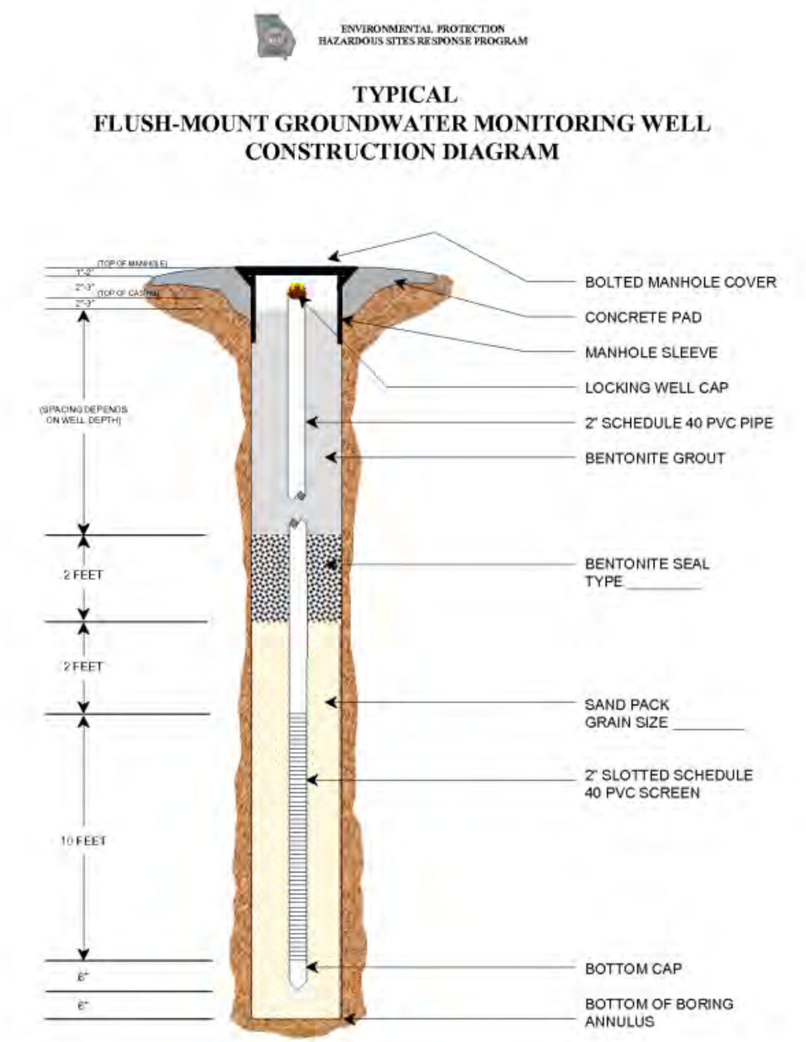


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

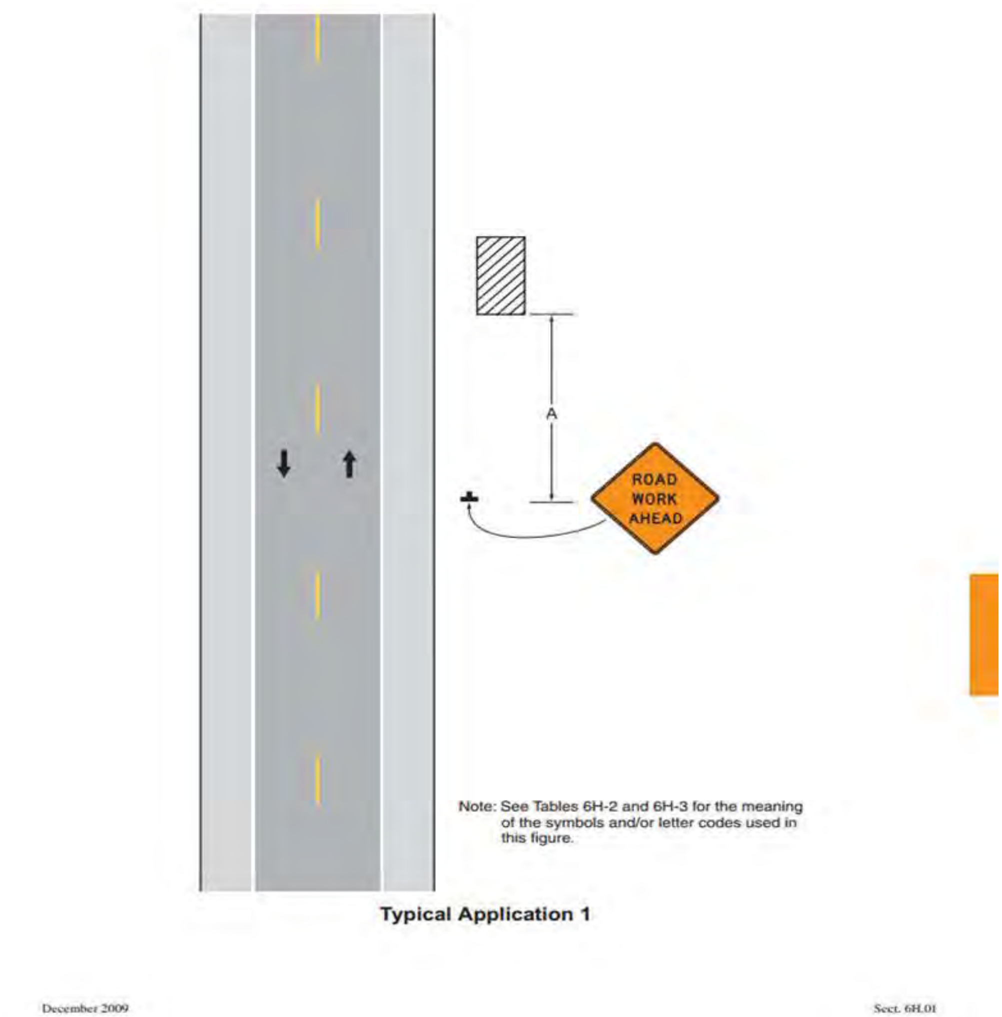


Figure 4: Temporary traffic control method as found from the *Manual on Uniform Traffic Control Devices.*

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of NC Highway 210 and NC Highway 242. (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.
    - Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" (**Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

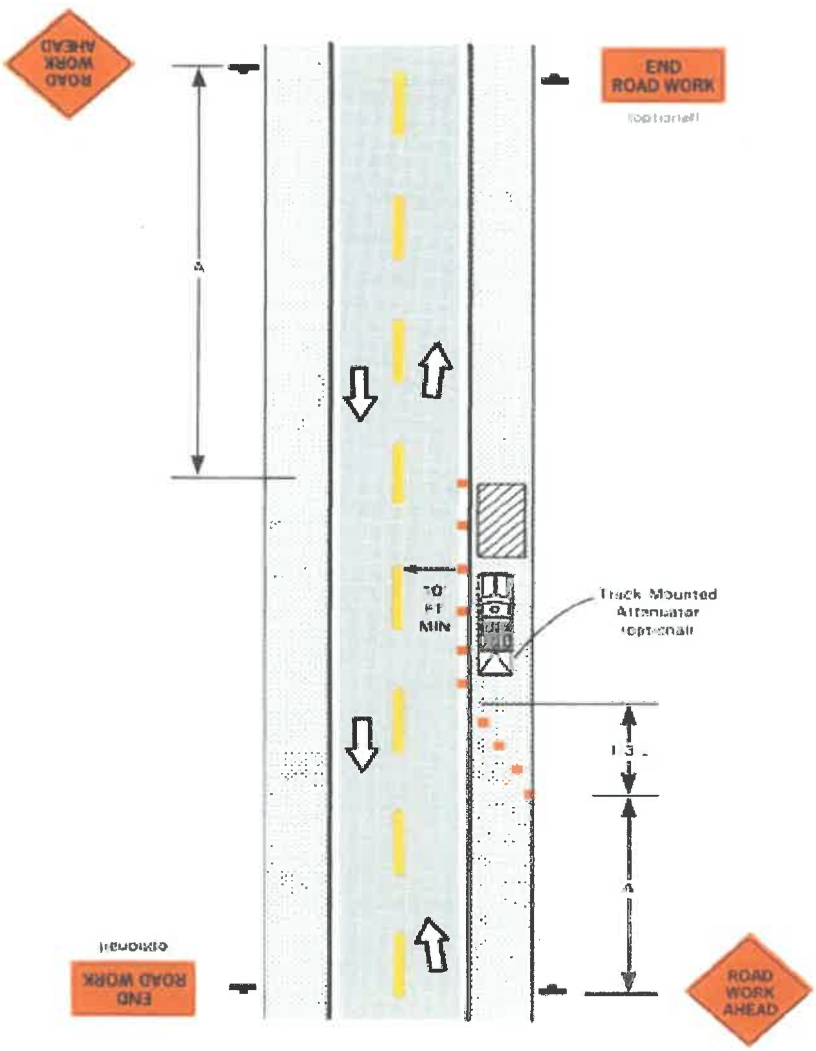


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

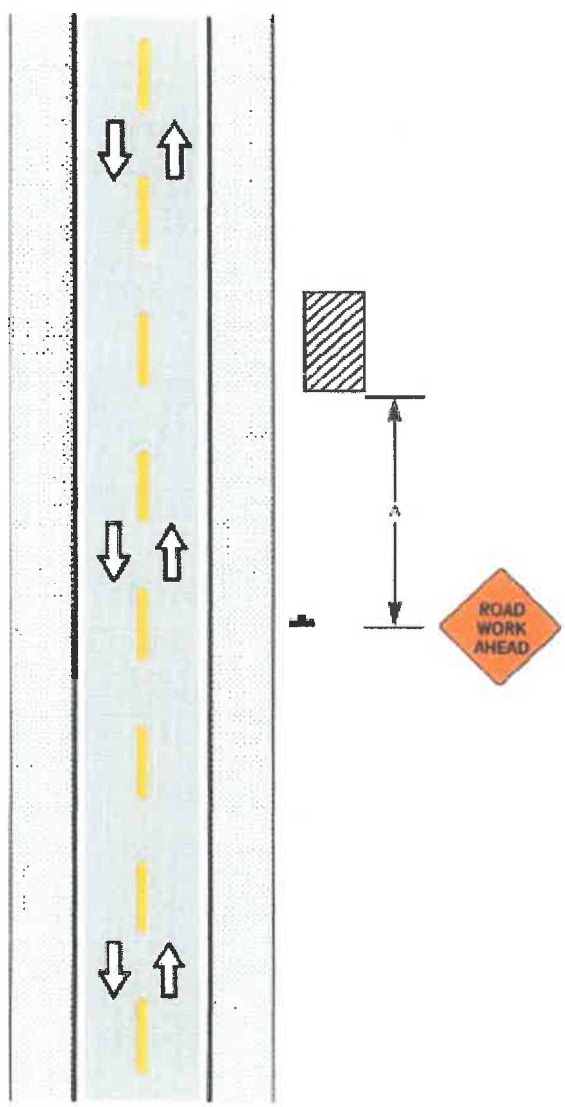


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Lee Hines
District Engineer
NCDOT
600 Southern Avenue
Fayetteville, NC 28306-1524

Subject: Request for Right of Way Encroachment in Cumberland County
NC Highway 210 and NC Highway 242
Geosyntec project # TR0795 NC210-NC242

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of five ROW encroachment requests in Cumberland County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of NC Highway 210 and NC Highway 242 in the City of Beaver Dam in Cumberland County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Cc: Greg Burns, NCDOT

Attachments: Encroachment Agreement
Figures

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 27, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01128
Two (2) monitoring wells: NCDOT right-of-way McDonald Rd & Parkton Rd site
(34.935435 & -78.963369)
Fayetteville, Cumberland County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 26 August 2019 and received in the Fayetteville Regional Office on 27 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01126 dated 27 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to McDonald road at the intersection of McDonald road and Parkton road in Fayetteville, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Cumberland County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to McDonald road at the intersection of McDonald road and Parkton road in Fayetteville, Cumberland County, North Carolina. This Permit is issued in accordance with the application received on 27 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 27th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01128

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 23, 2019

Mr. Christel E. Compton
The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

SUBJECT: Encroachment Agreement on SR 1121 (McDonald Road) for the installation of two (2) groundwater monitoring wells in Cumberland County (E062-026-19-00209).

Dear Sir:

Attached is an approved R/W form 16.1A and plans for the installation of two (2) co-located flush mount environmental groundwater monitoring wells on SR 1121 (McDonald Road) as associated with the Chemours Fayetteville Works project in Cumberland County as shown on the attached plans (Geosyntec project #TR0795 SR1121-SR1118).

Location:

Route	**At a point**	**Towards**
SR 1121	50'± south the intersection of SR 1121 (McDonald Road) and SR 1118 (Parkton Road)	US 301

This encroachment is approved subject to the following:

1. **Within ninety (90) days of the completion of the proposed utility installation, an As-Built drawing(s) and a executed Contractor Certification Memo shall be submitted to the District Office (online encroachment database). The As-Built drawing(s) shall depict the horizontal and vertical locations of all utilities and associated appurtenances.**
2. The Cumberland County Maintenance Engineer at (910) 364-0602 and Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601 shall be notified a minimum of three (3) days before construction is to begin.
3. Traffic will be maintained and proper signs, signal lights, flagmen and other warning devices will be provided for the protection of traffic, in conformance with the latest **Manual on Uniform Traffic Control Devices for Streets and Highways**. All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.
4. **All lanes of traffic on SR 1121 (McDonald Road) are to be open during the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless otherwise directed by the Engineer. No lane of traffic shall be closed on holidays, special events, or as directed by the engineer. Traffic shall be maintained at all times.**

5. **Any flush-mount groundwater monitoring well(s) shall be constructed at grade with the existing ground surface as not to interfere with the positive drainage of the roadway, roadway shoulder, drainage ditch and routine maintenance within departmental rights of way.**

6. **The proposed groundwater monitoring well(s) and other associated appurtenances are to be placed 5' or closer off of the right-of- way lines of SR 1121 (McDonald Road). All associated appurtenances must be placed behind the ditch line. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.**

7. Luminaire and utility poles shall be outside the Clear Recovery Area in accordance with the latest version of the AASHTO Roadside Design Guide or made breakaway in accordance with the requirements of NCHRP Report 350. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.

8. **All concrete installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.**

9. All concrete sidewalk installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01 and 848.01) and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

10. All ADA compliant curb ramps shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 848.06) and Amendments or Supplementals thereto including but not limited to the Alternate Curb Ramp Designs (Curb Ramp Details - Parallel Ramps). All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

11. All 30" curb and gutter within NCDOT rights of way shall be constructed with Class B concrete in accordance with Section 846 of the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01) and Amendment or Supplemental thereto or as directed by the engineer. All concrete testing results shall be provided to the District Engineer's office at time of project completion.

12. **Open cuts are not permitted on SR 1121 (McDonald Road).**

13. Any asphalt that is damaged as a result of construction shall be repaired at the encroaching party's expense. An NCDOT approved asphalt mix shall be used for all repairs within NCDOT rights of way. Contact Mr. Troy L. Baker, Senior Assistant District Engineer for acceptance of asphalt mix designs.

14. All open cuts (if permitted) on primary routes will require full depth patching with 5.0” of B 25.0 B (ACBC) Asphalt Concrete Base Course, 3.0” of I 19.0 B (ACIC) Asphalt Concrete Intermediate Course and 2.0” of S 9.5 B (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 2.0” and a width of 1.0’ on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

15. All open cuts (if permitted) on secondary routes will require full depth patching with 4.0” of B 25.0 C (ACBC) Asphalt Concrete Base Course and 3.0” of S 9.5 C (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 1.5” and a width of 1.0’ on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.

16. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the North Carolina Department of Transportation. All material to a depth of 8 inches below the finished surface shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The trench backfill material shall meet the Statewide Borrow criteria. The trench should be backfilled in accordance with Section 300-7 of the latest NCDOT Standard Specifications for Roads and Structures and Amendments or Supplementals thereto.

17. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of motorists and workers during construction and any subsequent maintenance. This shall be performed in conformance with the latest **NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures** and Amendments or Supplementals thereto. When there is no guidance provided in the Roadway Standard Drawings or Specifications, comply with the **Manual on Uniform Traffic Control Devices for Streets and Highways** and Amendment or Supplemental thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part. **All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.**

18. Disturbed areas shall have an established stand of vegetation according to the attached specifications for erosion control.

19. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.

20. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.

21. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.

22. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
23. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
24. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
25. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.
26. **Trenching, bore pits and/or other excavations shall not be left overnight. The contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.**
27. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
28. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
29. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.
30. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
31. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
32. No material storage shall be allowed along the shoulders of the roadway, and during non-working hours, equipment shall be parked as close to the right of way line as possible and shall be properly barricaded so that no equipment obstruction shall be within the Clear Recovery Area. No parking or material storage shall be allowed along the shoulders of any state maintained roadway.
33. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
34. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.

35. Excavations inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall should be made in accordance with the following conditions:
    - The trench backfill material should meet the Statewide Borrow Criteria. The trench should be backfilled in accordance with Section 300-7 of the latest **NCDOT Standard Specifications for Roads and Structures**, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by the NCDOT.
    - All trench excavation inside the limits of the theoretical 1:1 slope, as defined by the policy, should be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.
36. **When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within five (5) feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within fifteen (15) feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.**
37. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.
38. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.
39. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.
40. All roadway signs which are removed which are removed due to construction shall be reinstalled as soon as possible.
41. Any proposed driveway connections onto NCDOT roadways will require an approved driveway permit. The approval of this Two Party encroachment (RW 16.1A) does not constitute approval of any proposed driveway connections. For further information, contact Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601.
42. Excavated areas adjacent to pavement having more than a 2” drop shall be safed up at a 6:1 or flatter slope and designated by appropriate delineation during periods of inactivity, including, but not limited to, night and weekend hours. Excavated material shall not be placed on the roadway at any time.

43. **NCDOT reserves the right to further limit, restrict, or suspend operations within the Right of Way if, in the opinion of NCDOT, safety or traffic conditions warrant such action.**

44. It shall be the responsibility of the encroaching party to determine the location of other utilities within the encroachment area. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and to maintain accessibility to existing utilities.

45. **A qualified NCDOT inspector should be on site at all times during construction. The encroaching party should be required to reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector under the supervision of a Professional Engineer registered in North Carolina, on site at all times. The Registered Engineer should be required to certify that the structures have been installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.**

46. Excavation within 1000 feet of a signalized intersection will require notification by the party of the second part to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation.

47. All temporary and final paving markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number 910-364-0606 for review and approval.

48. The pavement marking contractor is required to have at least one member of every pavement marking crew that is working on the project, preferably the Crew Supervisor, be certified through the NCDOT Pavement Marking Technician Certification Process. For more information please contact the Work Zone Traffic Control Unit at (919) 773-2800 or **http://www.ncdot.org/doh/preconstruct/wztc/**".

49. Prior to installing pavement markings, contact Mr. Frank West with the NCDOT Division Six Traffic Services Unit at 910-364-0606 to review the proposed pavement-marking layout. This notification should take place a minimum of 48 hours in advance of the pavement marking installation.

50. Failure to contact the Traffic Services Unit to review the pavement-marking layout prior to installation may result in the removal and reinstallation of the markings at the expense of the Permittee.

51. All utility facilities, including but not limited to manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults, and covers within NCDOT right of way shall have been designed for HS-20 loading. A listing of currently approved manholes, valve boxes, and vaults is available at the following site: https://apps.dot.state.ns.us.vendor/approvedproducts . If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and calculations designed by a Professional Engineer registered in North Carolina for approval prior to construction.

52. All utility access points, including but not limited to manholes, splice boxes, junction boxes, and vaults shall be located outside of the right of way line. Manholes, splice boxes, junction boxes, and vaults shall not be placed in the ditch line, side slopes of the ditches, or in the pavement. All manholes, splice boxes, junction boxes, vaults, and covers shall be flush with the ground when located within the vehicle recovery area.

NCDOT WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personal performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance / Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) insidethe highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 662-4339 or skite@ncdot.gov or Roger Garrett at (919) 662-4383 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

If further information or assistance is needed in reference to this project, please feel free to call Mr. Lee R. Hines, Jr. (Richie), PE, District Engineer at (910) 364-0601.

Sincerely,

DS
TLB

DocuSigned by:
Greg W. Burns
Greg W. Burns, PE
Division Engineer

GWB:tlb

cc: https://connect.ncdot.gov/site/Permits/Pages/All-Submissions.aspx

SEEDING AND MULCHING:

(East)

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE SR 1121 PROJECT ______ COUNTY OF STATE OF NORTH CAROLINA Cumberland

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 23 day of Aug. , 20 19 , by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) SR 1121 , located In Cumberland County Approximately 50 feet south of the intersection of Parkton Rd (SR-1118) and McDonald Road (SR 1121) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

DocuSigned by:

BY: Greg W. Burns TLB

~~Asst. Manager of Right of Way~~

Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E. Compton

Christel E. Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

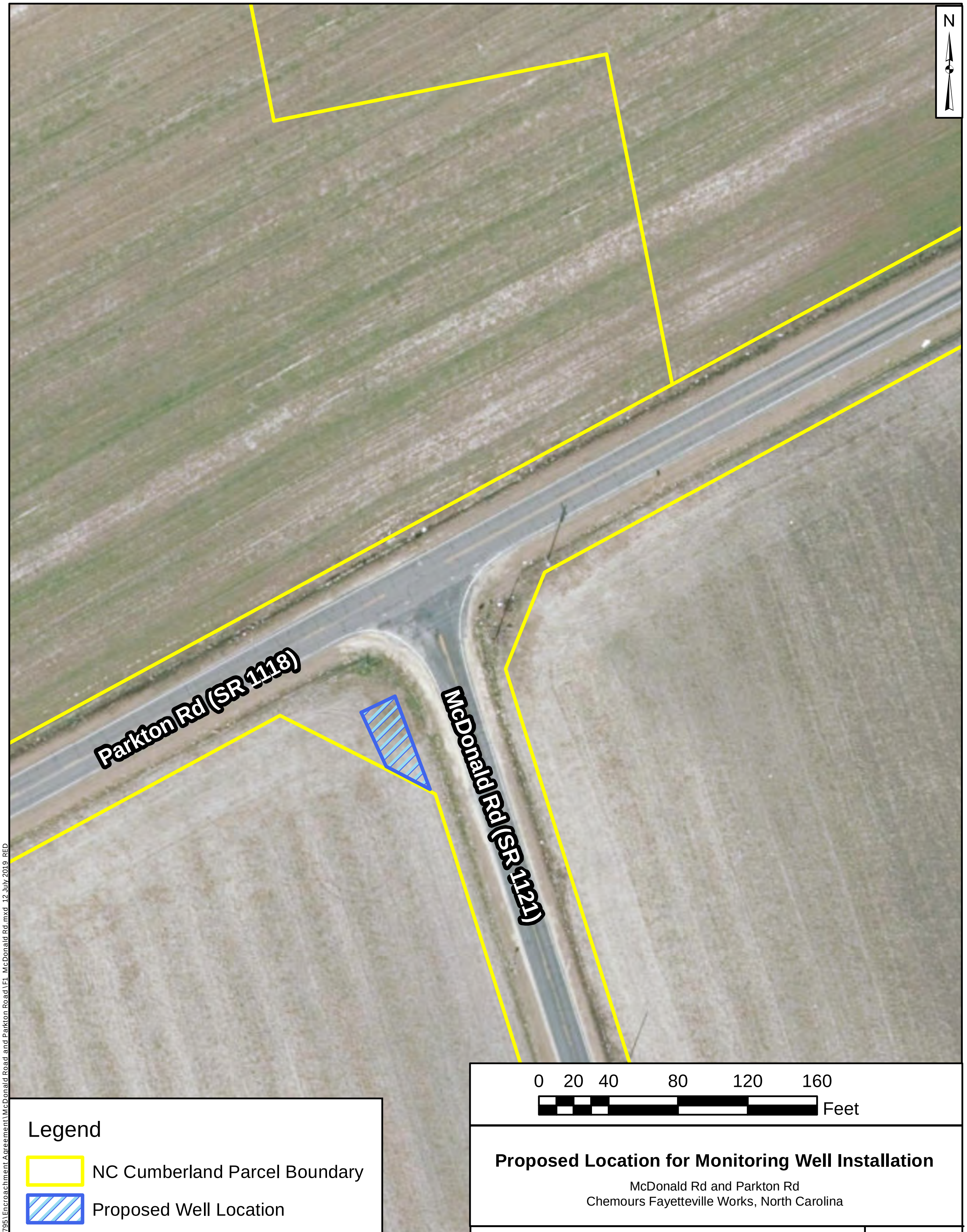
INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.



Legend

NC Cumberland Parcel Boundary

Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Cumberland County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

McDonald Rd and Parkton Rd
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Figure

1

Raleigh, NC

July 2019

Path: (Raleigh-01/Data) N:\TR0795\Encroachment Agreement\McDonald Road and Parkton Road\F1_McDonald Rd.mxd 12 July 2019 RED

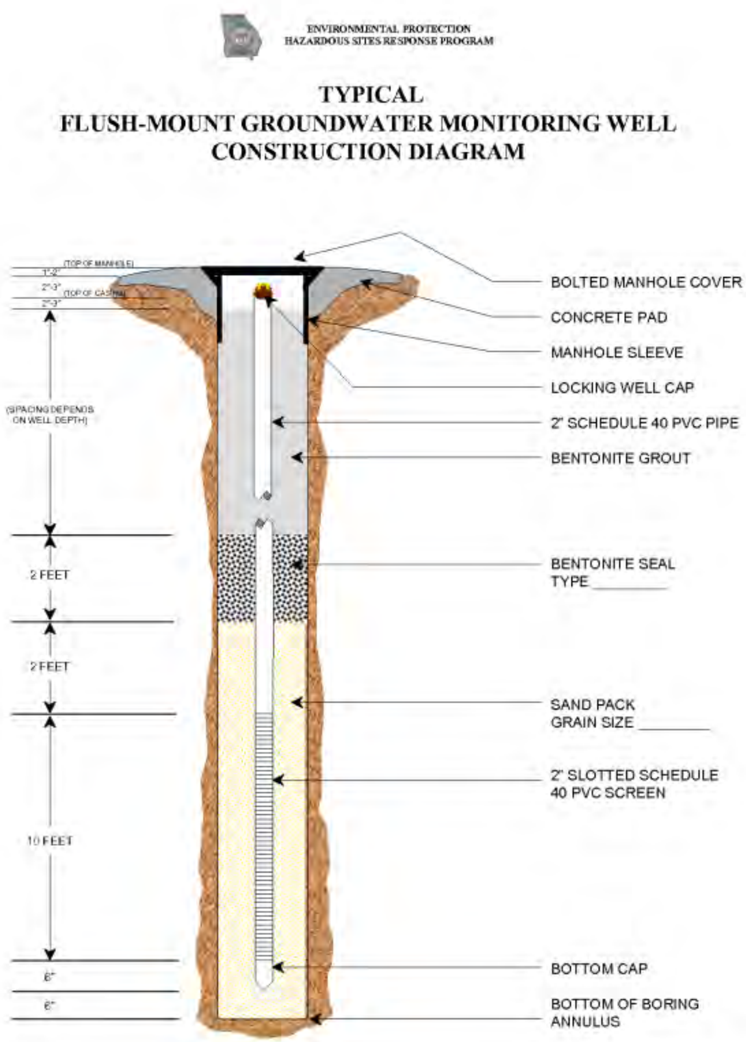


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

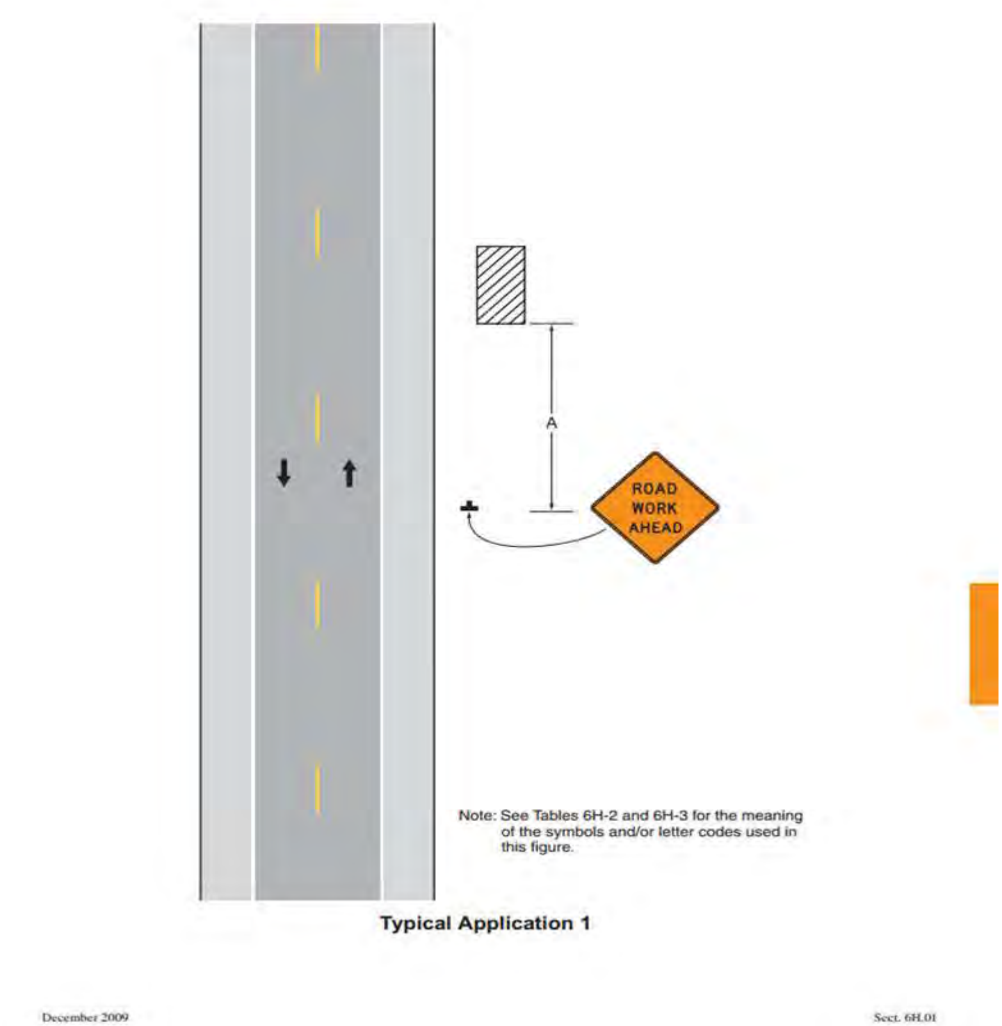


Figure 4: Temporary traffic control method as found from the *Manual on Uniform Traffic Control Devices.*

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of Parkton Road (SR 1118) and McDonald Road (SR 1121). (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour’s Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department’s Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, “Work Beyond the Shoulder, Typical Application 1” (**Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

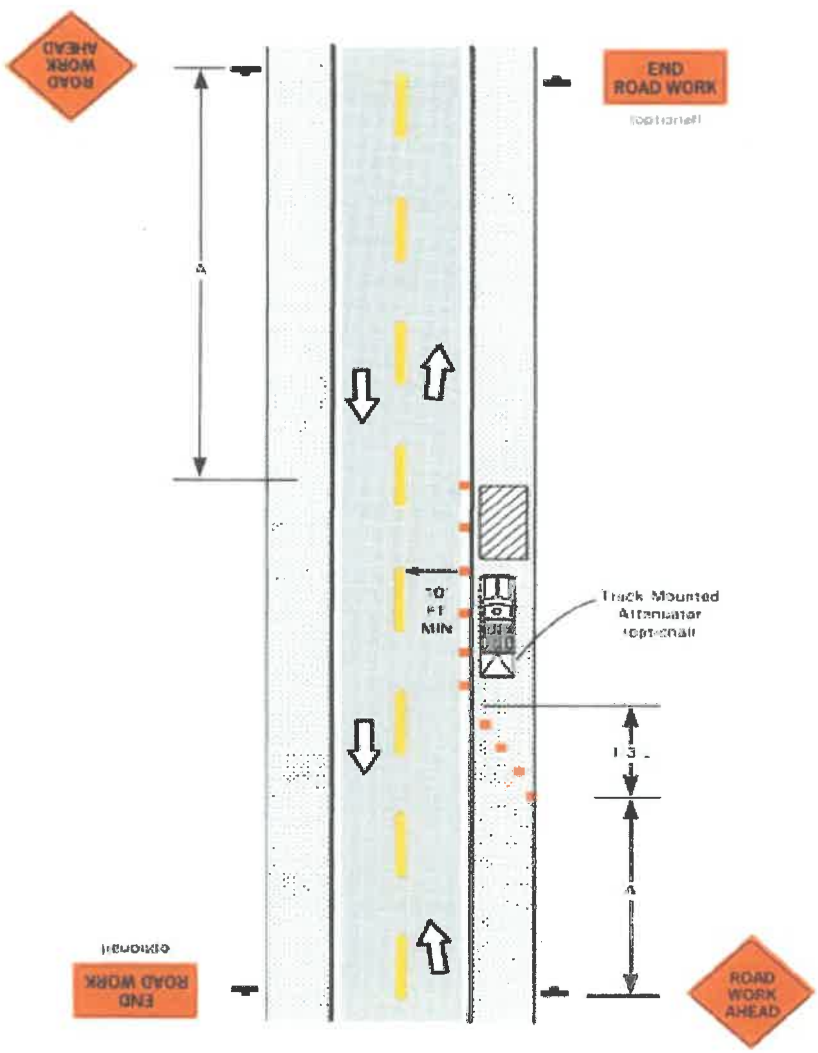


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

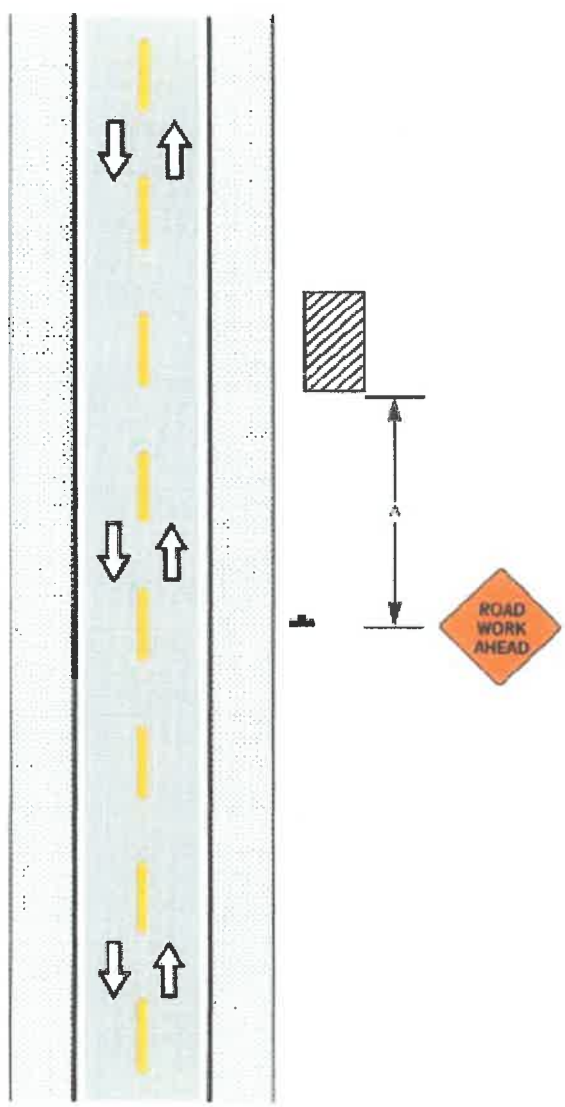


Figure TA-1

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Lee Hines
District Engineer
NCDOT
600 Southern Ave
Fayetteville, NC 28306-1524

Subject: Request for Right of Way Encroachment in Cumberland County
McDonald Road (SR 1121) near intersection with Parkton Road (SR 1118)
Geosyntec project # TR0795 SR1121-SR1118

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of five ROW encroachment requests in Cumberland County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of Parkton Road (SR 1118) and McDonald Road (SR 1121) in the Township of Rockfish in Cumberland County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

August 27, 2019

Ms. Christel Compton, Environmental Program Manager
The Chemours Company FC, LLC
22828 NC Highway 87 West
Fayetteville, North Carolina 28306

SUBJECT: Well Construction Permit No. WM06-01129
Two (2) monitoring wells: NCDOT right-of-way NC Hwy 210 & John Hall Rd site
(34.986503 & -78.753036)
Fayetteville, Cumberland County

Ms. Compton:

In accordance with the application prepared by Geosyntec Consultants of NC, PC dated 26 August 2019 and received in the Fayetteville Regional Office on 27 August 2019, we are forwarding herewith Well Construction Permit No. WM06-01126 dated 27 August 2019 issued to The Chemours Company FC, LLC for the construction of two (2) monitoring wells to be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 210 at the intersection of NC Hwy 210 and John Hall road in Fayetteville, North Carolina.

This Permit will be effective from the date of its issuance for one year and shall be subject to the conditions and limitations as specified therein.

Please note that according to North Carolina Administrative Code, Title 15A, Subchapter 2C, Section .0105 (g), "it is the responsibility of the well owner or his agent to see that a permit is secured prior to the commencement of construction of any well for which a permit is required."

Issuance of this permit does not constitute approval of the subject wells for reimbursement from Trust Funds.

If any parts, requirements, or limitations contained in this Permit are unacceptable to you, you have the right to an adjudicatory hearing before a hearing officer upon written demand to the Director within 30 days following receipt of this Permit, identifying the specific issues to be contended. Unless such demand is made, this Permit shall be final and binding.

Sincerely,

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs

cc: FRO Files
Cumberland County Health Department
NCDOT – Greg Burns
Geosyntec Consultants of NC, PC

NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES – WATER QUALITY PROGRAMS
PERMIT FOR THE CONSTRUCTION OF A MONITORING WELL

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations.

PERMISSION IS HEREBY GRANTED TO

THE CHEMOURS COMPANY FC, LLC

FOR THE CONSTRUCTION OF A MONITORING WELL SYSTEM consisting of two (2) monitoring wells owned by The Chemours Company FC, LLC located at 22828 NC Hwy 87 West, Fayetteville, North Carolina. The monitoring wells will be located in the North Carolina Department of Transportation right-of-way adjacent to NC Hwy 210 at the intersection of NC Hwy 210 and John Hall road in Fayetteville, Cumberland County, North Carolina. This Permit is issued in accordance with the application received on 27 August 2019, in conformity with specifications and supporting data, all of which are filed with the Department of Environmental Quality and are considered integral parts of this Permit.

This Permit is for **well construction only** and does not waive any provision or requirement of any other applicable law or regulation. Construction of any well under this Permit shall be in strict compliance with the North Carolina Well Construction Regulations and Standards (15A NCAC 02C .0100), and other State and Local Laws and regulations pertaining to well construction.

If any requirements or limitations specified in this Permit are unacceptable, you have a right to an adjudicatory hearing upon written request within 30 days of receipt of this Permit. The request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, North Carolina 27699-6714. Unless such a demand is made, this Permit is final and binding.

This Permit will be effective for one year from the date of its issuance and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. Issuance of this Permit does not obligate reimbursement from State trust funds, if these wells are being installed as part of an investigation for contamination from an underground storage tank or dry cleaner incident.
2. Issuance of this Permit does not supersede any other agreement, permit, or requirement issued by another agency.
3. The well(s) shall be located and constructed as shown on the attachments submitted as part of the Permit application.
4. Each well shall have a Well Contractor Identification Plate in accordance with 15A NCAC 02C .0108(o).
5. Well construction records (GW-1) for each well shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well completion.
6. When the well is discontinued or abandoned, it shall be abandoned in accordance with 15A NCAC 02C .0113 and a well abandonment record (GW-30) shall be submitted to the Division of Water Resources Information Processing Unit within 30 days of the well abandonment.

Permit issued the 27th day of August 2019
FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

Trent Allen

Trent Allen, Regional Supervisor
Division of Water Resources – Water Quality Programs
By Authority of the Environmental Management Commission
Permit No. # WM06-01129

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

August 23, 2019

Mr. Christel E. Compton
The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

SUBJECT: Encroachment Agreement on NC Highway 210 for the installation of two (2) groundwater monitoring wells in Cumberland County (E062-026-19-00208).

Dear Sir:

Attached is an approved R/W form 16.1A and plans for the installation of two (2) co-located flush mount environmental groundwater monitoring wells on NC Highway 210 as associated with the Chemours Fayetteville Works project in Cumberland County as shown on the attached plans (Geosyntec project #TR0795 SR2017-NC210).

Location:

Route	**At a point**	**Towards**
NC 210	50'± southeast the intersection of NC Highway 210 and SR 2017 (John Hall Road)	SR 2015

This encroachment is approved subject to the following:

1. **Within ninety (90) days of the completion of the proposed utility installation, an As-Built drawing(s) and a executed <u>Contractor Certification Memo</u> shall be submitted to the District Office (online encroachment database). The As-Built drawing(s) shall depict the horizontal and vertical locations of all utilities and associated appurtenances.**

2. The Cumberland County Maintenance Engineer at (910) 364-0602 and Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601 shall be notified a minimum of three (3) days before construction is to begin.

3. Traffic will be maintained and proper signs, signal lights, flagmen and other warning devices will be provided for the protection of traffic, in conformance with the latest **<u>Manual on Uniform Traffic Control Devices for Streets and Highways</u>.** All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.

4. **All lanes of traffic on NC Highway 210 are to be open during the hours of 6:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM <u>unless otherwise directed by the Engineer</u>. No lane of traffic shall be closed on holidays, special events, or as directed by the engineer. Traffic shall be maintained at all times.**

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
DIVISION SIX / DISTRICT TWO
POST OFFICE BOX 1150
FAYETTEVILLE, NC 28302

Telephone: (910) 364-0601
Fax: (910) 437-2529
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
600 SOUTHERN AVENUE
FAYETTEVILLE, NC 28306

5. **Any flush-mount groundwater monitoring well(s) shall be constructed at grade with the existing ground surface as not to interfere with the positive drainage of the roadway, roadway shoulder, drainage ditch and routine maintenance within departmental rights of way.**

6. **The proposed groundwater monitoring well(s) and other associated appurtenances are to be placed 5' or closer off of the right-of- way lines of NC Highway 210. All associated appurtenances must be placed behind the ditch line. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.**

7. Luminaire and utility poles shall be outside the Clear Recovery Area in accordance with the latest version of the AASHTO Roadside Design Guide or made breakaway in accordance with the requirements of NCHRP Report 350. Associated appurtenances will not be allowed to be placed in the ditch line or on the shoulder of the road.

8. **All concrete installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.**

9. All concrete sidewalk installed within NCDOT rights of way shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01 and 848.01) and Amendments or Supplementals thereto. All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

10. All ADA compliant curb ramps shall be constructed in accordance with the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 848.06) and Amendments or Supplementals thereto including but not limited to the Alternate Curb Ramp Designs (Curb Ramp Details - Parallel Ramps). All concrete shall be an approved NCDOT Class B mix. All materials testing results shall be provided to the District Engineer upon completion of the project.

11. All 30" curb and gutter within NCDOT rights of way shall be constructed with Class B concrete in accordance with Section 846 of the latest NCDOT Standard Specifications for Roads and Structures and Roadway Standard Drawings (Std. Dwg. No. 846.01) and Amendment or Supplemental thereto or as directed by the engineer. All concrete testing results shall be provided to the District Engineer's office at time of project completion.

12. **Open cuts are not permitted on NC Highway 242.**

13. Any asphalt that is damaged as a result of construction shall be repaired at the encroaching party's expense. An NCDOT approved asphalt mix shall be used for all repairs within NCDOT rights of way. Contact Mr. Troy L. Baker, Senior Assistant District Engineer for acceptance of asphalt mix designs.

14. All open cuts (if permitted) on primary routes will require full depth patching with 5.0" of B 25.0 B (ACBC) Asphalt Concrete Base Course, 3.0" of I 19.0 B (ACIC) Asphalt Concrete Intermediate Course and 2.0" of S 9.5 B (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 2.0" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.
15. All open cuts (if permitted) on secondary routes will require full depth patching with 4.0" of B 25.0 C (ACBC) Asphalt Concrete Base Course and 3.0" of S 9.5 C (ACSC) Asphalt Concrete Surface Course the same day as cut is made. It will also be required to mill the existing pavement surface at a depth of 1.5" and a width of 1.0' on each side of the cut to key in the patch with the existing pavement surface in accordance with the attached detail.
16. All fill areas/backfill shall be compacted to 95% density in accordance with AASHTO T99 as modified by the North Carolina Department of Transportation. All material to a depth of 8 inches below the finished surface shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T99 as modified by the department. The subgrade shall be compacted at a moisture content which is approximately that required to produce the maximum density indicated by the above test method. The contractor shall dry or add moisture to the subgrade when required to provide a uniformly compacted and acceptable subgrade. The trench backfill material shall meet the Statewide Borrow criteria. The trench should be backfilled in accordance with Section 300-7 of the latest NCDOT Standard Specifications for Roads and Structures and Amendments or Supplementals thereto.
17. The party of the second part agrees to provide traffic control devices, lane closures, road closures, positive protection and/or any other warning or positive protection devices necessary for the safety of motorists and workers during construction and any subsequent maintenance. This shall be performed in conformance with the latest **NCDOT Roadway Standard Drawings and Standard Specifications for Roads and Structures** and Amendments or Supplementals thereto. When there is no guidance provided in the Roadway Standard Drawings or Specifications, comply with the **Manual on Uniform Traffic Control Devices for Streets and Highways** and Amendment or Supplemental thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part. **All contractor personnel will be required to wear a class II ANSI approved safety vest while working within the DOT right of way.**
18. Disturbed areas shall have an established stand of vegetation according to the attached specifications for erosion control.
19. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
20. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
21. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.

22. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
23. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
24. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
25. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.
26. **Trenching, bore pits and/or other excavations shall not be left overnight. The contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.**
27. An executed copy of this encroachment agreement shall be present at the construction site at all times during construction. If safety or traffic conditions warrant such an action, NCDOT reserves the right to further limit, restrict or suspend operations within the right of way.
28. Written notice of the completion of the work will be furnished to the District Engineer, P. O. Box 1150, Fayetteville, North Carolina 28302, when the work has been completed.
29. SDR-26 PVC pipe shall not be used on NCDOT Rights of Way for lines under pressure.
30. Please be reminded that all OSHA Standards regarding trenching and shoring should be strictly adhered to.
31. The Contractor shall comply with all OSHA requirements and provide a competent person on site to supervise excavation at all times.
32. No material storage shall be allowed along the shoulders of the roadway, and during non-working hours, equipment shall be parked as close to the right of way line as possible and shall be properly barricaded so that no equipment obstruction shall be within the Clear Recovery Area. No parking or material storage shall be allowed along the shoulders of any state maintained roadway.
33. The Department of Transportation does not guarantee the right of way on this road, nor will it be responsible for any claim for damages brought by any property owner by reason of the installation.
34. The encroaching party shall comply with all applicable federal, state, and local environmental regulations, and shall obtain all necessary federal, state, and local environmental permits, including but not limited to, those related to sediment control, storm water, wetland, streams, endangered species, and historical sites.

35. Excavations inside the theoretical 1:1 slope from the existing edge of pavement to the bottom of the nearest excavation wall should be made in accordance with the following conditions:
    - The trench backfill material should meet the Statewide Borrow Criteria. The trench should be backfilled in accordance with Section 300-7 of the latest **NCDOT Standard Specifications for Roads and Structures**, which basically requires the backfill material to be placed in layers not to exceed 6 inches loose and compacted at least 95% of the density obtained by compacting a sample in accordance with AASHTO T99 as modified by the NCDOT.
    - All trench excavation inside the limits of the theoretical 1:1 slope, as defined by the policy, should be completely backfilled and compacted at the end of each construction day. No portion of the trench shall be left open overnight.

36. **When personnel and/or equipment are working on the shoulder adjacent to an undivided facility and within five (5) feet of an open travel lane, close the nearest open travel lane using Standard Drawing No. 1101.02 unless the work area is protected by barrier or guardrail. When personnel and/or equipment are working within a lane of travel of an undivided or divided facility, close the lane according to the traffic control plans, or as directed by the Engineer. Conduct the work so that all personnel and/or equipment remain within the closed travel lane. Do not work simultaneously, on both sides of an open travel way, within the same location, on a two-lane, two-way road. Do not perform work involving heavy equipment within fifteen (15) feet of the edge of travel way when work is being performed behind a lane closure on the opposite side of the travel way. Perform work only when weather and visibility conditions allow safe operations as directed by the Engineer.**

37. Drainage structures shall not be blocked with excavation materials. Any drainage structure disturbed or damaged shall be restored to its original condition as directed by the District Engineer.

38. Any disturbed guardrail shall be reset according to the applicable standard or as directed by the District Engineer.

39. All driveways altered during construction shall be returned to a state comparable with the condition of the driveways prior to construction.

40. All roadway signs which are removed which are removed due to construction shall be reinstalled as soon as possible.

41. Any proposed driveway connections onto NCDOT roadways will require an approved driveway permit. The approval of this Two Party encroachment (RW 16.1A) does not constitute approval of any proposed driveway connections. For further information, contact Mr. Troy L. Baker, Senior Assistant District Engineer at (910) 364-0601.

42. Excavated areas adjacent to pavement having more than a 2” drop shall be safed up at a 6:1 or flatter slope and designated by appropriate delineation during periods of inactivity, including, but not limited to, night and weekend hours. Excavated material shall not be placed on the roadway at any time.

43. **NCDOT reserves the right to further limit, restrict, or suspend operations within the Right of Way if, in the opinion of NCDOT, safety or traffic conditions warrant such action.**
44. It shall be the responsibility of the encroaching party to determine the location of other utilities within the encroachment area. The encroaching party shall be responsible for notifying other utility owners and providing protection and safeguards to prevent damage or interruption to existing facilities and to maintain accessibility to existing utilities.
45. **A qualified NCDOT inspector should be on site at all times during construction. The encroaching party should be required to reimburse NCDOT for the cost of providing the inspector. If NCDOT cannot supply an inspector, the encroaching party (not the utility contractor) should make arrangements to have a qualified inspector under the supervision of a Professional Engineer registered in North Carolina, on site at all times. The Registered Engineer should be required to certify that the structures have been installed in accordance with the encroachment agreement and that the backfill material meets the Statewide Borrow Criteria.**
46. Excavation within 1000 feet of a signalized intersection will require notification by the party of the second part to the Division Traffic Engineer at telephone number (910) 364-0606. All traffic signal or detection cables must be located prior to excavation.
47. All temporary and final paving markings are the responsibility of the encroaching party. Final pavement markings and sign plans shall be submitted to the Division Traffic Engineer at telephone number 910-364-0606 for review and approval.
48. The pavement marking contractor is required to have at least one member of every pavement marking crew that is working on the project, preferably the Crew Supervisor, be certified through the NCDOT Pavement Marking Technician Certification Process. For more information please contact the Work Zone Traffic Control Unit at (919) 773-2800 or **http://www.ncdot.org/doh/preconstruct/wztc/”**.
49. Prior to installing pavement markings, contact Mr. Frank West with the NCDOT Division Six Traffic Services Unit at 910-364-0606 to review the proposed pavement-marking layout. This notification should take place a minimum of 48 hours in advance of the pavement marking installation.
50. Failure to contact the Traffic Services Unit to review the pavement-marking layout prior to installation may result in the removal and reinstallation of the markings at the expense of the Permittee.
51. All utility facilities, including but not limited to manholes, valve boxes, meter boxes, splice boxes, junction boxes, vaults, and covers within NCDOT right of way shall have been designed for HS-20 loading. A listing of currently approved manholes, valve boxes, and vaults is available at the following site: https://apps.dot.state.ns.us.vendor/approvedproducts . If any proposed structure is not of a design pre-approved by NCDOT, the encroaching party shall submit details and calculations designed by a Professional Engineer registered in North Carolina for approval prior to construction.

52. All utility access points, including but not limited to manholes, splice boxes, junction boxes, and vaults shall be located outside of the right of way line. Manholes, splice boxes, junction boxes, and vaults shall not be placed in the ditch line, side slopes of the ditches, or in the pavement. All manholes, splice boxes, junction boxes, vaults, and covers shall be flush with the ground when located within the vehicle recovery area.

NCDOT WORK ZONE TRAFFIC CONTROL QUALIFICATIONS AND TRAINING PROGRAM

All personal performing any activity inside the highway right of way are required to be familiar with the NCDOT Maintenance / Utility Traffic Control Guidelines (MUTCG). No specific training course or test is required for qualification in the Maintenance / Utility Traffic Control Guidelines (MUTCG).

All flagging, spotting, or operating Automated Flagger Assist Devices (AFAD) insidethe highway right of way requires qualified and trained Work Zone Flaggers. Training for this certification is provided by NCDOT approved training resources and by private entities that have been pre-approved to train themselves.

All personnel in charge of overseeing work zone Temporary Traffic Control operations and installations inside the highway right of way are required to be qualified and trained Work Zone Supervisors. Training for this certification is provided by NCDOT approved training resources.

For questions and/or additional information regarding this training program please refer to our web site at https://connect.ncdot.gov/projects/WZTC/Pages/Training.aspx or call J.S. (Steve) Kite, PE at (919) 662-4339 or skite@ncdot.gov or Roger Garrett at (919) 662-4383 or rmgarrett@ncdot.gov, both with the NCDOT Work Zone Traffic Control Section.

If further information or assistance is needed in reference to this project, please feel free to call Mr. Lee R. Hines, Jr. (Richie), PE, District Engineer at (910) 364-0601.

Sincerely,

DS
TLB

DocuSigned by:
Greg W. Burns

Greg W. Burns, PE
Division Engineer

GWB:tlb

cc: https://connect.ncdot.gov/site/Permits/Pages/All-Submissions.aspx

SEEDING AND MULCHING: **(East)**

The kinds of seed and fertilizer, and the rates of application of seed, fertilizer, and limestone, shall be as stated below. During periods of overlapping dates, the kind of seed to be used shall be determined. All rates are in pounds per acre.

All Roadway Areas

March 1 - August 31		**September 1 - February 28**	
50#	Tall Fescue	50#	Tall Fescue
10#	Centipede	10#	Centipede
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Waste and Borrow Locations

March 1 – August 31		**September 1 - February 28**	
75#	Tall Fescue	75#	Tall Fescue
25#	Bermudagrass (hulled)	35#	Bermudagrass (unhulled)
500#	Fertilizer	500#	Fertilizer
4000#	Limestone	4000#	Limestone

Note: 50# of Bahiagrass may be substituted for either Centipede or Bermudagrass only upon Engineer's request.

Approved Tall Fescue Cultivars

Adventure	Brookstone	Grande	Rebel Jr
Adventure II	Bonanza	Guardian	Rebel II
Airlie	Bonanza II	Houndog	Red Coat
Amigo	Bulldog 51	Inferno	Renegade
Anthem	Chapel Hill	Jaguar	Safari
Anthem II	Chesapeake	Jaguar III	Shelby
Apache	Chieftain	Kentucky 31	Shenandoah
Apache II	Coronado	Kitty Hawk	Southern Choice II
Arid	Crossfire II	Monarch	South Paw
Arid II	Debutante	Montauk	Tempo
Arid III	Duster	Mustang	Titan
Aztec II	Escalade	Olympic	Tomahawk
Barfexas	Falcon	Pacer	Tacer
Barfexas II	Falcon III	Paraiso	Trailblazer
Barrera	Finelawn	Pixie	Tribute
Barrington	Finelawn I	Pyramid	Trooper
Bingo	Finelawn Petite	Quest	Wolfpack
Bravo	Genesis	Rebel	Wrangler

On cut and fill slopes 2:1 or steeper Centipede shall be applied at the rate of 5 pounds per acre and add 20# of Sericea Lespedeza from January 1 - December 31.

Fertilizer shall be 10-20-20 analysis. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as a 10-20-20 analysis.

TEMPORARY SEEDING:

Fertilizer shall be the same analysis as specified for *Seeding and Mulching* and applied at the rate of 400 pounds and seeded at the rate of 50 pounds per acre. Sweet Sudan Grass, German Millet or Browntop Millet shall be used in summer months and Rye Grain during the remainder of the year. The Engineer will determine the exact dates for using each kind of seed.

FERTILIZER TOPDRESSING:

Fertilizer used for topdressing on all roadway areas except slopes 2:1 and steeper shall be 10-20-20. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided grade and shall be applied at the rate of 500 pounds per acre. Upon the 1-2-2 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 10-20-20 analysis.

Fertilizer used for topdressing on slopes 2:1 and steeper and waste and borrow areas shall be 16-8-8 grade and shall be applied at the rate of 500 pounds per acre. Upon written approval of the Engineer, a different analysis of fertilizer may be used provided the 2-1-1 ratio is maintained and the rate of application adjusted to provide the same amount of plant food as 16-8-8 analysis.

SUPPLEMENTAL SEEDING:

The kinds of seed and proportions shall be the same as specified for *Seeding and Mulching*, with the exception that no centipede seed will be used in the seed mix for supplemental seeding. The rate of application for supplemental seeding may vary from 25# to 75# per acre. The actual rate per acre will be determined prior to the time of topdressing and the Contractor will be notified in writing of the rate per acre, total quantity needed, and areas on which to apply the supplemental seed. Minimum tillage equipment, consisting of a sod seeder shall be used for incorporating seed into the soil as to prevent disturbance of existing vegetation. A clodbuster (ball and chain) may be used where degree of slope prevents the use of a sod seeder.

MOWING:

The minimum mowing height on this project shall be 4 inches.

ROUTE NC-210 PROJECT ______ COUNTY OF STATE OF NORTH CAROLINA Cumberland

DEPARTMENT OF TRANSPORTATION

-AND-

The Chemours Company, FC LLC – Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

RIGHT OF WAY ENCROACHMENT AGREEMENT FOR NON-UTILITY ENCROACHMENTS ON PRIMARY AND SECONDARY HIGHWAYS

THIS AGREEMENT, made and entered into this the 23 day of Aug. , 20 19 , by and between the Department of Transportation, party of the first part; and The Chemours Company, FC LLC - Fayetteville Works party of the second part,

W I T N E S S E T H

THAT WHEREAS, the party of the second part desires to encroach on the right of way of the public road designated as Route(s) NC Hwy 210 , located In Cumberland County At / near intersection of NC Hwy 210 and John Hall Road (SR 2017) with the construction and/or erection of: Groundwater monitoring well(s)

WHEREAS, it is to the material advantage of the party of the second part to effect this encroachment, and the party of the first part in the exercise of authority conferred upon it by statute, is willing to permit the encroachment within the limits of the right of way as indicated, subject to the conditions of this agreement;

NOW, THEREFORE, IT IS AGREED that the party of the first part hereby grants to the party of the second part the right and privilege to make this encroachment as shown on attached plan sheet(s), specifications and special provisions which are made a part hereof upon the following conditions, to wit:

That the said party of the second part binds and obligates himself to install and maintain the encroaching facility in such safe and proper condition that it will not interfere with or endanger travel upon said highway, nor obstruct nor interfere with the proper maintenance thereof, to reimburse the party of the first part for the cost incurred for any repairs or maintenance to its roadways and structures necessary due to the installation and existence of the facilities of the party of the second part, and if at any time the party of the first part shall require the removal of or changes in the location of the said facilities, that the said party of the second part binds himself, his successors and assigns, to promptly remove or alter the said facilities, in order to conform to the said requirement, without any cost to the party of the first part.

That the party of the second part agrees to provide during construction and any subsequent maintenance proper signs, signal lights, flagmen and other warning devices for the protection of traffic in conformance with the latest Manual on Uniform Traffic Control Devices for Streets and Highways and Amendments or Supplements thereto. Information as to the above rules and regulations may be obtained from the Division Engineer of the party of the first part.

That the party of the second part hereby agrees to indemnify and save harmless the party of the first part from all damages and claims for damage that may arise by reason of the installation and maintenance of this encroachment.

It is clearly understood by the party of the second part that the party of the first part will assume no responsibility for any damage that may be caused to such facilities, within the highway rights of way limits, in carrying out its construction and maintenance operations.

That the party of the second part agrees to restore all areas disturbed during installation and maintenance to the satisfaction of the Division Engineer of the party of the first part. The party of the second part agrees to exercise every reasonable precaution during construction and maintenance to prevent eroding of soil; silting or pollution of rivers, streams, lakes, reservoirs, other water impoundments, ground surfaces or other property; or pollution of the air. There shall be compliance with applicable rules and regulations of the North Carolina Division of Environmental Management, North Carolina Sedimentation Control Commission, and with ordinances and regulations of various counties, municipalities and other official agencies relating to pollution prevention and control. When any installation or maintenance operation disturbs the ground surface and existing ground cover, the party of the second part agrees to remove and replace the sod or otherwise reestablish the grass cover to meet the satisfaction of the Division Engineer of the party of the first part.

That the party of the second part agrees to assume the actual cost of any inspection of the work considered to be necessary by the Division Engineer of the party of the first part.

That the party of the second part agrees to have available at the encroaching site, at all times during construction, a copy of this agreement showing evidence of approval by the party of the first part. The party of the first part reserves the right to stop all work unless evidence of approval can be shown.

Provided the work contained in this agreement is being performed on a completed highway open to traffic; the party of the second part agrees to give written notice to the Division Engineer of the party of the first part when all work contained herein has been completed. Unless specifically requested by the party of the first part, written notice of completion of work on highway projects under construction will not be required.

That in the case of noncompliance with the terms of this agreement by the party of the second part, the party of the first part reserves the right to stop all work until the facility has been brought into compliance or removed from the right of way at no cost to the party of the first part.

That it is agreed by both parties that this agreement shall become void if actual construction of the work contemplated herein is not begun within one (1) year from the date of authorization by the party of the first part unless written waiver is secured by the party of the second part from the party of the first part.

R/W (161A) : Party of the Second Part certifies that this agreement is true and accurate copy of the form R/W (161A) incorporating all revisions to date.

IN WITNESS WHEREOF, each of the parties to this agreement has caused the same to be executed the day and year first above written.

DEPARTMENT OF TRANSPORTATION

DocuSigned by:

BY: Greg W. Burns TLB

~~Asst. Manager of Right of Way~~
Division Engineer

ATTEST OR WITNESS:

Sonya Vargas

Sonya Vargas

22828 NC Highway 87 W, Fayetteville, NC 28306

Christel E Compton

Christel E Compton

22828 NC Highway 87 W, Fayetteville, NC 28306

Second Party

INSTRUCTIONS

When the applicant is a corporation or a municipality, this agreement must have the corporate seal and be attested by the corporation secretary or by the empowered city official, unless a waiver of corporate seal and attestation by the secretary or by the empowered City official is on file in the Raleigh office of the Manager of Right of Way. In the space provided in this agreement for execution, the name of the corporation or municipality shall be typed above the name, and title of all persons signing the agreement should be typed directly below their signature.

When the applicant is not a corporation, then his signature must be witnessed by one person. The address should be included in this agreement and the names of all persons signing the agreement should be typed directly below their signature.

This agreement must be accompanied, in the form of an attachment, by plans or drawings showing the following applicable information:

1. All roadways and ramps.
2. Right of way lines and where applicable, the control of access lines.
3. Location of the proposed encroachment.
4. Length and type of encroachment.
5. Drainage structures or bridges if affected by encroachment.
6. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
7. Horizontal alignment indicating general curve data, where applicable.
8. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
9. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
10. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
11. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
12. Erosion and sediment control.
13. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
14. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
15. Method of handling traffic during construction where applicable.
16. Scale of plans, north arrow, etc.

0 15 30 60 90 120
Feet

Legend

- NC Cumberland Parcel Boundary
- Proposed Well Location

Notes:
1. Aerial imagery provided by ArcMap10.5, ESRI
2. Parcel information provided by Cumberland County (http://data.nconemap.gov/downloads/vector/parcels/).

Proposed Location for Monitoring Well Installation

John Hall Rd and Hwy 210
Chemours Fayetteville Works, North Carolina

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | July 2019

Figure
1

Path: (Raleigh-01/Data) N:\TR0795\Encroachment Agreement\John Hall Road and Hwy 210\F1_John Hall Rd.mxd 15 July 2019 RED

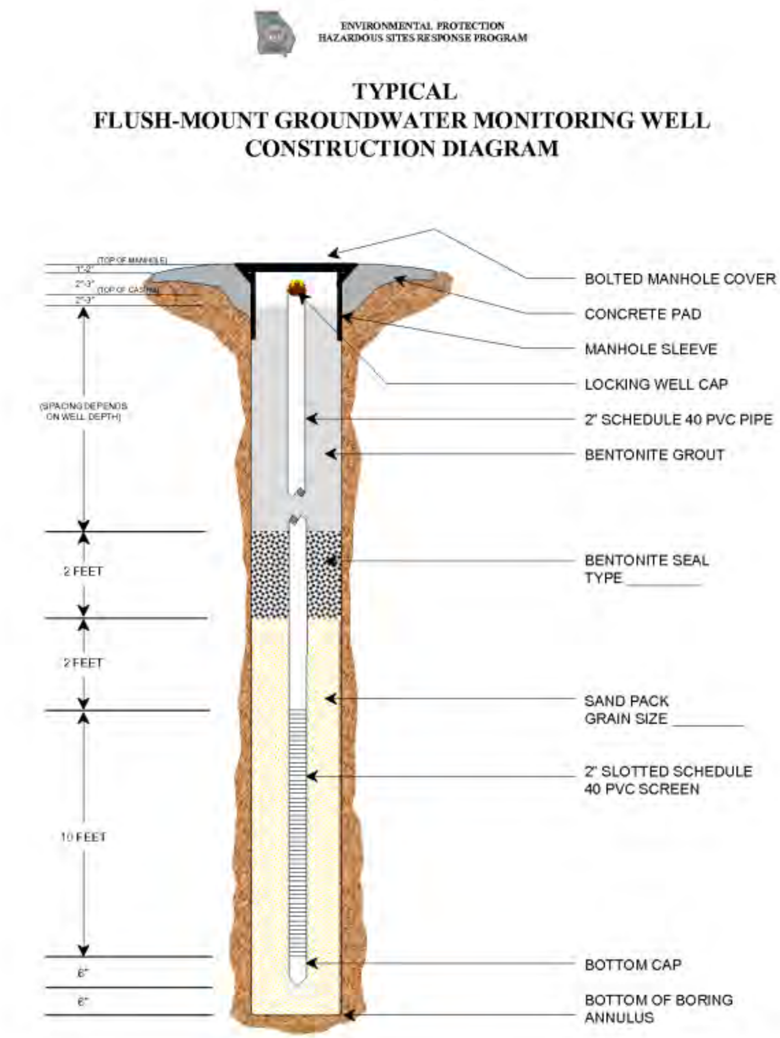


Figure 2: Typical Well construction

Figure 3: Typical appearance of a completed well at grade.

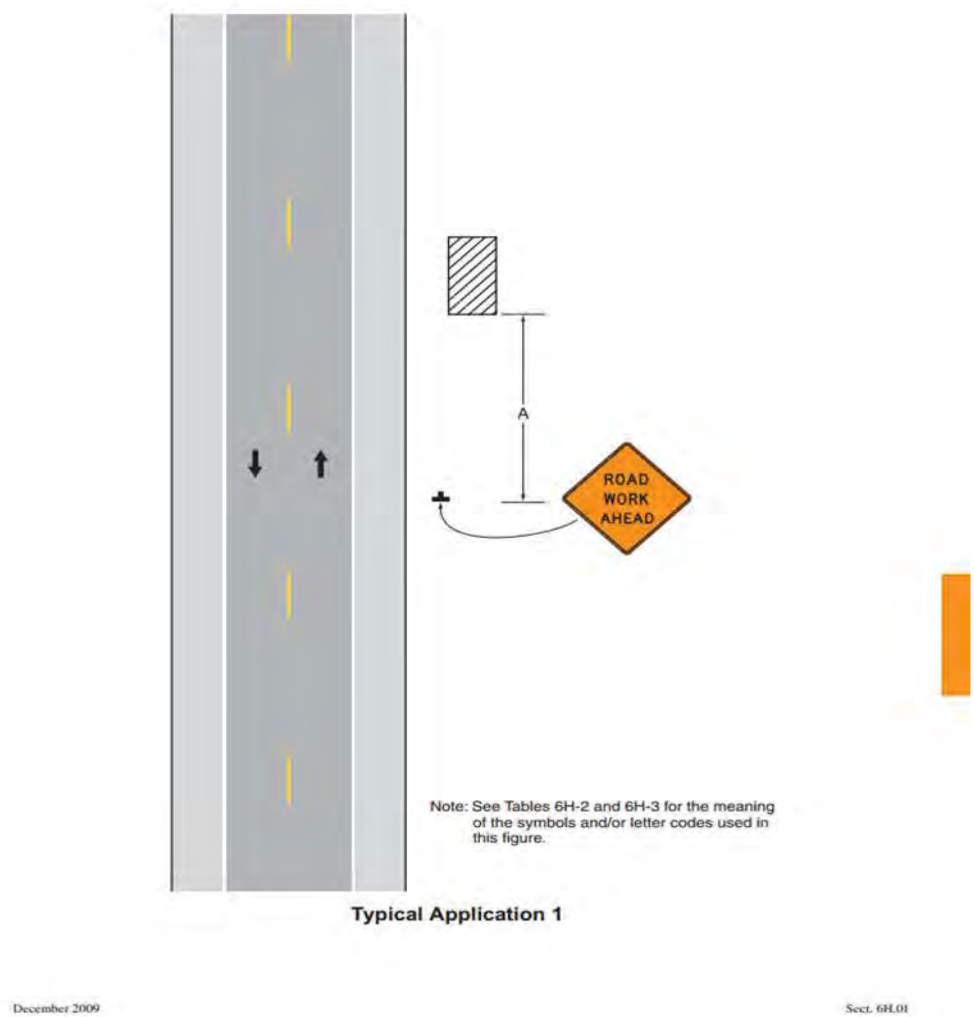


Figure 4: Temporary traffic control method as found from the *Manual on Uniform Traffic Control Devices.*

Agreement Checklist

1. All roadways and ramps.
    - See **Figure 1**
2. Right of way lines and where applicable, the control of access lines.
    - See **Figure 1**
    - Please notify Geosyntec if Plat drawing is available for official ROW information
3. Location of the proposed encroachment.
    - See **Figure 1**
    - Final monitoring well locations is dependent on conflicts with existing above ground and underground utilities in the ROW
4. Length and type of encroachment.
    - Flush mount monitoring well, within 2' x 2' concrete pad (**Figures 2 and 3**)
    - 8" manhole covers, H-20 rated, bolted down
    - Vertical boring depth will range from 40'-90' below ground surface
5. Location by highway survey station number. If station number cannot be obtained, location should be shown by distance from some identifiable point, such as a bridge, road, intersection, etc. (To assist in preparation of the encroachment plan, the Department's roadway plans may be seen at the various Highway Division Offices, or at the Raleigh office.)
    - Monitoring well locations will be located within the ROW at / near the intersection of John Hall Road (SR 2017) and NC Highway 210. (see **Figure 1**).
    - The proposed monitoring well borings are subject to minor relocation based on existing utilities and NCDOT ROW records.
6. Drainage structures or bridges if affected by encroachment.
    - Not Applicable
7. Typical section indicating the pavement design and width, and the slopes, widths and details for either a curb and gutter or a shoulder and ditch section, whichever is applicable.
    - Not Applicable
8. Horizontal alignment indicating general curve data, where applicable.
    - Not Applicable
9. Vertical alignment indicated by percent grade, P.I. station and vertical curve length, where applicable.
    - Not Applicable
10. Amount of material to be removed and/or placed on NCDOT right of way, if applicable.
    - Not Applicable
11. Cross-sections of all grading operations, indicating slope ratio and reference by station where applicable.
    - Not Applicable
12. All pertinent drainage structures proposed. Include all hydraulic data, pipe sizes, structure details and other related information.
    - Not Applicable
13. Erosion and sediment control.

- Not Applicable

14. Any special provisions or specifications as to the performance of the work or the method of construction that may be required by the Department must be shown on a separate sheet attached to encroachment agreement provided that such information cannot be shown on plans or drawings.
    - Wells will be installed by a NC licensed driller in accordance with 15A North Carolina Administrative Code, Sub-chapter 2C. All investigation derived waste will be transported to Chemour's Fayetteville Works facility.
    - Geosyntec will coordinate with 811 / MISS UTILITY to have the public utilities located and marked in the field prior to boring. A private utility locator may be used as well. The wells will be constructed as shown in the attached **Figure 2**. The surface completion will be flush to the current ROW grade (**Figure 3**). We estimate it will take 3 to 4 days. Drilling and support vehicles will be located entirely on the road shoulder.
15. The Department's Division Engineer should be given notice by the applicant prior to actual starting of installation included in this agreement.
    - Noted
16. Method of handling traffic during construction where applicable.
    - Unless otherwise suggested, traffic handling will follow procedures from the Manual on Uniform Traffic Control Devices, Chapter 6, Temporary Traffic Control, page 635, "Work Beyond the Shoulder, Typical Application 1" (**Figure 4).**
17. Scale of plans, north arrow, etc.
    - See **Figure 1**

Shoulder Work with Minor Encroachment

1. The treatment shown may be used on a minor road having low speeds. For higher speed traffic conditions, a lane closure should be considered.
2. The procedure shown should be adequate to carry bi-directional traffic at reduced speed through the activity area, provided the lanes are at least 10 feet wide.
3. Where the opposite shoulder is suitable for carrying traffic and of adequate width, traffic lanes may be shifted by use of closely spaced channelizing devices, provided 10-foot-wide lanes are maintained.
4. Additional advance warning may be appropriate, such as a Road NARROWS sign.
5. Portable concrete barriers may be used along the work space.
6. The protection vehicle is optional if a taper and channelizing devices are used. For short-duration work, the taper and channelizing devices are optional if the protection vehicle with an activated flashing yellow light is used.

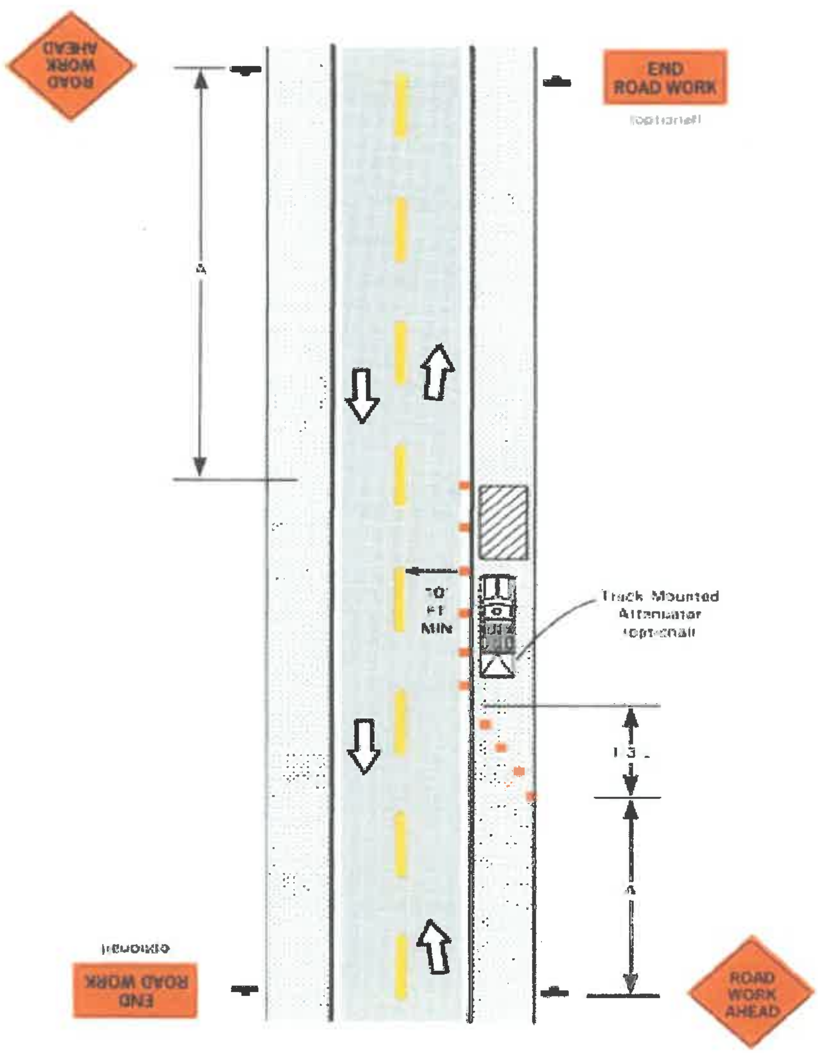


Figure TA-6

Work Beyond the Shoulder

1. The signs illustrated in this figure are not required if the work space is behind a barrier, more than 2 feet behind the curb, or 15 feet or more from the edge of any roadway.
2. The ROAD WORK AHEAD sign may be replaced with other appropriate signs, such as the SHOULDER WORK sign. The SHOULDER WORK sign may be used for work adjacent to the shoulder.
3. If the work space is in the median of a divided highway, an advance warning sign should also be placed on the left side the directional roadway.
4. For short-term, short-duration, or mobile operation, all signs and channelizing devices may be eliminated if a vehicle with an activated flashing or revolving yellow light is used.

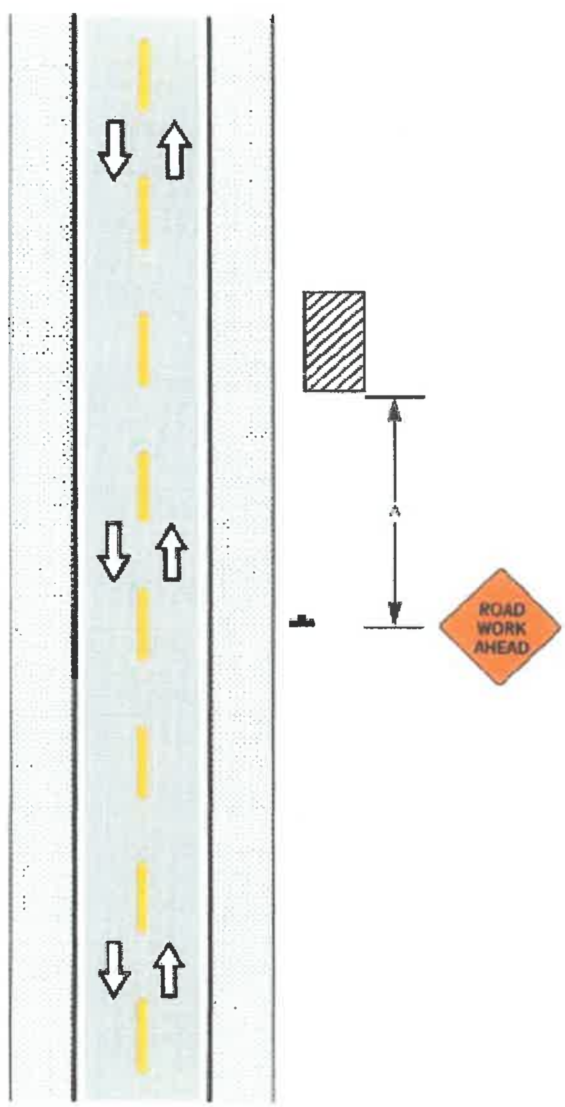


Figure TA-1

Geosyntec consultants

Geosyntec Consultants of NC, PC

Geosyntec Consultants of NC, PC
2501 Blue Ridge Road, Suite 430
Raleigh, North Carolina 27607
PH 919.870.0576
www.geosyntec.com

18 July 2019

Mr. Lee Hines
District Engineer
NCDOT
600 Southern Ave.
Fayetteville, NC 28306-1524

Subject: Request for Right of Way Encroachment in Cumberland County
John Hall Road (SR2017) and NC Highway 210
Geosyntec project #TR0795 SR2017-NC210

On behalf of our client, The Chemours Company FC, LLC, (Chemours), Geosyntec Consultants of NC, PC (Geosyntec) has prepared this request for a Right of Way (ROW) Encroachment as detailed in the following attachments. This request package has been prepared consistent with the State of North Carolina's standard Right of Way Encroachment Agreement for Non-Utility Encroachments on Primary and Secondary Highways (Form R/W 16.1A –January 1981). This is one of five ROW encroachment requests in Cumberland County.

Geosyntec is an environmental consulting firm working for Chemours to assess the horizontal and vertical extents of PFAS compounds in groundwater. More specifically, this assessment requires groundwater monitoring wells offsite of Chemour's Fayetteville Works facility located at 22828 NC Highway 87 West, Fayetteville.

Chemours is requesting permission to install two co-located environmental groundwater monitoring wells within NCDOT's ROW as shown on the attached map, **Figure 1**. A pair of monitoring wells is proposed within the ROW at the intersection of NC Highway 210 and John Hall Road (SR 2017) in Cumberland County. Details are presented in the enclosed attachment to the agreement. We would like to commence drilling by August 12, 2019.

Your cooperation in this matter is appreciated. Please contact me at (919) 424-1828 if you need any additional information or if you have any questions regarding this work plan.

Sincerely,

Beau Hodge

Beau Hodge

Attachments: Access Agreement Terms and Conditions
Figures

Cc: Greg Burns, NCDOT

APPENDIX G
Data Review Narratives and Laboratory Reports

APPENDIX G: DATA REVIEW NARRATIVES AND LABORATORY REPORTS

Data review narratives are included in this attachment. Due to file size limits, analytical laboratory reports will be provided separately with the hard copy of the report.

All analytical data were reviewed using the Data Verification Module (DVM) within the Locus™ Environmental Information Management (EIM) system, which is a commercial software program used to manage data. Following the DVM process, a manual review of the data was conducted. The DVM and the manual review results were combined in a data review narrative report for each set of sample results, which were consistent with Stage 2b of the EPA Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use (EPA-540-R-08-005 2009). The narrative report summarizes which samples were qualified (if any), the specific reasons for the qualification, and any potential bias in reported results. The data usability, in view of the project's data quality objectives (DQOs), was assessed and the data were entered into the EIM system.

The data were evaluated by the DVM against the following data usability checks:

- Hold time criteria;
- Field and laboratory blank contamination;
- Completeness of QA/QC samples;
- MS/MSD recoveries and the relative percent differences (RPDs) between these spikes;
- Laboratory control sample/control sample duplicate recoveries and the RPD between these spikes;
- Surrogate spike recoveries for organic analyses; and
- RPD between field duplicate sample pairs.

ADQM DATA REVIEW
NARRATIVE

Site	**Chemours FAY – Fayetteville**
Project	**2019 Off Site Sampling (updated for completeness)**
Project Reviewer	**Michael Aucoin, AECOM as a Chemours contractor**
Sampling Dates	**September 9, 2019** **September 11 - 13, 2019** **September 16, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds
TestAmerica - Burlington	9045D	pH
TestAmerica - Burlington	ASTM D2937	In Place Density
TestAmerica - Burlington	ASTM D422-63	Grain Size
TestAmerica - Burlington	Calculation	Porosity Calculation
TestAmerica - Burlington	Calculation	Void Ratio
TestAmerica - Burlington	D4318	Liquid Limit of Soils; Plastic Limit Soils; Plasticity Index
TestAmerica - Burlington	D854-92	Specific Gravity
TestAmerica - Pensacola	WALKLEY-BLACK	Fraction Organic Carbon
TestAmerica - Pensacola	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Solids

[1] Perfluoroalkylsubstances, a list of 33 or 37 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on:

  September 10, 2019
  September 12 - 14. 2019
  September 17 - 18, 2019

- The density results reported for soil samples do not represent the in-place density of the soil. The soil was received in a disturbed state and was subsequently molded in the laboratory to an approximation of the field environment

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- Non-detect results for R-EVE, Byproduct 4, and Byproduct 5 in some soil samples were qualified R and should be considered to be unusable due to very poor matrix spike recoveries.
- PFOSA results in two groundwater samples and a PFHxS result in one groundwater sample were qualified B and the reported results may be biased high, or false positives, due to a comparable concentration found in the associated method blanks.
- Several analytical results have been qualified J as estimated, and non-detect results qualified UJ indicating an estimated reporting limit, due to poor recovery of a surrogate, blank spike, or matrix spike; sample preparation and/or analysis which exceeded the laboratory established hold time; and poor lab replicate precision. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.
- The following samples are not amenable to Liquid Limits, Plastic Limits, and Plasticity Index determination due to the physical properties of the sample: Robeson-1S-soil-15-16-20190909 (200-50460-1). Values of zero, zero, and NP have been reported respectively for each determination.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	**Definition**
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to “DVM” if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals “DVM”), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Dup1-20190911	09/11/2019	200-50518-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Contamination detected in Method Blank(s). Sample result does not differ significantly from the analyte concentration detected in the associated method blank(s).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
CUMBER-1D-09162019	09/16/2019	320-54439-2	Perfluorooctane Sulfonamide	0.00088	UG/L	PQL		0.0019	B	537 Modified		3535_PFC
CUMBER-1S-09162019	09/16/2019	320-54439-1	Perfluorooctane Sulfonamide	0.001	UG/L	PQL		0.0019	B	537 Modified		3535_PFC
CUMBER-1D-09162019	09/16/2019	320-54439-2	Perfluorohexane Sulfonic Acid	0.0006	UG/L	PQL		0.0019	B	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Only one surrogate has relative percent recovery (RPR) values outside control limits and the parameter is a PFC (Nondetects).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumber-4S-09162019	09/16/2019	320-54378-2	Perfluorooctadecanoic acid	0.0020	ug/L	PQL	0.00041	0.0020	UJ	537 Modified		3535_PFC
Cumber-4S-09162019	09/16/2019	320-54378-2	Perfluorohexadecanoic acid (PFHxDA)	0.0020	ug/L	PQL	0.00079	0.0020	UJ	537 Modified		3535_PFC
Cumber-5D-09162019	09/16/2019	320-54378-3	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL	0.00079	0.0020	UJ	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated LCS and/or LCSD analysis had relative percent recovery (RPR) values less than the lower control limit but above 10%. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
CUMBER-1D-09162019	09/16/2019	320-54439-2	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
CUMBER-1D-09162019	09/16/2019	320-54439-2	PFO5DA	0.002	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
CUMBER-1S-09162019	09/16/2019	320-54439-1	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
CUMBER-1S-09162019	09/16/2019	320-54439-1	PFO5DA	0.002	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
ROBESON-1D-091219	09/12/2019	280-128413-2	PFO5DA	0.0020	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
ROBESON-1D-091219	09/12/2019	280-128413-2	PFO5DA	0.00034	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
ROBESON-1S-091219	09/12/2019	280-128413-1	PFO5DA	0.0020	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
ROBESON-1S-091219	09/12/2019	280-128413-1	PFO5DA	0.00034	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
CUMBER-1D-09162019	09/16/2019	320-54439-2	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
CUMBER-1D-09162019	09/16/2019	320-54439-2	PFMOAA	0.005	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
										SOP		
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-5S-3-4-20190911	09/11/2019	200-50518-4	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-5S-3-4-20190911	09/11/2019	200-50518-4	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-5S-3-4-20190911	09/11/2019	200-50518-4	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-5S-3-4-20190911	09/11/2019	200-50518-4	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Robeson-1S-soil-5-6-20190909	09/09/2019	200-50460-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumber-4D-09162019	09/16/2019	320-54378-1	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0014	0.0040	UJ	537 Modified		3535_PFC
Cumber-2D-09162019	09/16/2019	320-54378-8	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0015	0.0040	UJ	537 Modified		3535_PFC
Cumber-2S-09162019	09/16/2019	320-54378-7	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0013	0.0040	UJ	537 Modified		3535_PFC
Cumber-3D-09162019	09/16/2019	320-54378-6	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0014	0.0040	UJ	537 Modified		3535_PFC
Cumber-5D-09162019	09/16/2019	320-54378-3	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0014	0.0040	UJ	537 Modified		3535_PFC
Cumber-5S-09162019	09/16/2019	320-54378-4	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0015	0.0040	UJ	537 Modified		3535_PFC
ROBESON-1S-091219	09/12/2019	280-128413-1	Hfpo Dimer Acid	0.0040	UG/L	PQL	0.0014	0.0040	UJ	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumber-4S-09162019	09/16/2019	320-54378-2	R-EVE	0.018	UG/L	PQL	0.00070	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-4S-09162019	09/16/2019	320-54378-2	R-EVE	0.018	UG/L	PQL	0.00070	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-4S-09162019	09/16/2019	320-54378-2	Byproduct 4	0.074	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-4S-09162019	09/16/2019	320-54378-2	Byproduct 4	0.074	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3S-09162019	09/16/2019	320-54378-5	R-EVE	0.011	UG/L	PQL	0.00070	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3S-09162019	09/16/2019	320-54378-5	R-EVE	0.011	UG/L	PQL	0.00070	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3S-09162019	09/16/2019	320-54378-5	Byproduct 4	0.020	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3S-09162019	09/16/2019	320-54378-5	Byproduct 4	0.019	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-4D-09162019	09/16/2019	320-54378-1	Byproduct 4	0.0027	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-4D-09162019	09/16/2019	320-54378-1	Byproduct 4	0.0028	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Percent Moisture	18.4	%	MDL	0.01	0.01	J	MOISTURE		
Cumberland-3D-24-25-20190911	09/11/2019	200-50518-5	Percent Moisture	11.7	%	MDL	0.01	0.01	J	MOISTURE		
Cumber-3S-09162019	09/16/2019	320-54378-5	PFO3OA	0.0098	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3S-09162019	09/16/2019	320-54378-5	PFO3OA	0.011	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded by a factor of 2. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Robeson-1S-soil-15-16-20190909	09/09/2019	200-50460-1	Ph	8.2	STD UNITS	MDL		0	J	9045D		
CUMBERLAND-1D-46-47-20190912	09/12/2019	200-50567-1	Ph	4.4	STD UNITS	MDL		0	J	9045D		
CUMBERLAND-1S-6-7-20190913	09/13/2019	200-50567-2	Ph	5.2	STD UNITS	MDL		0	J	9045D		
Cumberland-2D-soil-49-50-0912	09/12/2019	200-50537-1	Ph	5.6	STD UNITS	MDL		0	J	9045D		
Cumberland-3D-24-25-20190911	09/11/2019	200-50518-5	Ph	5.0	STD UNITS	MDL		0	J	9045D		
Cumberland-4S-soil-5-6-0911	09/11/2019	200-50518-1	Ph	4.7	STD UNITS	MDL		0	J	9045D		
Cumberland-5D-54-55-20190911	09/11/2019	200-50518-3	Ph	4.9	STD UNITS	MDL		0	J	9045D		
Cumberland-2S-soil-5-6-0912	09/12/2019	200-50537-2	Ph	5.3	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit but above the rejection limit. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Cumber-3D-09162019	09/16/2019	320-54378-6	PFMOAA	0.017	ug/L	PQL	0.0021	0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Cumber-3D-09162019	09/16/2019	320-54378-6	PFMOAA	0.016	ug/L	PQL	0.0021	0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** 2019 Off Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
ROBESON-1D-091219	09/12/2019	280-128413-2	Hfpo Dimer Acid	0.006	UG/L	PQL	0.0014	0.0040	J	537 Modified		3535_PFC
Cumber-3S-09162019	09/16/2019	320-54378-5	Hfpo Dimer Acid	0.01	UG/L	PQL	0.0014	0.0040	J	537 Modified		3535_PFC
Cumber-4D-09162019	09/16/2019	320-54378-1	6:2 Fluorotelomer sulfonate	0.029	ug/L	PQL	0.0019	0.020	J	537 Modified		3535_PFC
Cumber-4S-09162019	09/16/2019	320-54378-2	Hfpo Dimer Acid	0.11	UG/L	PQL	0.0013	0.0040	J	537 Modified		3535_PFC

ADQM DATA REVIEW
NARRATIVE

Site	**Chemours FAY – Fayetteville**
Project	**2019 On Site Sampling (updated for completeness)**
Project Reviewer	**Michael Aucoin, AECOM as a Chemours contractor**
Sampling Dates	**June 24 - 28, 2019** **July 1 - 2, 2019** **July 23 - 26, 2019** **July 29 – 31, 2019** **August 8, 12, 13, and 15, 2019** **August 21, 22, and 26, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds
TestAmerica - Burlington	9045D	pH
TestAmerica - Burlington	ASTM D2937	In Place Density
TestAmerica - Burlington	ASTM D422-63	Grain Size
TestAmerica - Burlington	Calculation	Porosity Calculation
TestAmerica - Burlington	Calculation	Void Ratio
TestAmerica - Burlington	D4318	Liquid Limit of Soils; Plastic Limit Soils; Plasticity Index
TestAmerica - Burlington	D854-92	Specific Gravity
TestAmerica - Pensacola	WALKLEY-BLACK	Fraction Organic Carbon
TestAmerica - Pensacola	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Solids

[1] Perfluoroalkylsubstances, a list of 33 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on:

  July 10, 2019
  July 24 – 27, 2019

July 30, 2019
August 1, 2019
August 9, 2019
August 13, 14 and 16, 2019
August 23 and 27. 2019

- Samples PIW-1-24-25-20190627 (200-49557-1), PIW-1-41.5-42.5-20190627 (200-49557-2), PIW-3-14-15-20190702 (200-49557-3), PIW-3-24-25-20190702 (200-49557-4), PIW-4-13-14-20190701 (200-49557-5), PIW-4-33-34.2-20190701 (200-49557-6), PIW-6-19-20-20190628 200-49557-7), PIW-7-24-25-20190625 (200-49557-8), PIW-7-37-38-20190625 (200-49557-9), PIW-7-44-45-20190625 (200-49557-10), PIW-9-19-20-20190626 (200-49557-11), PIW-10-42-43-20190624 (200-49557-12), PW-10-SOIL-69-70-20190808 (200-50014-3) were analyzed for Density of Soil in Place by the Drive-Cylinder Method in accordance with ASTM D2937. The density results for the remaining soil samples reported do not represent the in-place density of the soil. The soil was received in a disturbed state and was subsequently molded in the laboratory to an approximation of the field environment.

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- Non-detect results for R-EVE, Byproduct 4, and Byproduct 5 in some soil samples and PFMOAA in one soil sample were qualified R and should be considered to be unusable due to very poor matrix spike recoveries.
- Several analytical results have been qualified J as estimated, and non-detect results qualified UJ indicating an estimated reporting limit, due to poor or very poor recovery of a matrix spike; sample preparation and/or analysis which exceeded the laboratory established hold time; and poor lab replicate precision. Fraction organic carbon results reported between the method detection limit (MDL) and practical quantitation limit (PQL) were qualified J as estimated. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.
- The following samples are not amenable to Liquid Limits, Plastic Limits, and Plasticity Index determination due to the physical properties of the sample: PIW-1-24-25-20190627 (200-49557-1), PIW-3-14-15-20190702 (200-49557-3), PIW-3-24-25-20190702 (200-49557-4), PIW-4-33-34.2-20190701 (200-49557-6), PIW-7-37-38-20190625 (200-49557-9), PIW-9-19-20-20190626 (200-49557-11), PIW-1-24-25-20190627 (200-49557-1), PIW-3-14-15-20190702 (200-49557-3), PIW-3-24-25-20190702 (200-49557-4), PIW-4-33-34.2-20190701 (200-49557-6), PIW-7-37-38-20190625 (200-49557-9), PIW-9-19-20-20190626 (200-49557-11), PW-04SOIL-23-24-20190724 (200-49770-1), PW-07SOIL-14-15-20190724 (200-49770-3), PW-01-SOIL-14-15-20190730 (200-49879-1), PW-01-SOIL-14-15-20190730 (200-49879-1[DU]), PW-12-SOIL-110-111-20190731 (200-49879-7), PW-13-Soil-25-26-20190821 (200-50221-1), PW-13-Soil-127-128-20190822 (200-50221-3), and PW-14-SOIL-144-145-20190826 (200-50265-1). Values of zero, zero, and NP have been reported respectively for each determination.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	**Definition**
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to “DVM” if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals “DVM”), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
DUP1-072419	07/24/2019	200-49770-5	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP1-072419	07/24/2019	200-49770-5	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP1-072419	07/24/2019	200-49770-5	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP1-072419	07/24/2019	200-49770-5	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP1-072419	07/24/2019	200-49770-5	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP1-072419	07/24/2019	200-49770-5	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
										SOP		
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFMOAA	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFMOAA	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-3.5-4-20190808	08/08/2019	200-50014-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound		Shake_Bath_14D

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	10:2 Fluorotelomer sulfonate	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Perfluorododecane sulfonic acid (PFDoS)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	R-EVE	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	10:2 Fluorotelomer sulfonate	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	PFOS	0.50	UG/KG	PQL		0.50	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	N-methyl perfluorooctane sulfonamidoacetic acid	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	6:2 Fluorotelomer sulfonate	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	N-ethyl perfluorooctane sulfonamidoacetic acid	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded by a factor of 2. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Byproduct 6	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded by a factor of 2. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-8.5-9-20190812	08/12/2019	200-50062-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded by a factor of 2. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	NVHOS	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PES	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PMPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PEPA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFESA-BP1	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO4DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded by a factor of 2. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFO5DA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFESA-BP2	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-09-SOIL-10-11-20190812	08/12/2019	200-50062-1	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PMPA	27	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PMPA	24.0	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PEPA	13	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PFO2HxA	10	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PFO2HxA	9.4	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Specific Gravity	2.68	NONE	MDL		0	J	D854-92		
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Porosity Calculation	44.7	%	MDL		0	J	Calculation		
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	In Place Density	1.48	G/CC	MDL		0	J	ASTM D2937		
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Void Ratio	0.8	NONE	MDL		0	J	Calculation		
PW-12-SOIL-110-111-20190731	07/31/2019	200-49879-7	Porosity Calculation	43.4	%	MDL		0	J	Calculation		
PW-12-SOIL-110-111-20190731	07/31/2019	200-49879-7	Void Ratio	0.8	NONE	MDL		0	J	Calculation		
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	PEPA	11.0	UG/KG	PQL		1.0	J	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
PW-12-SOIL-83-84-20190731	07/31/2019	200-49879-6	Porosity Calculation	58.2	%	MDL		0	J	Calculation		
PW-12-SOIL-83-84-20190731	07/31/2019	200-49879-6	Void Ratio	1.4	NONE	MDL		0	J	Calculation		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded by a factor of 2. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-01-SOIL-14-15-20190730	07/30/2019	200-49879-1	Ph	5.6	STD UNITS	MDL		0	J	9045D		
PIW-6-19-20-20190628	06/28/2019	200-49557-7	Void Ratio	0.7	NONE	MDL		0	J	Calculation		
PIW-7-24-25-20190625	06/25/2019	200-49557-8	Ph	4.6	STD UNITS	MDL		0	J	9045D		
PIW-7-24-25-20190625	06/25/2019	200-49557-8	Percent Moisture	20.1	%	MDL	0.01	0.01	J	MOISTURE		
PIW-7-24-25-20190625	06/25/2019	200-49557-8	Porosity Calculation	39.6	%	MDL		0	J	Calculation		
PIW-7-24-25-20190625	06/25/2019	200-49557-8	Void Ratio	0.7	NONE	MDL		0	J	Calculation		
PIW-7-37-38-20190625	06/25/2019	200-49557-9	Percent Moisture	14.0	%	MDL	0.01	0.01	J	MOISTURE		
PIW-7-37-38-20190625	06/25/2019	200-49557-9	Porosity Calculation	32.0	%	MDL		0	J	Calculation		
PIW-7-37-38-20190625	06/25/2019	200-49557-9	Void Ratio	0.5	NONE	MDL		0	J	Calculation		
PIW-7-44-45-20190625	06/25/2019	200-49557-10	Percent Moisture	20.2	%	MDL	0.01	0.01	J	MOISTURE		
PIW-7-44-45-20190625	06/25/2019	200-49557-10	Porosity Calculation	35.9	%	MDL		0	J	Calculation		
PIW-7-44-45-20190625	06/25/2019	200-49557-10	Void Ratio	0.6	NONE	MDL		0	J	Calculation		
PIW-9-19-20-20190626	06/26/2019	200-49557-11	Ph	5.5	STD UNITS	MDL		0	J	9045D		
PIW-9-19-20-20190626	06/26/2019	200-49557-11	Percent Moisture	7.6	%	MDL	0.01	0.01	J	MOISTURE		
PIW-9-19-20-20190626	06/26/2019	200-49557-11	Porosity Calculation	31.3	%	MDL		0	J	Calculation		
PIW-1-24-25-20190627	06/27/2019	200-49557-1	Ph	4.6	STD UNITS	MDL		0	J	9045D		
PIW-1-24-25-20190627	06/27/2019	200-49557-1	Percent Moisture	17.0	%	MDL	0.01	0.01	J	MOISTURE		
PIW-1-24-25-20190627	06/27/2019	200-49557-1	Porosity Calculation	35.6	%	MDL		0	J	Calculation		
PIW-1-24-25-20190627	06/27/2019	200-49557-1	Void Ratio	0.6	NONE	MDL		0	J	Calculation		
PIW-1-41.5-42.5-20190627	06/27/2019	200-49557-2	Percent Moisture	17.2	%	MDL	0.01	0.01	J	MOISTURE		
PIW-1-41.5-42.5-20190627	06/27/2019	200-49557-2	Porosity Calculation	47.9	%	MDL		0	J	Calculation		
PIW-1-41.5-42.5-20190627	06/27/2019	200-49557-2	Void Ratio	0.9	NONE	MDL		0	J	Calculation		
PIW-10-42-43-20190624	06/24/2019	200-49557-12	Percent Moisture	32.9	%	MDL	0.01	0.01	J	MOISTURE		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded by a factor of 2. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PIW-10-42-43-20190624	06/24/2019	200-49557-12	Porosity Calculation	52.5	%	MDL		0	J	Calculation		
PIW-10-42-43-20190624	06/24/2019	200-49557-12	Void Ratio	1.1	NONE	MDL		0	J	Calculation		
PIW-2D-Soil-24-25-20190815	08/15/2019	200-50125-1	Ph	4.2	STD UNITS	MDL		0	J	9045D		
PIW-2D-Soil-46-47-20190815	08/15/2019	200-50125-2	Ph	4.0	STD UNITS	MDL		0	J	9045D		
PIW-4-33-34.2-20190701	07/01/2019	200-49557-6	Ph	3.9	STD UNITS	MDL		0	J	9045D		
PIW-6-19-20-20190628	06/28/2019	200-49557-7	Porosity Calculation	40.5	%	MDL		0	J	Calculation		
PW-04-SOIL-23-24-20190724	07/24/2019	200-49770-1	Ph	3.1	STD UNITS	MDL		0	J	9045D		
PW-04-SOIL-29-29.5-20190724	07/24/2019	200-49770-2	Ph	3.7	STD UNITS	MDL		0	J	9045D		
PW-05 Soil-12-13-20190726	07/26/2019	200-49809-1	Ph	6.3	STD UNITS	MDL		0	J	9045D		
PW-05 Soil-51-52-20190726	07/26/2019	200-49809-3	Ph	4.4	STD UNITS	MDL		0	J	9045D		
PW-05 Soil-76-77-20190726	07/26/2019	200-49809-2	Ph	4.7	STD UNITS	MDL		0	J	9045D		
PW-07-SOIL-44-45-20190724	07/24/2019	200-49770-4	Ph	4.1	STD UNITS	MDL		0	J	9045D		
PW-07SOIL-14-15-20190724	07/24/2019	200-49770-3	Ph	5.2	STD UNITS	MDL		0	J	9045D		
PW-11-SOIL-61-62-20190725	07/25/2019	200-49801-2	Ph	4.1	STD UNITS	MDL		0	J	9045D		
PW-12-SOIL-110-111-20190731	07/31/2019	200-49879-7	Ph	4.8	STD UNITS	MDL		0	J	9045D		
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Ph	5.1	STD UNITS	MDL		0	J	9045D		
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Ph	4.9	STD UNITS	MDL		0	J	9045D		
PW-10-SOIL-69-70-20190808	08/08/2019	200-50014-3	Ph	5.4	STD UNITS	MDL		0	J	9045D		
PW-10-SOIL-8-8.5-20190808	08/08/2019	200-50014-2	Ph	5.3	STD UNITS	MDL		0	J	9045D		
PW-12-SOIL-83-84-20190731	07/31/2019	200-49879-6	Ph	4.3	STD UNITS	MDL		0	J	9045D		
PW-13-Soil-127-128-20190822	08/22/2019	200-50221-3	Ph	6.8	STD UNITS	MDL		0	J	9045D		
PW-13-Soil-25-26-20190821	08/21/2019	200-50221-1	Ph	5.2	STD UNITS	MDL		0	J	9045D		
PW-13-Soil-71-72-20190821	08/21/2019	200-50221-2	Ph	4.5	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded by a factor of 2. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-14-SOIL-144-145-20190826	08/26/2019	200-50265-1	Ph	5.7	STD UNITS	MDL		0	J	9045D		
PW-14-SOIL-144-145-20190826	08/26/2019	200-50265-1	Porosity Calculation	42.9	%	MDL		0	J	Calculation		
PW-14-SOIL-144-145-20190826	08/26/2019	200-50265-1	Void Ratio	0.8	NONE	MDL		0	J	Calculation		
PIW-9-19-20-20190626	06/26/2019	200-49557-11	Void Ratio	0.5	NONE	MDL		0	J	Calculation		
PW-03-SOIL-16-17-20190723	07/23/2019	200-49745-2	Ph	4.7	STD UNITS	MDL		0	J	9045D		
PW-03-SOIL-43-44-20190723	07/23/2019	200-49745-3	Ph	4.1	STD UNITS	MDL		0	J	9045D		
PW-03-SOIL-6.5-7-20190723	07/23/2019	200-49745-1	Ph	5.7	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-02-SOIL-14-15-20190729	07/29/2019	200-49846-2	Ph	5.2	STD UNITS	MDL		0	J	9045D		
PIW-3-14-15-20190702	07/02/2019	200-49557-3	Percent Moisture	14.2	%	MDL	0.01	0.01	J	MOISTURE		
PIW-3-14-15-20190702	07/02/2019	200-49557-3	Porosity Calculation	18.7	%	MDL		0	J	Calculation		
PIW-3-14-15-20190702	07/02/2019	200-49557-3	Void Ratio	0.2	NONE	MDL		0	J	Calculation		
PIW-3-24-25-20190702	07/02/2019	200-49557-4	Percent Moisture	17.4	%	MDL	0.01	0.01	J	MOISTURE		
PIW-3-24-25-20190702	07/02/2019	200-49557-4	Porosity Calculation	37.0	%	MDL		0	J	Calculation		
PIW-3-24-25-20190702	07/02/2019	200-49557-4	Void Ratio	0.6	NONE	MDL		0	J	Calculation		
PIW-4-13-14-20190701	07/01/2019	200-49557-5	Percent Moisture	26.8	%	MDL	0.01	0.01	J	MOISTURE		
PIW-4-13-14-20190701	07/01/2019	200-49557-5	Porosity Calculation	54.1	%	MDL		0	J	Calculation		
PIW-4-13-14-20190701	07/01/2019	200-49557-5	Void Ratio	1.2	NONE	MDL		0	J	Calculation		
PIW-4-33-34.2-20190701	07/01/2019	200-49557-6	Percent Moisture	12.7	%	MDL	0.01	0.01	J	MOISTURE		
PIW-4-33-34.2-20190701	07/01/2019	200-49557-6	Porosity Calculation	26.1	%	MDL		0	J	Calculation		
PIW-4-33-34.2-20190701	07/01/2019	200-49557-6	Void Ratio	0.4	NONE	MDL		0	J	Calculation		
PIW-6-19-20-20190628	06/28/2019	200-49557-7	Percent Moisture	23.3	%	MDL	0.01	0.01	J	MOISTURE		
PW-02-SOIL-16-17-20190729	07/29/2019	200-49846-3	Ph	4.9	STD UNITS	MDL		0	J	9045D		
PW-02-SOIL-35-36-20190729	07/29/2019	200-49846-4	Ph	4.7	STD UNITS	MDL		0	J	9045D		
PW-06-SOIL-16-17-20190729	07/29/2019	200-49846-1	Ph	5.3	STD UNITS	MDL		0	J	9045D		
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Percent Moisture	20.3	%	PQL		0.1	J	Moisture		
PW-12-SOIL-45-46-20190731	07/31/2019	200-49879-5	Percent Solids	79.7	%	PQL		0.1	J	Moisture		
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Percent Moisture	12.8	%	PQL		0.1	J	Moisture		
PW-12-SOIL-36-37-20190731	07/31/2019	200-49879-4	Percent Solids	87.2	%	PQL		0.1	J	Moisture		
PW-15-SOIL-112-113-20190813	08/13/2019	200-50083-4	Ph	4.1	STD UNITS	MDL		0	J	9045D		
PW-15-SOIL-17.5-18-20190813	08/13/2019	200-50083-1	Ph	4.0	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-15-SOIL-38-39-20190813	08/13/2019	200-50083-2	Ph	4.1	STD UNITS	MDL		0	J	9045D		
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Percent Moisture	13.7	%	PQL		0.1	J	Moisture		
PW-01-SOIL-11-12-20190731	07/31/2019	200-49879-3	Percent Solids	86.3	%	PQL		0.1	J	Moisture		
PW-15-SOIL-55-56-20190813	08/13/2019	200-50083-3	Ph	4.1	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit but above the rejection limit. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-12-SOIL-110-111-20190731	07/31/2019	200-49879-7	Fraction Organic Carbon	0.011	G/G	MDL	0.00056	0.0013	J	WALKLEY-BLACK		
PW-12-SOIL-83-84-20190731	07/31/2019	200-49879-6	Fraction Organic Carbon	0.037	G/G	MDL	0.00058	0.0014	J	WALKLEY-BLACK		

Site: Fayetteville **Sampling Program:** 2019 On Site Sampling **Validation Options:** LABSTATS

Validation Reason The result is estimated since the concentration is between the method detection limit and practical quantitation limit.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-15-SOIL-38-39-20190813	08/13/2019	200-50083-2	Fraction Organic Carbon	0.00070	G/G	MDL	0.00043	0.0010	J	WALKLEY-BLACK		
PW-11-SOIL-16-17-20190725	07/25/2019	200-49801-1	Fraction Organic Carbon	0.00071	G/G	MDL	0.00047	0.0011	J	WALKLEY-BLACK		
PW-02-SOIL-35-36-20190729	07/29/2019	200-49846-4	Fraction Organic Carbon	0.00079	G/G	MDL	0.00048	0.0011	J	WALKLEY-BLACK		
PIW-6-19-20-20190628	06/28/2019	200-49557-7	Fraction Organic Carbon	0.0011	G/G	MDL	0.00055	0.0013	J	WALKLEY-BLACK		
PIW-9-19-20-20190626	06/26/2019	200-49557-11	Fraction Organic Carbon	0.00063	G/G	MDL	0.00045	0.0011	J	WALKLEY-BLACK		

ADQM DATA REVIEW
NARRATIVE

Site **Chemours FAY – Fayetteville**

Project **Monitoring Well Sampling**

Project Reviewer **Michael Aucoin, AECOM as a Chemours contractor**

Sampling Dates **September 19, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds

[1] Perfluoroalkylsubstances, a list of 33 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on September 20, 2019.

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- Some analytical results have been qualified J as estimated due to an exceedance of the laboratory preparation hold time; and poor field duplicate or lab replicate precision. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	**Definition**
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to “DVM” if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals “DVM”), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** Monitoring Well Sampling **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between field duplicate and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Hfpo Dimer Acid	8.7	UG/L	PQL		0.14	J	537 Modified		3535_PFC
GW0619-PW-15R	09/19/2019	320-54519-1	Perfluoroheptanoic Acid	0.094	UG/L	PQL		0.023	J	537 Modified		3535_PFC
GW0619-PW-15R	09/19/2019	320-54519-1	Byproduct 4	1.5	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Byproduct 4	1.4	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R-D	09/19/2019	320-54519-2	Hfpo Dimer Acid	11.0	UG/L	PQL		0.14	J	537 Modified		3535_PFC
GW0619-PW-15R-D	09/19/2019	320-54519-2	Perfluoroheptanoic Acid	0.056	UG/L	PQL		0.023	J	537 Modified		3535_PFC
GW0619-PW-15R-D	09/19/2019	320-54519-2	Byproduct 4	1.8	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R-D	09/19/2019	320-54519-2	Byproduct 4	1.8	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Monitoring Well Sampling **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PW-15R	09/19/2019	320-54519-1	EVE Acid	0.25	UG/L	PQL		0.049	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	EVE Acid	0.16	UG/L	PQL		0.049	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	PFESA-BP2	0.64	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	PFESA-BP2	0.54	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Hydro-EVE Acid	0.55	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Hydro-EVE Acid	0.44	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Perfluorobutanoic Acid (trial)	0.12	UG/L	PQL		0.032	J	537 Modified		3535_PFC
GW0619-PW-15R	09/19/2019	320-54519-1	Perfluoroheptanoic Acid (trial)	0.05	UG/L	PQL		0.023	J	537 Modified		3535_PFC
GW0619-PW-15R	09/19/2019	320-54519-1	R-EVE	0.70	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PW-15R	09/19/2019	320-54519-1	R-EVE	0.58	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Monitoring Well Sampling **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PW-15R	09/19/2019	320-54519-1	Hfpo Dimer Acid (trial)	6.8	UG/L	PQL		0.14	J	537 Modified		3535_PFC

ADQM DATA REVIEW
NARRATIVE

Site **Chemours FAY – Fayetteville**

Project **PW Well Sampling (updated for completeness)**

Project Reviewer **Michael Aucoin, AECOM as a Chemours contractor**

Sampling Dates **September 9 - 13, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds

[1] Perfluoroalkylsubstances, a list of 37 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on:

  September 11, 13 and 14, 2019

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- Several analytical results have been qualified J as estimated, and non-detect results qualified UJ indicating an estimated reporting limit, due to poor or very poor recovery of a surrogate or matrix spike; and poor lab replicate precision. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	**Definition**
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to “DVM” if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals “DVM”), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Only one surrogate has relative percent recovery (RPR) values outside control limits and the parameter is a PFC (Nondetects).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-04-091119	09/11/2019	320-54294-4	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	537 Modified		3535_PFC
PW-12-091119	09/11/2019	320-54299-4	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
PW-12-091119	09/11/2019	320-54299-4	Perfluorohexadecanoic acid (PFHxDA)	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
PW-12-091119-Z	09/11/2019	320-54299-5	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
PW-12-091119-Z	09/11/2019	320-54299-5	Perfluorohexadecanoic acid (PFHxDA)	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-05-090919	09/09/2019	320-54174-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-05-090919	09/09/2019	320-54174-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-090919-01	09/09/2019	320-54174-2	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-090919-01	09/09/2019	320-54174-2	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-090919-02	09/09/2019	320-54174-3	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-090919-02	09/09/2019	320-54174-3	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-091019-02	09/10/2019	320-54176-3	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
EQBLK-091019-02	09/10/2019	320-54176-3	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
FBLK-090919	09/09/2019	320-54174-4	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
FBLK-090919	09/09/2019	320-54174-4	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason One or more surrogates had relative percent recovery (RPR) values less than the data rejection level. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-03-091119-Z	09/11/2019	320-54319-1	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0085	ug/L	PQL		0.0085	UJ	537 Modified		3535_PFC
PW-03-091119-Z	09/11/2019	320-54319-1	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.014	ug/L	PQL		0.014	UJ	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-04-091119-Z	09/11/2019	320-54294-5	Byproduct 4	0.16	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-04-091119-Z	09/11/2019	320-54294-5	Byproduct 4	0.16	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-04-091119-Z	09/11/2019	320-54294-5	Byproduct 5	0.0044	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-04-091119-Z	09/11/2019	320-54294-5	Byproduct 5	0.0043	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-07-091319-Z	09/13/2019	320-54328-3	R-EVE	0.016	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-07-091319-Z	09/13/2019	320-54328-3	R-EVE	0.017	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-07-091319-Z	09/13/2019	320-54328-3	Byproduct 4	0.059	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-07-091319-Z	09/13/2019	320-54328-3	Byproduct 4	0.062	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119-Z	09/11/2019	320-54278-2	Byproduct 5	0.065	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119-Z	09/11/2019	320-54278-2	Byproduct 5	0.065	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO2HxA	56	ug/L	PQL		0.41	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO2HxA	52.0	ug/L	PQL		0.41	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO3OA	32	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO3OA	29.0	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	Byproduct 5	6.4	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	Byproduct 5	5.8	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-01-090919	09/09/2019	320-54217-1	Byproduct 5	0.90	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919-D	09/09/2019	320-54217-2	Byproduct 5	0.88	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919-D	09/09/2019	320-54217-2	Byproduct 5	0.87	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFO4DA	1.2	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFO4DA	0.97	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119	09/11/2019	320-54274-2	PFESA-BP1	0.16	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119	09/11/2019	320-54274-2	PFESA-BP1	0.14	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119	09/11/2019	320-54274-2	PFO2HxA	0.17	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-09-091119	09/11/2019	320-54274-2	PFO2HxA	0.13	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO5DA	0.67	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-11-091019	09/10/2019	320-54231-2	PFO5DA	0.58	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFESA-BP2	0.16	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	PFESA-BP2	0.14	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	Hydro-EVE Acid	0.79	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-10DR-091019	09/10/2019	320-54176-1	Hydro-EVE Acid	0.69	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-2D-091219	09/12/2019	320-54314-2	NVHOS	0.11	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PIW-2D-091219	09/12/2019	320-54314-2	NVHOS	0.11	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	NVHOS	0.28	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	NVHOS	0.25	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PMPA	4.1	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** PW Well Sampling **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
PW-01-090919	09/09/2019	320-54217-1	PMPA	3.5	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO3OA	2.0	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO3OA	1.7	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO4DA	1.0	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO4DA	0.82	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO5DA	0.66	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFO5DA	0.52	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	EVE Acid	0.11	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	EVE Acid	0.095	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFESA-BP2	0.49	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	PFESA-BP2	0.39	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	Hydro-EVE Acid	0.13	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	Hydro-EVE Acid	0.11	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
PW-01-090919	09/09/2019	320-54217-1	Byproduct 5	0.77	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

ADQM DATA REVIEW
NARRATIVE

Site	**Chemours FAY – Fayetteville**
Project	**Sitewide GW Sampling 2019 (updated for completeness)**
Project Reviewer	**Michael Aucoin, AECOM as a Chemours contractor**
Sampling Dates	**June 19 - 21, 2019** **June 25 - 28, 2019** **July 1 - 3, 2019** **July 8 – 12, 2019** **July 15 – 19, 2019** **July 22, 23, and 25, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds

[1] Perfluoroalkylsubstances, a list of 27 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on:

  June 25, 2019
  June 27, 2019
  July 2, 2019
  July 9, 2019
  July 11, 2019
  July 16, 17, and 20, 2019
  July 24 and 27, 2019

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- HFPO-DA results in three groundwater samples and a field duplicate sample were qualified B and the reported results may be biased high, or false positives, due to a comparable concentration found in the associated equipment blanks.
- Several analytical results have been qualified J as estimated, and non-detect results qualified UJ indicating an estimated reporting limit, due to poor recovery of a surrogate or blank spike or matrix spike; sample analysis which exceeded the laboratory established hold time; and poor blank spike duplicate or field duplicate or lab replicate precision. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	Definition
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to “DVM” if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals “DVM”), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Contamination detected in equipment blank(s). Sample result does not differ significantly from the analyte concentration detected in the associated equipment blank(s).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-LTW-05	07/16/2019	320-52322-4	Hfpo Dimer Acid	26.0	UG/L	PQL		0.12	B	537 Modified		3535_PFC
GW0619-PZ-11	07/16/2019	320-52322-1	Hfpo Dimer Acid	4.9	UG/L	PQL		0.13	B	537 Modified		3535_PFC
GW0619-PZ-11-D	07/16/2019	320-52322-2	Hfpo Dimer Acid	6.2	UG/L	PQL		0.13	B	537 Modified		3535_PFC
GW0619-SMW-08B	07/16/2019	320-52322-3	Hfpo Dimer Acid	8.7	UG/L	PQL		0.12	B	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Only one surrogate has relative percent recovery (RPR) values outside control limits and the parameter is a PFC (Nondetects).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PIW-9D	07/23/2019	320-52722-1	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-10	06/27/2019	320-51903-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-11	06/26/2019	320-51903-7	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFESA-BP1	0.053	UG/L	PQL		0.053	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFESA-BP1	0.053	UG/L	PQL		0.053	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	N-methyl perfluoro-1-octanesulfonamide	0.069	ug/L	PQL		0.069	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	N-methyl perfluoro-1-octanesulfonamide	0.069	ug/L	PQL		0.069	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PES	0.092	UG/L	PQL		0.092	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PES	0.092	UG/L	PQL		0.092	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	N-ethylperfluoro-1-octanesulfonamide	0.075	UG/L	PQL		0.075	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	N-ethylperfluoro-1-octanesulfonamide	0.075	UG/L	PQL		0.075	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFECA-G	0.082	UG/L	PQL		0.082	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFECA-G	0.082	UG/L	PQL		0.082	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 6	0.031	UG/L	PQL		0.031	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 6	0.031	UG/L	PQL		0.031	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	EVE Acid	0.049	UG/L	PQL		0.049	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	EVE Acid	0.049	UG/L	PQL		0.049	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-24	06/25/2019	320-51746-10	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-26	06/25/2019	320-51746-9	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFECA-G	2.0	UG/L	PQL		2.0	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFECA-G	2.0	UG/L	PQL		2.0	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PES	2.3	UG/L	PQL		2.3	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PES	2.3	UG/L	PQL		2.3	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 6	0.77	UG/L	PQL		0.77	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 6	0.77	UG/L	PQL		0.77	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFECA B	0.30	UG/L	PQL		0.30	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFECA B	0.30	UG/L	PQL		0.30	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFECA-G	0.20	UG/L	PQL		0.20	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFECA-G	0.20	UG/L	PQL		0.20	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PES	0.23	UG/L	PQL		0.23	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PES	0.23	UG/L	PQL		0.23	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-27	06/25/2019	320-51746-8	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PES	0.0023	UG/L	PQL		0.0023	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PES	0.0023	UG/L	PQL		0.0023	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFECA B	0.0030	UG/L	PQL		0.0030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFECA B	0.0030	UG/L	PQL		0.0030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 5	0.0029	UG/L	PQL		0.0029	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 5	0.0029	UG/L	PQL		0.0029	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	2-(N-ethyl perfluoro-1-octanesulfonamido)-	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
			ethanol									
GW0619-PZ-31	06/21/2019	320-51667-3	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFECA B	0.030	UG/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFECA B	0.030	UG/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
GW0619-PZ-32	06/21/2019	320-51667-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.055	ug/L	PQL		0.055	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.055	ug/L	PQL		0.055	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	N-methyl perfluoro-1-octanesulfonamide	0.017	ug/L	PQL		0.017	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	N-methyl perfluoro-1-octanesulfonamide	0.017	ug/L	PQL		0.017	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PES	0.023	UG/L	PQL		0.023	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PES	0.023	UG/L	PQL		0.023	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	N-ethylperfluoro-1-octanesulfonamide	0.019	UG/L	PQL		0.019	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	N-ethylperfluoro-1-octanesulfonamide	0.019	UG/L	PQL		0.019	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFECA-G	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFECA-G	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	EVE Acid	0.012	UG/L	PQL		0.012	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	EVE Acid	0.012	UG/L	PQL		0.012	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 6	0.0077	UG/L	PQL		0.0077	UJ	Cl. Spec. Table 3 Compound		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 6	0.0077	UG/L	PQL		0.0077	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.060	ug/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.11	ug/L	PQL		0.11	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	N-methyl perfluoro-1-octanesulfonamide	0.035	ug/L	PQL		0.035	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	N-ethylperfluoro-1-octanesulfonamide	0.037	UG/L	PQL		0.037	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
GW0619-PZ-33	06/19/2019	320-51662-2	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFECA B	0.12	UG/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFECA B	0.12	UG/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.12	ug/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.12	ug/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.22	ug/L	PQL		0.22	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.22	ug/L	PQL		0.22	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method SOP	Pre-prep	Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-23	06/25/2019	320-51746-2	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-25	06/25/2019	320-51746-11	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PES	0.092	UG/L	PQL		0.092	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PES	0.092	UG/L	PQL		0.092	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFECA B	0.12	UG/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFECA B	0.12	UG/L	PQL		0.12	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFESA-BP1	0.053	UG/L	PQL		0.053	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFESA-BP1	0.053	UG/L	PQL		0.053	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-28	06/26/2019	320-51904-1	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-28	06/26/2019	320-51904-1	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFECA-G	0.082	UG/L	PQL		0.082	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFECA-G	0.082	UG/L	PQL		0.082	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	EVE Acid	0.049	UG/L	PQL		0.049	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	EVE Acid	0.049	UG/L	PQL		0.049	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFECA B	3.0	UG/L	PQL		3.0	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFECA B	3.0	UG/L	PQL		3.0	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-061919	06/19/2019	320-51662-4	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062019	06/20/2019	320-51662-5	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	NVHOS	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PES	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PMPA	0.010	UG/L	PQL		0.010	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFECA B	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PEPA	0.020	UG/L	PQL		0.020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFESA-BP1	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	N-methyl perfluoro-1-octanesulfonamide	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO2HxA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO3OA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO4DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFO5DA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	N-ethylperfluoro-1-octanesulfonamide	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFMOAA	0.0050	ug/L	PQL		0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFESA-BP2	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Hydro-EVE Acid	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	PFECA-G	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	R-EVE	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 4	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 5	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062119	06/21/2019	320-51662-6	Byproduct 6	0.0020	UG/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PMPA	0.57	UG/L	PQL		0.57	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PEPA	0.047	UG/L	PQL		0.047	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO2HxA	0.081	ug/L	PQL		0.081	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO3OA	0.058	ug/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFO5DA	0.034	ug/L	PQL		0.034	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFESA-BP2	0.030	ug/L	PQL		0.030	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062719	06/27/2019	320-51903-5	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	NVHOS	0.054	UG/L	PQL		0.054	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PES	0.046	UG/L	PQL		0.046	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFESA-BP1	0.027	UG/L	PQL		0.027	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO4DA	0.079	ug/L	PQL		0.079	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFMOAA	0.21	ug/L	PQL		0.21	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	EVE Acid	0.024	UG/L	PQL		0.024	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Hydro-EVE Acid	0.028	UG/L	PQL		0.028	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	R-EVE	0.070	UG/L	PQL		0.070	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 4	0.16	UG/L	PQL		0.16	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 5	0.058	UG/L	PQL		0.058	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	Byproduct 6	0.015	UG/L	PQL		0.015	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFECA-G	0.041	UG/L	PQL		0.041	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFECA B	0.060	UG/L	PQL		0.060	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Associated LCS and/or LCSD analysis had relative percent recovery (RPR) values less than the lower control limit but above 10%. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-09	07/11/2019	320-52282-6	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-NAF-04	07/15/2019	320-52288-5	Perfluorooctadecanoic acid	0.039	ug/L	PQL		0.039	UJ	537 Modified		3535_PFC
GW0619-NAF-06	07/11/2019	320-52282-1	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-NAF-08A	07/15/2019	320-52288-4	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-21D	07/11/2019	320-52282-3	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-PZ-12	07/11/2019	320-52282-2	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-13D	07/11/2019	320-52282-5	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-14D	07/11/2019	320-52282-4	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-16D	07/15/2019	320-52288-2	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-17D	07/15/2019	320-52288-3	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-18D	07/15/2019	320-52288-6	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-MW-22D	07/15/2019	320-52288-1	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-EQBLK	06/25/2019	320-51746-1	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK	06/25/2019	320-51746-1	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-BCA-02	07/09/2019	320-52149-5	Perfluorooctadecanoic acid	0.0020	ug/L	PQL		0.0020	UJ	537 Modified		3535_PFC
GW0619-EB-02-071519	07/15/2019	320-52285-5	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EB-02-071519	07/15/2019	320-52285-5	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-070319	07/03/2019	320-52030-5	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-070319	07/03/2019	320-52030-5	PFO5DA	0.0020	ug/L	PQL		0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason Associated LCS and/or LCSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 5	0.51	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 5	0.55	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO5DA	0.29	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO5DA	0.3	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 5	0.18	UG/L	PQL		0.029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 5	0.2	UG/L	PQL		0.029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO5DA	0.19	ug/L	PQL		0.017	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO5DA	0.2	ug/L	PQL		0.017	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 5	1.4	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 5	1.3	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO5DA	0.61	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO5DA	0.65	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 5	1.3	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 5	1.3	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO5DA	0.59	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 5	0.63	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason Associated LCS and/or LCSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 5	0.69	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO5DA	0.092	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-09	07/02/2019	320-52028-4	PFO5DA	2.2	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-09	07/02/2019	320-52028-4	PFO5DA	2.3	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-19R	07/01/2019	320-52028-2	PFO5DA	0.45	ug/L	PQL		0.0034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-19R	07/01/2019	320-52028-2	PFO5DA	0.45	ug/L	PQL		0.0034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-20R	07/01/2019	320-52028-1	PFO5DA	0.16	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-20R	07/01/2019	320-52028-1	PFO5DA	0.15	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	PFO5DA	0.41	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	PFO5DA	0.44	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 5	0.79	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 5	0.81	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO5DA	0.58	ug/L	PQL		0.067	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO5DA	0.58	ug/L	PQL		0.067	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO4DA	0.82	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO4DA	0.78	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 5	0.95	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO4DA	1.7	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO4DA	1.8	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-2S	07/10/2019	320-52165-1	PFESA-BP1	0.027	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-2S	07/10/2019	320-52165-1	PFESA-BP1	0.027	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-7S	07/10/2019	320-52165-2	PFESA-BP1	0.058	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-7S	07/10/2019	320-52165-2	PFESA-BP1	0.056	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO2HxA	62	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO2HxA	59.0	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO2HxA	0.43	ug/L	PQL		0.0041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO2HxA	0.42	ug/L	PQL		0.0041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 5	1.1	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 5	1.1	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-9D	07/23/2019	320-52722-1	Byproduct 4	1.9	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PIW-9D	07/23/2019	320-52722-1	Byproduct 4	1.9	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 5	32	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 5	32.0	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO4DA	7.8	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO4DA	8.0	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	Byproduct 5	0.015	UG/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	Byproduct 5	0.014	UG/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-22	07/23/2019	320-52722-2	Byproduct 4	0.76	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-22	07/23/2019	320-52722-2	Byproduct 4	0.65	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-05P	07/25/2019	320-52722-3	Byproduct 4	1.3	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-05P	07/25/2019	320-52722-3	Byproduct 4	1.4	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	R-EVE	0.053	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	R-EVE	0.054	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	Byproduct 4	0.092	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	Byproduct 4	0.092	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	Byproduct 5	0.033	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-35	07/02/2019	320-52028-3	Byproduct 5	0.033	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
										SOP		
GW0619-SMW-11	06/26/2019	320-51903-7	PFO4DA	0.19	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO4DA	0.18	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	R-EVE	0.043	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	R-EVE	0.042	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 4	0.11	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Byproduct 4	0.11	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between field duplicate and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-BCA-02-D	07/09/2019	320-52149-6	Hfpo Dimer Acid	12.0	UG/L	PQL		0.13	J	537 Modified		3535_PFC
GW0619-PIW-1D	07/19/2019	320-52621-1	Hfpo Dimer Acid	11.0	UG/L	PQL		0.13	J	537 Modified		3535_PFC
GW0619-PIW-1D	07/19/2019	320-52621-1	R-EVE	0.29	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-1D	07/19/2019	320-52621-1	R-EVE	0.27	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-1D-D	07/19/2019	320-52621-2	Hfpo Dimer Acid	8.7	UG/L	PQL		0.14	J	537 Modified		3535_PFC
GW0619-PIW-1D-D	07/19/2019	320-52621-2	R-EVE	0.35	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-1D-D	07/19/2019	320-52621-2	R-EVE	0.41	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-BCA-02	07/09/2019	320-52149-5	Hfpo Dimer Acid	18.0	UG/L	PQL		0.13	J	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between LCS and LCSD samples. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO3OA	1.0	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO3OA	1.0	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO5DA	2.1	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO5DA	2.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-22D	07/15/2019	320-52288-1	PFO3OA	0.083	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-22D	07/15/2019	320-52288-1	PFO3OA	0.09	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-22D	07/15/2019	320-52288-1	PFO5DA	0.0055	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-22D	07/15/2019	320-52288-1	PFO5DA	0.0052	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-18D	07/15/2019	320-52288-6	PFO3OA	0.0046	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-18D	07/15/2019	320-52288-6	PFO3OA	0.0048	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-17D	07/15/2019	320-52288-3	PFO3OA	0.081	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-17D	07/15/2019	320-52288-3	PFO3OA	0.082	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO3OA	0.076	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO3OA	0.074	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO5DA	0.012	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-16D	07/15/2019	320-52288-2	PFO5DA	0.012	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-08A	07/15/2019	320-52288-4	PFO3OA	5.1	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between LCS and LCSD samples. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-08A	07/15/2019	320-52288-4	PFO3OA	5.0	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-08A	07/15/2019	320-52288-4	PFO5DA	2.7	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-08A	07/15/2019	320-52288-4	PFO5DA	2.4	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-10	07/03/2019	320-52030-3	PFO3OA	1.6	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-10	07/03/2019	320-52030-3	PFO3OA	1.6	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-10	07/03/2019	320-52030-3	PFO5DA	1.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-10	07/03/2019	320-52030-3	PFO5DA	1.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-04	07/15/2019	320-52288-5	PFO3OA	110	ug/L	PQL		1.2	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-04	07/15/2019	320-52288-5	PFO3OA	100.0	ug/L	PQL		1.2	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-04	07/15/2019	320-52288-5	PFO5DA	32	ug/L	PQL		0.67	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-04	07/15/2019	320-52288-5	PFO5DA	35.0	ug/L	PQL		0.67	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PMPA	47	UG/L	PQL		2.8	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PMPA	47.0	UG/L	PQL		2.8	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PEPA	23	UG/L	PQL		0.23	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PEPA	23.0	UG/L	PQL		0.23	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFESA-BP1	57	UG/L	PQL		0.13	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFESA-BP1	57.0	UG/L	PQL		0.13	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between LCS and LCSD samples. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-03	06/27/2019	320-51904-2	EVE Acid	6.8	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	EVE Acid	6.7	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFESA-BP2	9.2	ug/L	PQL		0.15	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFESA-BP2	9.1	ug/L	PQL		0.15	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO3OA	0.19	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO3OA	0.19	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO5DA	0.15	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO5DA	0.15	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO3OA	2.8	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO3OA	2.9	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO5DA	3.1	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO5DA	3.2	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-03B	07/12/2019	320-52285-2	PFO3OA	10	ug/L	PQL		0.58	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-03B	07/12/2019	320-52285-2	PFO3OA	10.0	ug/L	PQL		0.58	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-04B	07/12/2019	320-52285-3	PFO3OA	1.6	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-04B	07/12/2019	320-52285-3	PFO3OA	1.6	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-04B	07/12/2019	320-52285-3	PFO5DA	0.061	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between LCS and LCSD samples. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-04B	07/12/2019	320-52285-3	PFO5DA	0.054	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Only one surrogate has relative percent recovery (RPR) values outside control limits and the parameter is a PFC (Detects).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-12	07/17/2019	320-52464-4	Perfluoroundecanoic Acid	0.042	UG/L	PQL		0.0020	J	537 Modified		3535_PFC
GW0619-NAF-12	07/17/2019	320-52464-4	Perfluorohexanoic Acid	1.7	UG/L	PQL		0.0020	J	537 Modified		3535_PFC
GW0619-NAF-12	07/17/2019	320-52464-4	Perfluorohexane Sulfonic Acid	0.0053	UG/L	PQL		0.0020	J	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO5DA	1.2	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO5DA	1.4	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 4	1.5	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 4	1.7	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 5	1.1	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PEPA	2.4	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PEPA	2.7	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFESA-BP1	1.3	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFESA-BP1	1.5	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO2HxA	8.8	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO2HxA	10.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO3OA	2.0	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO3OA	2.3	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO4DA	100.0	ug/L	PQL		3.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO4DA	120	ug/L	PQL		3.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO5DA	36	ug/L	PQL		1.7	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO5DA	31.0	ug/L	PQL		1.7	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-01	07/10/2019	320-52165-3	PFO5DA	6.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-01	07/10/2019	320-52165-3	PFO5DA	5.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-2S	07/10/2019	320-52165-1	Byproduct 4	0.73	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-2S	07/10/2019	320-52165-1	Byproduct 4	0.59	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO4DA	1.6	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-30	07/02/2019	320-52030-2	PFO4DA	1.8	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-1S	06/28/2019	320-51904-3	PFO4DA	1.5	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-BCA-02	07/09/2019	320-52149-5	Hfpo Dimer Acid (trial)	18.0	UG/L	PQL		0.13	J	537 Modified		3535_PFC
GW0619-LTW-02	07/17/2019	320-52454-2	Byproduct 4	0.49	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-LTW-02	07/17/2019	320-52454-2	Byproduct 4	0.59	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-13D	07/11/2019	320-52282-5	Byproduct 5	3.0	UG/L	PQL		0.58	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-13D	07/11/2019	320-52282-5	Byproduct 5	3.4	UG/L	PQL		0.58	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 4	0.63	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 4	0.73	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO5DA	0.67	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO3OA	1.1	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO3OA	1.2	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO5DA	0.11	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-21D	07/11/2019	320-52282-3	Byproduct 4	0.0083	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-21D	07/11/2019	320-52282-3	Byproduct 4	0.0071	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-09	07/02/2019	320-52028-4	Byproduct 4	1.1	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-09	07/02/2019	320-52028-4	Byproduct 4	1.3	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-7D	07/19/2019	320-52624-3	Hydro-EVE Acid	0.17	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-7D	07/19/2019	320-52624-3	Hydro-EVE Acid	0.19	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-7D	07/19/2019	320-52624-3	R-EVE	0.35	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PIW-7D	07/19/2019	320-52624-3	R-EVE	0.42	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO4DA	0.28	ug/L	PQL		0.0039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO4DA	2.1	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-14	07/03/2019	320-52030-4	PFO4DA	2.5	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-07	07/08/2019	320-52171-5	PFO5DA	0.072	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-07	07/08/2019	320-52171-5	PFO5DA	0.072	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PEPA	2.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PEPA	2.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFESA-BP1	0.55	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFESA-BP1	0.55	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO2HxA	6.5	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO2HxA	6.4	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO3OA	0.78	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFO3OA	0.76	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFMOAA	3.2	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFMOAA	3.2	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	EVE Acid	0.097	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	EVE Acid	0.097	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFESA-BP2	0.61	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PFESA-BP2	0.61	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Hydro-EVE Acid	0.15	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Hydro-EVE Acid	0.15	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	R-EVE	0.56	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-02	06/27/2019	320-51903-1	R-EVE	0.61	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 6	0.019	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Byproduct 6	0.02	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	NVHOS	0.17	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	NVHOS	0.19	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	NVHOS	0.45	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	NVHOS	0.51	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO5DA	2.4	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFO5DA	2.7	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFMOAA	11	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFMOAA	12.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	EVE Acid	24	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	EVE Acid	27.0	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFESA-BP2	3.5	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PFESA-BP2	4.0	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Hydro-EVE Acid	1.1	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	Hydro-EVE Acid	1.2	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFESA-BP2	0.032	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFESA-BP2	0.03	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO5DA	0.077	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO5DA	0.078	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO2HxA	0.39	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO2HxA	0.35	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO3OA	0.058	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PFO3OA	0.058	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PEPA	0.29	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PEPA	0.26	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PMPA	1.5	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-01	06/27/2019	320-51903-3	PMPA	1.3	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO5DA	0.058	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-EQBLK-062619	06/26/2019	320-51904-5	PFO5DA	0.055	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PEPA	32	UG/L	PQL		2.3	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PEPA	33.0	UG/L	PQL		2.3	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFESA-BP1	23	UG/L	PQL		1.3	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFESA-BP1	23.0	UG/L	PQL		1.3	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO2HxA	780.0	ug/L	PQL		4.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO2HxA	790	ug/L	PQL		4.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO3OA	240	ug/L	PQL		2.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFO3OA	220.0	ug/L	PQL		2.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFMOAA	2900.0	ug/L	PQL		11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFMOAA	2900	ug/L	PQL		11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	EVE Acid	7.3	UG/L	PQL		1.2	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	EVE Acid	7.1	UG/L	PQL		1.2	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFESA-BP2	17	ug/L	PQL		1.5	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PFESA-BP2	16.0	ug/L	PQL		1.5	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Hydro-EVE Acid	14	UG/L	PQL		1.4	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Hydro-EVE Acid	14.0	UG/L	PQL		1.4	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	NVHOS	27	UG/L	PQL		2.7	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	NVHOS	26.0	UG/L	PQL		2.7	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	R-EVE	0.17	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	R-EVE	0.16	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 4	0.31	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Byproduct 4	0.29	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFESA-BP2	0.20	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFESA-BP2	0.19	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Hydro-EVE Acid	0.053	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	Hydro-EVE Acid	0.047	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PEPA	2.8	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PEPA	2.7	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFESA-BP1	0.038	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFESA-BP1	0.04	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO2HxA	2.7	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO2HxA	2.6	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO3OA	0.36	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO3OA	0.35	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO4DA	0.36	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO4DA	0.35	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO5DA	0.22	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFO5DA	0.22	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFMOAA	1.6	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PFMOAA	1.5	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PMPA	7.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-9S	06/25/2019	320-51746-4	PMPA	6.8	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFESA-BP2	0.55	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFESA-BP2	0.53	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Hydro-EVE Acid	0.24	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Hydro-EVE Acid	0.24	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	R-EVE	0.22	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	R-EVE	0.21	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 4	0.57	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 4	0.42	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 5	0.81	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 5	0.75	UG/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 6	0.035	UG/L	PQL		0.031	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	Byproduct 6	0.033	UG/L	PQL		0.031	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO3OA	17	ug/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO3OA	16.0	ug/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO4DA	4.5	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO4DA	4.4	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO5DA	0.26	ug/L	PQL		0.067	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFO5DA	0.23	ug/L	PQL		0.067	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFMOAA	240	ug/L	PQL		0.42	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PFMOAA	230.0	ug/L	PQL		0.42	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PEPA	2.9	UG/L	PQL		0.093	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PEPA	2.7	UG/L	PQL		0.093	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PMPA	7.8	UG/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	PMPA	7.7	UG/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	NVHOS	3.1	UG/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-27	06/25/2019	320-51746-5	NVHOS	3.0	UG/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFESA-BP2	0.41	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFESA-BP2	0.39	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Hydro-EVE Acid	0.19	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-25	06/25/2019	320-51746-11	Hydro-EVE Acid	0.18	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	R-EVE	1.4	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	R-EVE	1.4	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 4	1.7	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 4	1.6	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 5	0.36	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	Byproduct 5	0.33	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO2HxA	8.1	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO2HxA	7.9	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO3OA	1.4	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO3OA	1.4	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO4DA	1.4	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO4DA	1.3	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO5DA	0.75	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFO5DA	0.75	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFMOAA	2.7	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PFMOAA	2.7	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-25	06/25/2019	320-51746-11	PEPA	9.8	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PEPA	9.7	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PMPA	25	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	PMPA	24.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	NVHOS	0.18	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-25	06/25/2019	320-51746-11	NVHOS	0.19	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	R-EVE	0.29	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	R-EVE	0.28	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 4	0.45	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Byproduct 4	0.45	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFESA-BP2	0.15	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFESA-BP2	0.15	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Hydro-EVE Acid	0.041	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	Hydro-EVE Acid	0.039	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PEPA	1.6	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PEPA	1.6	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO2HxA	2.2	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO2HxA	2.1	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO3OA	0.18	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO3OA	0.17	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO4DA	0.25	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO4DA	0.25	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO5DA	0.13	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFO5DA	0.13	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFMOAA	0.79	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PFMOAA	0.77	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PMPA	4.4	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-MW-23	06/25/2019	320-51746-2	PMPA	4.2	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PEPA	0.23	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PEPA	0.23	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PMPA	0.80	UG/L	PQL		0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PMPA	0.8	UG/L	PQL		0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	NVHOS	0.0050	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	NVHOS	0.0052	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-FTA-03	06/27/2019	320-51903-2	R-EVE	2.1	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	R-EVE	2.1	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 4	1.4	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	Byproduct 4	1.4	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PMPA	6.5	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-03	06/27/2019	320-51903-2	PMPA	6.6	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PMPA	6.4	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-FTA-02	06/27/2019	320-51903-1	PMPA	7.1	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFESA-BP2	0.017	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFESA-BP2	0.017	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFMOAA	0.21	ug/L	PQL		0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFMOAA	0.21	ug/L	PQL		0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO2HxA	0.46	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO2HxA	0.46	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO3OA	0.036	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO3OA	0.037	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO4DA	0.0051	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	PFO4DA	0.0052	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	R-EVE	0.025	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	R-EVE	0.024	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 4	0.038	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-INSITU-01	06/20/2019	320-51662-3	Byproduct 4	0.036	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PEPA	3.0	UG/L	PQL		0.093	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PEPA	3.0	UG/L	PQL		0.093	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	NVHOS	0.91	UG/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	NVHOS	0.93	UG/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFESA-BP2	0.24	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFESA-BP2	0.26	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Hydro-EVE Acid	0.045	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Hydro-EVE Acid	0.043	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 4	0.36	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	Byproduct 4	0.38	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFMOAA	42	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFMOAA	43.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PMPA	2.3	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PMPA	2.4	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO2HxA	9.6	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO2HxA	9.8	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO3OA	2.4	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO3OA	2.5	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO4DA	0.73	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFO4DA	0.77	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PEPA	1.1	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PEPA	1.1	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFESA-BP1	0.042	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	PFESA-BP1	0.042	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	NVHOS	0.44	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-33	06/19/2019	320-51662-2	NVHOS	0.44	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFESA-BP2	0.23	ug/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFESA-BP2	0.23	ug/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Hydro-EVE Acid	0.026	UG/L	PQL		0.014	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Hydro-EVE Acid	0.029	UG/L	PQL		0.014	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	R-EVE	0.065	UG/L	PQL		0.035	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	R-EVE	0.08	UG/L	PQL		0.035	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 4	0.089	UG/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	Byproduct 4	0.089	UG/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFMOAA	12	ug/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFMOAA	12.0	ug/L	PQL		0.11	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PMPA	2.4	UG/L	PQL		0.28	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PMPA	2.5	UG/L	PQL		0.28	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO2HxA	3.1	ug/L	PQL		0.041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO2HxA	3.2	ug/L	PQL		0.041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO3OA	0.66	ug/L	PQL		0.029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO3OA	0.67	ug/L	PQL		0.029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO4DA	0.23	ug/L	PQL		0.039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFO4DA	0.23	ug/L	PQL		0.039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PEPA	1.0	UG/L	PQL		0.023	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PEPA	1.0	UG/L	PQL		0.023	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFESA-BP1	0.013	UG/L	PQL		0.013	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	PFESA-BP1	0.013	UG/L	PQL		0.013	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	R-EVE	0.17	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	R-EVE	0.15	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 4	0.72	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 4	0.7	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 6	0.017	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Byproduct 6	0.017	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	NVHOS	0.14	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-32	06/21/2019	320-51667-2	NVHOS	0.15	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFESA-BP2	0.77	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFESA-BP2	0.73	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Hydro-EVE Acid	0.11	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	Hydro-EVE Acid	0.11	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFMOAA	115	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFMOAA	110.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO2HxA	26	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO2HxA	25.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO3OA	6.5	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO3OA	6.7	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO4DA	1.9	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFO4DA	1.8	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PEPA	2.1	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PEPA	2.1	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFESA-BP1	0.037	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PFESA-BP1	0.033	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PMPA	4.8	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	PMPA	4.6	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFESA-BP2	0.74	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFESA-BP2	0.74	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Hydro-EVE Acid	0.11	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Hydro-EVE Acid	0.11	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	R-EVE	0.18	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	R-EVE	0.18	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 6	0.015	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	Byproduct 6	0.015	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	NVHOS	1.4	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31-D	06/21/2019	320-51667-4	NVHOS	1.3	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFMOAA	109	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFMOAA	110.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PMPA	4.8	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PMPA	4.8	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO2HxA	25	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO2HxA	25.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO3OA	6.2	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO3OA	6.7	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO4DA	1.8	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PFO4DA	1.9	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PEPA	2.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	PEPA	2.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-31	06/21/2019	320-51667-3	NVHOS	1.3	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-31	06/21/2019	320-51667-3	NVHOS	1.3	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFESA-BP2	0.19	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFESA-BP2	0.21	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 4	0.19	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	Byproduct 4	0.19	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFMOAA	18	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFMOAA	20.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	NVHOS	0.26	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	NVHOS	0.27	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO2HxA	3.9	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO2HxA	4.2	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO4DA	0.31	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFO4DA	0.34	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PEPA	0.27	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PEPA	0.3	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFESA-BP1	0.057	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-29	06/21/2019	320-51667-1	PFESA-BP1	0.061	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-28	06/25/2019	320-51746-7	R-EVE	0.082	UG/L	PQL		0.0035	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	R-EVE	0.086	UG/L	PQL		0.0035	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 4	0.15	UG/L	PQL		0.0079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Byproduct 4	0.16	UG/L	PQL		0.0079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFESA-BP2	0.054	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFESA-BP2	0.056	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Hydro-EVE Acid	0.016	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	Hydro-EVE Acid	0.017	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO2HxA	1.3	ug/L	PQL		0.0041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO2HxA	1.3	ug/L	PQL		0.0041	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO3OA	0.16	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO3OA	0.17	ug/L	PQL		0.0029	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO4DA	0.19	ug/L	PQL		0.0039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO4DA	0.21	ug/L	PQL		0.0039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFMOAA	0.46	ug/L	PQL		0.011	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFMOAA	0.47	ug/L	PQL		0.011	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PEPA	1.1	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PEPA	1.2	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PMPA	3.2	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PMPA	3.3	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	NVHOS	0.030	UG/L	PQL		0.0027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	NVHOS	0.031	UG/L	PQL		0.0027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFESA-BP2	0.18	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFESA-BP2	0.17	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 5	0.44	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	Byproduct 5	0.45	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PEPA	0.27	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PEPA	0.26	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFESA-BP1	0.029	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFESA-BP1	0.028	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO2HxA	1.3	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO2HxA	1.2	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO3OA	0.31	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO3OA	0.29	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO4DA	0.15	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO4DA	0.15	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO5DA	0.12	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFO5DA	0.11	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFMOAA	5.8	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PFMOAA	5.6	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFESA-BP1	0.32	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFESA-BP1	0.33	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO2HxA	20	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO2HxA	20.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO3OA	3.2	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO3OA	3.2	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO4DA	3.3	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO4DA	3.4	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO5DA	4.6	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFO5DA	4.8	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFMOAA	8.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFMOAA	8.2	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	EVE Acid	0.20	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	EVE Acid	0.2	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFESA-BP2	1.3	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PFESA-BP2	1.3	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Hydro-EVE Acid	0.32	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Hydro-EVE Acid	0.35	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	NVHOS	0.29	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	NVHOS	0.3	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PMPA	26	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PMPA	26.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	R-EVE	2.4	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	R-EVE	2.4	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 4	5.1	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 4	5.2	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 6	0.063	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Byproduct 6	0.065	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-07	06/27/2019	320-51903-6	NVHOS	1.8	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	NVHOS	1.8	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PEPA	10	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PEPA	10.0	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFESA-BP1	0.61	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFESA-BP1	0.66	UG/L	PQL		0.027	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO2HxA	46	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO2HxA	46.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO3OA	14	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO3OA	14.0	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO5DA	4.3	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFO5DA	4.5	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFMOAA	93	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFMOAA	93.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	EVE Acid	0.27	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	EVE Acid	0.27	UG/L	PQL		0.024	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFESA-BP2	2.0	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-07	06/27/2019	320-51903-6	PFESA-BP2	2.1	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Hydro-EVE Acid	0.85	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-07	06/27/2019	320-51903-6	Hydro-EVE Acid	0.86	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	R-EVE	4.4	UG/L	PQL		0.35	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	R-EVE	4.4	UG/L	PQL		0.35	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 4	6.0	UG/L	PQL		0.79	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 4	6.3	UG/L	PQL		0.79	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 5	37	UG/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 5	38.0	UG/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 6	0.60	UG/L	PQL		0.077	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Byproduct 6	0.58	UG/L	PQL		0.077	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO2HxA	110	ug/L	PQL		0.41	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO2HxA	110.0	ug/L	PQL		0.41	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO3OA	39	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO3OA	38.0	ug/L	PQL		0.29	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO4DA	21	ug/L	PQL		0.39	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO4DA	21.0	ug/L	PQL		0.39	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO5DA	19	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFO5DA	19.0	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFMOAA	260	ug/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	PFMOAA	260.0	ug/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Hydro-EVE Acid	3.3	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	Hydro-EVE Acid	3.3	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	NVHOS	4.9	UG/L	PQL		0.27	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-03	06/27/2019	320-51904-2	NVHOS	4.9	UG/L	PQL		0.27	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PMPA	74	UG/L	PQL		28	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	PMPA	73.0	UG/L	PQL		28	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	R-EVE	12	UG/L	PQL		3.5	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	R-EVE	11.0	UG/L	PQL		3.5	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 4	21	UG/L	PQL		7.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 4	21.0	UG/L	PQL		7.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 5	210.0	UG/L	PQL		2.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-02	06/27/2019	320-51904-4	Byproduct 5	210	UG/L	PQL		2.9	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PMPA	0.66	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-27	06/25/2019	320-51746-8	PMPA	0.71	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO5DA	0.058	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO5DA	0.064	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO2HxA	0.19	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PFO2HxA	0.19	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	R-EVE	0.28	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	R-EVE	0.29	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 4	0.33	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Byproduct 4	0.38	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	NVHOS	0.11	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-27	06/25/2019	320-51746-8	NVHOS	0.11	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PEPA	0.14	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-26	06/25/2019	320-51746-9	PEPA	0.14	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFESA-BP2	0.18	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFESA-BP2	0.19	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Hydro-EVE Acid	0.082	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	Hydro-EVE Acid	0.087	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PEPA	5.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PEPA	5.3	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO2HxA	4.1	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO2HxA	4.2	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO3OA	0.81	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO3OA	0.83	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO4DA	0.71	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO4DA	0.72	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO5DA	0.19	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFO5DA	0.21	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFMOAA	1.3	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PFMOAA	1.3	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PMPA	14	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	PMPA	14.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFESA-BP2	0.55	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFESA-BP2	0.53	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Hydro-EVE Acid	0.14	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

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Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Hydro-EVE Acid	0.14	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	NVHOS	0.093	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-24	06/25/2019	320-51746-10	NVHOS	0.1	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	R-EVE	0.62	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	R-EVE	0.62	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 4	0.97	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 4	0.92	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 5	0.18	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	Byproduct 5	0.17	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO2HxA	9.0	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO2HxA	8.5	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO3OA	1.3	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO3OA	1.3	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO4DA	1.1	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO4DA	1.0	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO5DA	1.0	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFO5DA	0.97	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFMOAA	2.8	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PFMOAA	2.7	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	R-EVE	2.3	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	R-EVE	2.4	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 4	3.2	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 4	3.2	UG/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 5	1.6	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 5	1.6	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 6	0.028	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	Byproduct 6	0.029	UG/L	PQL		0.015	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	NVHOS	0.13	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	NVHOS	0.12	UG/L	PQL		0.054	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PEPA	7.6	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PEPA	7.2	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PMPA	19	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-15	06/25/2019	320-51746-3	PMPA	18.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PMPA	110.0	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PMPA	110	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFESA-BP2	0.055	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFESA-BP2	0.052	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Hydro-EVE Acid	0.0049	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	Hydro-EVE Acid	0.0048	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PEPA	0.57	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PEPA	0.55	UG/L	PQL		0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO2HxA	0.98	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO2HxA	0.97	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO4DA	0.054	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO4DA	0.059	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFMOAA	0.36	ug/L	PQL		0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFMOAA	0.35	ug/L	PQL		0.0050	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PMPA	1.7	UG/L	PQL		0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PMPA	1.7	UG/L	PQL		0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFESA-BP2	0.45	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFESA-BP2	0.46	ug/L	PQL		0.061	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Hydro-EVE Acid	0.14	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Hydro-EVE Acid	0.13	UG/L	PQL		0.056	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	NVHOS	0.011	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	NVHOS	0.011	UG/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	R-EVE	0.18	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	R-EVE	0.18	UG/L	PQL		0.14	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 4	0.66	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	Byproduct 4	0.59	UG/L	PQL		0.32	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFMOAA	77	ug/L	PQL		0.42	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFMOAA	78.0	ug/L	PQL		0.42	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PMPA	6.2	UG/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PMPA	6.2	UG/L	PQL		1.1	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO2HxA	20	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO2HxA	21.0	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO3OA	4.8	ug/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO3OA	4.9	ug/L	PQL		0.12	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO4DA	1.3	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-34	06/19/2019	320-51662-1	PFO4DA	1.3	ug/L	PQL		0.16	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PMPA	2.9	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PMPA	2.7	UG/L	PQL		0.57	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO5DA	0.051	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-10	06/27/2019	320-51903-4	PFO5DA	0.059	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	R-EVE	0.14	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	R-EVE	0.14	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFESA-BP2	0.072	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFESA-BP2	0.069	ug/L	PQL		0.030	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Hydro-EVE Acid	0.03	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	Hydro-EVE Acid	0.03	UG/L	PQL		0.028	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PEPA	0.76	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PEPA	0.68	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO2HxA	2.4	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO2HxA	2.2	ug/L	PQL		0.081	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO3OA	0.40	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO3OA	0.37	ug/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019 **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO5DA	0.062	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFO5DA	0.067	ug/L	PQL		0.034	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFMOAA	1.6	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-11	06/26/2019	320-51903-7	PFMOAA	1.6	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** SITEWIDE GW SAMPLING 2019 **Validation Options:** LABSTATS

Validation Reason Associated LCS and/or LCSD analysis had relative percent recovery (RPR) values less than the lower control limit. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO5DA	0.046	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-28	06/25/2019	320-51746-7	PFO5DA	0.044	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO5DA	0.0031	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO5DA	0.0029	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit but above the rejection limit. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-MW-1S	06/28/2019	320-51904-3	PFO4DA	1.3	ug/L	PQL		0.079	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PEPA	62	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-13	06/25/2019	320-51746-6	PEPA	63.0	UG/L	PQL		0.047	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	PFMOAA	63	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	PFMOAA	63.0	ug/L	PQL		0.21	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	R-EVE	0.20	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	R-EVE	0.21	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	Byproduct 5	5.8	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-12	07/11/2019	320-52282-2	Byproduct 5	6.0	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	PFESA-BP1	78	UG/L	PQL		0.13	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	PFESA-BP1	78.0	UG/L	PQL		0.13	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	PFO5DA	45	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	PFO5DA	46.0	ug/L	PQL		0.17	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	R-EVE	4.7	UG/L	PQL		0.35	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-NAF-06	07/11/2019	320-52282-1	R-EVE	4.6	UG/L	PQL		0.35	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-21R	07/02/2019	320-52030-1	PFO4DA	0.22	ug/L	PQL		0.0039	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit but above the rejection limit. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-PZ-11-D	07/16/2019	320-52322-2	R-EVE	0.11	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-11-D	07/16/2019	320-52322-2	R-EVE	0.12	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-11	07/16/2019	320-52322-1	R-EVE	0.11	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-PZ-11	07/16/2019	320-52322-1	R-EVE	0.13	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO3OA	0.21	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-01	06/25/2019	320-51746-12	PFO3OA	0.2	ug/L	PQL		0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-09	07/11/2019	320-52282-6	R-EVE	0.36	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-09	07/11/2019	320-52282-6	R-EVE	0.34	UG/L	PQL		0.070	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-09	07/11/2019	320-52282-6	Byproduct 5	54	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
GW0619-SMW-09	07/11/2019	320-52282-6	Byproduct 5	53.0	UG/L	PQL		0.058	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Sitewide GW Sampling 2019-2 **Validation Options:** LABSTATS

Validation Reason One or more surrogates had relative percent recovery (RPR) values less than the data rejection level. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
GW0619-NAF-12	07/17/2019	320-52464-4	Perfluorobutanoic Acid	6.5	UG/L	PQL		0.0020	J	537 Modified		3535_PFC

ADQM DATA REVIEW
NARRATIVE

Site	**Chemours FAY – Fayetteville**
Project	**Bladen Well Install**
Project Reviewer	**Michael Aucoin, AECOM as a Chemours contractor**
Sampling Dates	**August 14 - 16, 2019** **August 19 - 21, 2019** **August 27 - 28, 2019**

Analytical Protocol

Laboratory	Analytical Method	Parameter(s)
TestAmerica - Sacramento	537 Modified	PFAS[1]
TestAmerica - Sacramento	Cl. Spec. Table 3 Compound SOP	Table 3+ compounds
TestAmerica - Burlington	9045D	pH
TestAmerica - Burlington	ASTM D2937	In Place Density
TestAmerica - Burlington	ASTM D422-63	Grain Size
TestAmerica - Burlington	Calculation	Porosity Calculation
TestAmerica - Burlington	Calculation	Void Ratio
TestAmerica - Burlington	D4318	Liquid Limit of Soils; Plastic Limit Soils; Plasticity Index
TestAmerica - Burlington	D854-92	Specific Gravity
TestAmerica - Pensacola	WALKLEY-BLACK	Fraction Organic Carbon
TestAmerica - Pensacola	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Moisture
TestAmerica - Sacramento	ASTM D2216-90	Percent Solids

[1] Perfluoroalkylsubstances, a list of 37 compounds including HFPO-DA.

Sample Receipt

The following items are noted for this data set:

- All samples were received in satisfactory condition and within EPA temperature guidelines on:

  August 15 and 17, 2019
  August 21 - 22. 2019
  August 29, 2019

- The density results reported do not represent the in-place density of the soil. The soil was received in a disturbed state and was subsequently molded in the laboratory to an approximation of the field environment

Data Review

The electronic data submitted for this project was reviewed via the Data Verification Module (DVM) process.

Overall the data is acceptable for use without qualification, except as noted below:

- Non-detect results for R-EVE, Byproduct 4, and Byproduct 5 in some soil samples were qualified R and should be considered to be unusable due to very poor matrix spike recoveries.
- PFHxS and PFTDA results in two or more groundwater samples were qualified B and the reported results may be biased high, or false positives, due to a comparable concentration found in the associated method blanks.
- Several analytical results have been qualified J as estimated, and non-detect results qualified UJ indicating an estimated reporting limit, due to poor or very poor recovery of a surrogate or matrix spike; sample preparation and/or analysis which exceeded the laboratory established hold time; and poor field duplicate or lab replicate precision. See the Data Verification Module (DVM) Narrative Report for which samples were qualified, the specific reasons for qualification, and potential bias in reported results.
- The groundwater samples were inadvertently reported by the laboratory to the method detection limit (MDL); results reported between the MDL and the limit of quantitation (LOQ) are qualified J and should be considered to be estimated values.

Attachments

The DVM Narrative report is attached. The lab reports due to a large page count are stored on an AECOM network shared drive and are available to be posted on external shared drives, or on a flash drive.

Data Verification Module (DVM)

The DVM is an internal review process used by the ADQM group to assist with the determination of data usability. The electronic data deliverables received from the laboratory are loaded into the Locus EIM™ database and processed through a series of data quality checks, which are a combination of software (Locus EIM™ database Data Verification Module (DVM)) and manual reviewer evaluations. The data is evaluated against the following data usability checks:

- Field and laboratory blank contamination
- US EPA hold time criteria
- Missing Quality Control (QC) samples
- Matrix spike(MS)/matrix spike duplicate (MSD) recoveries and the relative percent differences (RPDs) between these spikes
- Laboratory control sample(LCS)/control sample duplicate (LCSD) recoveries and the RPD between these spikes
- Surrogate spike recoveries for organic analyses
- RPD between field duplicate sample pairs
- RPD between laboratory replicates for inorganic analyses
- Difference / percent difference between total and dissolved sample pairs.

There are two qualifier fields in EIM:

Lab Qualifier is the qualifier assigned by the lab and may not reflect the usability of the data. This qualifier may have many different meanings and can vary between labs and over time within the same lab. Please refer to the laboratory report for a description of the lab qualifiers. As they are lab descriptors they are not to be used when evaluating the data.

Validation Qualifier is the 3rd party formal validation qualifier if this was performed. Otherwise this field contains the qualifier resulting from the ADQM DVM review process. This qualifier assesses the usability of the data and may not equal the lab qualifier. The DVM applies the following data evaluation qualifiers to analysis results, as warranted:

Qualifier	**Definition**
B	Not detected substantially above the level reported in the laboratory or field blanks.
R	Unusable result. Analyte may or may not be present in the sample.
J	Analyte present. Reported value may not be accurate or precise.
UJ	Not detected. Reporting limit may not be accurate or precise.

The **Validation Status Code** field is set to "DVM" if the ADQM DVM process has been performed. If the DVM has not been run, the field will be blank.

If the DVM has been run (**Validation Status Code** equals "DVM"), use the **Validation Qualifier.**

DVM Narrative Report

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is unusable.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-1S-081419	08/14/2019	200-50099-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Byproduct 4	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Byproduct 5	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	R-EVE	1.0	UG/KG	PQL		1.0	R	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Contamination detected in Method Blank(s). Sample result does not differ significantly from the analyte concentration detected in the associated method blank(s).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluorohexane Sulfonic Acid	0.00076	UG/L	PQL	0.00016	0.0018	B	537 Modified		3535_PFC
DUP-1-082719	08/27/2019	280-127778-2	Perfluorohexane Sulfonic Acid	0.00032	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC
BLADEN-4D-082819	08/28/2019	280-127778-7	Perfluorohexane Sulfonic Acid	0.00026	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC
BLADEN-3D-082819	08/28/2019	280-127778-6	Perfluorohexane Sulfonic Acid	0.00026	UG/L	PQL	0.00015	0.0018	B	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluorohexane Sulfonic Acid	0.00027	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC
BLADEN-2D-082719	08/27/2019	280-127778-4	Perfluorohexane Sulfonic Acid	0.00052	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluorohexane Sulfonic Acid	0.0011	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluorotetradecanoic Acid	0.00024	UG/L	PQL	0.00024	0.0017	B	537 Modified		3535_PFC
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluorotetradecanoic Acid	0.00036	UG/L	PQL	0.00024	0.0017	B	537 Modified		3535_PFC
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluorohexane Sulfonic Acid	0.00033	UG/L	PQL	0.00014	0.0017	B	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-1S-081419	08/14/2019	200-50099-1	10:2 Fluorotelomer sulfonate	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	11Cl-PF3OUdS	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	Perfluorododecane sulfonic acid (PFDoS)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFECA B	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFO2HxA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFO3OA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFMOAA	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Hydro-EVE Acid	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	PFECA-G	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-4D-082819	08/28/2019	280-127778-7	PFO5DA	0.0003	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-4D-082819	08/28/2019	280-127778-7	PFO5DA	0.002	ug/L	PQL	0.00034	0.0020	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the lower control limit. The actual detection limits may be higher than reported.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-4D-082819	08/28/2019	280-127778-7	PFMOAA	0.0021	ug/L	PQL	0.0021	0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-4D-082819	08/28/2019	280-127778-7	PFMOAA	0.005	ug/L	PQL	0.0021	0.0050	UJ	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Perfluorobutane Sulfonic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	Perfluorobutane Sulfonic Acid (trial)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	10:2 Fluorotelomer sulfonate	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Hfpo Dimer Acid	0.25	UG/KG	PQL		0.25	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorooctadecanoic acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	PFOS	0.50	UG/KG	PQL		0.50	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluoroundecanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	N-methyl perfluorooctane sulfonamidoacetic acid	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluoropentanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluoropentane sulfonic acid (PFPeS)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	6:2 Fluorotelomer sulfonate	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	N-ethyl perfluorooctane sulfonamidoacetic acid	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorohexanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorododecanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	N-methyl perfluoro-1-octanesulfonamide	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	PFOA	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorodecanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorodecane Sulfonic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorohexane Sulfonic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorobutanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorobutane Sulfonic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The preparation hold time for this sample was exceeded. The reporting limit may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluoroheptanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluoroheptane sulfonic acid (PFHpS)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorononanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorotetradecanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	N-ethylperfluoro-1-octanesulfonamide	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorohexadecanoic acid (PFHxDA)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorononanesulfonic acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorotridecanoic Acid	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorooctane Sulfonamide	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	9Cl-PF3ONS	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	2.0	UG/KG	PQL		2.0	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	11Cl-PF3OUdS	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	Perfluorododecane sulfonic acid (PFDoS)	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	ADONA	0.21	UG/KG	PQL		0.21	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	NaDONA	0.21	UG/KG	PQL		0.21	UJ	537 Modified		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason One or more surrogates had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is considered to be an estimated value.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
BLADEN-2S-081619-9.5-10.5	08/16/2019	200-50148-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D
Bladen-3S-Soil-082019-5-6	08/20/2019	200-50185-2	2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	0.20	UG/KG	PQL		0.20	UJ	537 Modified		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values less than the data rejection level. The reported non-detect result is considered to be an estimated value.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-1S-081419	08/14/2019	200-50099-1	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
BLADEN-1S-081419	08/14/2019	200-50099-1	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	Byproduct 4	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D
DUP-1-081419	08/14/2019	200-50099-2	Byproduct 5	1.0	UG/KG	PQL		1.0	UJ	Cl. Spec. Table 3 Compound SOP		Shake_Bath_14D

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Associated MS and/or MSD analysis had relative percent recovery (RPR) values higher than the upper control limit. The reported result may be biased high.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Byproduct 4	0.0016	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Byproduct 4	0.0019	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason High relative percent difference (RPD) observed between field duplicate and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
DUP-1-082719	08/27/2019	280-127778-2	Byproduct 4	0.011	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	Byproduct 4	0.0094	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-1D-082719	08/27/2019	280-127778-1	Byproduct 4	0.013	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-1D-082719	08/27/2019	280-127778-1	Byproduct 4	0.012	UG/L	PQL	0.0016	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Only one surrogate has relative percent recovery (RPR) values outside control limits and the parameter is a PFC (Detects).

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	Perfluorobutanoic Acid	0.0021	UG/L	PQL	0.00030	0.0017	J	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason Quality review criteria exceeded between the REP (laboratory replicate) and parent sample. The reported result may be imprecise.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	PMPA	0.077	UG/L	PQL	0.0057	0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO2HxA	0.019	ug/L	PQL	0.00081	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO2HxA	0.012	ug/L	PQL	0.00081	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded by a factor of 2. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Bladen-4S-Soil-082119-5-6	08/21/2019	200-50202-1	Ph	7.8	STD UNITS	MDL		0	J	9045D		
Bladen-3D-Soil-081919-42-43	08/19/2019	200-50185-1	Ph	6.0	STD UNITS	MDL		0	J	9045D		
BLADEN-2D-081519-72-73	08/15/2019	200-50148-1	Ph	4.2	STD UNITS	MDL		0	J	9045D		
BLADEN-1S-081419	08/14/2019	200-50099-1	Ph	4.0	STD UNITS	MDL		0	J	9045D		

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The analysis hold time for this sample was exceeded. The reported result may be biased low.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
Bladen-4S-Soil-082119-5-6	08/21/2019	200-50202-1	Porosity Calculation	42.0	%	MDL		0	J	Calculation		
Bladen-4S-Soil-082119-5-6	08/21/2019	200-50202-1	Void Ratio	0.7	NONE	MDL		0	J	Calculation		
Bladen-3D-Soil-081919-42-43	08/19/2019	200-50185-1	Porosity Calculation	46.2	%	MDL		0	J	Calculation		
Bladen-3D-Soil-081919-42-43	08/19/2019	200-50185-1	Void Ratio	0.9	NONE	MDL		0	J	Calculation		

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The result is estimated since the concentration is between the method detection limit and practical quantitation limit.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	PMPA	0.0057	UG/L	PQL	0.0057	0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluorobutane Sulfonic Acid	0.00043	UG/L	PQL	0.00017	0.0017	J	537 Modified		3535_PFC
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluoroheptanoic Acid	0.00027	UG/L	PQL	0.00021	0.0017	J	537 Modified		3535_PFC
BLADEN-1D-082719	08/27/2019	280-127778-1	PFESA-BP2	0.0005	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-1D-082719	08/27/2019	280-127778-1	PFESA-BP2	0.00049	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluorooctane Sulfonamide	0.00048	UG/L	PQL	0.00029	0.0017	J	537 Modified		3535_PFC
BLADEN EQBLK-1	08/28/2019	280-127778-8	Perfluorohexane Sulfonic Acid	0.00034	UG/L	PQL	0.00016	0.0019	J	537 Modified		3535_PFC
BLADEN EQBLK-1	08/28/2019	280-127778-8	Perfluorotetradecanoic Acid	0.0003	UG/L	PQL	0.00028	0.0019	J	537 Modified		3535_PFC
BLADEN EQBLK-2	08/28/2019	280-127778-9	Perfluorohexane Sulfonic Acid	0.00026	UG/L	PQL	0.00016	0.0019	J	537 Modified		3535_PFC
BLADEN-1D-082719	08/27/2019	280-127778-1	Perfluorohexanoic Acid	0.0011	UG/L	PQL	0.00048	0.0017	J	537 Modified		3535_PFC
BLADEN-2D-082719	08/27/2019	280-127778-4	Perfluorobutane Sulfonic Acid	0.0015	UG/L	PQL	0.00017	0.0017	J	537 Modified		3535_PFC
BLADEN-2D-082719	08/27/2019	280-127778-4	Perfluoroheptanoic Acid	0.00022	UG/L	PQL	0.00021	0.0017	J	537 Modified		3535_PFC
BLADEN-2D-082719	08/27/2019	280-127778-4	PFO3OA	0.0006	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	PFO3OA	0.00096	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluorobutane Sulfonic Acid	0.0013	UG/L	PQL	0.00017	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluoroheptanoic Acid	0.00043	UG/L	PQL	0.00021	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluoroheptane sulfonic acid (PFHpS)	0.00026	ug/L	PQL	0.00016	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO3OA	0.0018	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO3OA	0.0012	ug/L	PQL	0.00058	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO4DA	0.0015	ug/L	PQL	0.00079	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The result is estimated since the concentration is between the method detection limit and practical quantitation limit.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PFO4DA	0.001	ug/L	PQL	0.00079	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluorooctane Sulfonamide	0.00048	UG/L	PQL	0.00029	0.0017	J	537 Modified		3535_PFC
BLADEN-3D-082819	08/28/2019	280-127778-6	Hfpo Dimer Acid	0.0022	UG/L	PQL	0.0013	0.0035	J	537 Modified		3535_PFC
BLADEN-3D-082819	08/28/2019	280-127778-6	PEPA	0.0021	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3D-082819	08/28/2019	280-127778-6	PEPA	0.0021	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	PFOS	0.0006	UG/L	PQL	0.00046	0.0017	J	537 Modified		3535_PFC
BLADEN-2D-082719	08/27/2019	280-127778-4	PEPA	0.012	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	PEPA	0.012	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2D-082719	08/27/2019	280-127778-4	Perfluoropentanoic Acid	0.00046	UG/L	PQL	0.00041	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	NVHOS	0.0015	UG/L	PQL	0.00054	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	NVHOS	0.0015	UG/L	PQL	0.00054	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PEPA	0.0068	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	PEPA	0.006	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluoropentanoic Acid	0.00098	UG/L	PQL	0.00041	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	Perfluorohexanoic Acid	0.00062	UG/L	PQL	0.00049	0.0017	J	537 Modified		3535_PFC
BLADEN-2S-082719	08/27/2019	280-127778-3	PFOA	0.0013	UG/L	PQL	0.00071	0.0017	J	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	PEPA	0.0056	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	PEPA	0.0058	UG/L	PQL	0.00047	0.020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluoropentanoic Acid	0.00093	UG/L	PQL	0.00041	0.0017	J	537 Modified		3535_PFC

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The result is estimated since the concentration is between the method detection limit and practical quantitation limit.

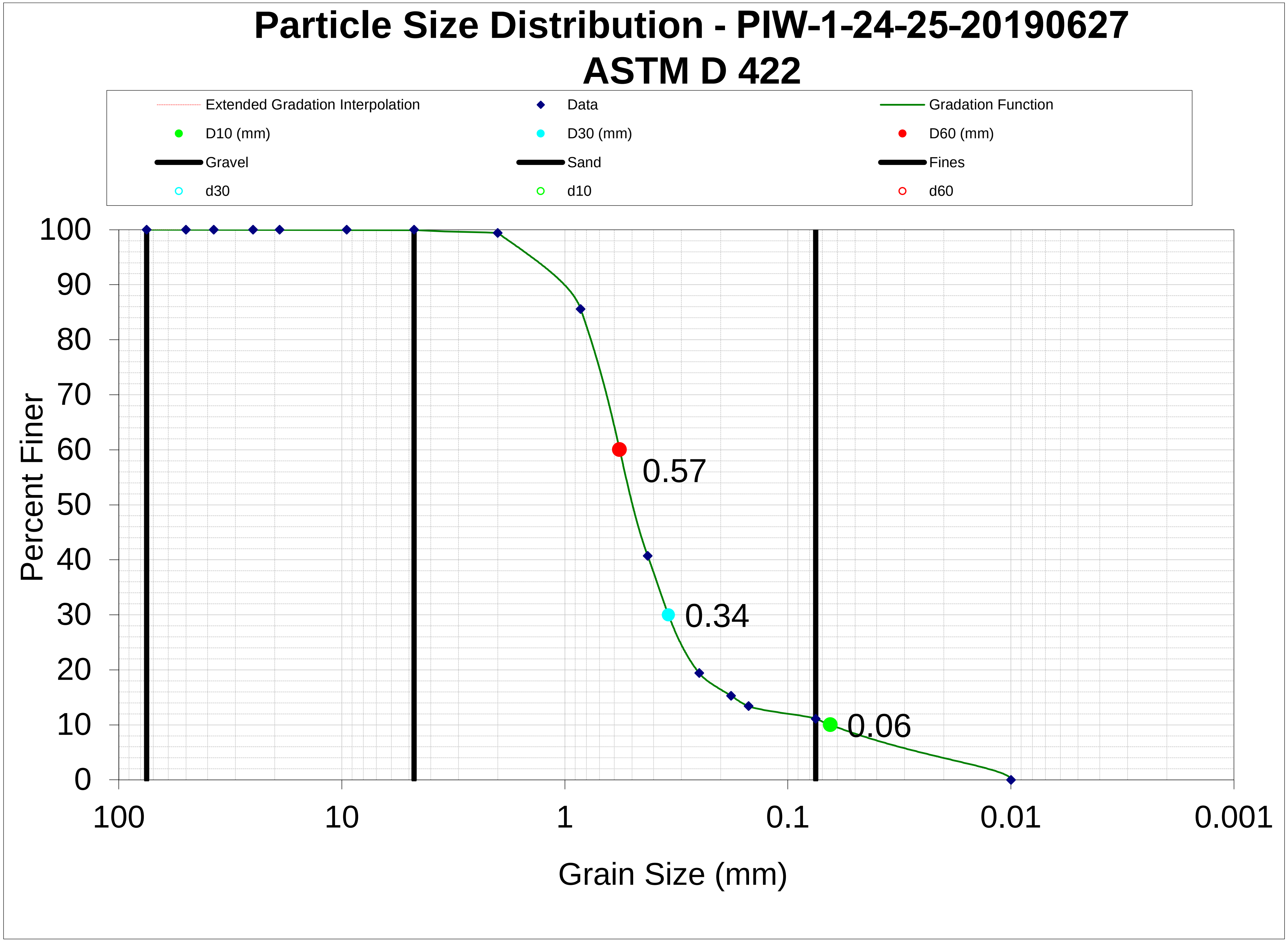
Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluorohexanoic Acid	0.00065	UG/L	PQL	0.00049	0.0017	J	537 Modified		3535_PFC
BLADEN-3D-082819	08/28/2019	280-127778-6	Perfluorobutane Sulfonic Acid	0.00033	UG/L	PQL	0.00018	0.0018	J	537 Modified		3535_PFC
BLADEN-3D-082819	08/28/2019	280-127778-6	PFO2HxA	0.0013	ug/L	PQL	0.00081	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3D-082819	08/28/2019	280-127778-6	PFO2HxA	0.0012	ug/L	PQL	0.00081	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3D-082819	08/28/2019	280-127778-6	PFESA-BP2	0.0006	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3D-082819	08/28/2019	280-127778-6	PFESA-BP2	0.00062	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluorobutane Sulfonic Acid	0.00026	UG/L	PQL	0.00017	0.0017	J	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluoroheptanoic Acid	0.00081	UG/L	PQL	0.00021	0.0017	J	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluorononanoic Acid	0.00038	UG/L	PQL	0.00023	0.0017	J	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	PFO5DA	0.0010	ug/L	PQL	0.00034	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	PFO5DA	0.00099	ug/L	PQL	0.00034	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Perfluorooctane Sulfonamide	0.00033	UG/L	PQL	0.00029	0.0017	J	537 Modified		3535_PFC
BLADEN-3S-082819	08/28/2019	280-127778-5	Hydro-EVE Acid	0.0005	UG/L	PQL	0.00028	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-3S-082819	08/28/2019	280-127778-5	Hydro-EVE Acid	0.00044	UG/L	PQL	0.00028	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-4D-082819	08/28/2019	280-127778-7	Perfluorohexane Sulfonic Acid (trial)	0.00023	UG/L	PQL	0.00014	0.0017	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluoropentanoic Acid	0.0008	UG/L	PQL	0.00045	0.0018	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluorohexanoic Acid	0.00075	UG/L	PQL	0.00053	0.0018	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	PFOA	0.0015	UG/L	PQL	0.00078	0.0018	J	537 Modified		3535_PFC
BLADEN-4D-082819	08/28/2019	280-127778-7	PMPA	0.0092	UG/L	PQL	0.0057	0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

Site: Fayetteville **Sampling Program:** Bladen Well Install **Validation Options:** LABSTATS

Validation Reason The result is estimated since the concentration is between the method detection limit and practical quantitation limit.

Field Sample ID	Date Sampled	Lab Sample ID	Analyte	Result	Units	Type	MDL	PQL	Validation Qualifier	Analytical Method	Pre-prep	Prep
BLADEN-4D-082819	08/28/2019	280-127778-7	PMPA	0.0093	UG/L	PQL	0.0057	0.010	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
Bladen-4S-Soil-082119-5-6	08/21/2019	200-50202-1	Fraction Organic Carbon	0.00054	G/G	MDL	0.00053	0.0013	J	WALKLEY-BLACK		
DUP-1-082719	08/27/2019	280-127778-2	NVHOS	0.0019	UG/L	PQL	0.00054	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	NVHOS	0.0017	UG/L	PQL	0.00054	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	Perfluorohexanoic Acid	0.0011	UG/L	PQL	0.00048	0.0017	J	537 Modified		3535_PFC
DUP-1-082719	08/27/2019	280-127778-2	Perfluorobutane Sulfonic Acid	0.00039	UG/L	PQL	0.00017	0.0017	J	537 Modified		3535_PFC
DUP-1-082719	08/27/2019	280-127778-2	Perfluoroheptanoic Acid	0.00026	UG/L	PQL	0.00021	0.0017	J	537 Modified		3535_PFC
DUP-1-082719	08/27/2019	280-127778-2	PFESA-BP2	0.0005	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	PFESA-BP2	0.00046	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	Hydro-EVE Acid	0.0003	UG/L	PQL	0.00028	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
DUP-1-082719	08/27/2019	280-127778-2	Hydro-EVE Acid	0.00033	UG/L	PQL	0.00028	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluorobutanoic Acid	0.0011	UG/L	PQL	0.00032	0.0018	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluorobutane Sulfonic Acid	0.0005	UG/L	PQL	0.00018	0.0018	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	Perfluoroheptanoic Acid	0.00048	UG/L	PQL	0.00023	0.0018	J	537 Modified		3535_PFC
BLADEN-4S-082819	08/28/2019	280-127778-10	PFESA-BP2	0.0015	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep
BLADEN-4S-082819	08/28/2019	280-127778-10	PFESA-BP2	0.0015	ug/L	PQL	0.00030	0.0020	J	Cl. Spec. Table 3 Compound SOP		PFAS_DI_Prep

APPENDIX H
Grain Size Analysis


Particle Size Distribution - PIW-1-24-25-20190627
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.57
0.34
0.06
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

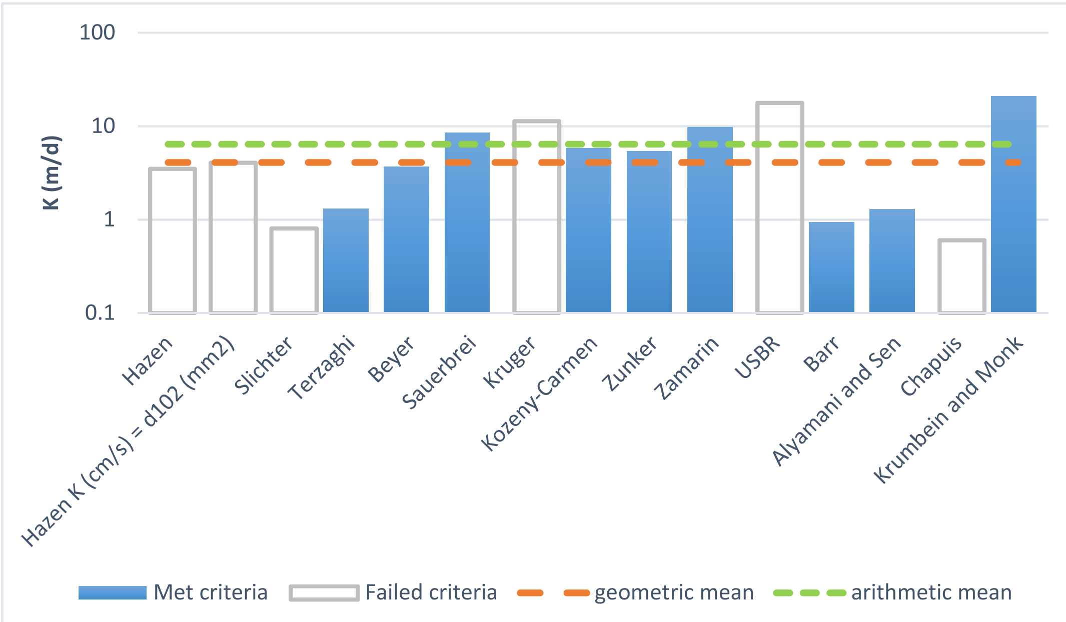
Date: 6/27/2019

Sample Name: PIW-1-24-25-20190627

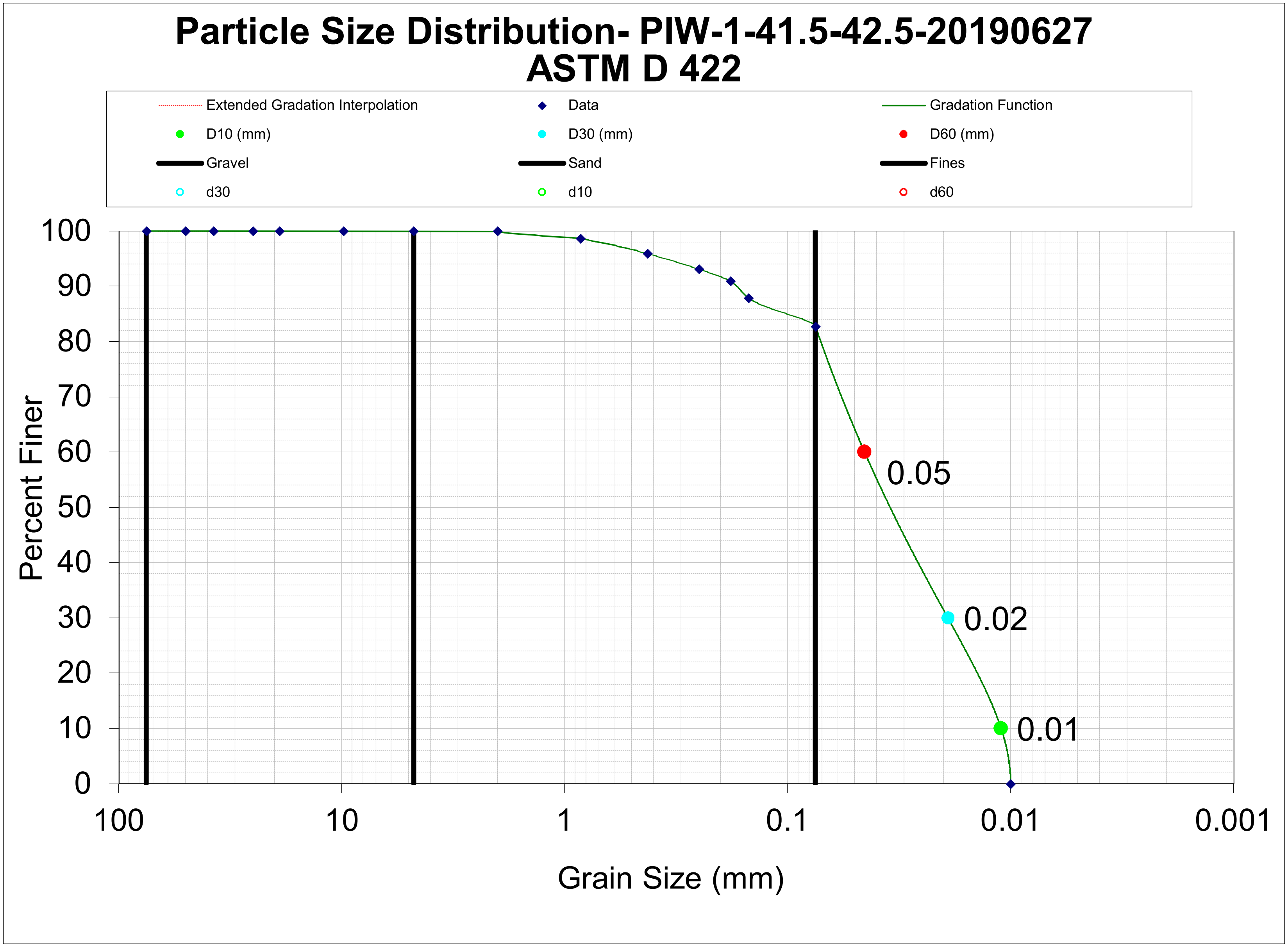
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.403E-02	.403E-04	3.48	11.43
Hazen K (cm/s) = d_{10} (mm)	.470E-02	.470E-04	4.06	13.32
Slichter	.931E-03	.931E-05	0.80	2.64
Terzaghi	.151E-02	.151E-04	1.30	4.28
Beyer	.425E-02	.425E-04	3.67	12.05
Sauerbrei	.993E-02	.993E-04	8.58	28.14
Kruger	.131E-01	.131E-03	11.28	37.00
Kozeny-Carmen	.674E-02	.674E-04	5.82	19.10
Zunker	.627E-02	.627E-04	5.42	17.78
Zamarin	.113E-01	.113E-03	9.73	31.94
USBR	.206E-01	.206E-03	17.77	58.29
Barr	.109E-02	.109E-04	0.94	3.08
Alyamani and Sen	.149E-02	.149E-04	1.29	4.22
Chapuis	.697E-03	.697E-05	0.60	1.98
Krumbein and Monk	.242E-01	.242E-03	20.90	68.58
geometric mean	.473E-02	.473E-04	4.09	13.41
arithmetic mean	.741E-02	.741E-04	6.41	21.02


Particle Size Distribution- PIW-1-41.5-42.5-20190627
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

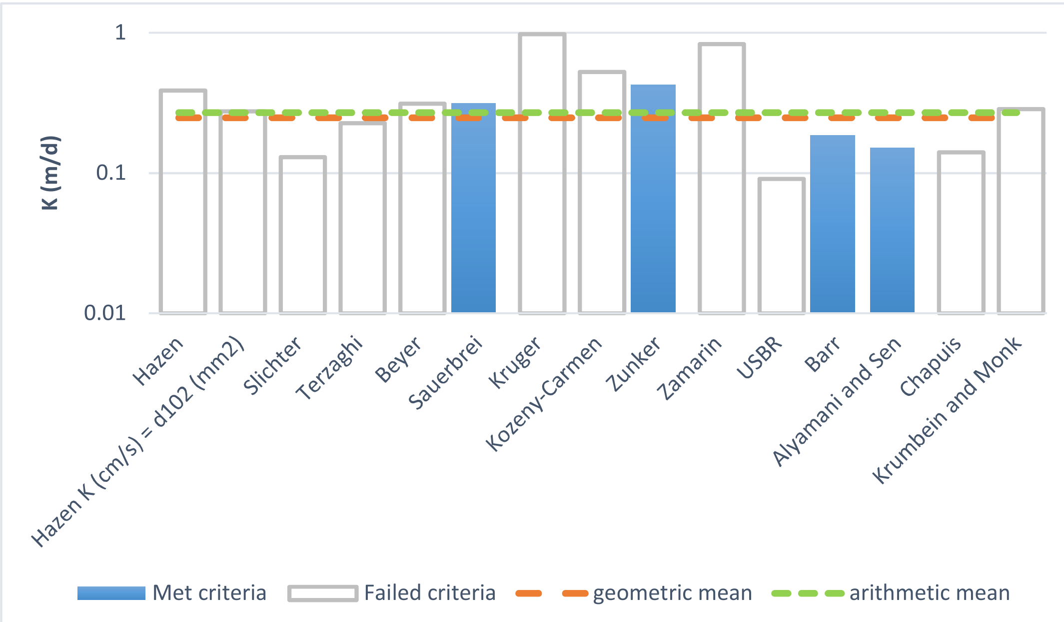
Date: 6/27/2019

Sample Name: PIW-1-41.5-42.5-20190627

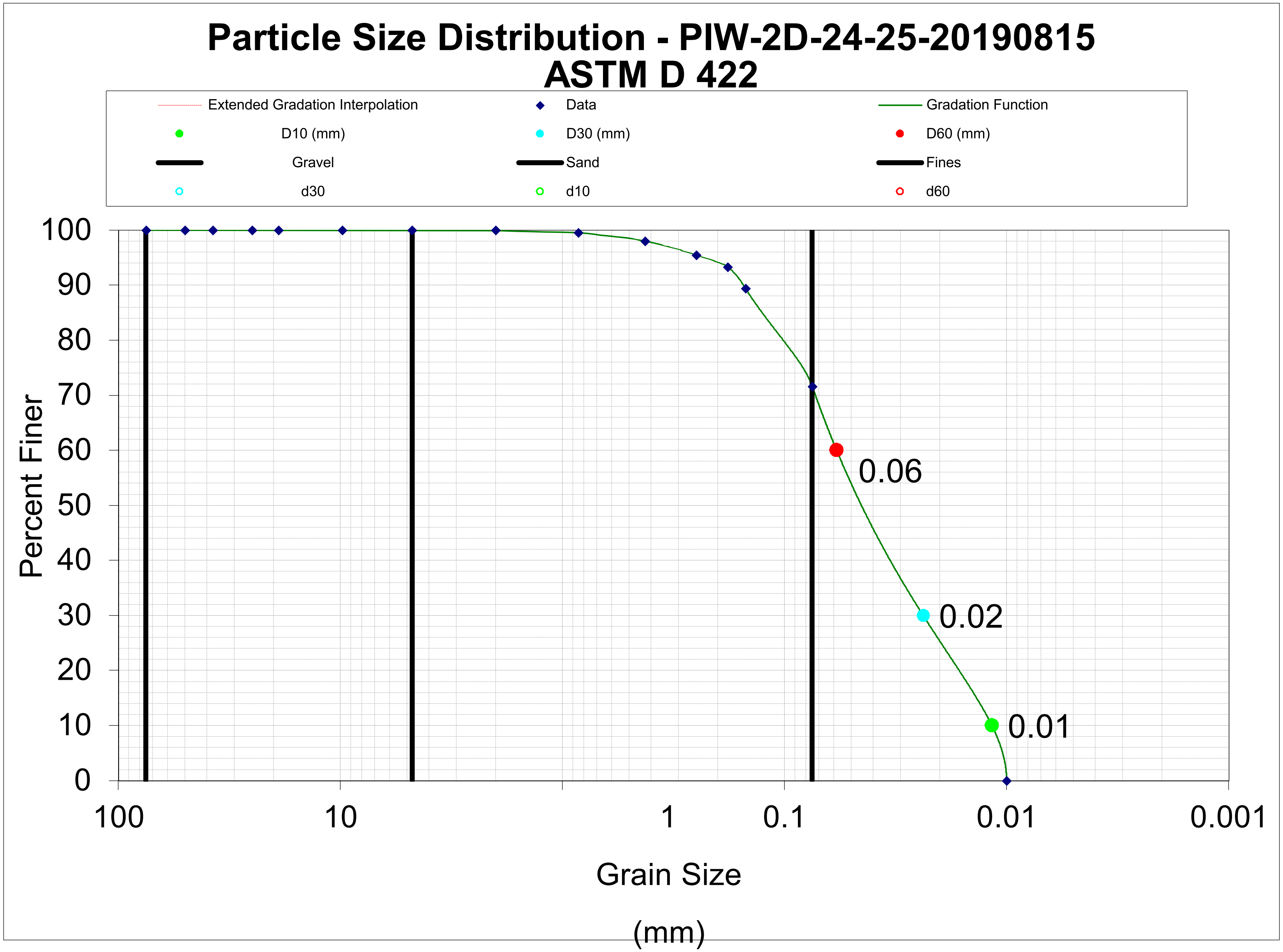
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.448E-03	.448E-05	0.39	1.27
Hazen K (cm/s) = d_{10} (mm)	.319E-03	.319E-05	0.28	0.90
Slichter	.150E-03	.150E-05	0.13	0.43
Terzaghi	.262E-03	.262E-05	0.23	0.74
Beyer	.361E-03	.361E-05	0.31	1.02
Sauerbrei	.362E-03	.362E-05	0.31	1.03
Kruger	.113E-02	.113E-04	0.98	3.20
Kozeny-Carmen	.610E-03	.610E-05	0.53	1.73
Zunker	.494E-03	.494E-05	0.43	1.40
Zamarin	.959E-03	.959E-05	0.83	2.72
USBR	.105E-03	.105E-05	0.09	0.30
Barr	.216E-03	.216E-05	0.19	0.61
Alyamani and Sen	.175E-03	.175E-05	0.15	0.50
Chapuis	.163E-03	.163E-05	0.14	0.46
Krumbein and Monk	.330E-03	.330E-05	0.29	0.94
geometric mean	.287E-03	.287E-05	0.25	0.81
arithmetic mean	.312E-03	.312E-05	0.27	0.88


Particle Size Distribution - PIW-2D-24-25-20190815
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.06
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size
(mm)

K from Grain Size Analysis Report

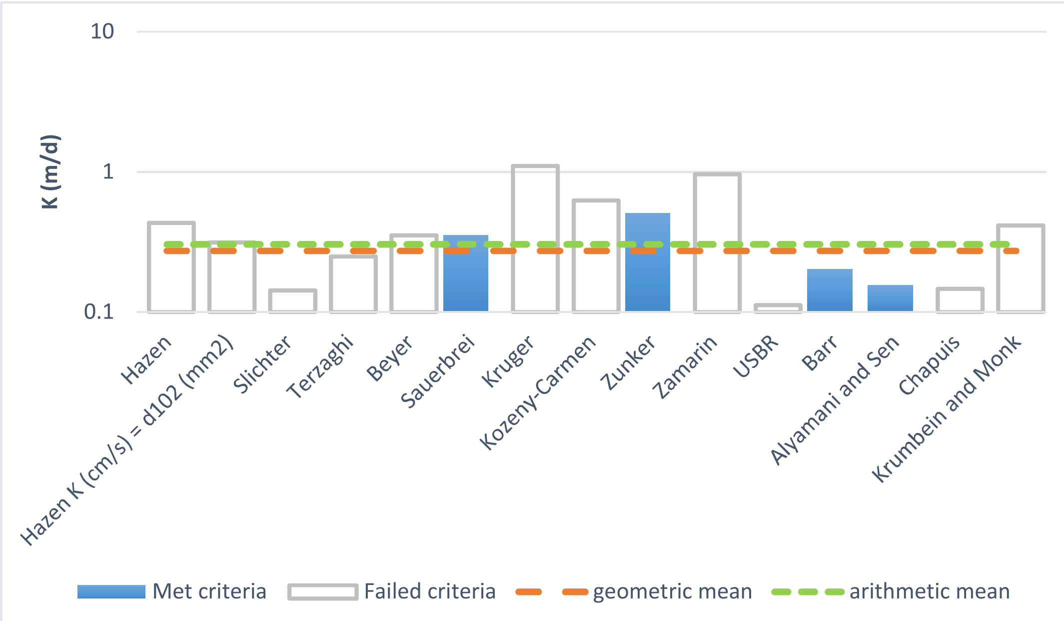
Date: 8/15/2019

Sample Name: PIW-2D-24-25-20190815

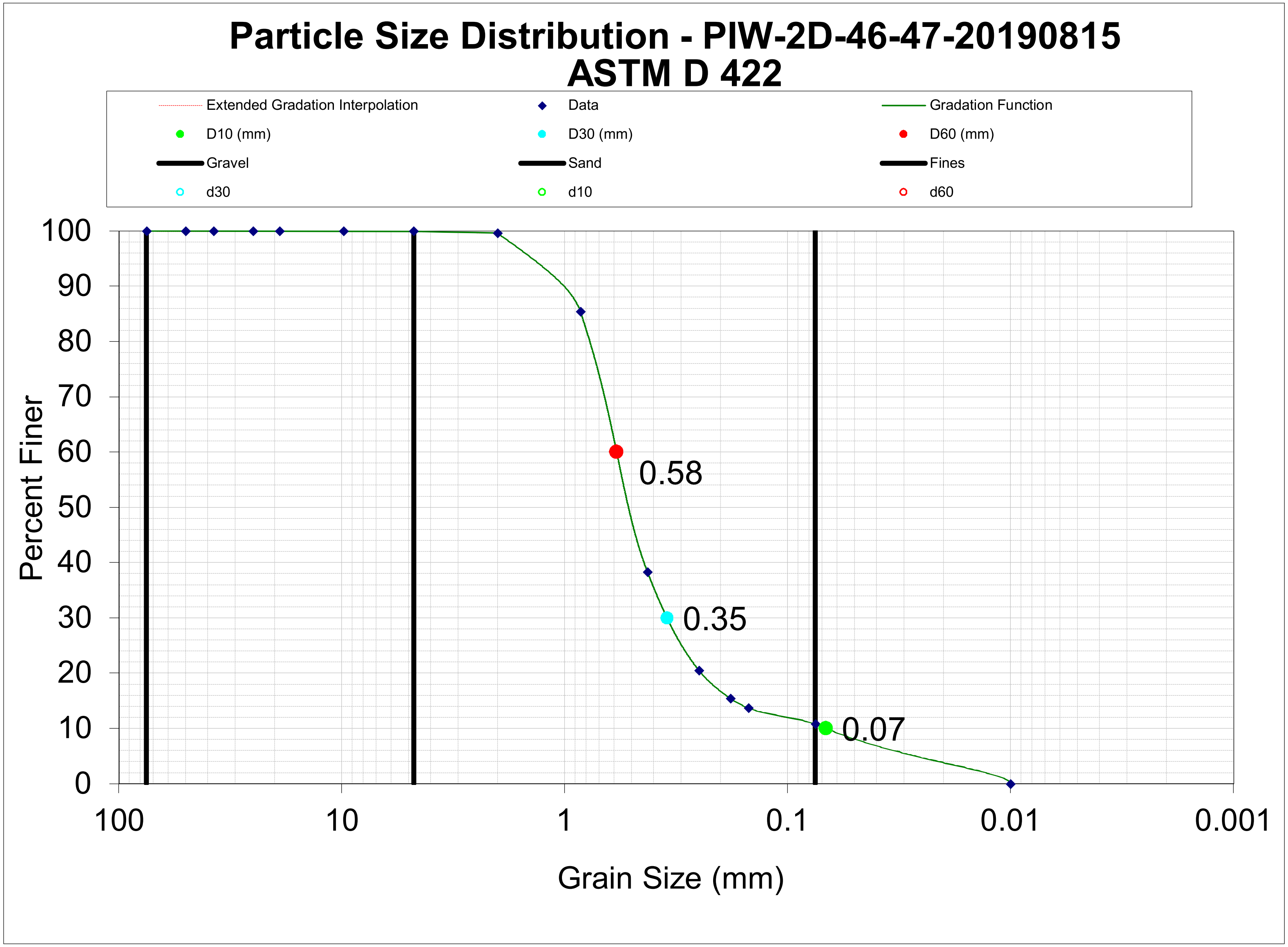
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.501E-03	.501E-05	0.43	1.42
Hazen K (cm/s) = d_{10} (mm)	.364E-03	.364E-05	0.31	1.03
Slichter	.165E-03	.165E-05	0.14	0.47
Terzaghi	.288E-03	.288E-05	0.25	0.82
Beyer	.408E-03	.408E-05	0.35	1.16
Sauerbrei	.408E-03	.408E-05	0.35	1.16
Kruger	.128E-02	.128E-04	1.10	3.62
Kozeny-Carmen	.724E-03	.724E-05	0.63	2.05
Zunker	.584E-03	.584E-05	0.50	1.65
Zamarin	.111E-02	.111E-04	0.96	3.15
USBR	.130E-03	.130E-05	0.11	0.37
Barr	.234E-03	.234E-05	0.20	0.66
Alyamani and Sen	.179E-03	.179E-05	0.15	0.51
Chapuis	.169E-03	.169E-05	0.15	0.48
Krumbein and Monk	.480E-03	.480E-05	0.41	1.36
geometric mean	.316E-03	.316E-05	0.27	0.90
arithmetic mean	.351E-03	.351E-05	0.30	1.00


Particle Size Distribution - PIW-2D-46-47-20190815
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.58
0.35
0.07
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

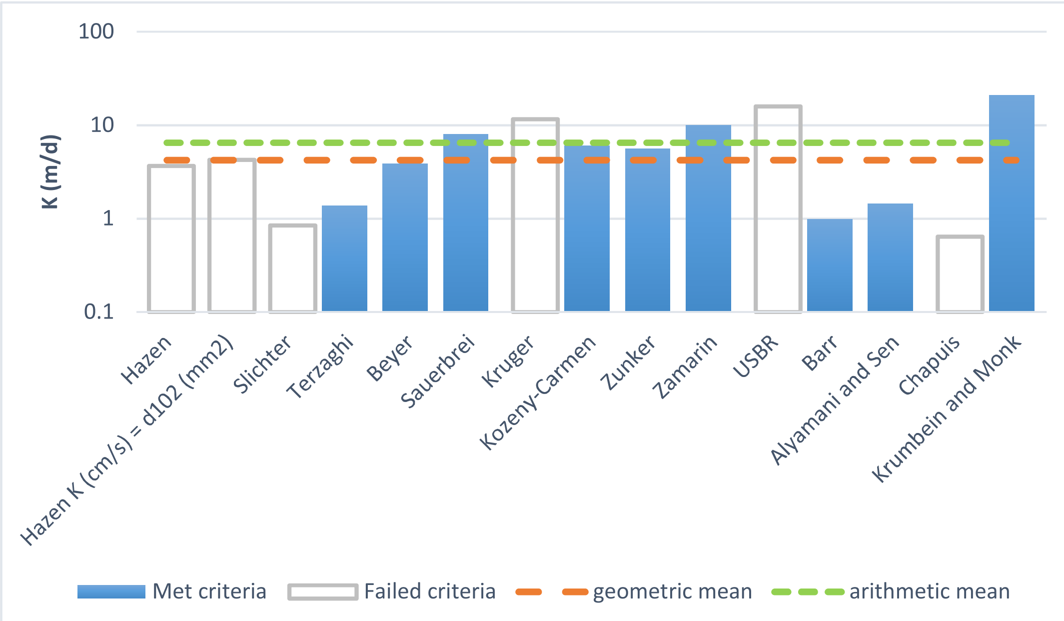
Date: 8/15/2019

Sample Name: PIW-2D-46-47-20190815

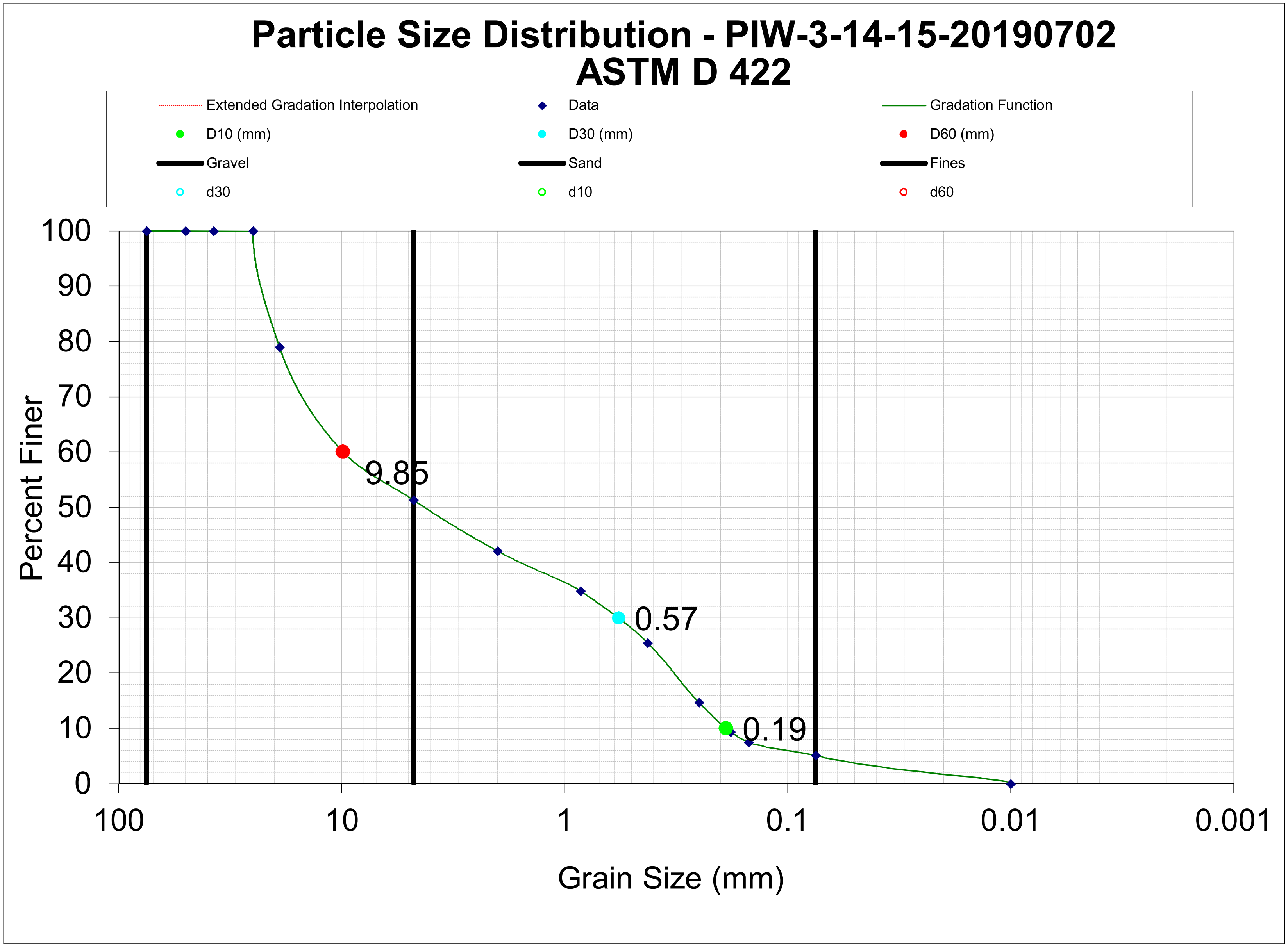
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.423E-02	.423E-04	3.65	11.99
Hazen K (cm/s) = d_{10} (mm)	.493E-02	.493E-04	4.26	13.96
Slichter	.977E-03	.977E-05	0.84	2.77
Terzaghi	.159E-02	.159E-04	1.37	4.49
Beyer	.446E-02	.446E-04	3.85	12.64
Sauerbrei	.929E-02	.929E-04	8.02	26.32
Kruger	.134E-01	.134E-03	11.54	37.87
Kozeny-Carmen	.699E-02	.699E-04	6.04	19.81
Zunker	.648E-02	.648E-04	5.60	18.37
Zamarin	.116E-01	.116E-03	10.01	32.83
USBR	.184E-01	.184E-03	15.93	52.27
Barr	.114E-02	.114E-04	0.99	3.24
Alyamani and Sen	.168E-02	.168E-04	1.45	4.76
Chapuis	.744E-03	.744E-05	0.64	2.11
Krumbein and Monk	.244E-01	.244E-03	21.06	69.11
geometric mean	.489E-02	.489E-04	4.23	13.87
arithmetic mean	.751E-02	.751E-04	6.49	21.29

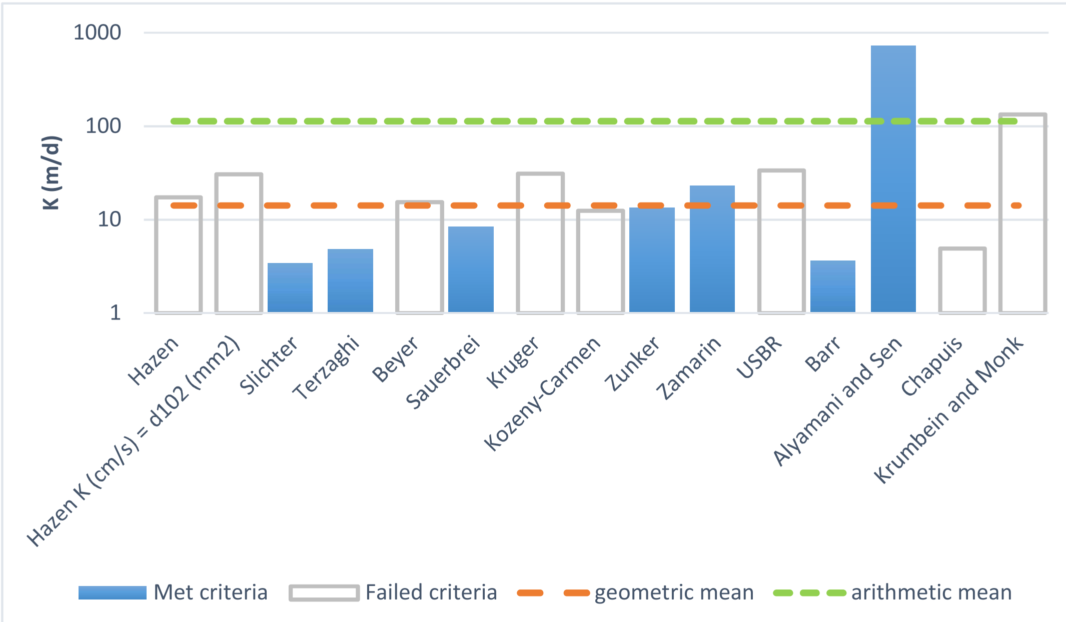

Particle Size Distribution - PIW-3-14-15-20190702
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
9.85
0.57
0.19
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 7/2/2019

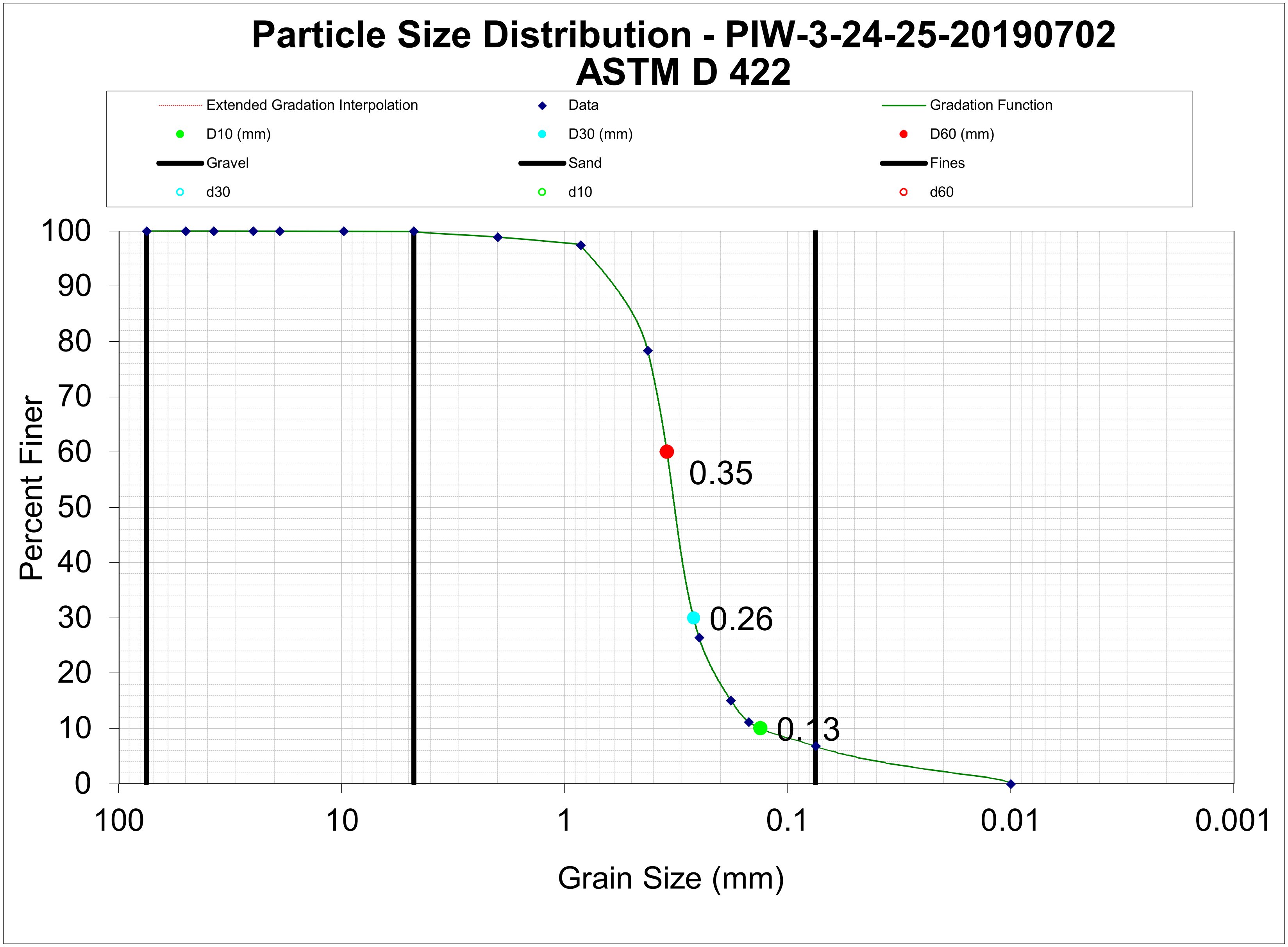
Sample Name: PIW-3-14-15-20190702

Mass Sample (g): 100 T (oC) 20

Poorly sorted sandy gravel low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.200E-01	.200E-03	17.28	56.69
Hazen K (cm/s) = d_{10} (mm)	.353E-01	.353E-03	30.51	100.11
Slichter	.393E-02	.393E-04	3.40	11.14
Terzaghi	.560E-02	.560E-04	4.84	15.88
Beyer	.179E-01	.179E-03	15.44	50.65
Sauerbrei	.967E-02	.967E-04	8.36	27.42
Kruger	.358E-01	.358E-03	30.93	101.48
Kozeny-Carmen	.144E-01	.144E-03	12.42	40.76
Zunker	.155E-01	.155E-03	13.40	43.96
Zamarin	.267E-01	.267E-03	23.10	75.77
USBR	.388E-01	.388E-03	33.50	109.91
Barr	.421E-02	.421E-04	3.64	11.94
Alyamani and Sen	.849E+00	.849E-02	733.42	2406.22
Chapuis	.566E-02	.566E-04	4.89	16.05
Krumbein and Monk	.155E+00	.155E-02	133.70	438.64
geometric mean	.164E-01	.164E-03	14.15	46.42
arithmetic mean	.131E+00	.131E-02	112.88	370.33


Particle Size Distribution - PIW-3-24-25-20190702
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.35
0.26
0.13
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

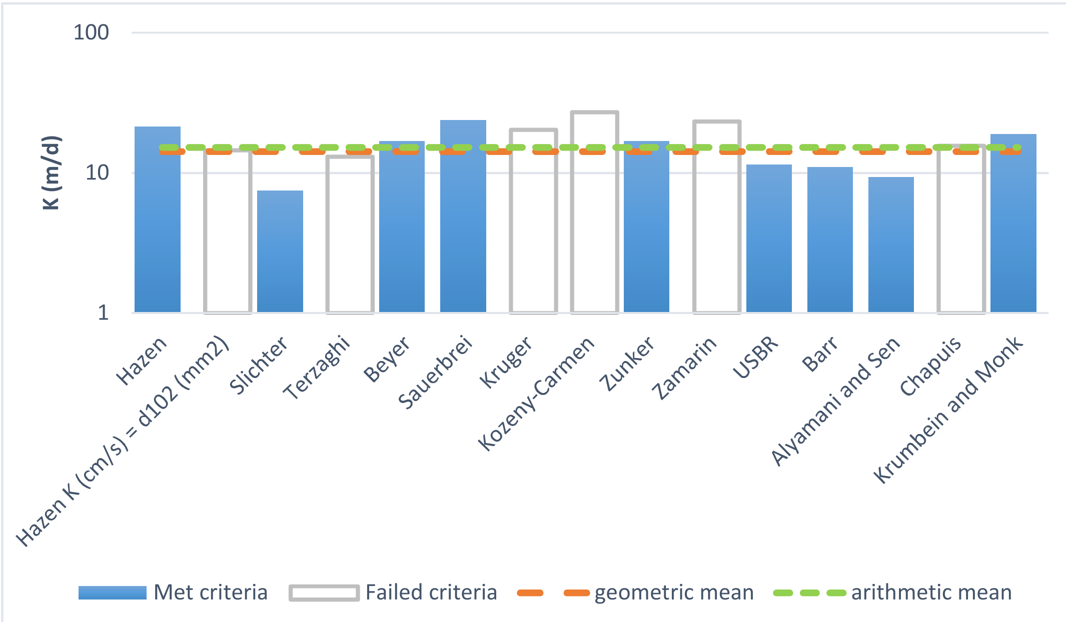
Date: 7/2/2019

Sample Name: PIW-3-24-25-20190702

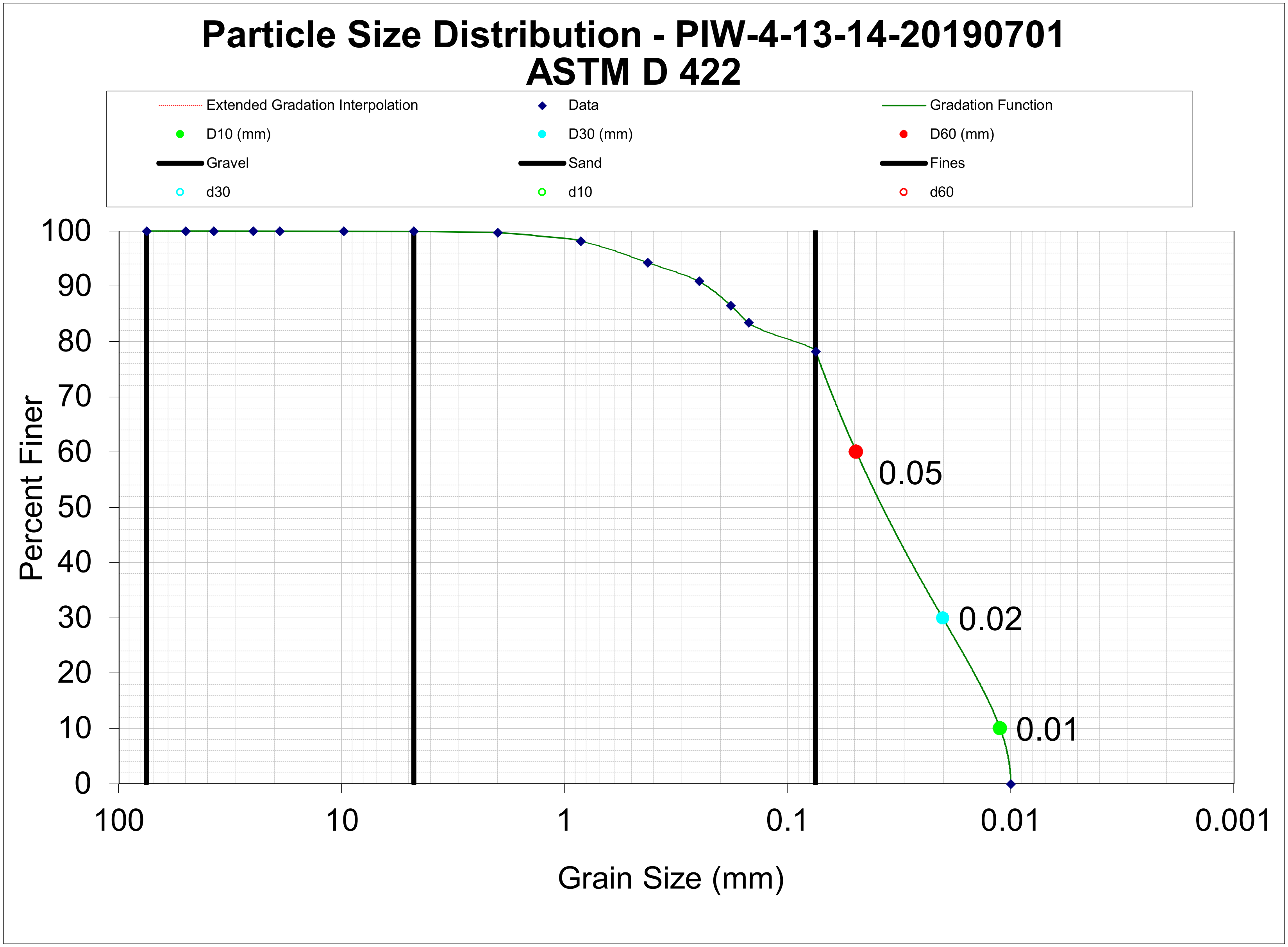
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.246E-01	.246E-03	21.28	69.83
Hazen K (cm/s) = d_{10} (mm)	.168E-01	.168E-03	14.50	47.57
Slichter	.863E-02	.863E-04	7.46	24.47
Terzaghi	.151E-01	.151E-03	13.07	42.89
Beyer	.195E-01	.195E-03	16.86	55.32
Sauerbrei	.274E-01	.274E-03	23.69	77.71
Kruger	.235E-01	.235E-03	20.27	66.50
Kozeny-Carmen	.313E-01	.313E-03	27.06	88.79
Zunker	.195E-01	.195E-03	16.88	55.39
Zamarin	.269E-01	.269E-03	23.27	76.36
USBR	.132E-01	.132E-03	11.39	37.35
Barr	.127E-01	.127E-03	11.02	36.14
Alyamani and Sen	.108E-01	.108E-03	9.31	30.54
Chapuis	.180E-01	.180E-03	15.56	51.06
Krumbein and Monk	.219E-01	.219E-03	18.94	62.13
geometric mean	.164E-01	.164E-03	14.21	46.63
arithmetic mean	.176E-01	.176E-03	15.20	49.87

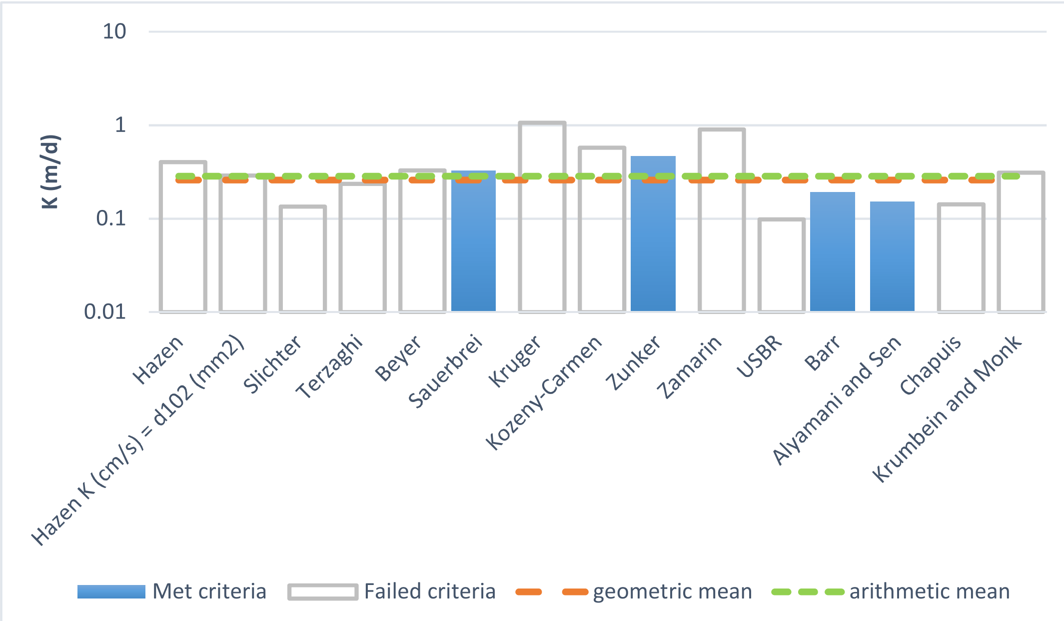

Particle Size Distribution - PIW-4-13-14-20190701
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 7/1/2019

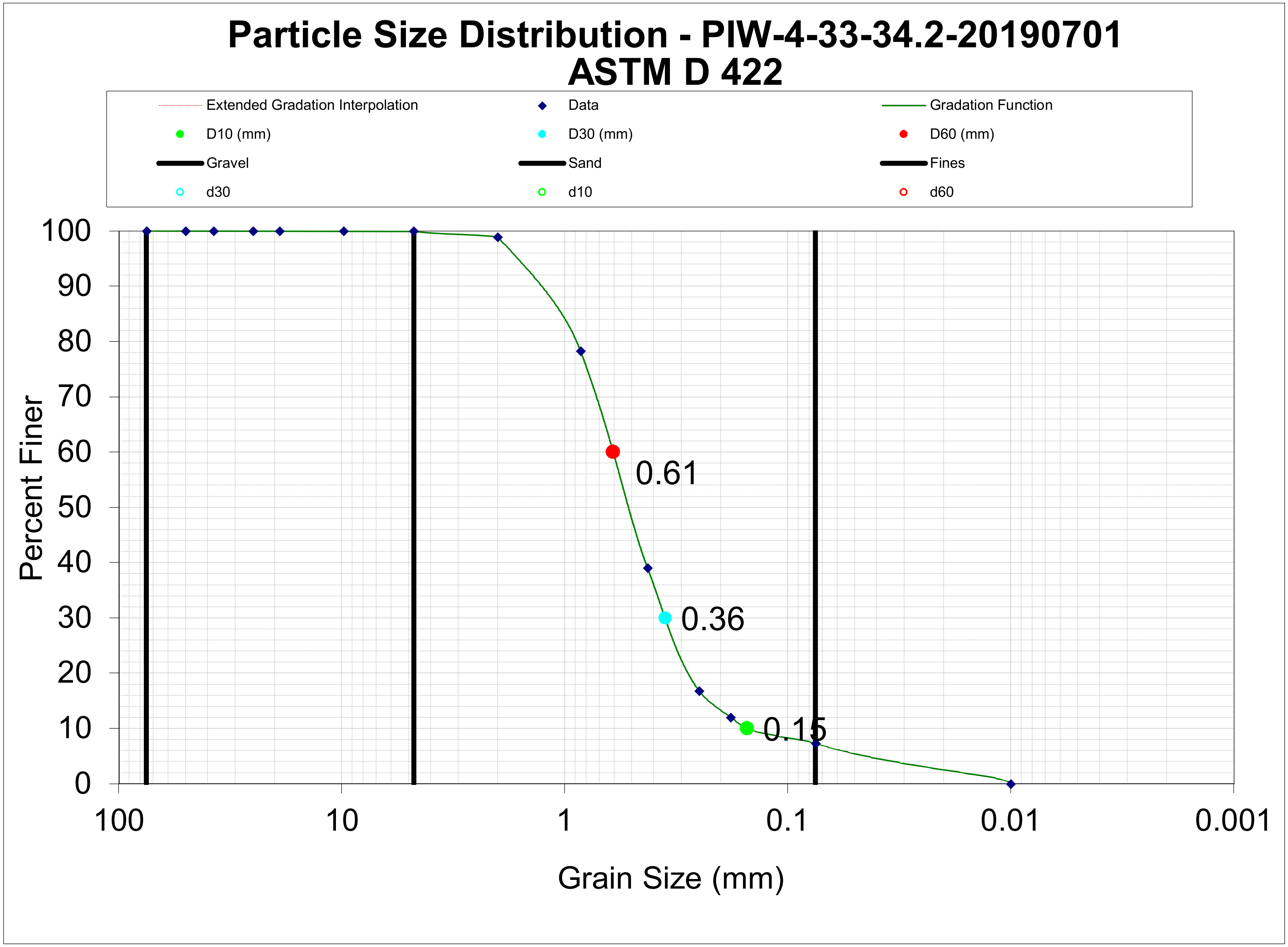
Sample Name: PIW-4-13-14-20190701

Mass Sample (g): 100 T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.467E-03	.467E-05	0.40	1.32
Hazen K (cm/s) = d_{10} (mm)	.335E-03	.335E-05	0.29	0.95
Slichter	.155E-03	.155E-05	0.13	0.44
Terzaghi	.272E-03	.272E-05	0.23	0.77
Beyer	.378E-03	.378E-05	0.33	1.07
Sauerbrei	.379E-03	.379E-05	0.33	1.07
Kruger	.123E-02	.123E-04	1.06	3.47
Kozeny-Carmen	.663E-03	.663E-05	0.57	1.88
Zunker	.538E-03	.538E-05	0.47	1.53
Zamarin	.104E-02	.104E-04	0.90	2.96
USBR	.114E-03	.114E-05	0.10	0.32
Barr	.222E-03	.222E-05	0.19	0.63
Alyamani and Sen	.177E-03	.177E-05	0.15	0.50
Chapuis	.165E-03	.165E-05	0.14	0.47
Krumbein and Monk	.358E-03	.358E-05	0.31	1.02
geometric mean	.299E-03	.299E-05	0.26	0.85
arithmetic mean	.329E-03	.329E-05	0.28	0.93

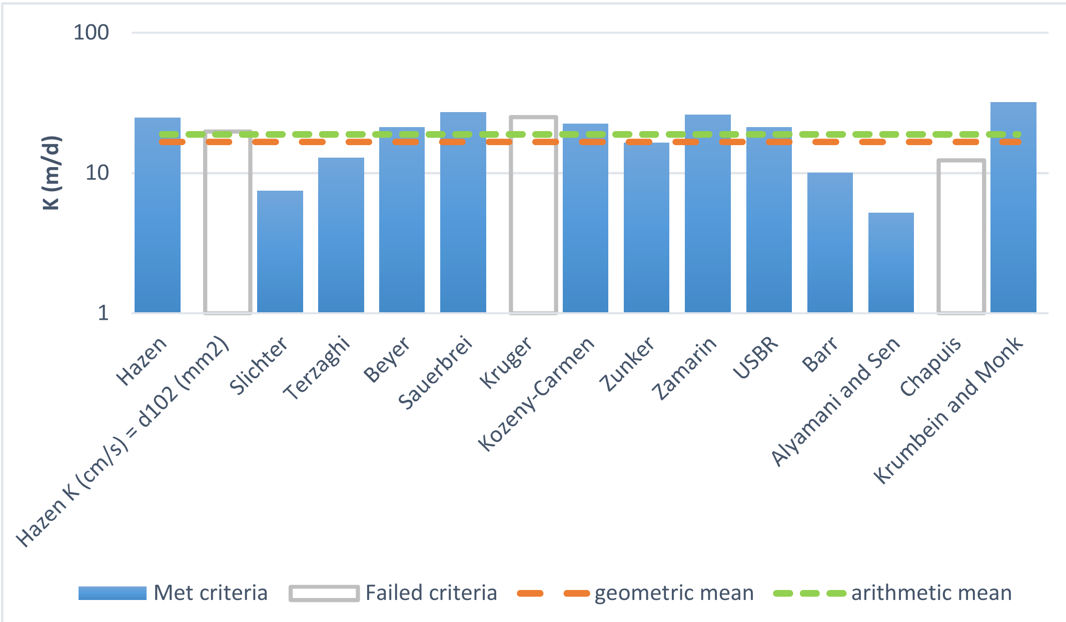

Particle Size Distribution - PIW-4-33-34.2-20190701
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.61
0.36
0.15
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 7/1/2019

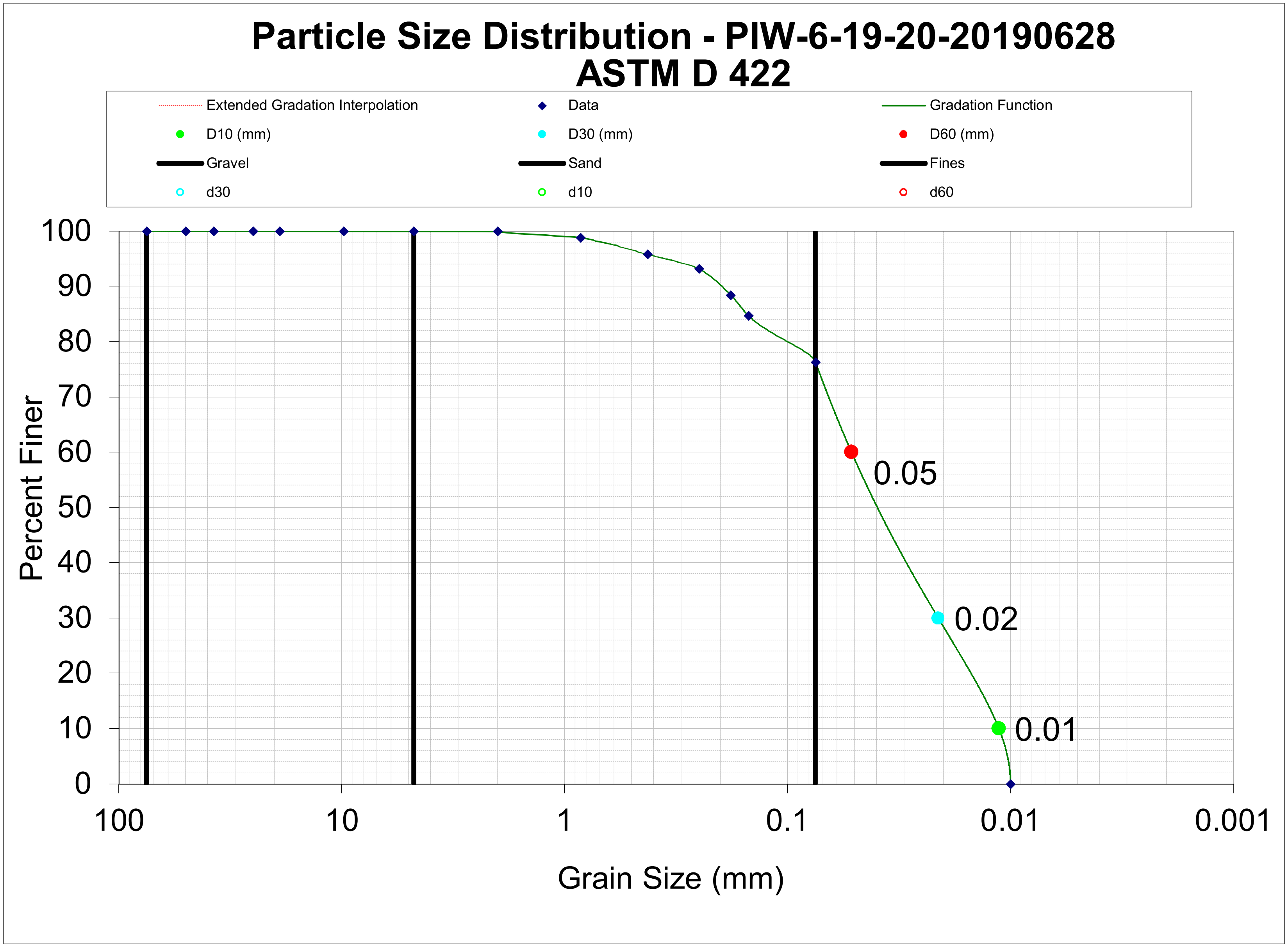
Sample Name: PIW-4-33-34.2-20190701

Mass Sample (g): 100 — T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.286E-01	.286E-03	24.71	81.08
Hazen K (cm/s) = d_{10} (mm)	.229E-01	.229E-03	19.81	65.00
Slichter	.862E-02	.862E-04	7.45	24.43
Terzaghi	.149E-01	.149E-03	12.87	42.23
Beyer	.245E-01	.245E-03	21.13	69.32
Sauerbrei	.314E-01	.314E-03	27.16	89.10
Kruger	.290E-01	.290E-03	25.03	82.11
Kozeny-Carmen	.261E-01	.261E-03	22.51	73.86
Zunker	.190E-01	.190E-03	16.43	53.92
Zamarin	.302E-01	.302E-03	26.10	85.64
USBR	.245E-01	.245E-03	21.19	69.52
Barr	.116E-01	.116E-03	10.02	32.86
Alyamani and Sen	.599E-02	.599E-04	5.18	16.99
Chapuis	.142E-01	.142E-03	12.29	40.32
Krumbein and Monk	.368E-01	.368E-03	31.81	104.35
geometric mean	.193E-01	.193E-03	16.67	54.68
arithmetic mean	.219E-01	.219E-03	18.88	61.94

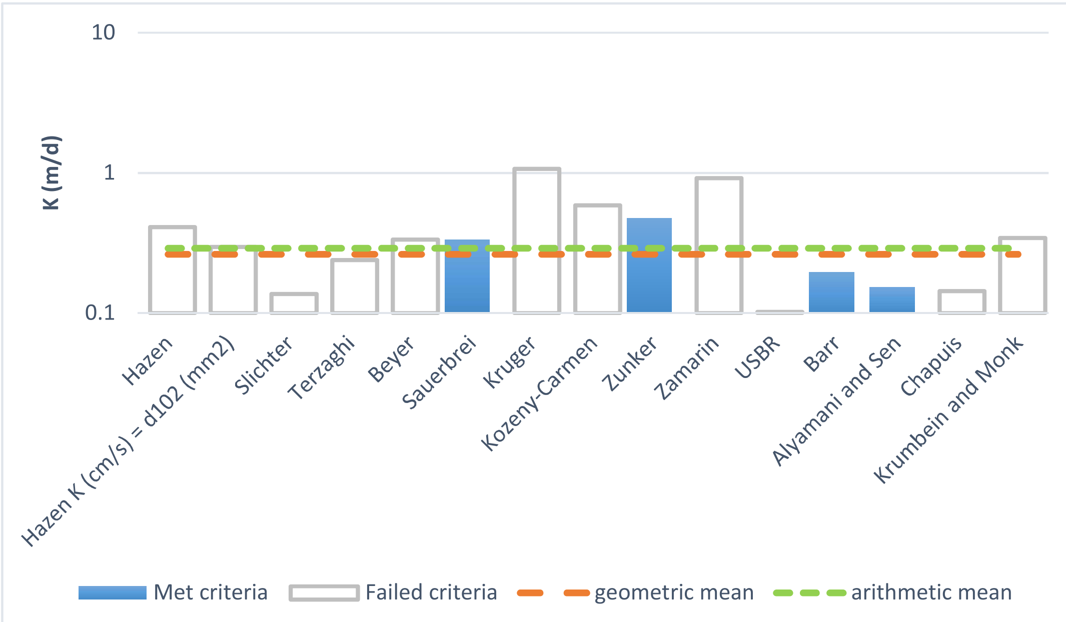

Particle Size Distribution - PIW-6-19-20-20190628
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 6/28/2019

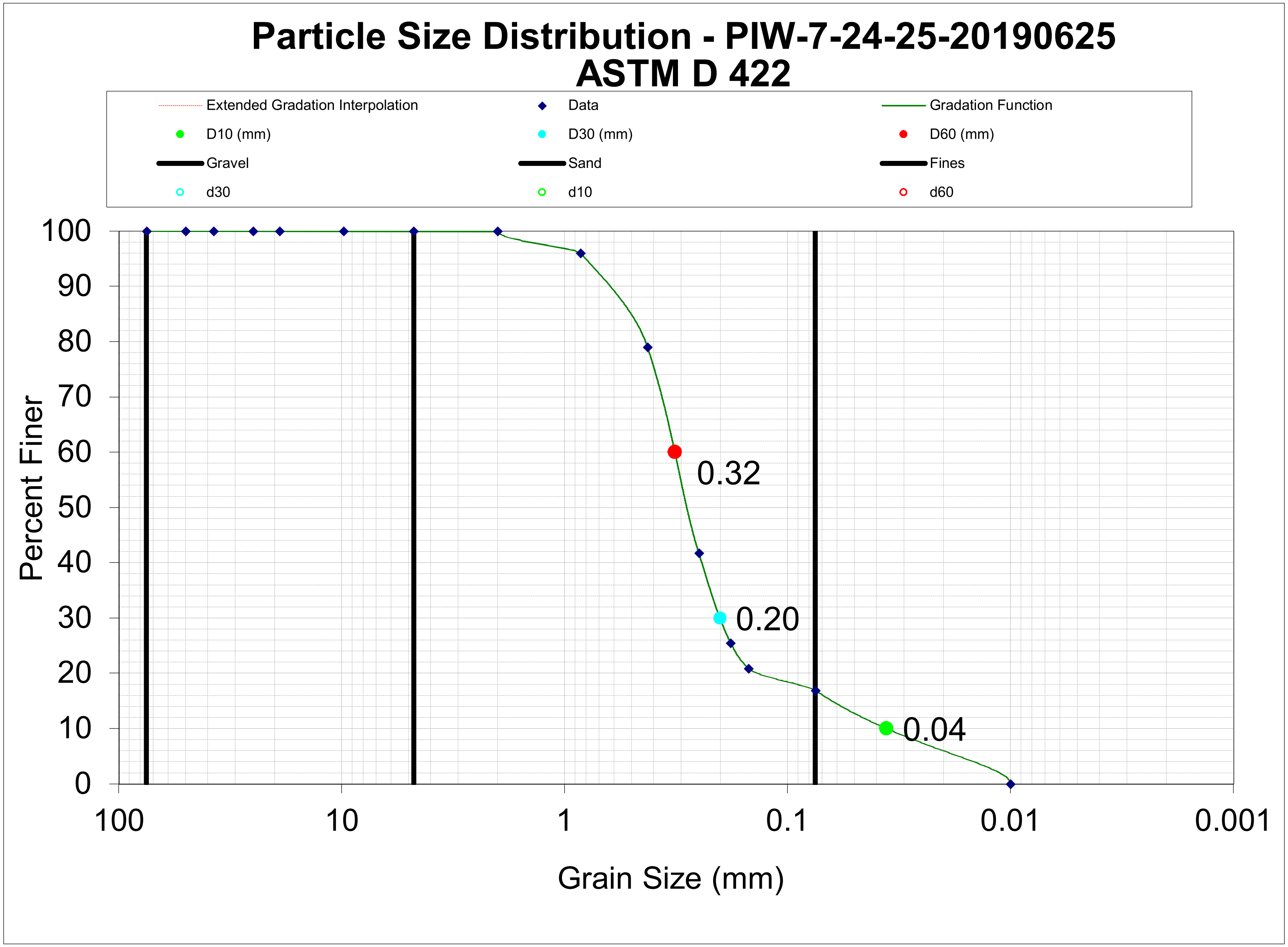
Sample Name: PIW-6-19-20-20190628

Mass Sample (g): 100 | T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.476E-03	.476E-05	0.41	1.35
Hazen K (cm/s) = d_{10} (mm)	.343E-03	.343E-05	0.30	0.97
Slichter	.158E-03	.158E-05	0.14	0.45
Terzaghi	.276E-03	.276E-05	0.24	0.78
Beyer	.386E-03	.386E-05	0.33	1.09
Sauerbrei	.387E-03	.387E-05	0.33	1.10
Kruger	.124E-02	.124E-04	1.07	3.51
Kozeny-Carmen	.679E-03	.679E-05	0.59	1.93
Zunker	.551E-03	.551E-05	0.48	1.56
Zamarin	.106E-02	.106E-04	0.92	3.01
USBR	.118E-03	.118E-05	0.10	0.33
Barr	.225E-03	.225E-05	0.19	0.64
Alyamani and Sen	.177E-03	.177E-05	0.15	0.50
Chapuis	.166E-03	.166E-05	0.14	0.47
Krumbein and Monk	.397E-03	.397E-05	0.34	1.12
geometric mean	.304E-03	.304E-05	0.26	0.86
arithmetic mean	.335E-03	.335E-05	0.29	0.95


Particle Size Distribution - PIW-7-24-25-20190625
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.32
0.20
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

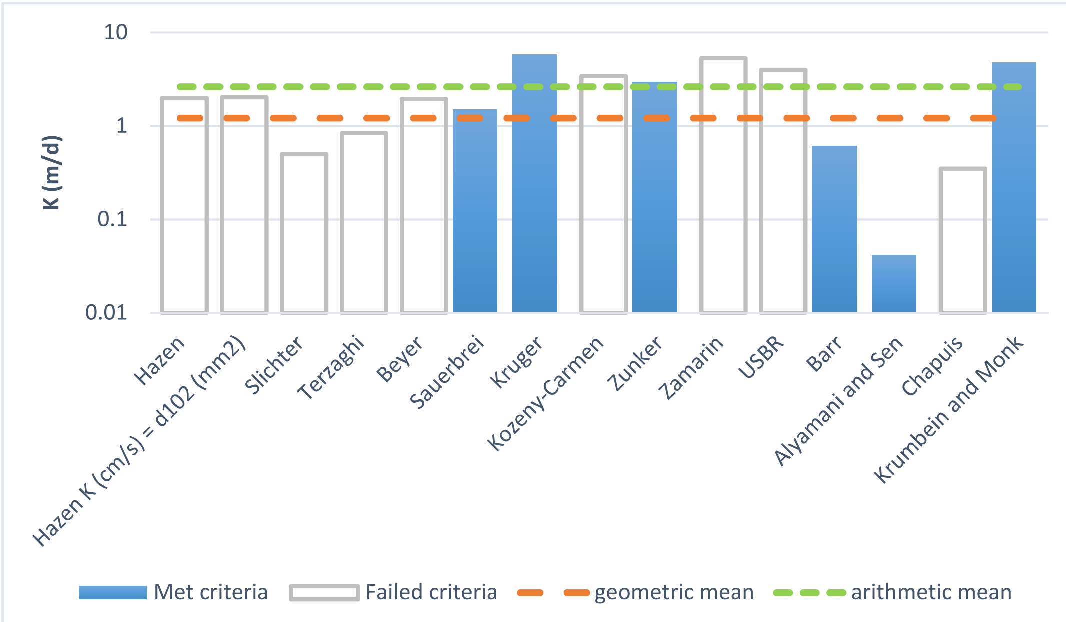
Date: 6/25/2019

Sample Name: PIW-7-24-25-20190625

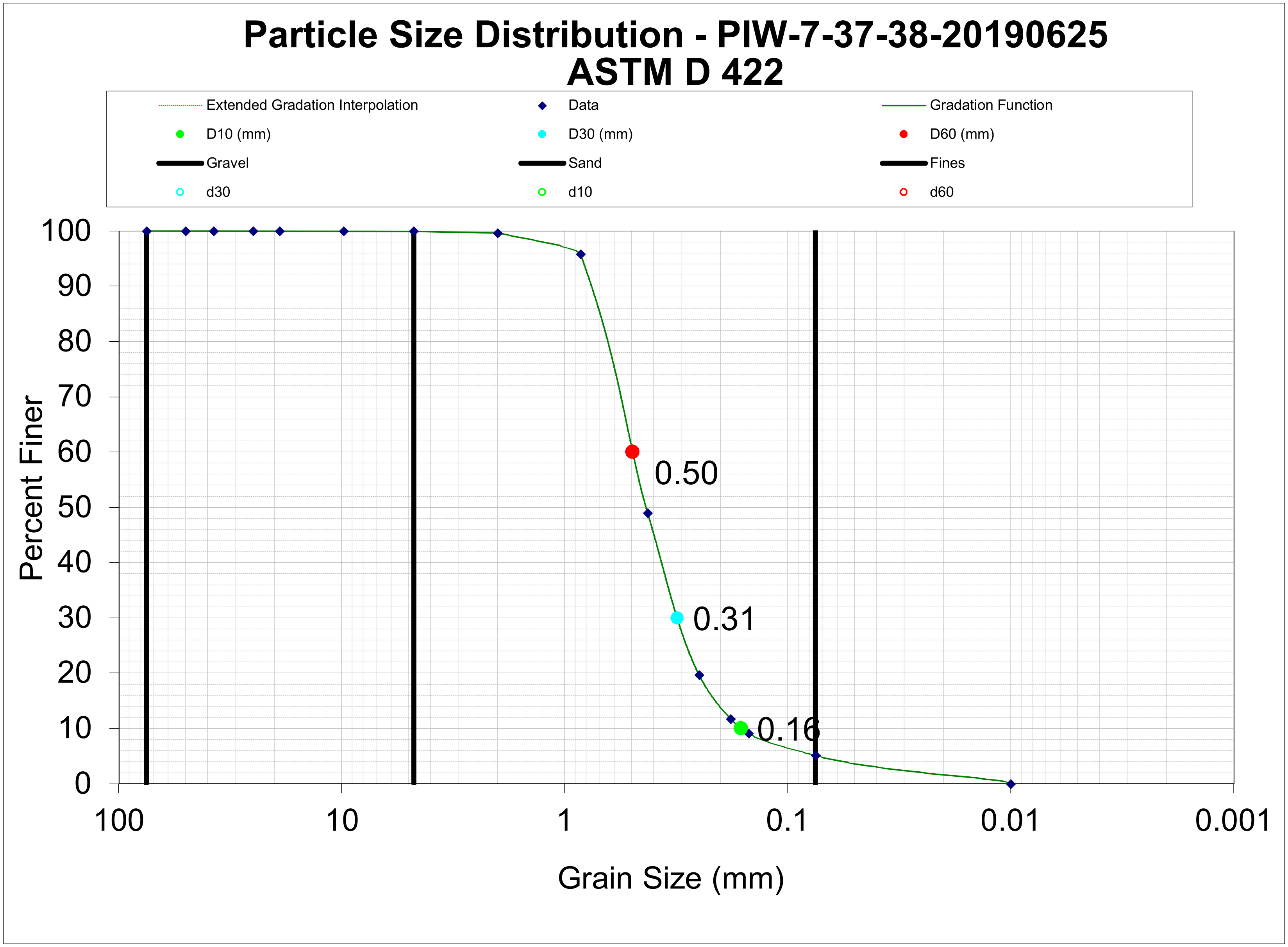
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.231E-02	.231E-04	2.00	6.55
Hazen K (cm/s) = d_{10} (mm)	.235E-02	.235E-04	2.03	6.66
Slichter	.581E-03	.581E-05	0.50	1.65
Terzaghi	.969E-03	.969E-05	0.84	2.75
Beyer	.225E-02	.225E-04	1.95	6.39
Sauerbrei	.175E-02	.175E-04	1.51	4.96
Kruger	.674E-02	.674E-04	5.82	19.11
Kozeny-Carmen	.395E-02	.395E-04	3.41	11.19
Zunker	.345E-02	.345E-04	2.98	9.77
Zamarin	.614E-02	.614E-04	5.31	17.42
USBR	.461E-02	.461E-04	3.99	13.08
Barr	.707E-03	.707E-05	0.61	2.01
Alyamani and Sen	.480E-04	.480E-06	0.04	0.14
Chapuis	.405E-03	.405E-05	0.35	1.15
Krumbein and Monk	.552E-02	.552E-04	4.77	15.66
geometric mean	.140E-02	.140E-04	1.21	3.98
arithmetic mean	.304E-02	.304E-04	2.62	8.61

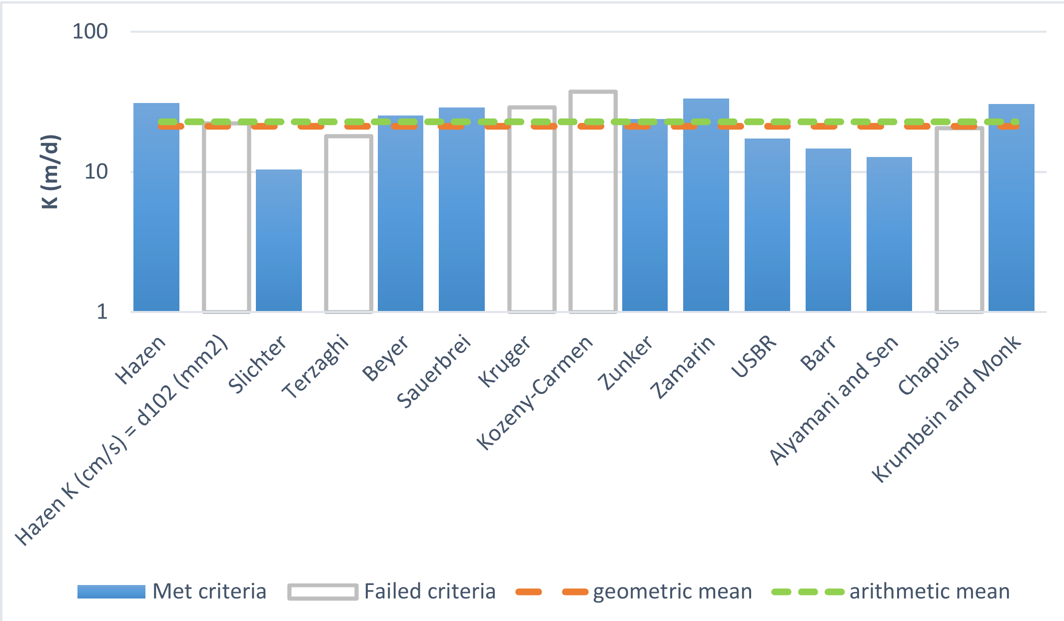

Particle Size Distribution - PIW-7-37-38-20190625
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.50
0.31
0.16
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 6/25/2019

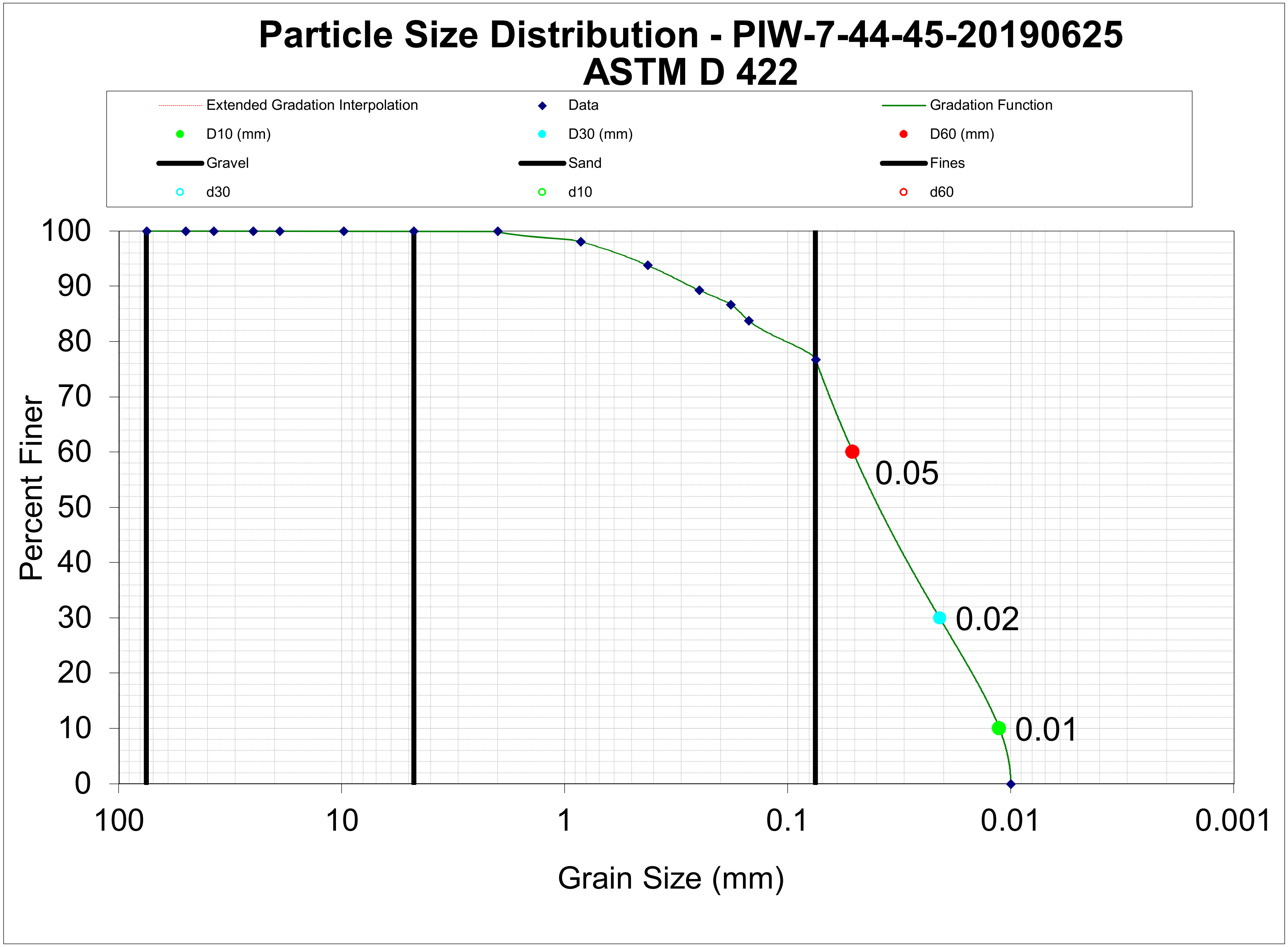
Sample Name: PIW-7-37-38-20190625

Mass Sample (g): 100 — T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.358E-01	.358E-03	30.94	101.50
Hazen K (cm/s) = d_{10} (mm)	.257E-01	.257E-03	22.22	72.92
Slichter	.119E-01	.119E-03	10.30	33.79
Terzaghi	.208E-01	.208E-03	17.98	59.00
Beyer	.290E-01	.290E-03	25.07	82.25
Sauerbrei	.333E-01	.333E-03	28.79	94.46
Kruger	.335E-01	.335E-03	28.94	94.96
Kozeny-Carmen	.433E-01	.433E-03	37.38	122.63
Zunker	.276E-01	.276E-03	23.81	78.13
Zamarin	.385E-01	.385E-03	33.25	109.08
USBR	.200E-01	.200E-03	17.27	56.65
Barr	.170E-01	.170E-03	14.71	48.27
Alyamani and Sen	.147E-01	.147E-03	12.69	41.64
Chapuis	.237E-01	.237E-03	20.46	67.13
Krumbein and Monk	.353E-01	.353E-03	30.53	100.17
geometric mean	.245E-01	.245E-03	21.15	69.40
arithmetic mean	.263E-01	.263E-03	22.74	74.59


Particle Size Distribution - PIW-7-44-45-20190625
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

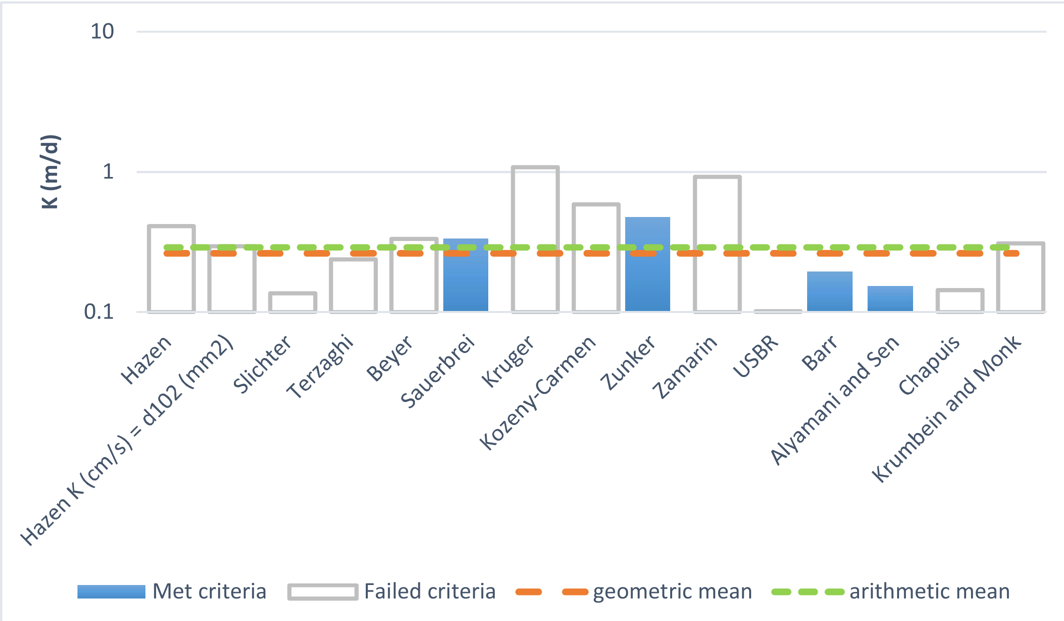
Date: 6/25/2019

Sample Name: PIW-7-44-45-20190625

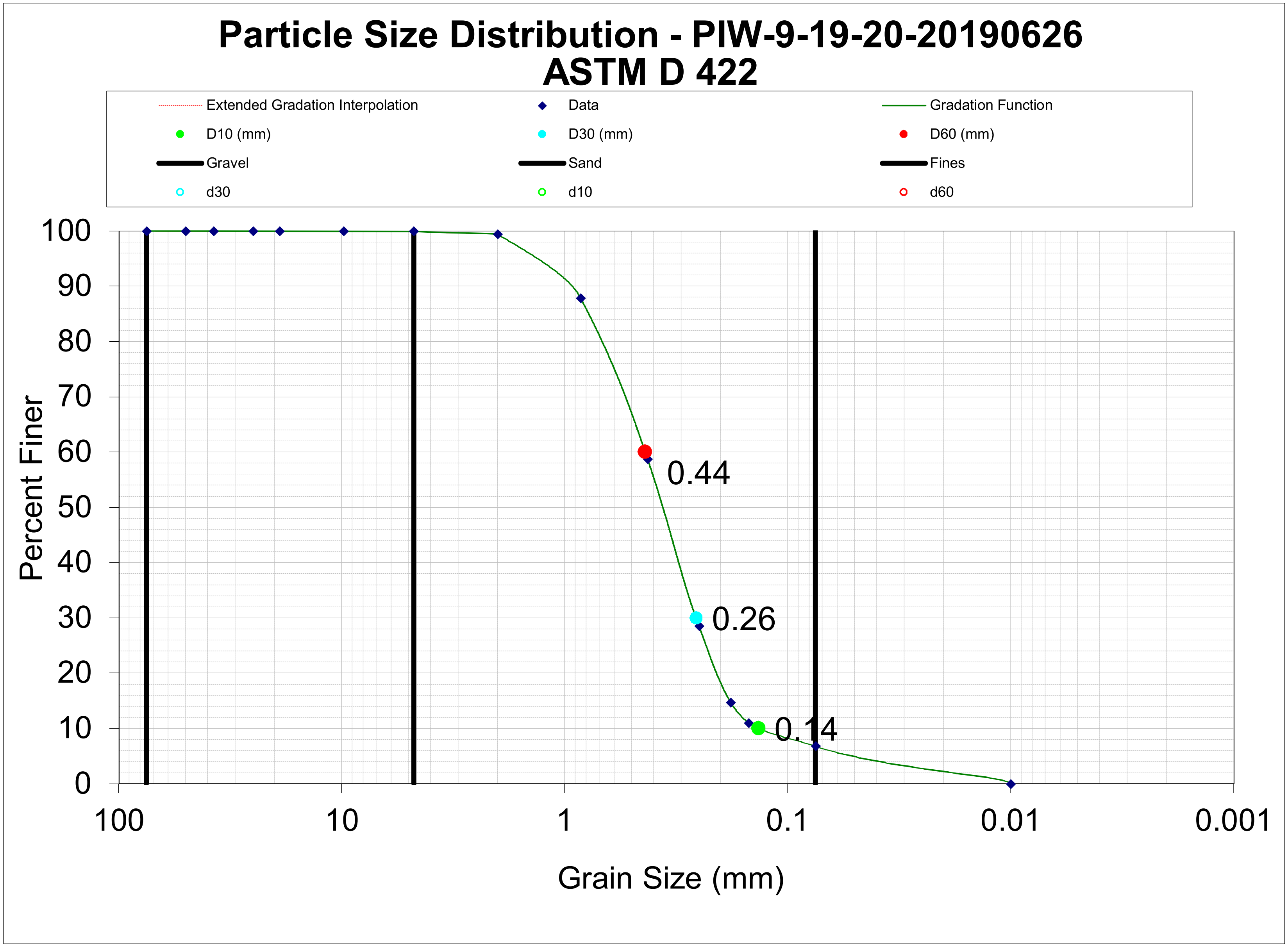
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.474E-03	.474E-05	0.41	1.34
Hazen K (cm/s) = d_{10} (mm)	.341E-03	.341E-05	0.29	0.97
Slichter	.157E-03	.157E-05	0.14	0.45
Terzaghi	.275E-03	.275E-05	0.24	0.78
Beyer	.385E-03	.385E-05	0.33	1.09
Sauerbrei	.385E-03	.385E-05	0.33	1.09
Kruger	.125E-02	.125E-04	1.08	3.55
Kozeny-Carmen	.680E-03	.680E-05	0.59	1.93
Zunker	.552E-03	.552E-05	0.48	1.56
Zamarin	.107E-02	.107E-04	0.92	3.03
USBR	.117E-03	.117E-05	0.10	0.33
Barr	.225E-03	.225E-05	0.19	0.64
Alyamani and Sen	.177E-03	.177E-05	0.15	0.50
Chapuis	.166E-03	.166E-05	0.14	0.47
Krumbein and Monk	.357E-03	.357E-05	0.31	1.01
geometric mean	.303E-03	.303E-05	0.26	0.86
arithmetic mean	.335E-03	.335E-05	0.29	0.95


Particle Size Distribution - PIW-9-19-20-20190626
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.44
0.26
0.14
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

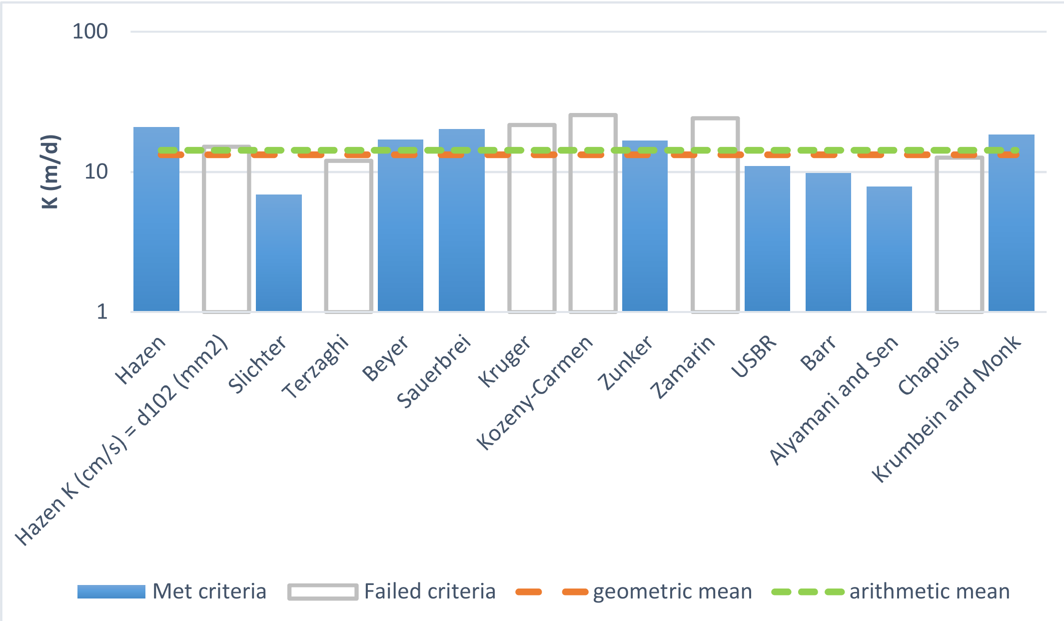
Date: 8/26/2019

Sample Name: PIW-9-19-20-20190626

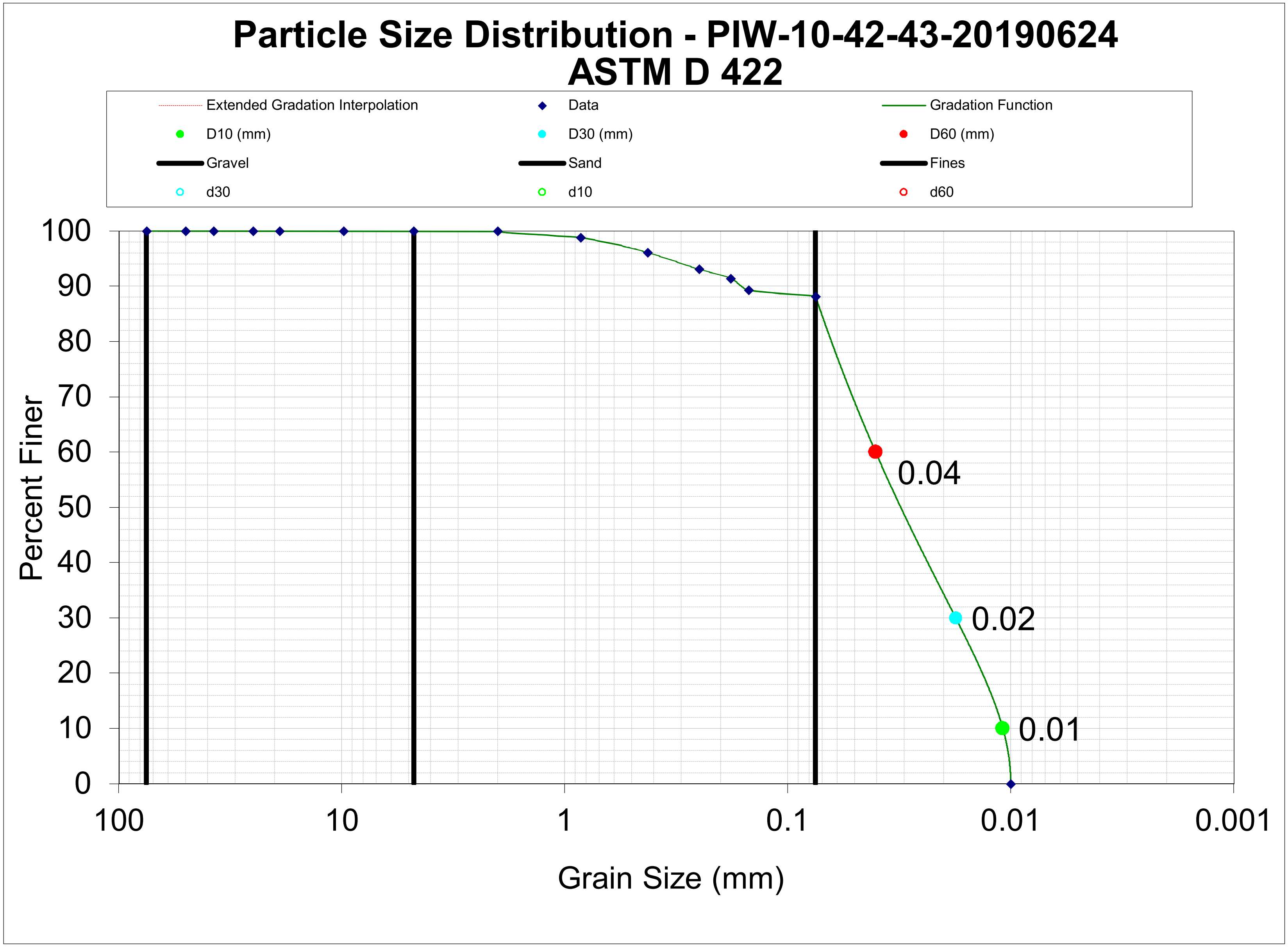
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.241E-01	.241E-03	20.80	68.25
Hazen K (cm/s) = d_{10} (mm)	.175E-01	.175E-03	15.09	49.50
Slichter	.794E-02	.794E-04	6.86	22.51
Terzaghi	.139E-01	.139E-03	11.97	39.28
Beyer	.196E-01	.196E-03	16.93	55.55
Sauerbrei	.233E-01	.233E-03	20.14	66.09
Kruger	.250E-01	.250E-03	21.58	70.81
Kozeny-Carmen	.294E-01	.294E-03	25.43	83.44
Zunker	.194E-01	.194E-03	16.73	54.89
Zamarin	.280E-01	.280E-03	24.19	79.36
USBR	.127E-01	.127E-03	10.99	36.06
Barr	.113E-01	.113E-03	9.75	31.98
Alyamani and Sen	.906E-02	.906E-04	7.83	25.68
Chapuis	.147E-01	.147E-03	12.66	41.53
Krumbein and Monk	.213E-01	.213E-03	18.39	60.35
geometric mean	.153E-01	.153E-03	13.25	43.46
arithmetic mean	.165E-01	.165E-03	14.27	46.82


Particle Size Distribution - PIW-10-42-43-20190624
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

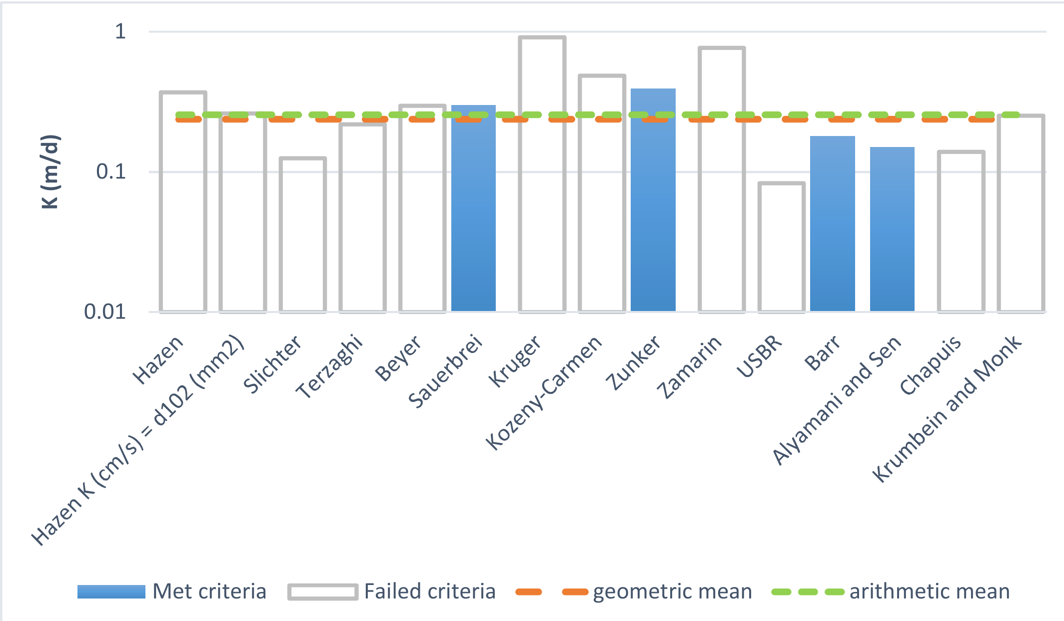
Date: 6/24/2019

Sample Name: PIW-10-42-43-20190624

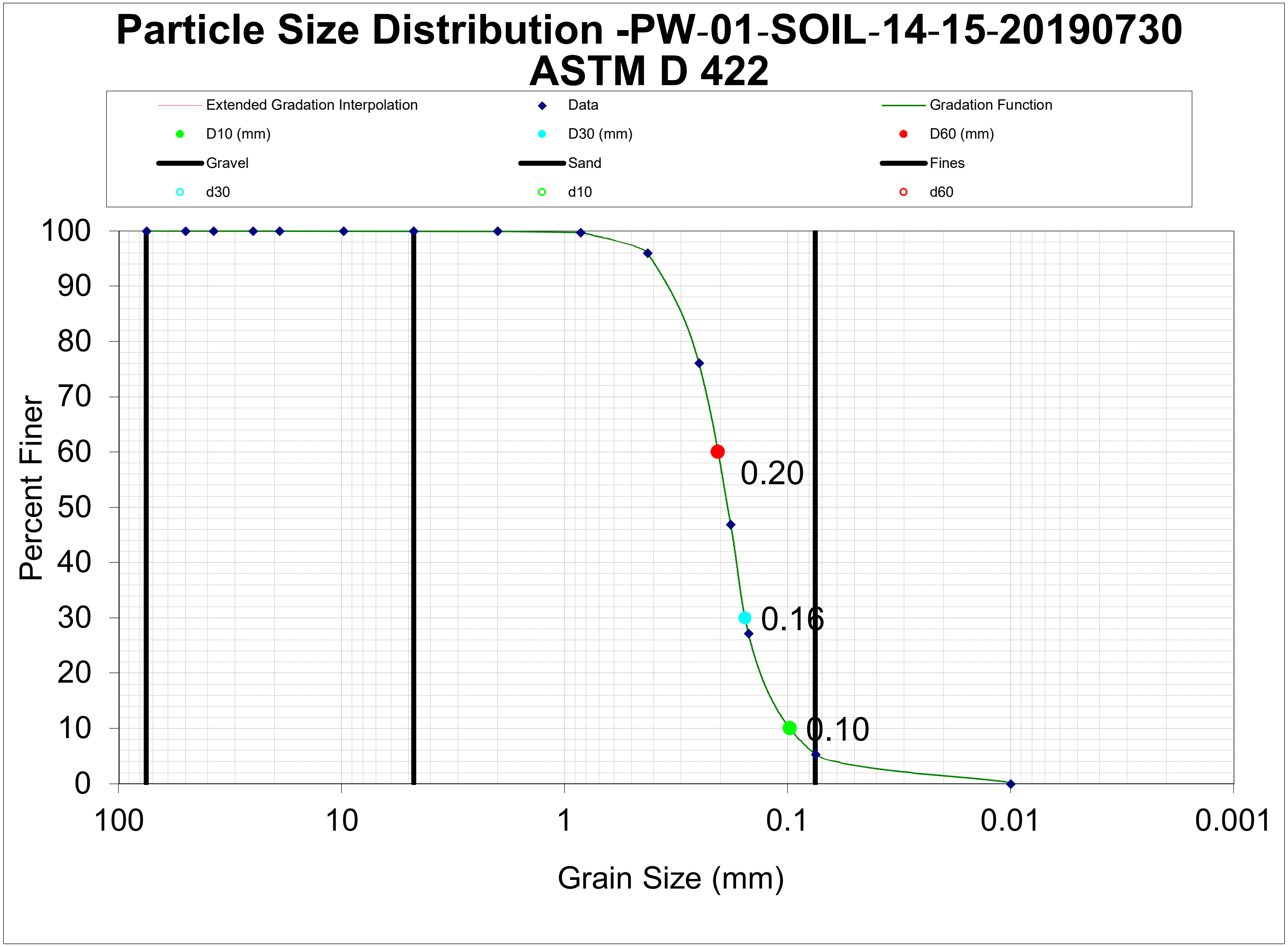
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.427E-03	.427E-05	0.37	1.21
Hazen K (cm/s) = d_{10} (mm)	.302E-03	.302E-05	0.26	0.86
Slichter	.145E-03	.145E-05	0.12	0.41
Terzaghi	.253E-03	.253E-05	0.22	0.72
Beyer	.344E-03	.344E-05	0.30	0.97
Sauerbrei	.345E-03	.345E-05	0.30	0.98
Kruger	.105E-02	.105E-04	0.91	2.99
Kozeny-Carmen	.561E-03	.561E-05	0.49	1.59
Zunker	.455E-03	.455E-05	0.39	1.29
Zamarin	.888E-03	.888E-05	0.77	2.52
USBR	.963E-04	.963E-06	0.08	0.27
Barr	.209E-03	.209E-05	0.18	0.59
Alyamani and Sen	.173E-03	.173E-05	0.15	0.49
Chapuis	.161E-03	.161E-05	0.14	0.46
Krumbein and Monk	.292E-03	.292E-05	0.25	0.83
geometric mean	.275E-03	.275E-05	0.24	0.78
arithmetic mean	.296E-03	.296E-05	0.26	0.84

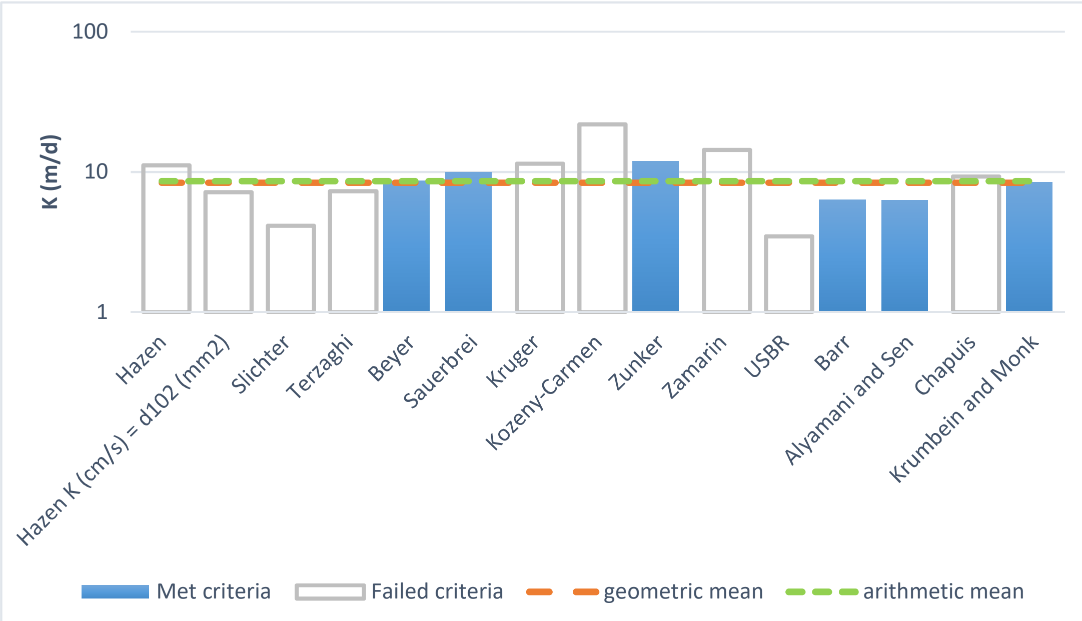

Particle Size Distribution -PW-01-SOIL-14-15-20190730
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.20
0.16
0.10
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

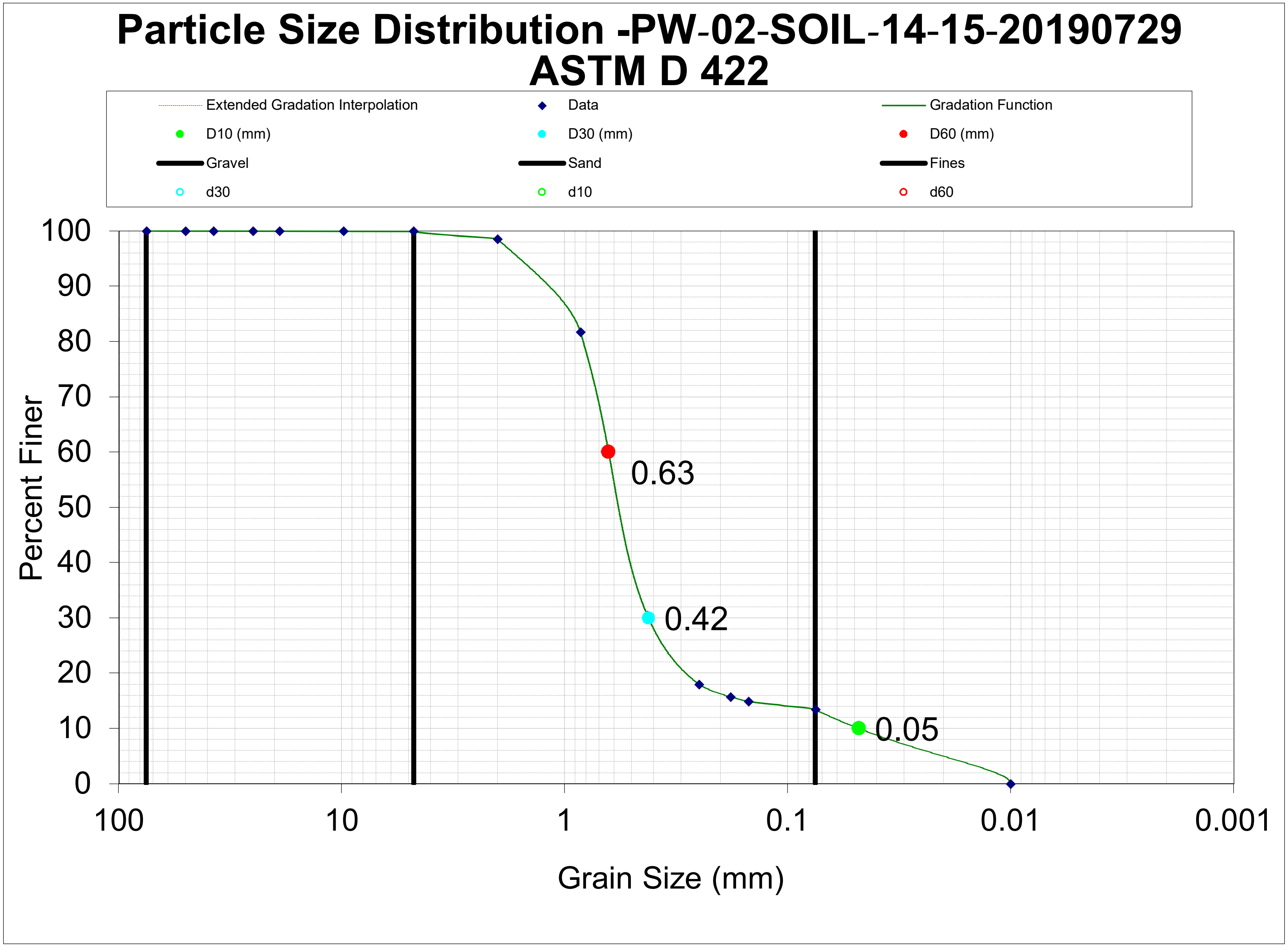
Sample Name: PW-01-SOIL-14-15-20190730

Mass Sample (g): 100 | T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.129E-01	.129E-03	11.13	36.52
Hazen K (cm/s) = d_{10} (mm)	.830E-02	.830E-04	7.17	23.52
Slichter	.478E-02	.478E-04	4.13	13.55
Terzaghi	.840E-02	.840E-04	7.26	23.82
Beyer	.100E-01	.100E-03	8.64	28.35
Sauerbrei	.115E-01	.115E-03	9.93	32.59
Kruger	.132E-01	.132E-03	11.43	37.49
Kozeny-Carmen	.253E-01	.253E-03	21.86	71.73
Zunker	.138E-01	.138E-03	11.96	39.24
Zamarin	.166E-01	.166E-03	14.32	47.00
USBR	.402E-02	.402E-04	3.47	11.39
Barr	.733E-02	.733E-04	6.34	20.79
Alyamani and Sen	.725E-02	.725E-04	6.26	20.55
Chapuis	.107E-01	.107E-03	9.28	30.44
Krumbein and Monk	.972E-02	.972E-04	8.40	27.54
geometric mean	.968E-02	.968E-04	8.36	27.44
arithmetic mean	.994E-02	.994E-04	8.59	28.18

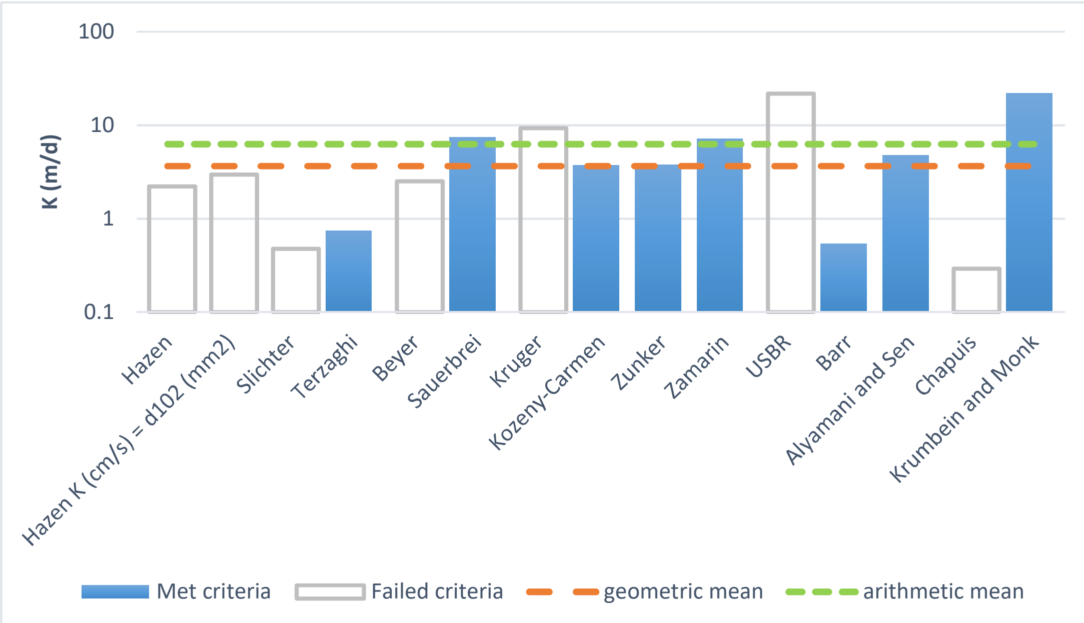

Particle Size Distribution -PW-02-SOIL-14-15-20190729
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.63
0.42
0.05
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

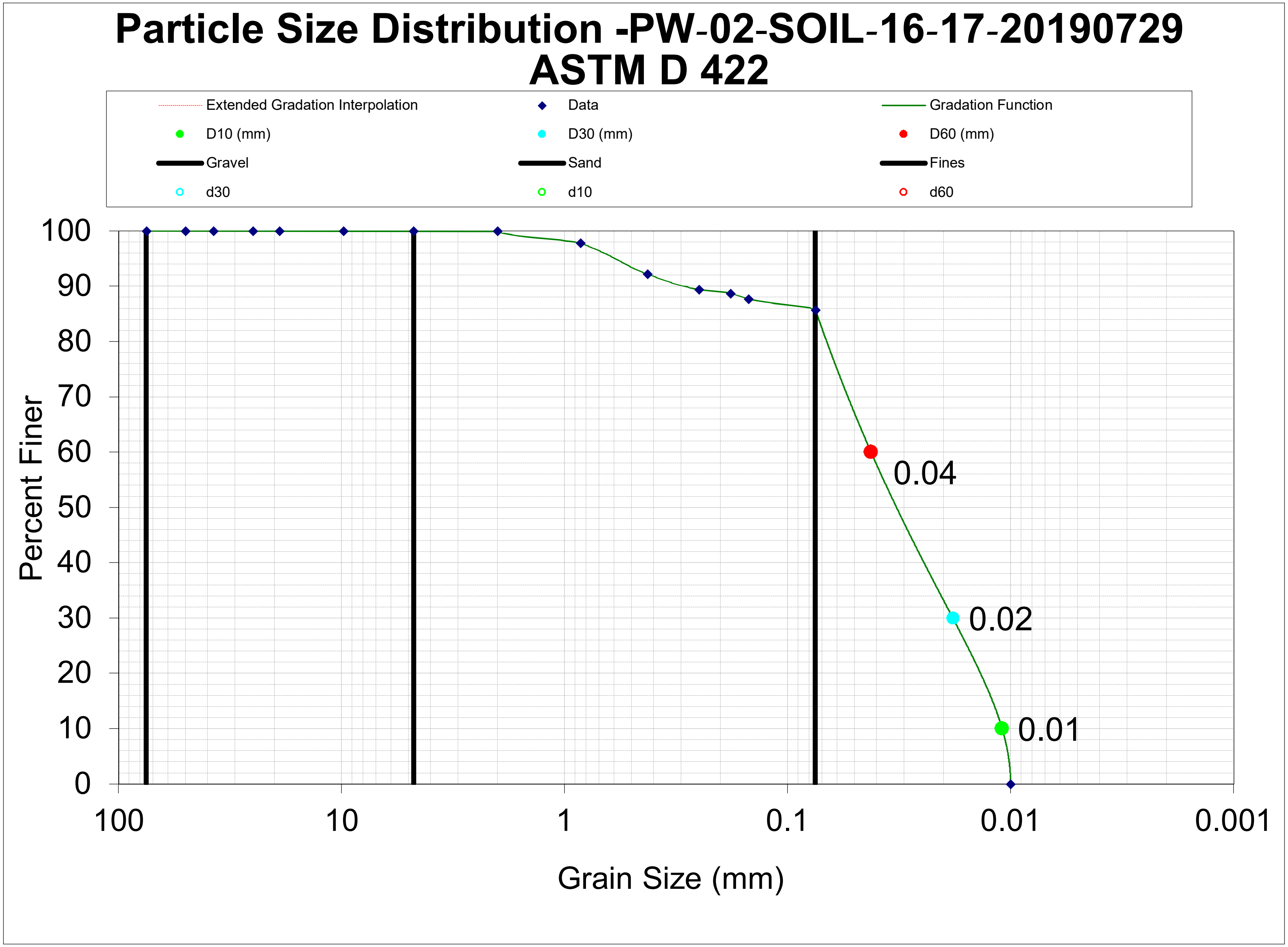
Sample Name: PW-02-SOIL-14-15-20190729

Mass Sample (g): 100 | T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.255E-02	.255E-04	2.21	7.24
Hazen K (cm/s) = d_{10} (mm)	.342E-02	.342E-04	2.96	9.70
Slichter	.550E-03	.550E-05	0.48	1.56
Terzaghi	.860E-03	.860E-05	0.74	2.44
Beyer	.290E-02	.290E-04	2.51	8.22
Sauerbrei	.858E-02	.858E-04	7.41	24.33
Kruger	.107E-01	.107E-03	9.29	30.47
Kozeny-Carmen	.428E-02	.428E-04	3.70	12.14
Zunker	.440E-02	.440E-04	3.80	12.48
Zamarin	.835E-02	.835E-04	7.21	23.66
USBR	.251E-01	.251E-03	21.72	71.27
Barr	.620E-03	.620E-05	0.54	1.76
Alyamani and Sen	.551E-02	.551E-04	4.76	15.61
Chapuis	.338E-03	.338E-05	0.29	0.96
Krumbein and Monk	.254E-01	.254E-03	21.96	72.04
geometric mean	.422E-02	.422E-04	3.65	11.97
arithmetic mean	.725E-02	.725E-04	6.27	20.56


Particle Size Distribution -PW-02-SOIL-16-17-20190729
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

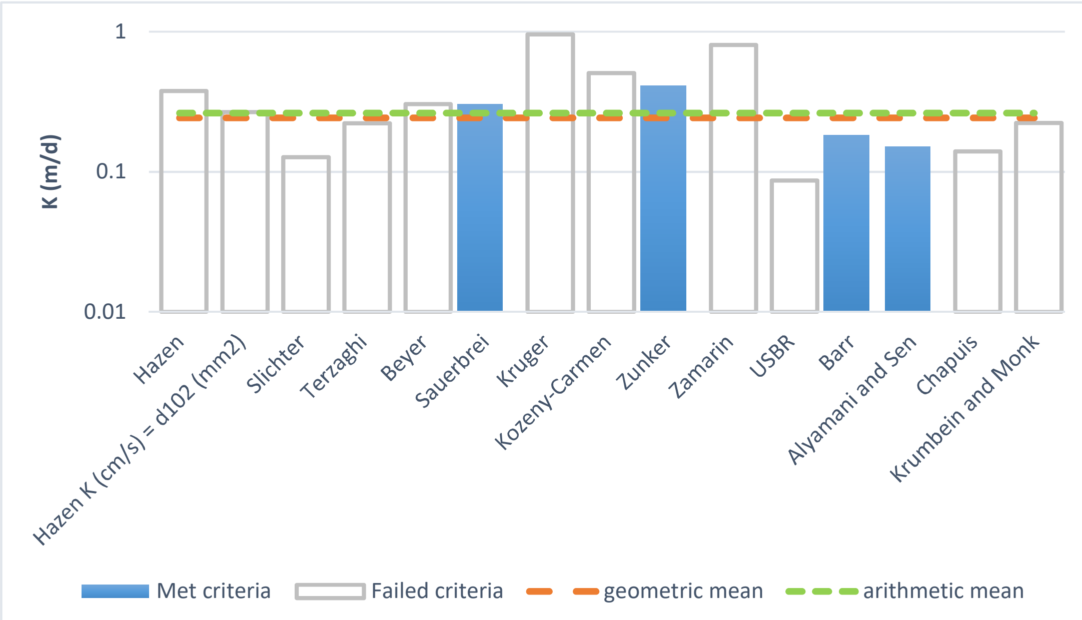
Date: 10/16/2019

Sample Name: PW-02-SOIL-16-17-20190729

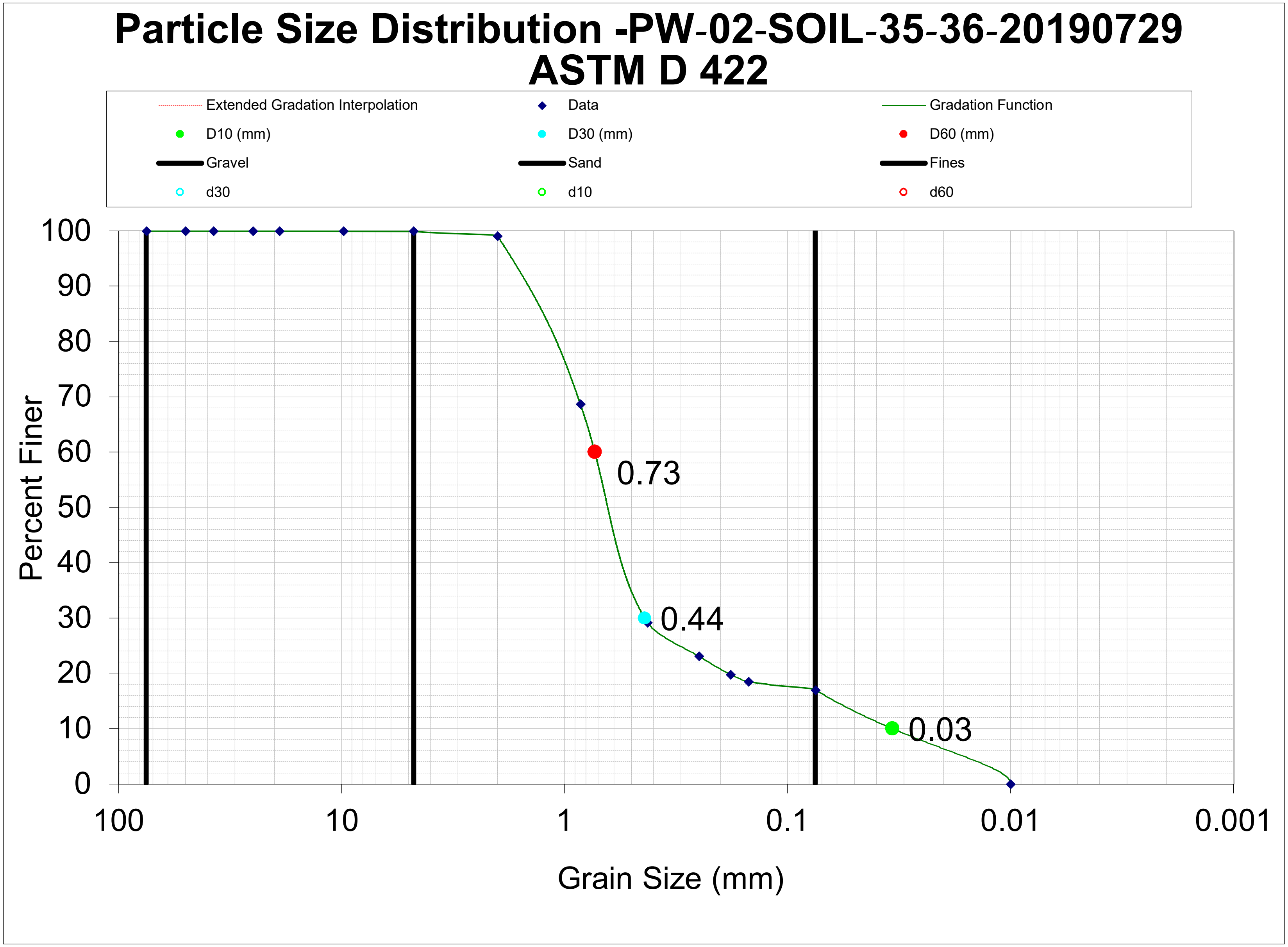
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.436E-03	.436E-05	0.38	1.24
Hazen K (cm/s) = d_{10} (mm)	.309E-03	.309E-05	0.27	0.88
Slichter	.147E-03	.147E-05	0.13	0.42
Terzaghi	.257E-03	.257E-05	0.22	0.73
Beyer	.351E-03	.351E-05	0.30	1.00
Sauerbrei	.352E-03	.352E-05	0.30	1.00
Kruger	.111E-02	.111E-04	0.96	3.14
Kozeny-Carmen	.587E-03	.587E-05	0.51	1.66
Zunker	.477E-03	.477E-05	0.41	1.35
Zamarin	.932E-03	.932E-05	0.80	2.64
USBR	.100E-03	.100E-05	0.09	0.28
Barr	.212E-03	.212E-05	0.18	0.60
Alyamani and Sen	.174E-03	.174E-05	0.15	0.49
Chapuis	.162E-03	.162E-05	0.14	0.46
Krumbein and Monk	.258E-03	.258E-05	0.22	0.73
geometric mean	.280E-03	.280E-05	0.24	0.80
arithmetic mean	.304E-03	.304E-05	0.26	0.86

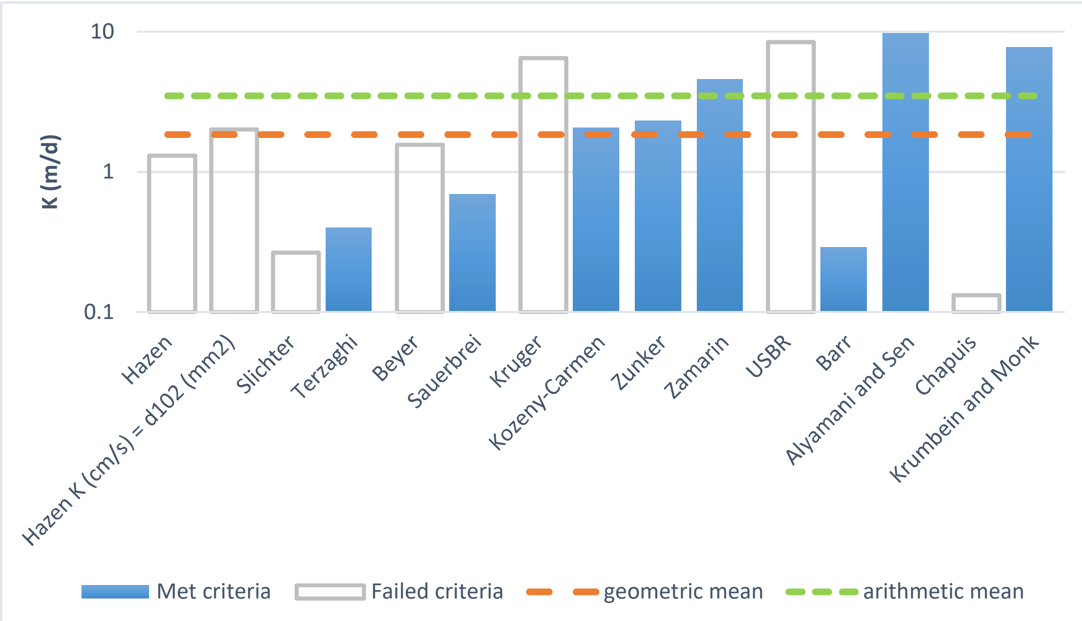

Particle Size Distribution -PW-02-SOIL-35-36-20190729
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.73
0.44
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

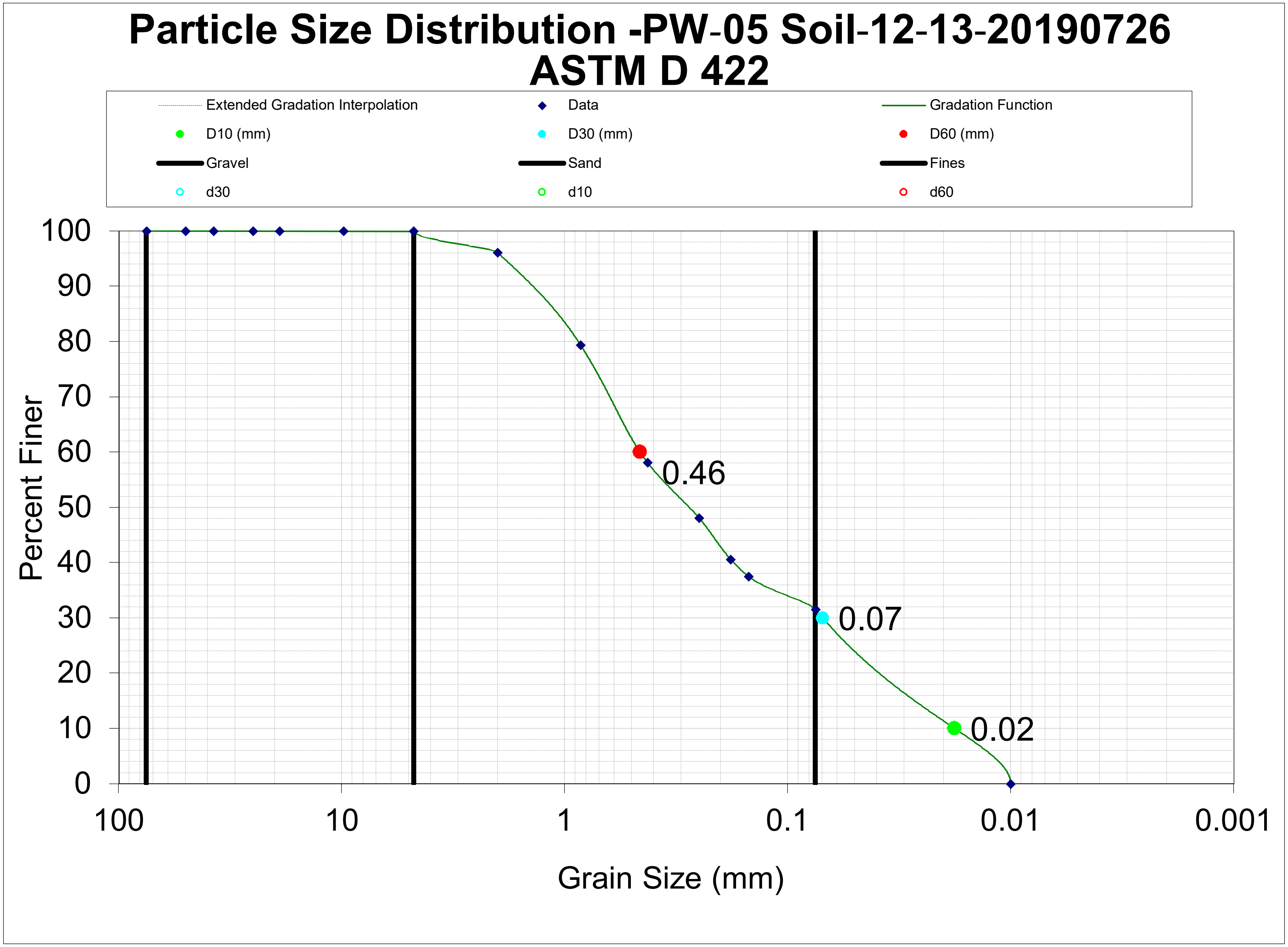
Sample Name: PW-02-SOIL-35-36-20190729

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.151E-02	.151E-04	1.30	4.27
Hazen K (cm/s) = d_{10} (mm)	.233E-02	.233E-04	2.01	6.60
Slichter	.308E-03	.308E-05	0.27	0.87
Terzaghi	.460E-03	.460E-05	0.40	1.30
Beyer	.181E-02	.181E-04	1.56	5.12
Sauerbrei	.801E-03	.801E-05	0.69	2.27
Kruger	.750E-02	.750E-04	6.48	21.25
Kozeny-Carmen	.240E-02	.240E-04	2.07	6.80
Zunker	.269E-02	.269E-04	2.32	7.62
Zamarin	.528E-02	.528E-04	4.56	14.97
USBR	.974E-02	.974E-04	8.42	27.62
Barr	.337E-03	.337E-05	0.29	0.96
Alyamani and Sen	.114E-01	.114E-03	9.82	32.20
Chapuis	.153E-03	.153E-05	0.13	0.43
Krumbein and Monk	.899E-02	.899E-04	7.77	25.48
geometric mean	.214E-02	.214E-04	1.84	6.05
arithmetic mean	.404E-02	.404E-04	3.49	11.45


Particle Size Distribution -PW-05 Soil-12-13-20190726
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.46
0.07
0.02
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

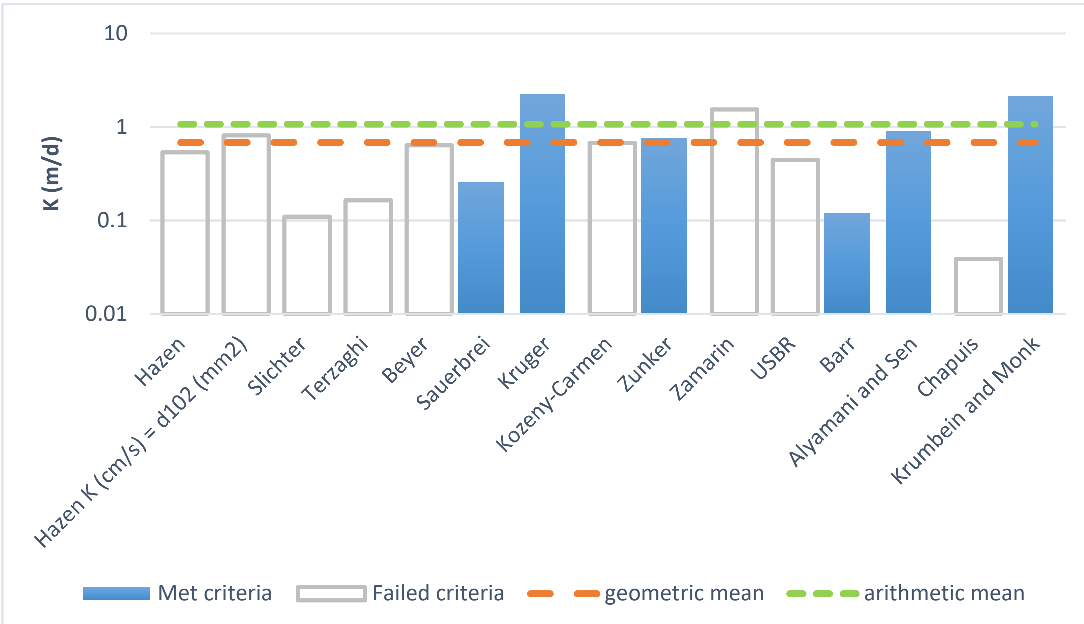
Date: 10/16/2019

Sample Name: PW-05 Soil-12-13-20190726

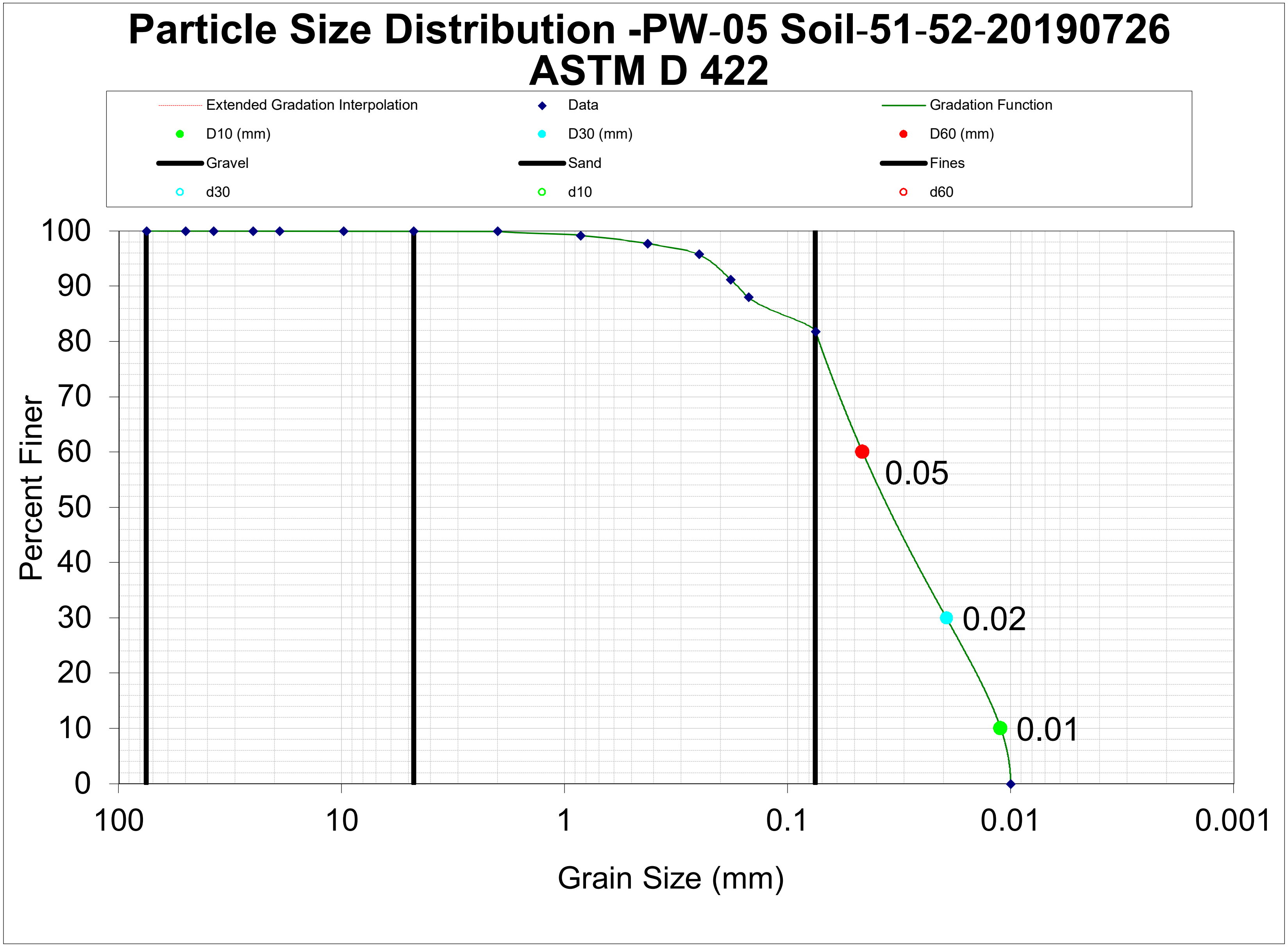
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.617E-03	.617E-05	0.53	1.75
Hazen K (cm/s) = d_{10} (mm)	.938E-03	.938E-05	0.81	2.66
Slichter	.126E-03	.126E-05	0.11	0.36
Terzaghi	.190E-03	.190E-05	0.16	0.54
Beyer	.737E-03	.737E-05	0.64	2.09
Sauerbrei	.295E-03	.295E-05	0.26	0.84
Kruger	.257E-02	.257E-04	2.22	7.28
Kozeny-Carmen	.776E-03	.776E-05	0.67	2.20
Zunker	.880E-03	.880E-05	0.76	2.50
Zamarin	.178E-02	.178E-04	1.53	5.03
USBR	.514E-03	.514E-05	0.44	1.46
Barr	.139E-03	.139E-05	0.12	0.39
Alyamani and Sen	.103E-02	.103E-04	0.89	2.93
Chapuis	.446E-04	.446E-06	0.04	0.13
Krumbein and Monk	.250E-02	.250E-04	2.16	7.08
geometric mean	.788E-03	.788E-05	0.68	2.23
arithmetic mean	.124E-02	.124E-04	1.07	3.50

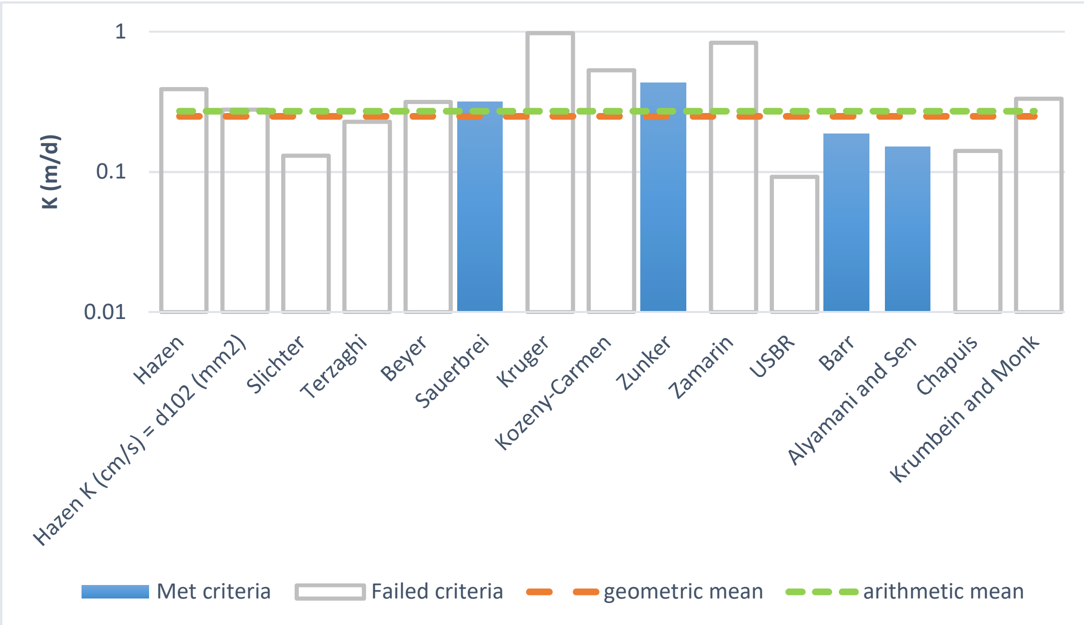

Particle Size Distribution -PW-05 Soil-51-52-20190726
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

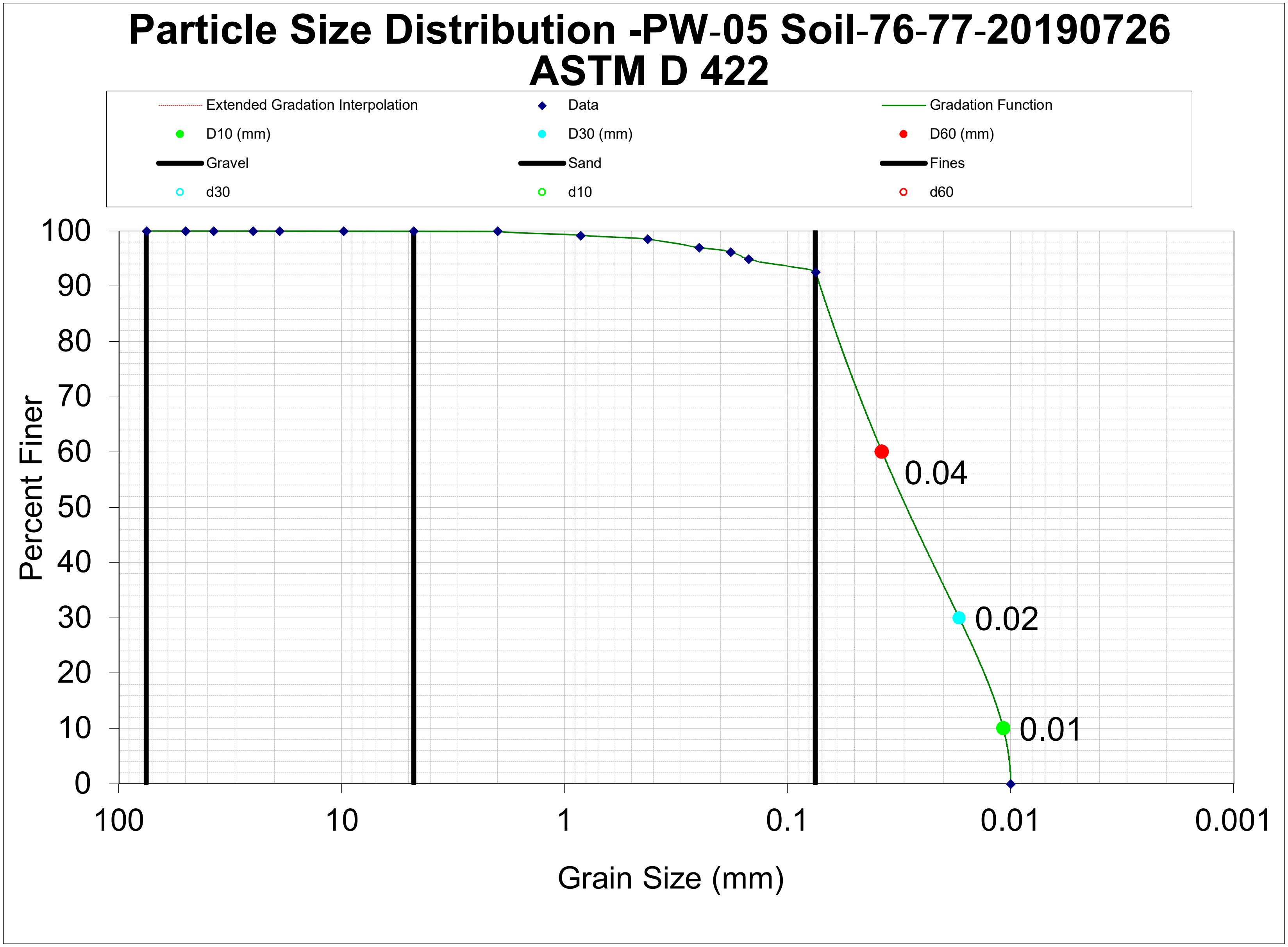
Sample Name: PW-05 Soil-51-52-20190726

Mass Sample (g): 100 T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.451E-03	.451E-05	0.39	1.28
Hazen K (cm/s) = d_{10} (mm)	.322E-03	.322E-05	0.28	0.91
Slichter	.151E-03	.151E-05	0.13	0.43
Terzaghi	.264E-03	.264E-05	0.23	0.75
Beyer	.365E-03	.365E-05	0.32	1.03
Sauerbrei	.365E-03	.365E-05	0.32	1.04
Kruger	.113E-02	.113E-04	0.98	3.21
Kozeny-Carmen	.616E-03	.616E-05	0.53	1.75
Zunker	.499E-03	.499E-05	0.43	1.41
Zamarin	.965E-03	.965E-05	0.83	2.74
USBR	.107E-03	.107E-05	0.09	0.30
Barr	.217E-03	.217E-05	0.19	0.61
Alyamani and Sen	.175E-03	.175E-05	0.15	0.50
Chapuis	.163E-03	.163E-05	0.14	0.46
Krumbein and Monk	.386E-03	.386E-05	0.33	1.09
geometric mean	.289E-03	.289E-05	0.25	0.82
arithmetic mean	.314E-03	.314E-05	0.27	0.89

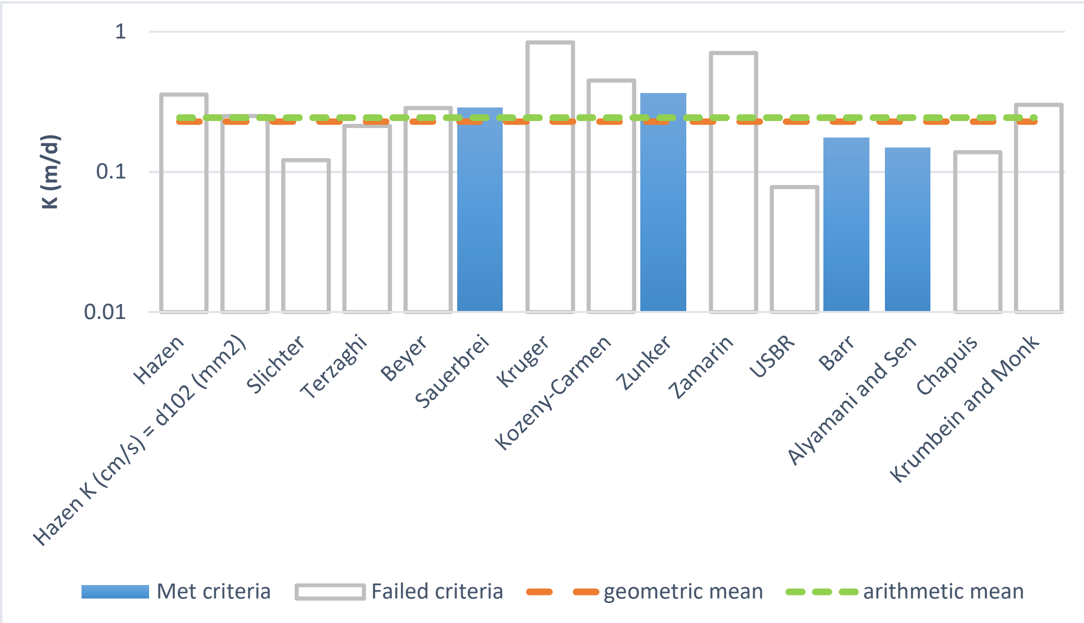

Particle Size Distribution -PW-05 Soil-76-77-20190726
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

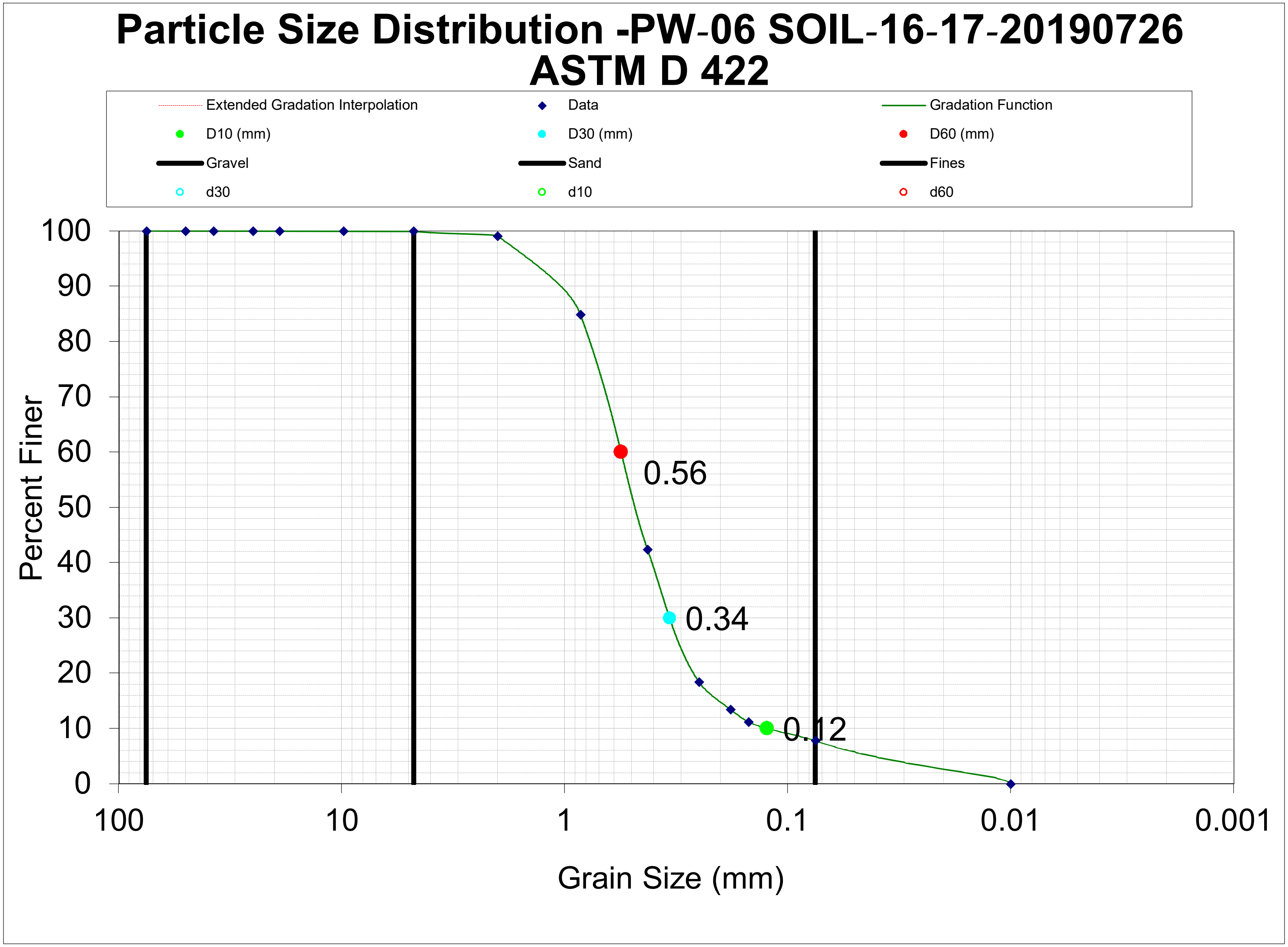
Sample Name: PW-05 Soil-76-77-20190726

Mass Sample (g): 100 T (oC) 20

Moderately well sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.413E-03	.413E-05	0.36	1.17
Hazen K (cm/s) = d_{10} (mm)	.290E-03	.290E-05	0.25	0.82
Slichter	.141E-03	.141E-05	0.12	0.40
Terzaghi	.246E-03	.246E-05	0.21	0.70
Beyer	.331E-03	.331E-05	0.29	0.94
Sauerbrei	.332E-03	.332E-05	0.29	0.94
Kruger	.972E-03	.972E-05	0.84	2.75
Kozeny-Carmen	.519E-03	.519E-05	0.45	1.47
Zunker	.420E-03	.420E-05	0.36	1.19
Zamarin	.817E-03	.817E-05	0.71	2.32
USBR	.900E-04	.900E-06	0.08	0.26
Barr	.204E-03	.204E-05	0.18	0.58
Alyamani and Sen	.172E-03	.172E-05	0.15	0.49
Chapuis	.160E-03	.160E-05	0.14	0.45
Krumbein and Monk	.349E-03	.349E-05	0.30	0.99
geometric mean	.264E-03	.264E-05	0.23	0.75
arithmetic mean	.282E-03	.282E-05	0.24	0.80


Particle Size Distribution -PW-06 SOIL-16-17-20190726
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.56
0.34
0.12
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

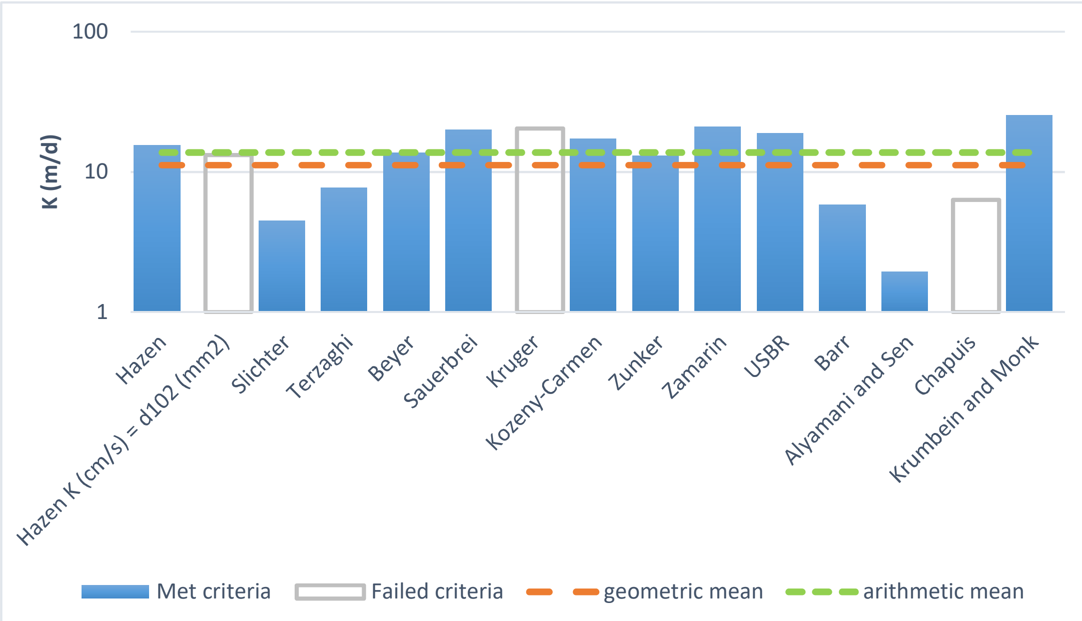
Date: 10/16/2019

Sample Name: PW-06 SOIL-16-17-20190726

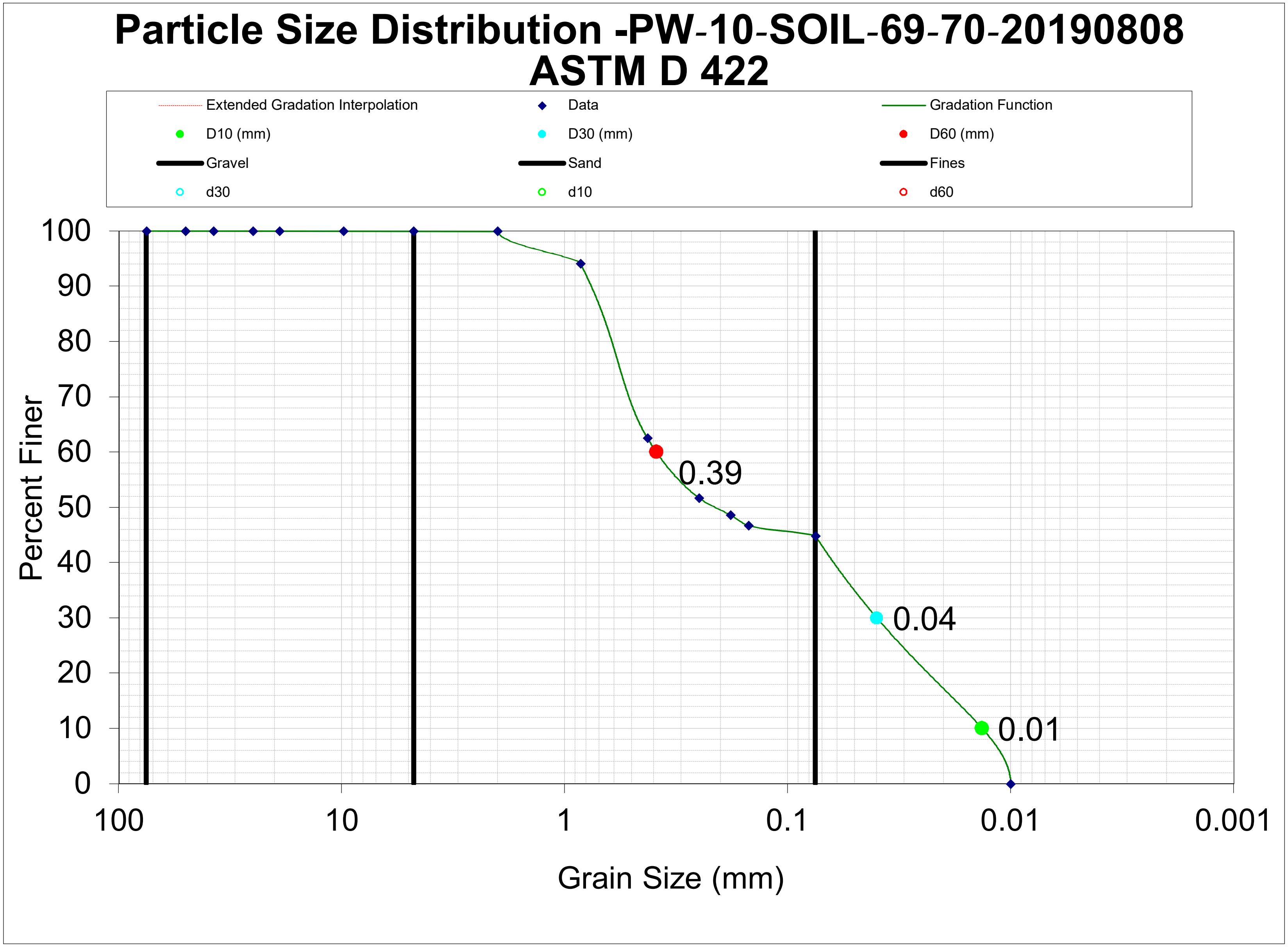
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.180E-01	.180E-03	15.56	51.04
Hazen K (cm/s) = d_{10} (mm)	.153E-01	.153E-03	13.18	43.26
Slichter	.518E-02	.518E-04	4.47	14.68
Terzaghi	.889E-02	.889E-04	7.68	25.21
Beyer	.159E-01	.159E-03	13.70	44.95
Sauerbrei	.232E-01	.232E-03	20.03	65.70
Kruger	.237E-01	.237E-03	20.43	67.04
Kozeny-Carmen	.200E-01	.200E-03	17.31	56.80
Zunker	.151E-01	.151E-03	13.03	42.75
Zamarin	.243E-01	.243E-03	21.00	68.89
USBR	.218E-01	.218E-03	18.86	61.89
Barr	.678E-02	.678E-04	5.86	19.23
Alyamani and Sen	.224E-02	.224E-04	1.94	6.35
Chapuis	.732E-02	.732E-04	6.32	20.74
Krumbein and Monk	.294E-01	.294E-03	25.40	83.32
geometric mean	.129E-01	.129E-03	11.17	36.65
arithmetic mean	.159E-01	.159E-03	13.74	45.07

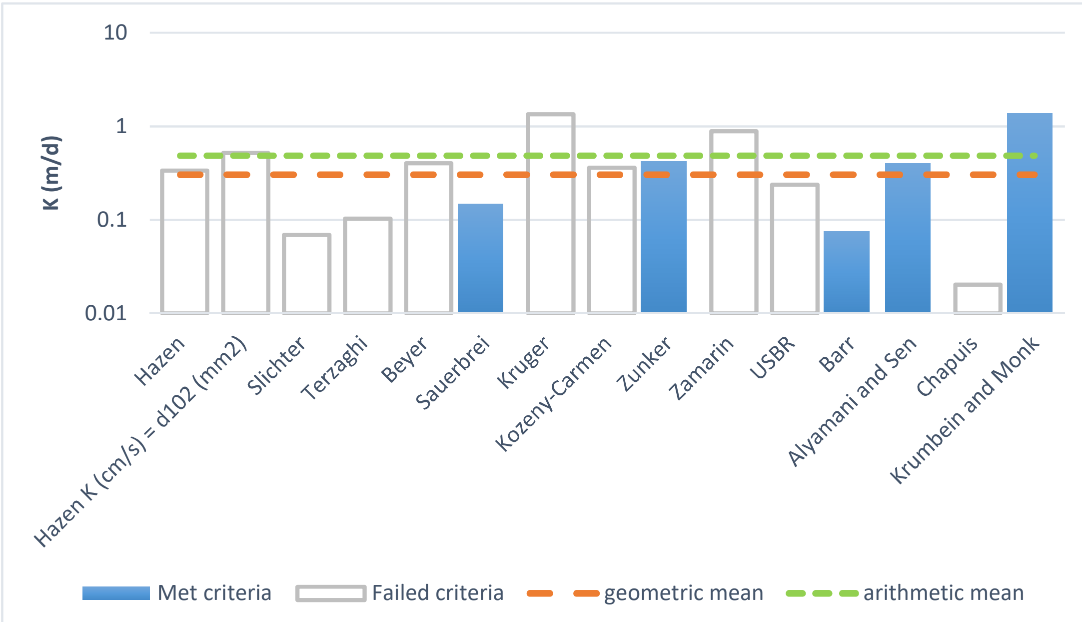

Particle Size Distribution -PW-10-SOIL-69-70-20190808
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.39
0.04
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

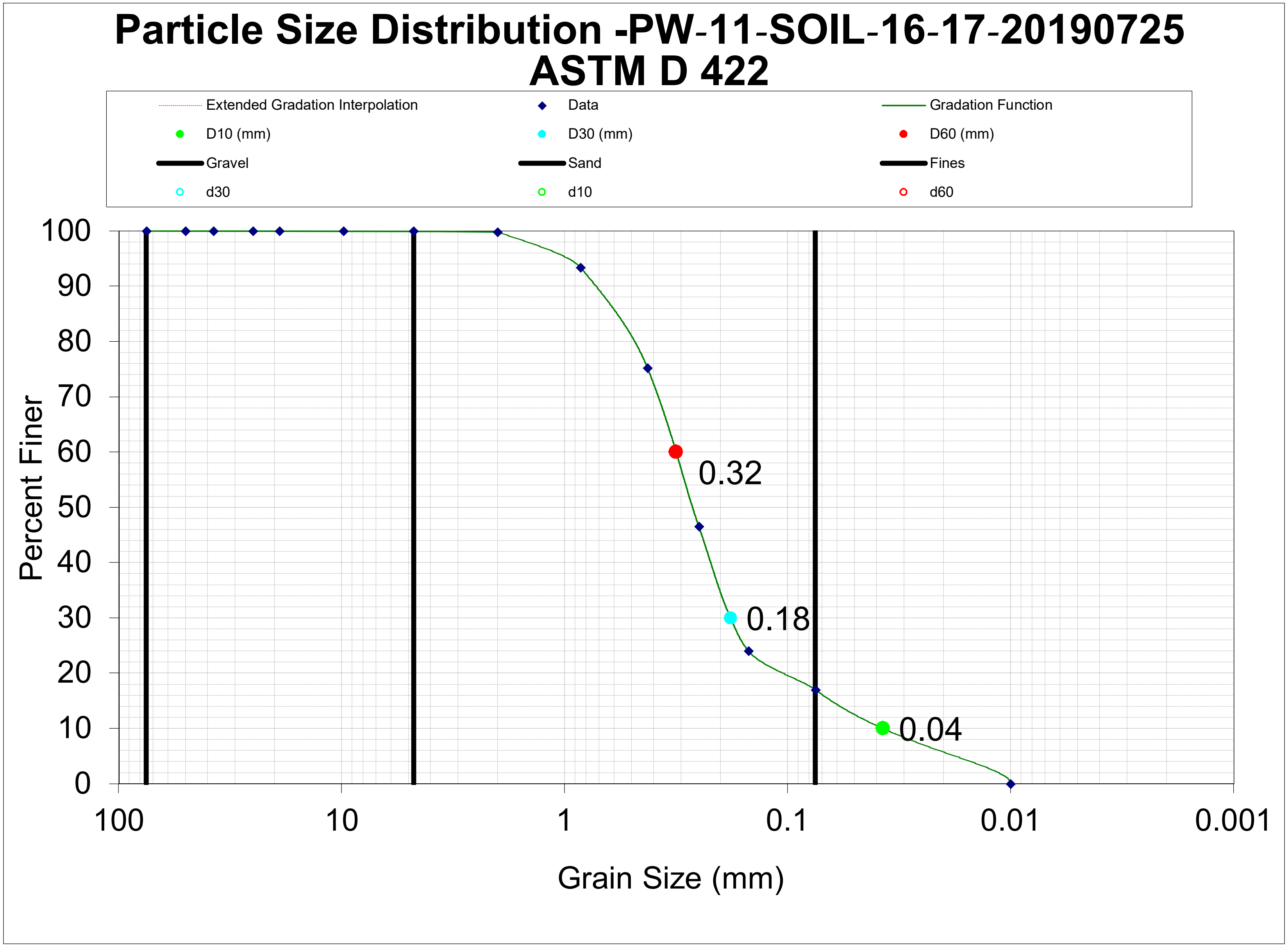
Sample Name: PW-10-SOIL-69-70-20190808

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.389E-03	.389E-05	0.34	1.10
Hazen K (cm/s) = d_{10} (mm)	.601E-03	.601E-05	0.52	1.70
Slichter	.794E-04	.794E-06	0.07	0.23
Terzaghi	.119E-03	.119E-05	0.10	0.34
Beyer	.466E-03	.466E-05	0.40	1.32
Sauerbrei	.171E-03	.171E-05	0.15	0.48
Kruger	.155E-02	.155E-04	1.34	4.40
Kozeny-Carmen	.417E-03	.417E-05	0.36	1.18
Zunker	.488E-03	.488E-05	0.42	1.38
Zamarin	.102E-02	.102E-04	0.89	2.90
USBR	.274E-03	.274E-05	0.24	0.78
Barr	.870E-04	.870E-06	0.08	0.25
Alyamani and Sen	.466E-03	.466E-05	0.40	1.32
Chapuis	.234E-04	.234E-06	0.02	0.07
Krumbein and Monk	.159E-02	.159E-04	1.38	4.51
geometric mean	.352E-03	.352E-05	0.30	1.00
arithmetic mean	.561E-03	.561E-05	0.48	1.59


Particle Size Distribution -PW-11-SOIL-16-17-20190725
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.32
0.18
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

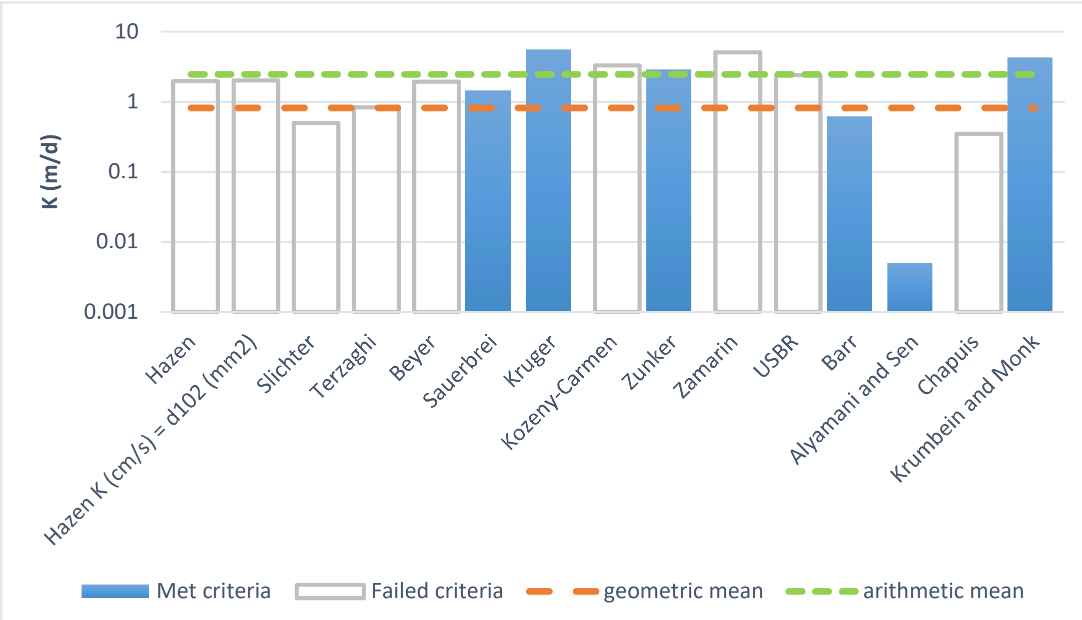
Date: 10/16/2019

Sample Name: PW-11-SOIL-16-17-20190725

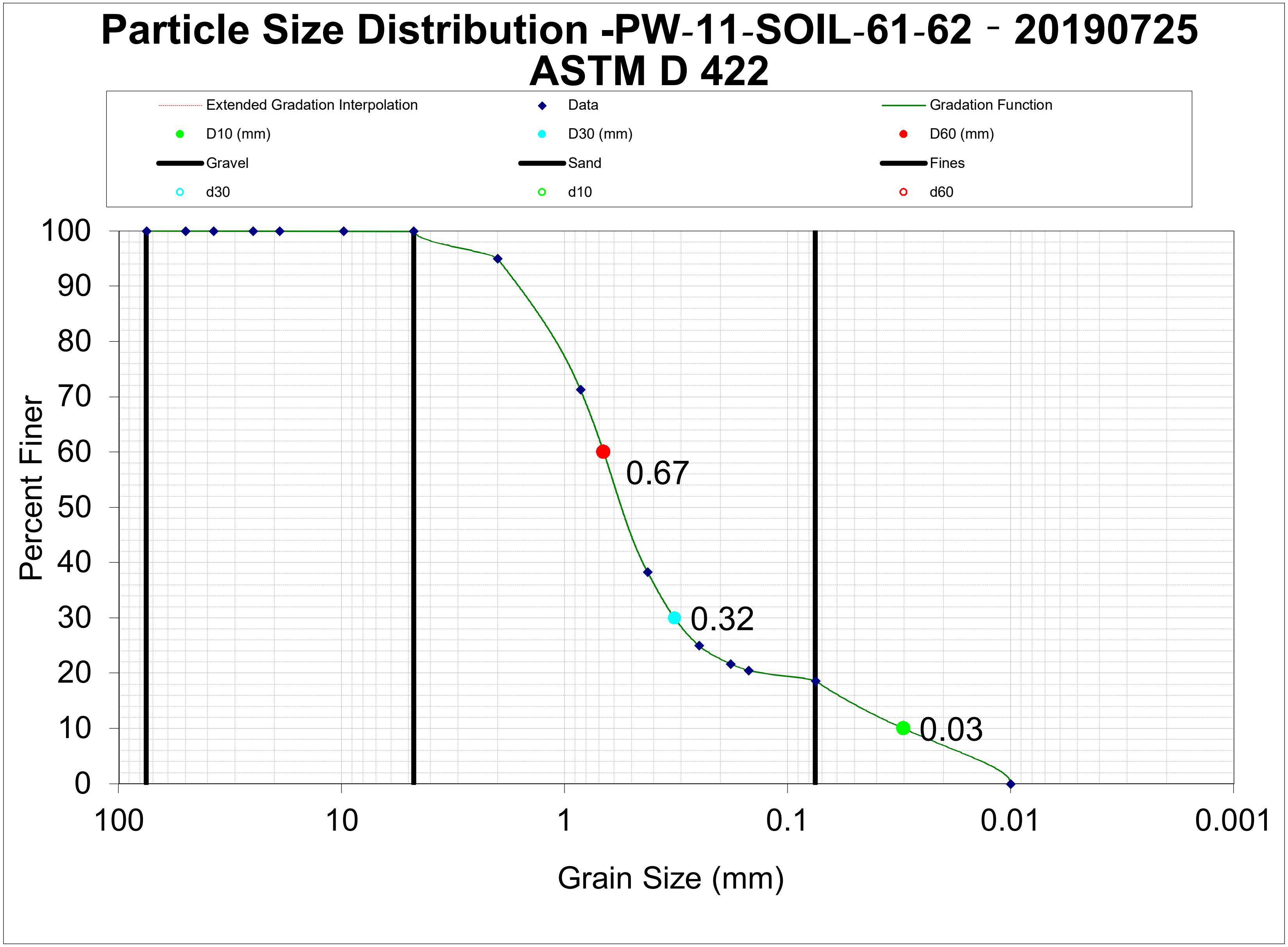
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.230E-02	.230E-04	1.98	6.51
Hazen K (cm/s) = d_{10} (mm)	.233E-02	.233E-04	2.01	6.60
Slichter	.578E-03	.578E-05	0.50	1.64
Terzaghi	.966E-03	.966E-05	0.83	2.74
Beyer	.224E-02	.224E-04	1.93	6.34
Sauerbrei	.168E-02	.168E-04	1.45	4.75
Kruger	.644E-02	.644E-04	5.56	18.24
Kozeny-Carmen	.384E-02	.384E-04	3.31	10.87
Zunker	.333E-02	.333E-04	2.88	9.44
Zamarin	.590E-02	.590E-04	5.10	16.73
USBR	.280E-02	.280E-04	2.42	7.94
Barr	.705E-03	.705E-05	0.61	2.00
Alyamani and Sen	.580E-05	.580E-07	0.01	0.02
Chapuis	.404E-03	.404E-05	0.35	1.15
Krumbein and Monk	.493E-02	.493E-04	4.26	13.97
geometric mean	.948E-03	.948E-05	0.82	2.69
arithmetic mean	.285E-02	.285E-04	2.46	8.07

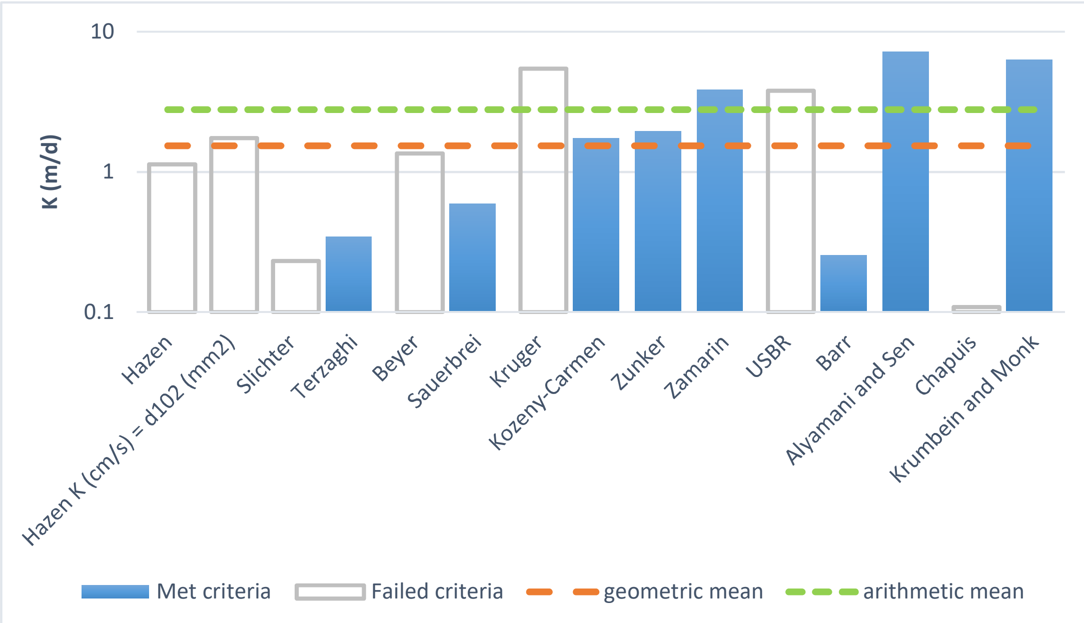

Particle Size Distribution -PW-11-SOIL-61-62 - 20190725
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.67
0.32
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

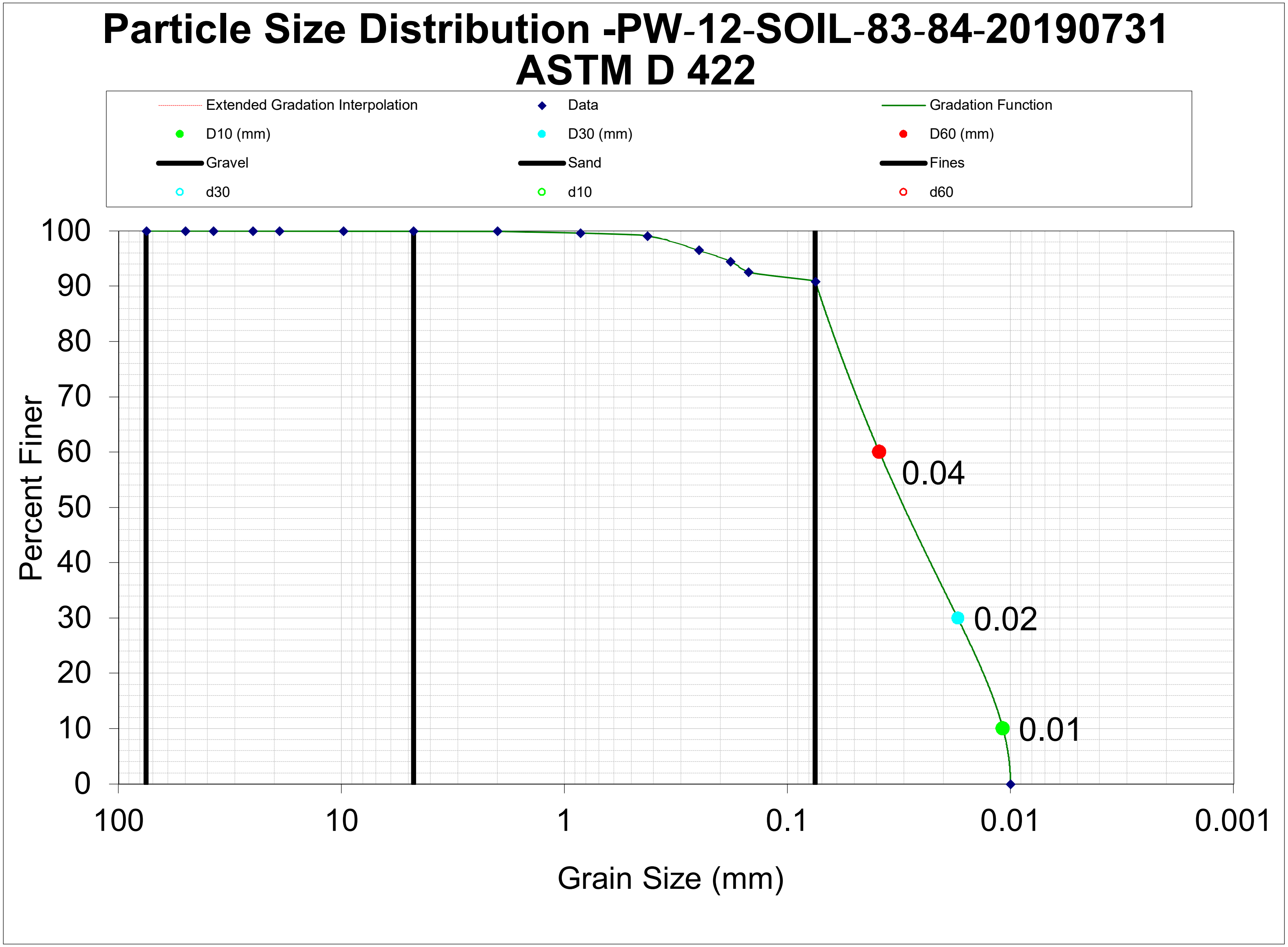
Sample Name: PW-11-SOIL-61-62-20190725

Mass Sample (g): 100 | T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.131E-02	.131E-04	1.13	3.71
Hazen K (cm/s) = d_{10} (mm)	.202E-02	.202E-04	1.75	5.73
Slichter	.267E-03	.267E-05	0.23	0.76
Terzaghi	.400E-03	.400E-05	0.35	1.13
Beyer	.157E-02	.157E-04	1.36	4.45
Sauerbrei	.686E-03	.686E-05	0.59	1.94
Kruger	.631E-02	.631E-04	5.46	17.90
Kozeny-Carmen	.202E-02	.202E-04	1.74	5.72
Zunker	.226E-02	.226E-04	1.95	6.41
Zamarin	.445E-02	.445E-04	3.84	12.60
USBR	.439E-02	.439E-04	3.79	12.44
Barr	.293E-03	.293E-05	0.25	0.83
Alyamani and Sen	.834E-02	.834E-04	7.21	23.65
Chapuis	.126E-03	.126E-05	0.11	0.36
Krumbein and Monk	.735E-02	.735E-04	6.35	20.83
geometric mean	.178E-02	.178E-04	1.54	5.04
arithmetic mean	.322E-02	.322E-04	2.79	9.14


Particle Size Distribution -PW-12-SOIL-83-84-20190731
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

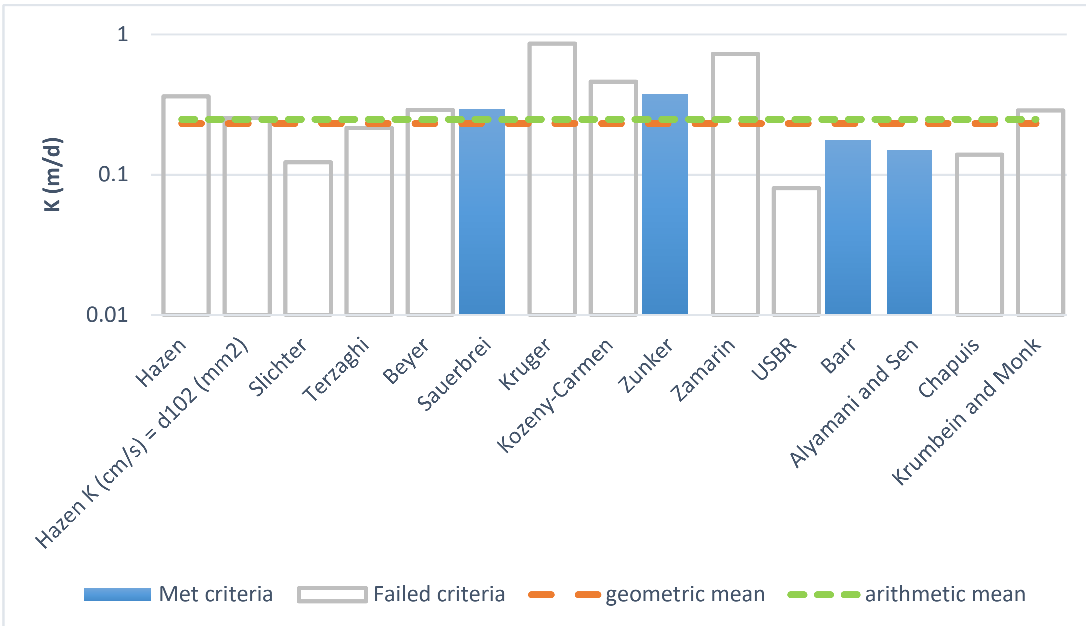
Date: 10/16/2019

Sample Name: PW-12-SOIL-83-84-20190731

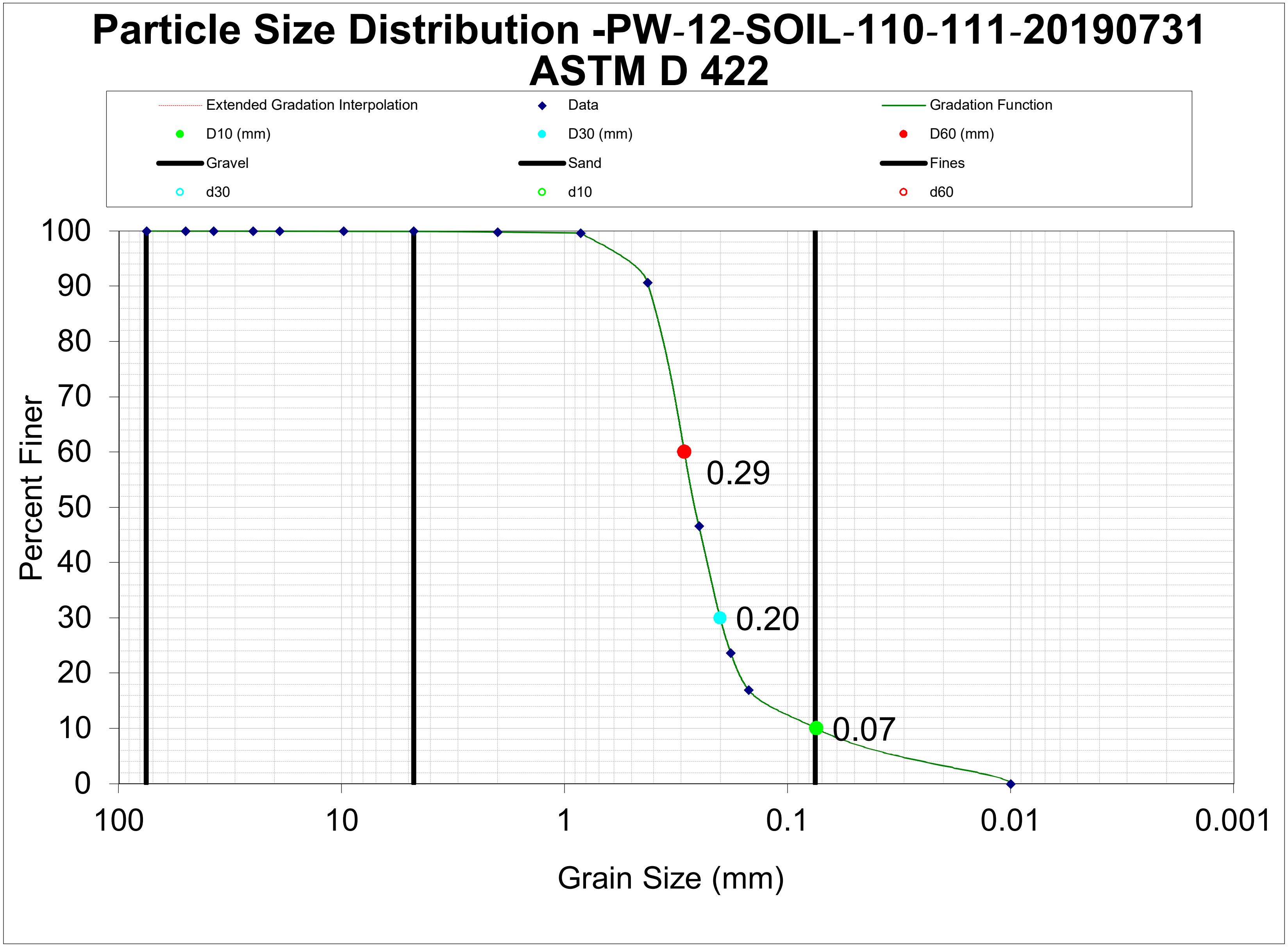
Mass Sample (g): 100

T (oC) 20

Moderately well sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.418E-03	.418E-05	0.36	1.19
Hazen K (cm/s) = d_{10} (mm)	.294E-03	.294E-05	0.25	0.83
Slichter	.142E-03	.142E-05	0.12	0.40
Terzaghi	.249E-03	.249E-05	0.21	0.70
Beyer	.336E-03	.336E-05	0.29	0.95
Sauerbrei	.337E-03	.337E-05	0.29	0.96
Kruger	.999E-03	.999E-05	0.86	2.83
Kozeny-Carmen	.534E-03	.534E-05	0.46	1.51
Zunker	.432E-03	.432E-05	0.37	1.23
Zamarin	.842E-03	.842E-05	0.73	2.39
USBR	.925E-04	.925E-06	0.08	0.26
Barr	.206E-03	.206E-05	0.18	0.58
Alyamani and Sen	.173E-03	.173E-05	0.15	0.49
Chapuis	.161E-03	.161E-05	0.14	0.46
Krumbein and Monk	.333E-03	.333E-05	0.29	0.94
geometric mean	.268E-03	.268E-05	0.23	0.76
arithmetic mean	.287E-03	.287E-05	0.25	0.81


Particle Size Distribution -PW-12-SOIL-110-111-20190731
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.29
0.20
0.07
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

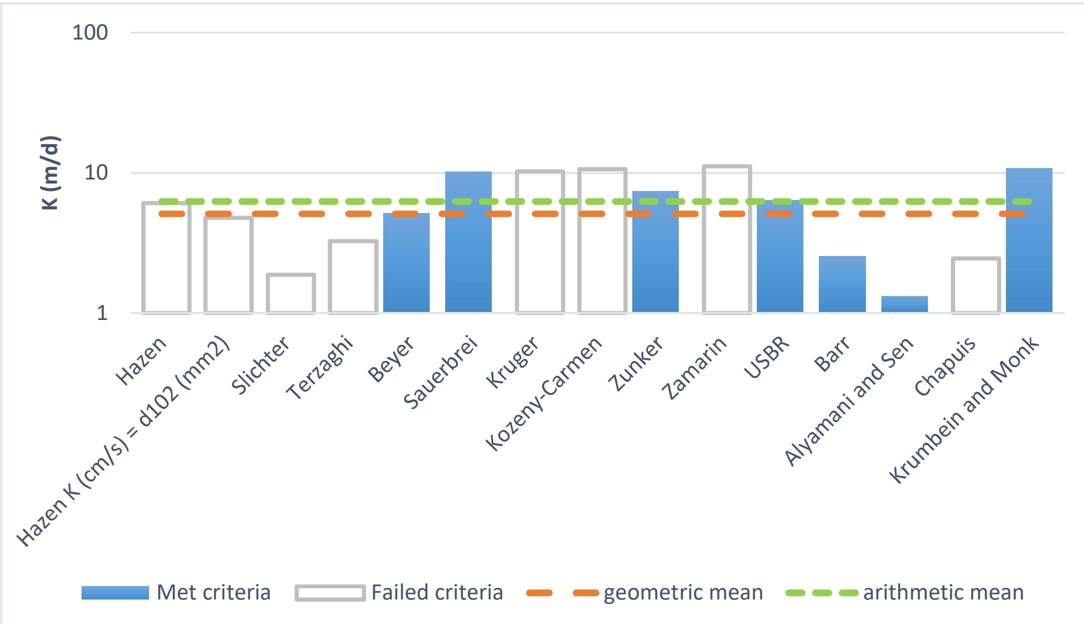
Date: 10/16/2019

Sample Name: PW-12-SOIL-110-111-20190731

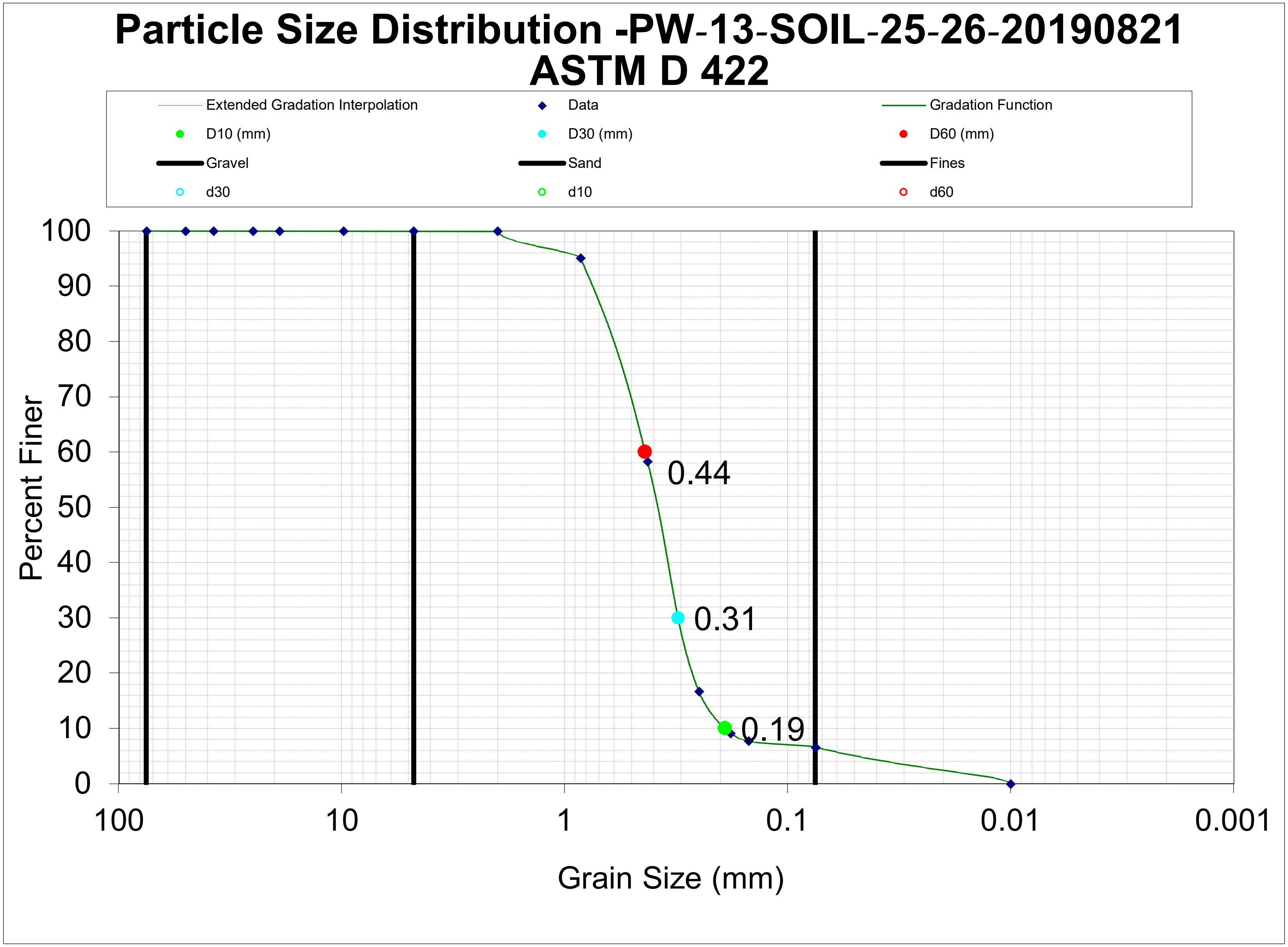
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.706E-02	.706E-04	6.10	20.01
Hazen K (cm/s) = d_{10} (mm)	.553E-02	.553E-04	4.78	15.67
Slichter	.217E-02	.217E-04	1.88	6.16
Terzaghi	.376E-02	.376E-04	3.25	10.67
Beyer	.596E-02	.596E-04	5.15	16.91
Sauerbrei	.118E-01	.118E-03	10.21	33.50
Kruger	.118E-01	.118E-03	10.22	33.53
Kozeny-Carmen	.123E-01	.123E-03	10.62	34.85
Zunker	.856E-02	.856E-04	7.39	24.26
Zamarin	.129E-01	.129E-03	11.16	36.62
USBR	.740E-02	.740E-04	6.39	20.96
Barr	.296E-02	.296E-04	2.55	8.38
Alyamani and Sen	.152E-02	.152E-04	1.31	4.31
Chapuis	.284E-02	.284E-04	2.46	8.06
Krumbein and Monk	.125E-01	.125E-03	10.79	35.41
geometric mean	.591E-02	.591E-04	5.10	16.74
arithmetic mean	.724E-02	.724E-04	6.26	20.53


Particle Size Distribution -PW-13-SOIL-25-26-20190821
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.44
0.31
0.19
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

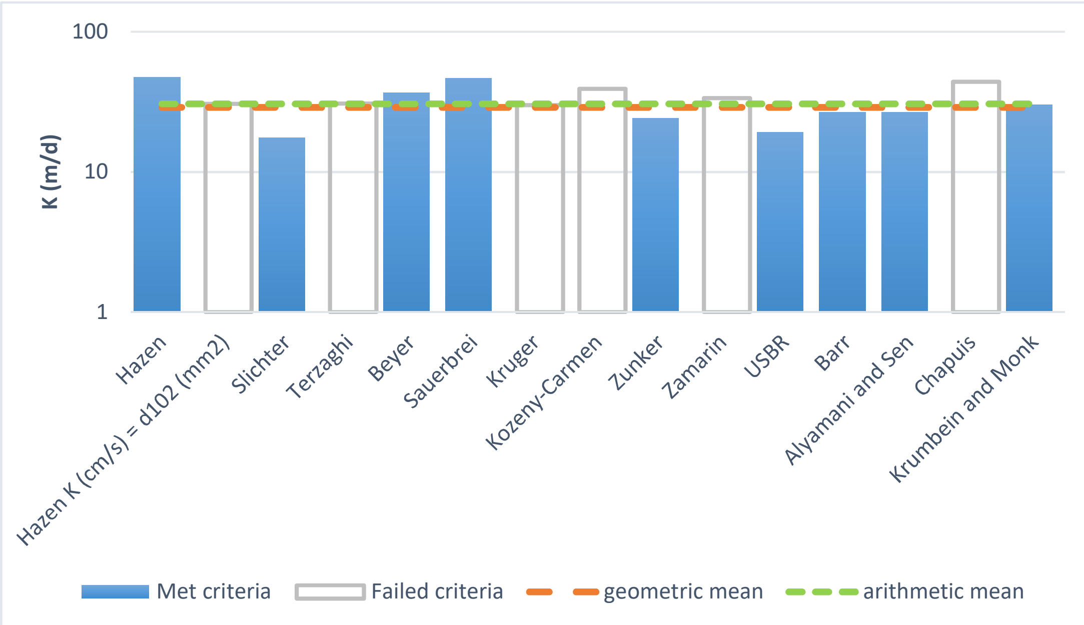
Date: 10/16/2019

Sample Name: PW-13-SOIL-25-26-20190821

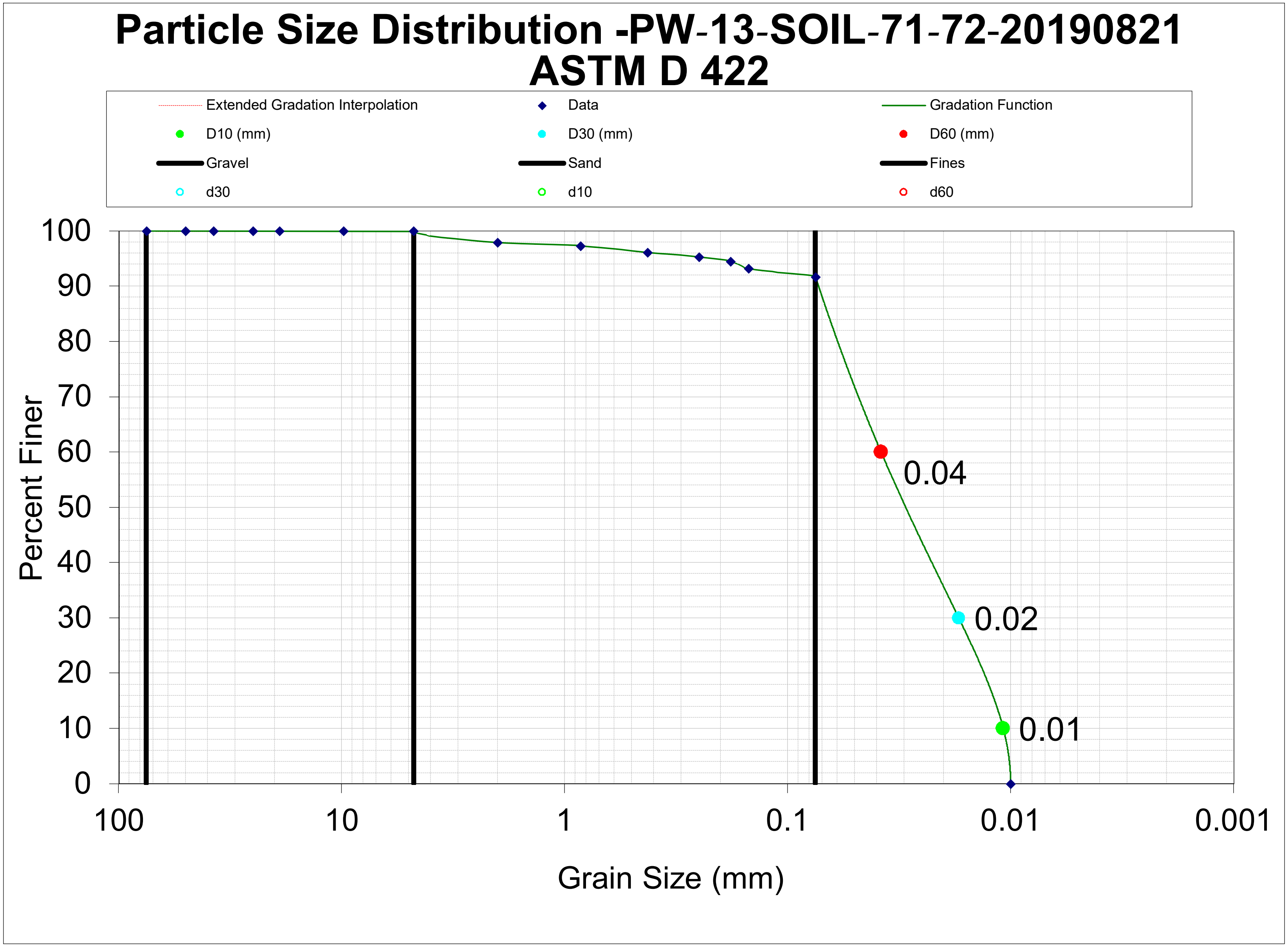
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.548E-01	.548E-03	47.32	155.26
Hazen K (cm/s) = d_{10} (mm)	.355E-01	.355E-03	30.63	100.50
Slichter	.202E-01	.202E-03	17.47	57.31
Terzaghi	.355E-01	.355E-03	30.71	100.77
Beyer	.426E-01	.426E-03	36.80	120.72
Sauerbrei	.541E-01	.541E-03	46.74	153.33
Kruger	.347E-01	.347E-03	29.99	98.40
Kozeny-Carmen	.452E-01	.452E-03	39.07	128.19
Zunker	.281E-01	.281E-03	24.27	79.61
Zamarin	.389E-01	.389E-03	33.62	110.31
USBR	.223E-01	.223E-03	19.23	63.10
Barr	.309E-01	.309E-03	26.72	87.66
Alyamani and Sen	.307E-01	.307E-03	26.54	87.08
Chapuis	.510E-01	.510E-03	44.08	144.63
Krumbein and Monk	.349E-01	.349E-03	30.13	98.85
geometric mean	.335E-01	.335E-03	28.93	94.90
arithmetic mean	.354E-01	.354E-03	30.58	100.32


Particle Size Distribution -PW-13-SOIL-71-72-20190821
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

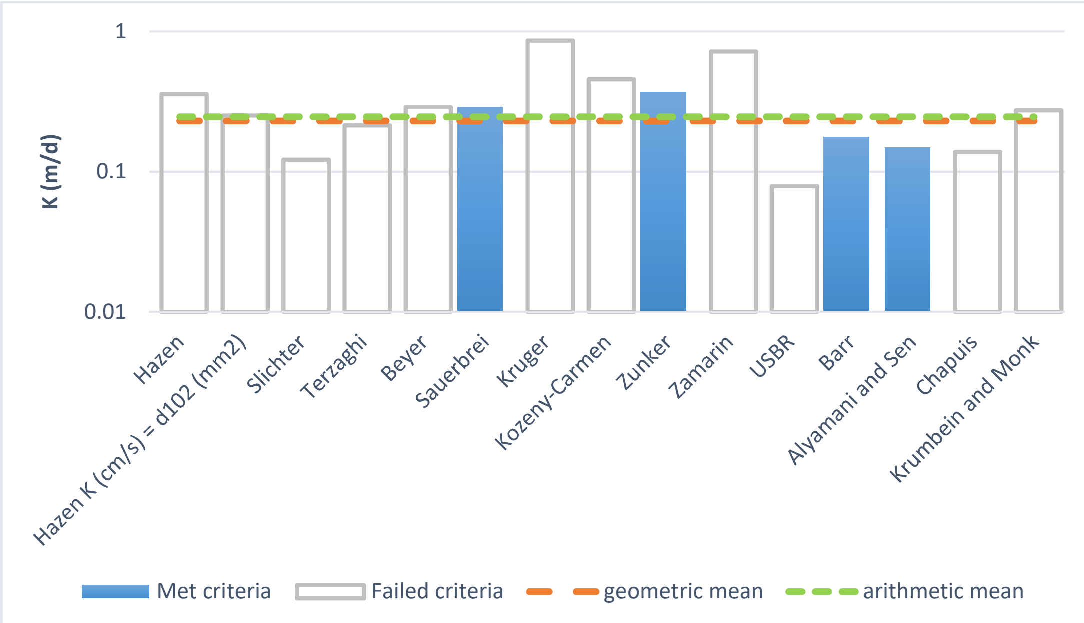
Date: 10/16/2019

Sample Name: PW-13-SOIL-71-72-20190821

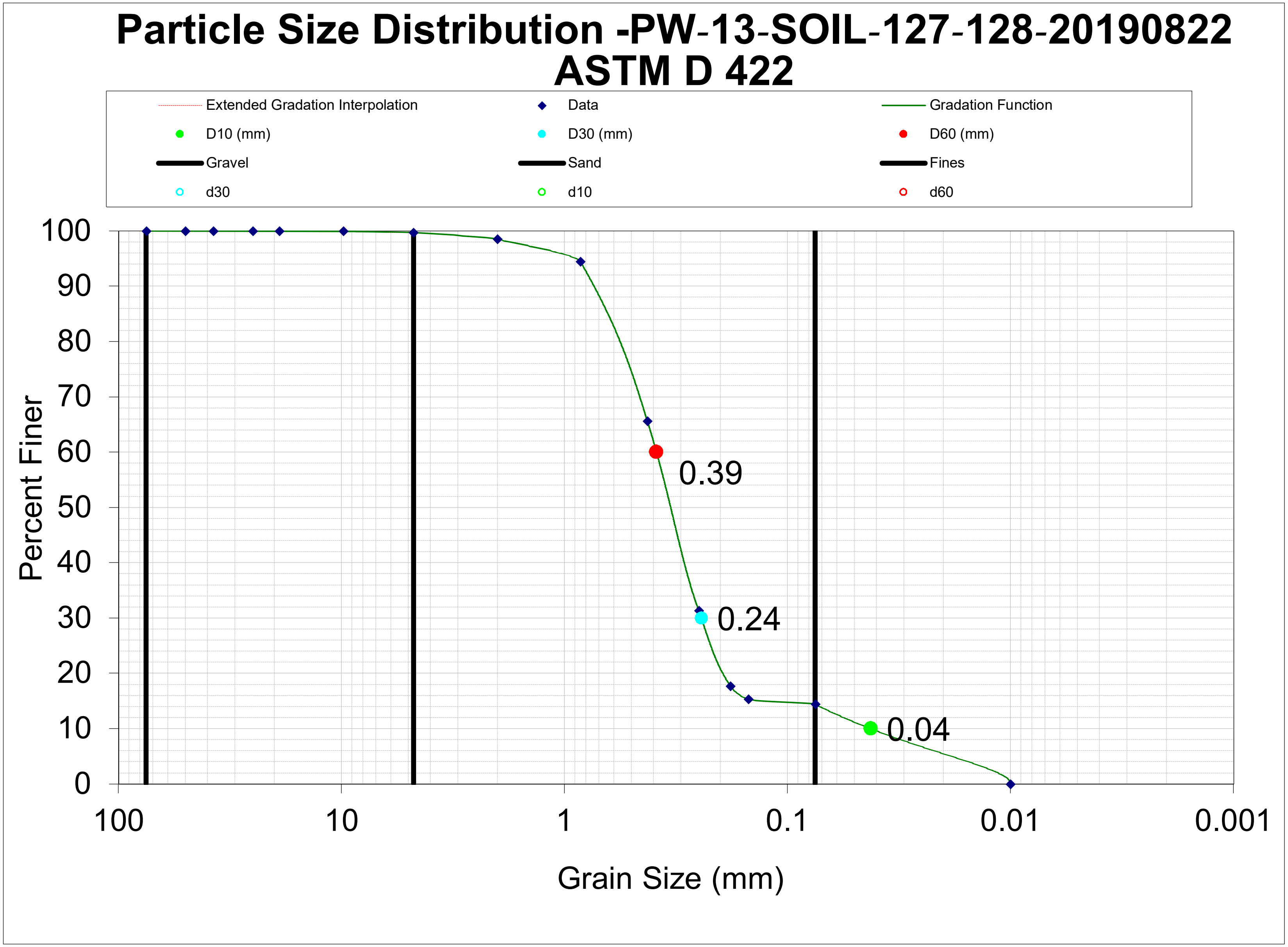
Mass Sample (g): 100

T (oC) 20

Moderately well sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.416E-03	.416E-05	0.36	1.18
Hazen K (cm/s) = d_{10} (mm)	.292E-03	.292E-05	0.25	0.83
Slichter	.141E-03	.141E-05	0.12	0.40
Terzaghi	.247E-03	.247E-05	0.21	0.70
Beyer	.334E-03	.334E-05	0.29	0.95
Sauerbrei	.335E-03	.335E-05	0.29	0.95
Kruger	.996E-03	.996E-05	0.86	2.82
Kozeny-Carmen	.529E-03	.529E-05	0.46	1.50
Zunker	.429E-03	.429E-05	0.37	1.21
Zamarin	.836E-03	.836E-05	0.72	2.37
USBR	.912E-04	.912E-06	0.08	0.26
Barr	.205E-03	.205E-05	0.18	0.58
Alyamani and Sen	.173E-03	.173E-05	0.15	0.49
Chapuis	.160E-03	.160E-05	0.14	0.45
Krumbein and Monk	.317E-03	.317E-05	0.27	0.90
geometric mean	.267E-03	.267E-05	0.23	0.76
arithmetic mean	.285E-03	.285E-05	0.25	0.81


Particle Size Distribution -PW-13-SOIL-127-128-20190822
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.39
0.24
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

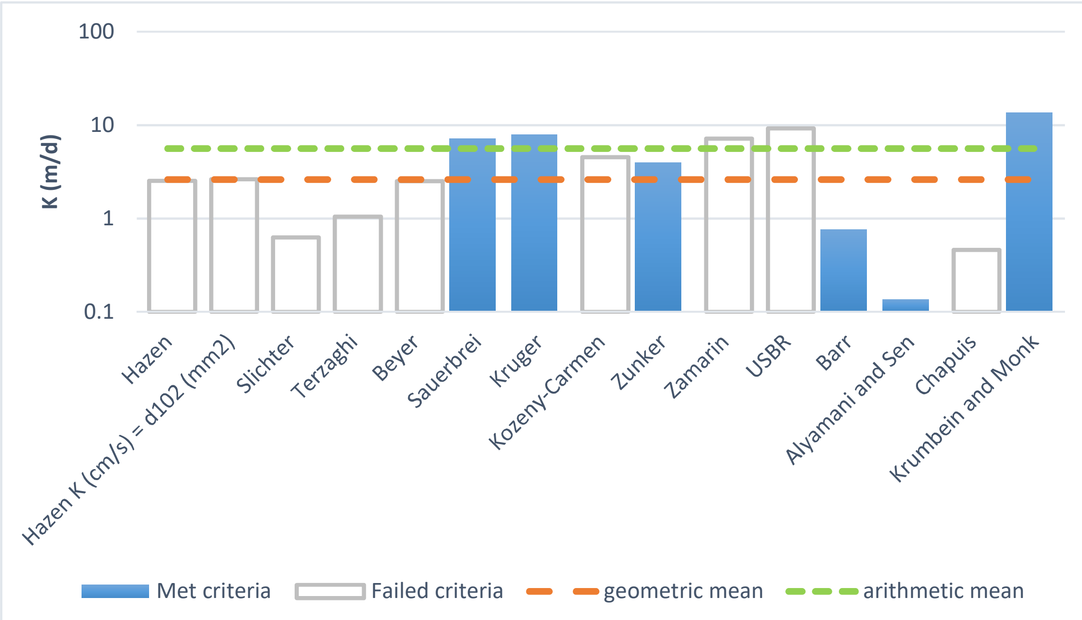
Date: 10/16/2019

Sample Name: PW-13-SOIL-127-128-20190822

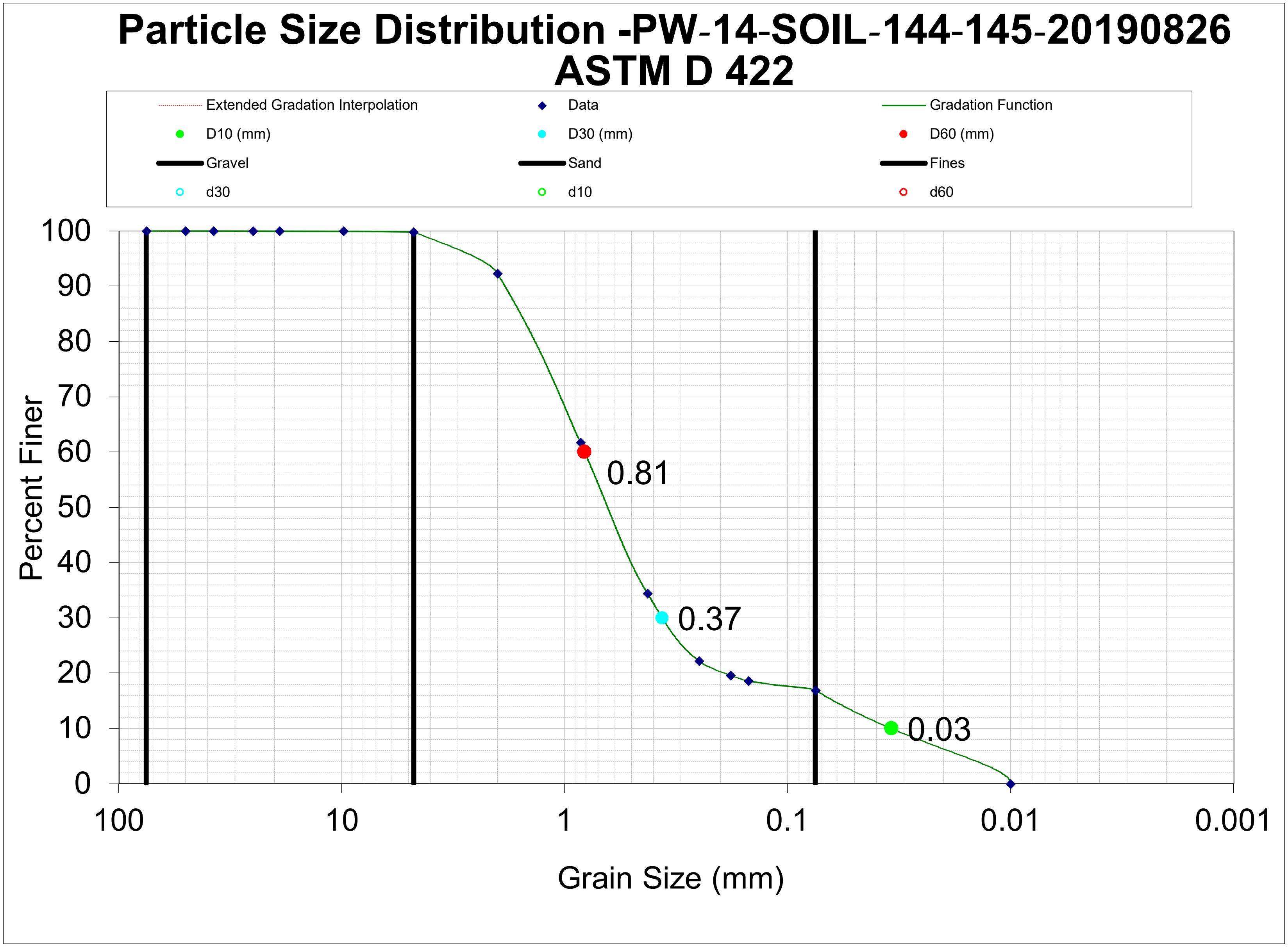
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.293E-02	.293E-04	2.53	8.31
Hazen K (cm/s) = d_{10} (mm)	.304E-02	.304E-04	2.63	8.62
Slichter	.727E-03	.727E-05	0.63	2.06
Terzaghi	.121E-02	.121E-04	1.04	3.43
Beyer	.289E-02	.289E-04	2.50	8.20
Sauerbrei	.833E-02	.833E-04	7.20	23.62
Kruger	.915E-02	.915E-04	7.91	25.94
Kozeny-Carmen	.523E-02	.523E-04	4.52	14.83
Zunker	.462E-02	.462E-04	3.99	13.09
Zamarin	.826E-02	.826E-04	7.14	23.42
USBR	.107E-01	.107E-03	9.24	30.31
Barr	.879E-03	.879E-05	0.76	2.49
Alyamani and Sen	.156E-03	.156E-05	0.13	0.44
Chapuis	.532E-03	.532E-05	0.46	1.51
Krumbein and Monk	.158E-01	.158E-03	13.64	44.76
geometric mean	.302E-02	.302E-04	2.61	8.57
arithmetic mean	.649E-02	.649E-04	5.61	18.39

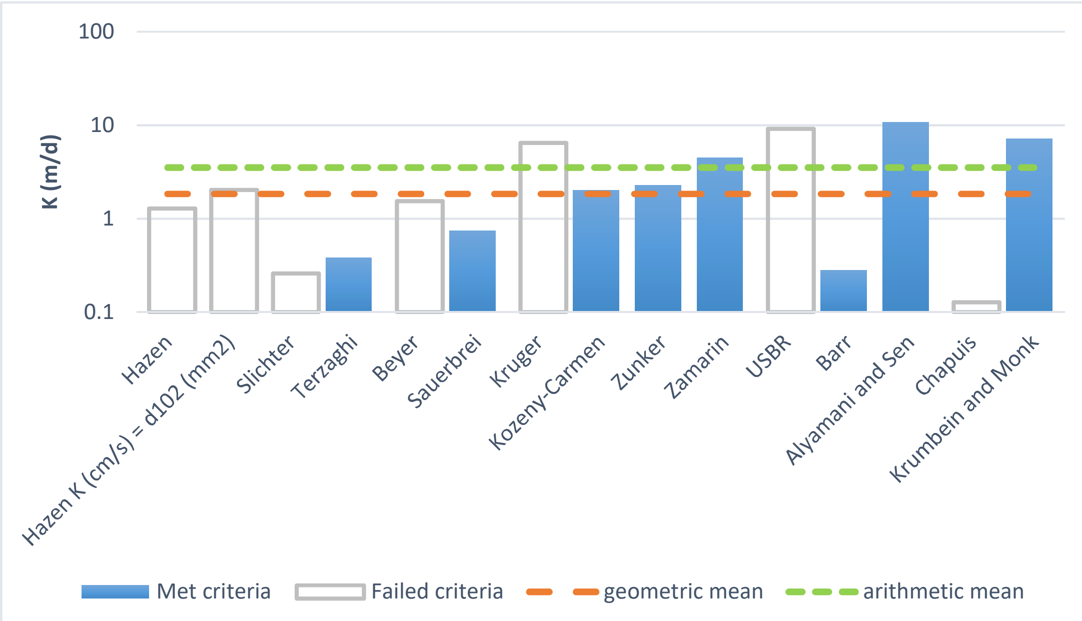

Particle Size Distribution -PW-14-SOIL-144-145-20190826
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.81
0.37
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

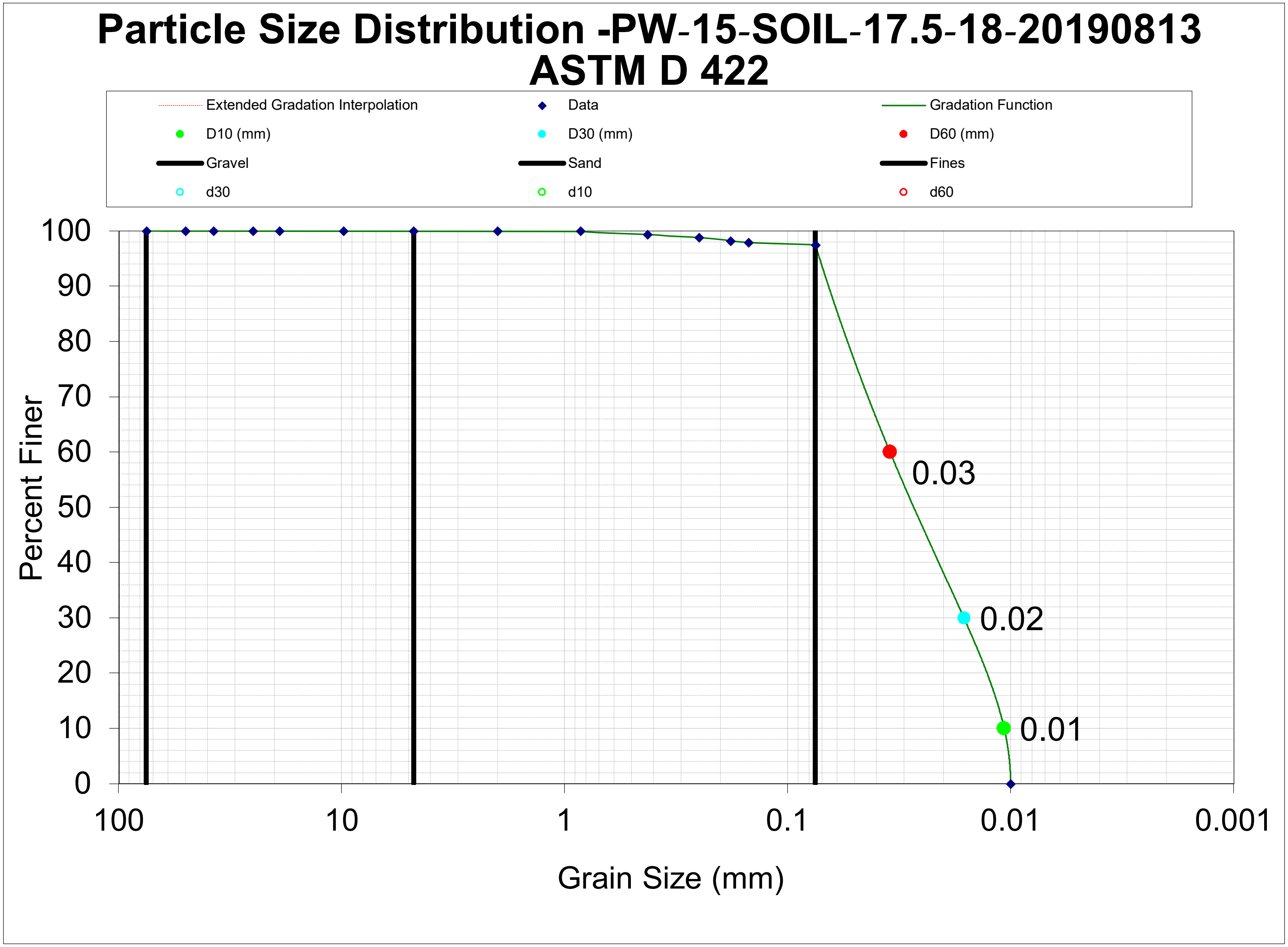
Sample Name: PW-14-SOIL-144-145-20190826

Mass Sample (g): 100 T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.148E-02	.148E-04	1.28	4.20
Hazen K (cm/s) = d_{10} (mm)	.235E-02	.235E-04	2.03	6.66
Slichter	.299E-03	.299E-05	0.26	0.85
Terzaghi	.444E-03	.444E-05	0.38	1.26
Beyer	.178E-02	.178E-04	1.54	5.05
Sauerbrei	.861E-03	.861E-05	0.74	2.44
Kruger	.748E-02	.748E-04	6.46	21.20
Kozeny-Carmen	.234E-02	.234E-04	2.02	6.62
Zunker	.265E-02	.265E-04	2.29	7.51
Zamarin	.520E-02	.520E-04	4.49	14.75
USBR	.106E-01	.106E-03	9.12	29.92
Barr	.326E-03	.326E-05	0.28	0.93
Alyamani and Sen	.124E-01	.124E-03	10.74	35.24
Chapuis	.147E-03	.147E-05	0.13	0.42
Krumbein and Monk	.830E-02	.830E-04	7.17	23.53
geometric mean	.212E-02	.212E-04	1.84	6.02
arithmetic mean	.407E-02	.407E-04	3.52	11.53


Particle Size Distribution -PW-15-SOIL-17.5-18-20190813
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.03
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

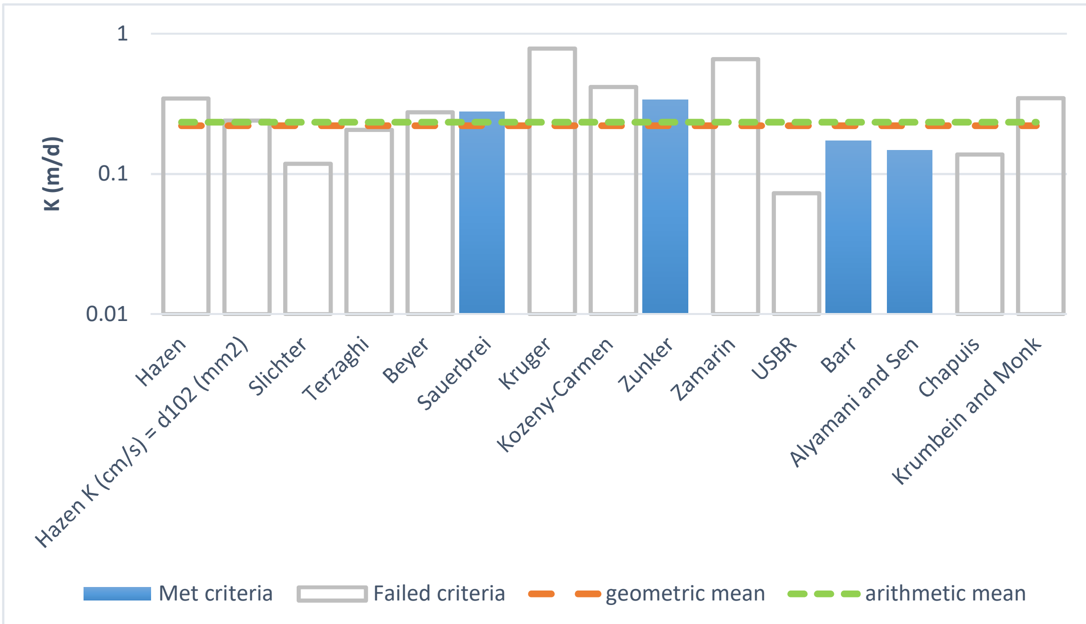
Date: 10/16/2019

Sample Name: PW-15-SOIL-17.5-18-20190813

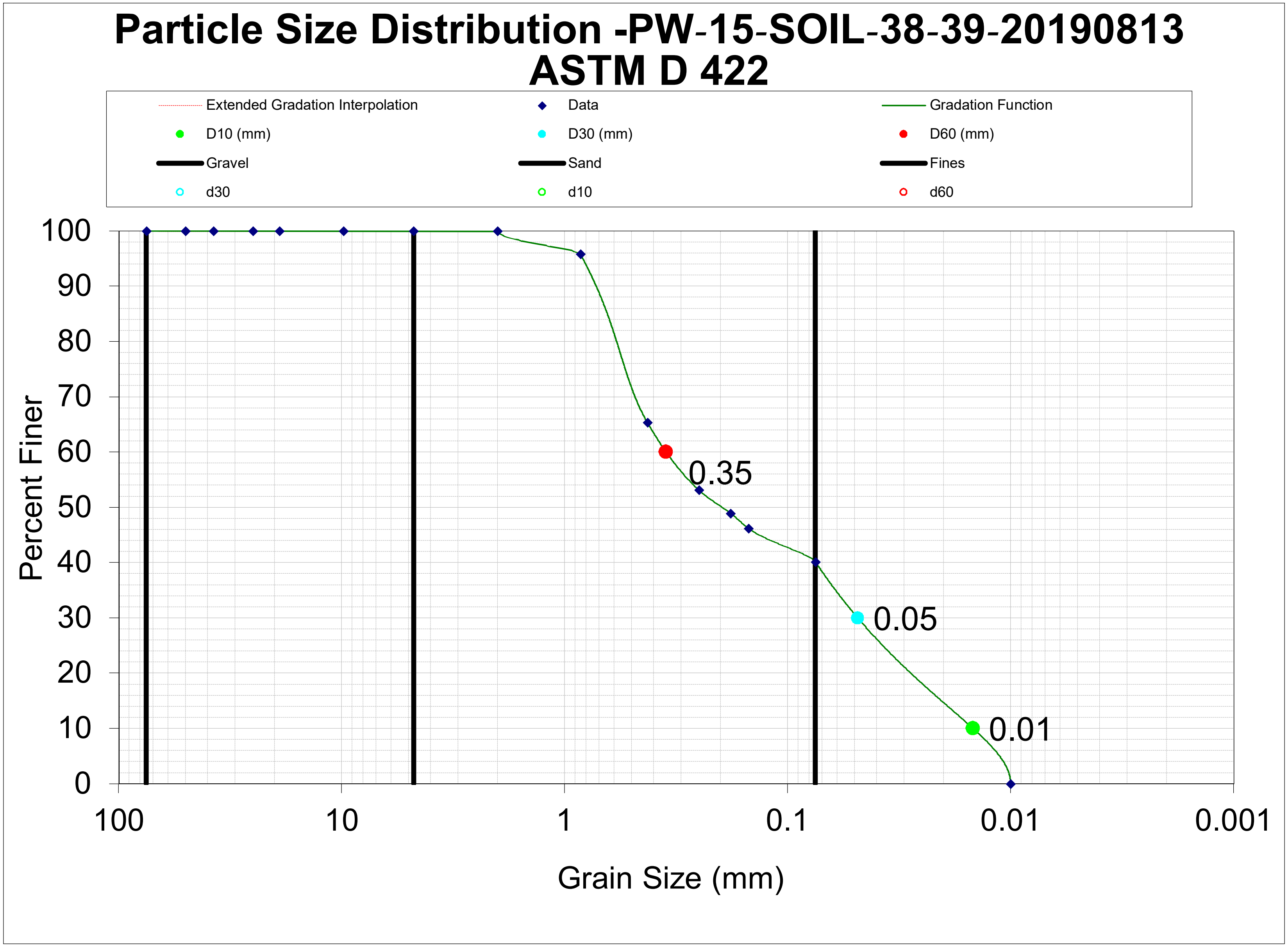
Mass Sample (g): 100

T (oC) 20

Moderately well sorted silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.399E-03	.399E-05	0.34	1.13
Hazen K (cm/s) = d_{10} (mm)	.278E-03	.278E-05	0.24	0.79
Slichter	.137E-03	.137E-05	0.12	0.39
Terzaghi	.239E-03	.239E-05	0.21	0.68
Beyer	.319E-03	.319E-05	0.28	0.90
Sauerbrei	.320E-03	.320E-05	0.28	0.91
Kruger	.909E-03	.909E-05	0.79	2.58
Kozeny-Carmen	.483E-03	.483E-05	0.42	1.37
Zunker	.390E-03	.390E-05	0.34	1.11
Zamarin	.761E-03	.761E-05	0.66	2.16
USBR	.842E-04	.842E-06	0.07	0.24
Barr	.199E-03	.199E-05	0.17	0.56
Alyamani and Sen	.171E-03	.171E-05	0.15	0.49
Chapuis	.160E-03	.160E-05	0.14	0.45
Krumbein and Monk	.402E-03	.402E-05	0.35	1.14
geometric mean	.255E-03	.255E-05	0.22	0.72
arithmetic mean	.270E-03	.270E-05	0.23	0.77

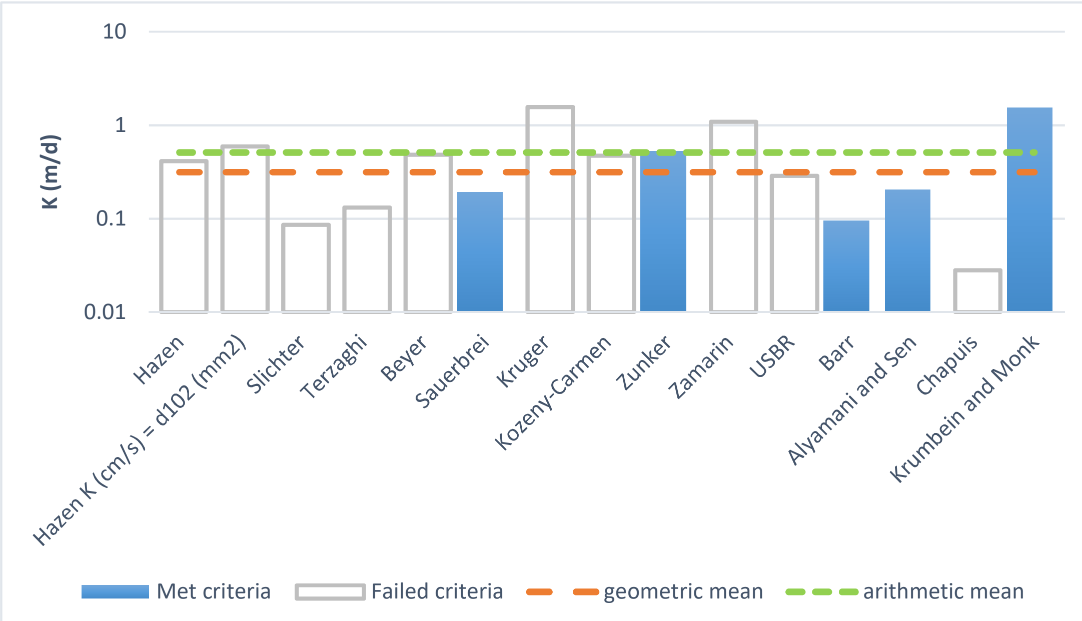

Particle Size Distribution -PW-15-SOIL-38-39-20190813
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.35
0.05
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

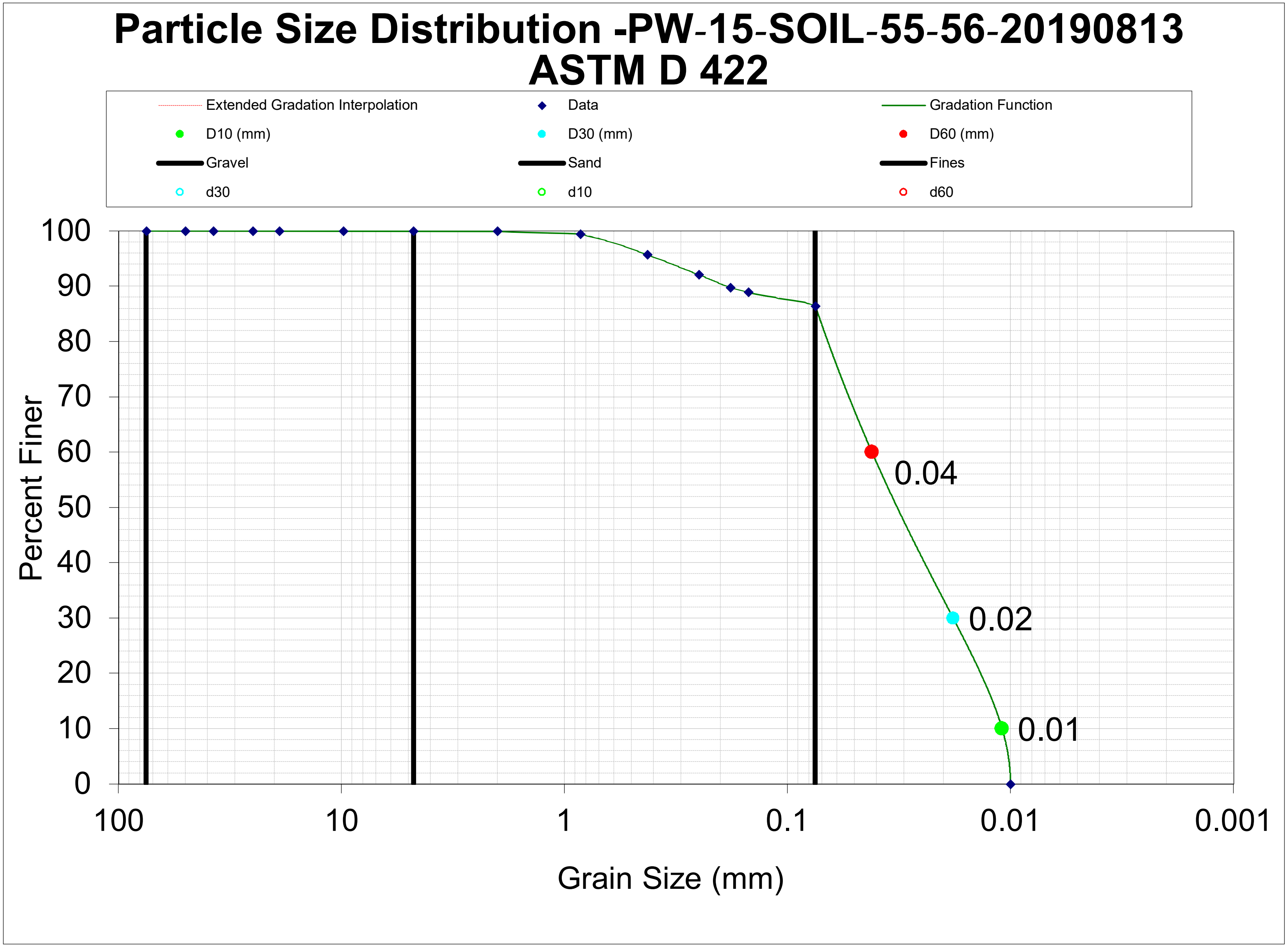
Sample Name: PW-15-SOIL-38-39-20190813

Mass Sample (g): 100 | T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.476E-03	.476E-05	0.41	1.35
Hazen K (cm/s) = d_{10} (mm)	.687E-03	.687E-05	0.59	1.95
Slichter	.995E-04	.995E-06	0.09	0.28
Terzaghi	.152E-03	.152E-05	0.13	0.43
Beyer	.559E-03	.559E-05	0.48	1.58
Sauerbrei	.223E-03	.223E-05	0.19	0.63
Kruger	.182E-02	.182E-04	1.57	5.15
Kozeny-Carmen	.546E-03	.546E-05	0.47	1.55
Zunker	.614E-03	.614E-05	0.53	1.74
Zamarin	.126E-02	.126E-04	1.09	3.58
USBR	.332E-03	.332E-05	0.29	0.94
Barr	.111E-03	.111E-05	0.10	0.31
Alyamani and Sen	.236E-03	.236E-05	0.20	0.67
Chapuis	.324E-04	.324E-06	0.03	0.09
Krumbein and Monk	.178E-02	.178E-04	1.54	5.04
geometric mean	.363E-03	.363E-05	0.31	1.03
arithmetic mean	.592E-03	.592E-05	0.51	1.68

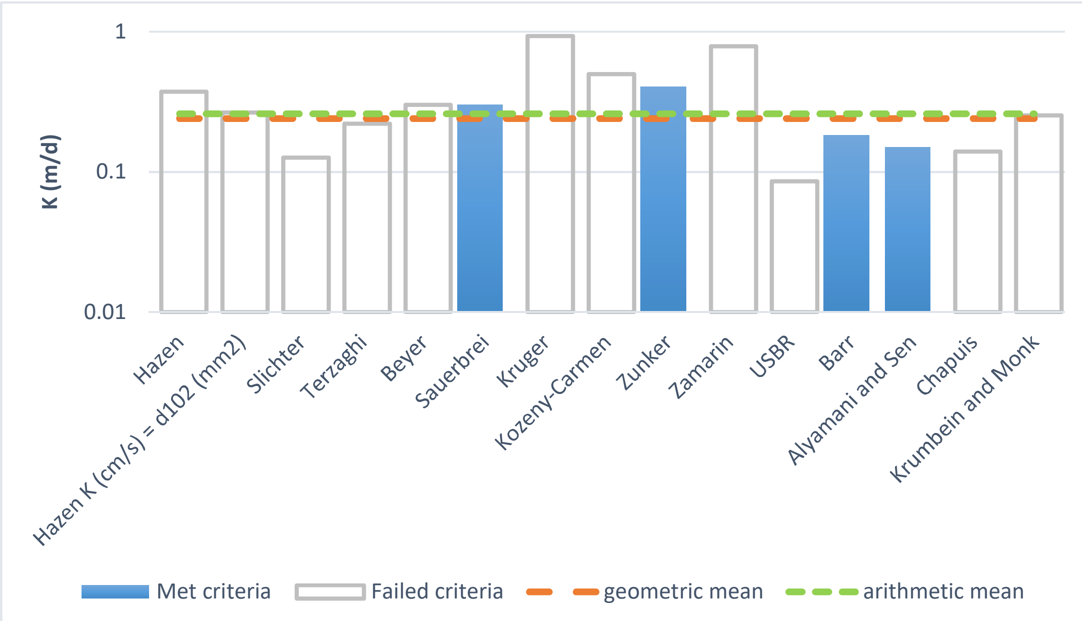

Particle Size Distribution -PW-15-SOIL-55-56-20190813
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

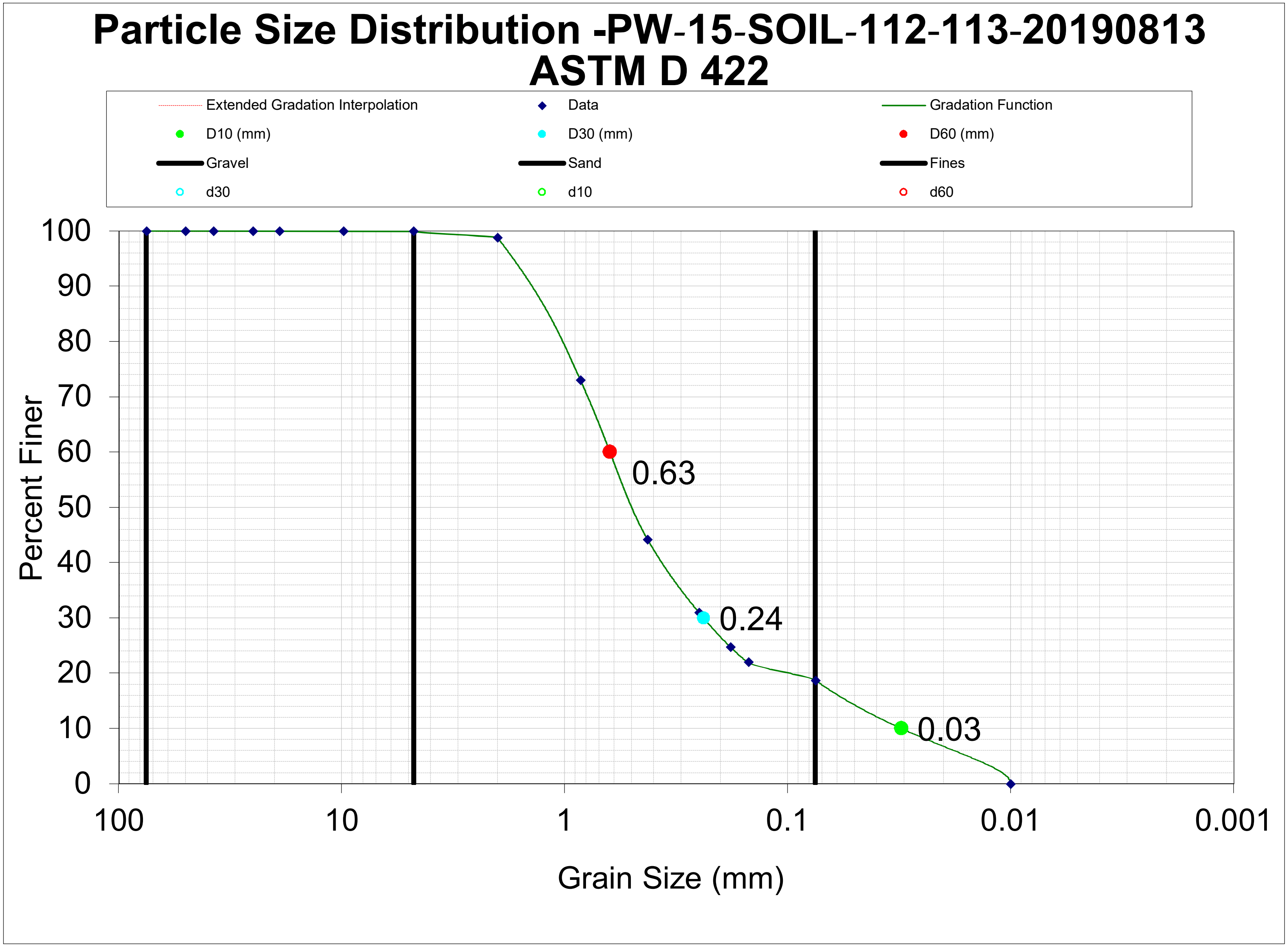
Sample Name: PW-15-SOIL-55-56-20190813

Mass Sample (g): 100 | T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.433E-03	.433E-05	0.37	1.23
Hazen K (cm/s) = d_{10} (mm)	.307E-03	.307E-05	0.27	0.87
Slichter	.146E-03	.146E-05	0.13	0.41
Terzaghi	.256E-03	.256E-05	0.22	0.72
Beyer	.349E-03	.349E-05	0.30	0.99
Sauerbrei	.350E-03	.350E-05	0.30	0.99
Kruger	.108E-02	.108E-04	0.93	3.06
Kozeny-Carmen	.577E-03	.577E-05	0.50	1.64
Zunker	.468E-03	.468E-05	0.40	1.33
Zamarin	.912E-03	.912E-05	0.79	2.58
USBR	.990E-04	.990E-06	0.09	0.28
Barr	.211E-03	.211E-05	0.18	0.60
Alyamani and Sen	.174E-03	.174E-05	0.15	0.49
Chapuis	.162E-03	.162E-05	0.14	0.46
Krumbein and Monk	.293E-03	.293E-05	0.25	0.83
geometric mean	.278E-03	.278E-05	0.24	0.79
arithmetic mean	.301E-03	.301E-05	0.26	0.85


Particle Size Distribution -PW-15-SOIL-112-113-20190813
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.63
0.24
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

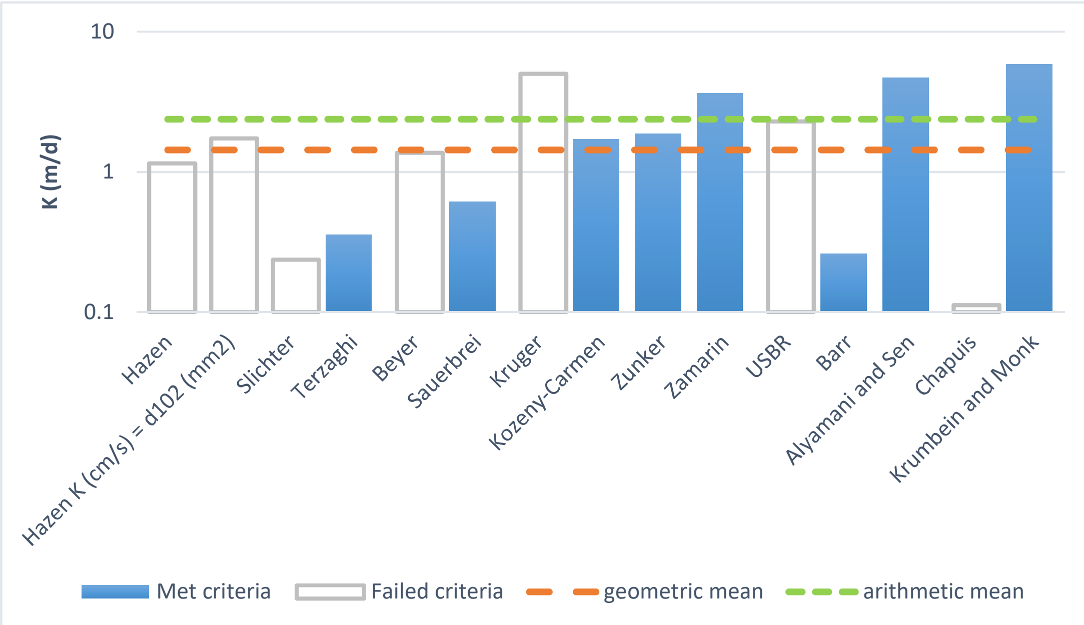
Date: 10/16/2019

Sample Name: PW-15-SOIL-112-113-20190813

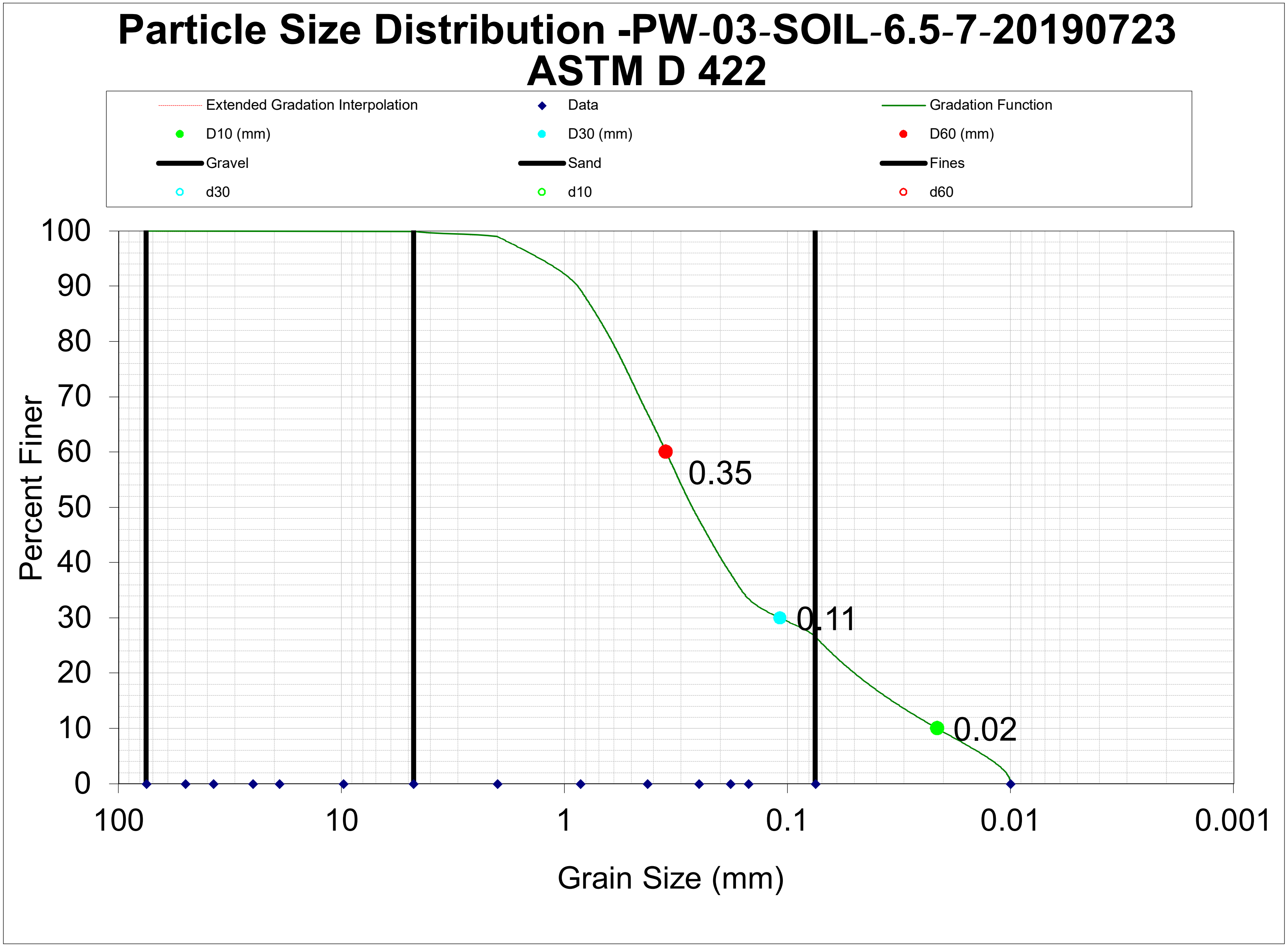
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.133E-02	.133E-04	1.15	3.77
Hazen K (cm/s) = d_{10} (mm)	.200E-02	.200E-04	1.73	5.68
Slichter	.274E-03	.274E-05	0.24	0.78
Terzaghi	.413E-03	.413E-05	0.36	1.17
Beyer	.158E-02	.158E-04	1.37	4.49
Sauerbrei	.706E-03	.706E-05	0.61	2.00
Kruger	.579E-02	.579E-04	5.00	16.42
Kozeny-Carmen	.198E-02	.198E-04	1.71	5.60
Zunker	.217E-02	.217E-04	1.87	6.15
Zamarin	.419E-02	.419E-04	3.62	11.88
USBR	.265E-02	.265E-04	2.29	7.50
Barr	.302E-03	.302E-05	0.26	0.85
Alyamani and Sen	.543E-02	.543E-04	4.69	15.38
Chapuis	.130E-03	.130E-05	0.11	0.37
Krumbein and Monk	.679E-02	.679E-04	5.87	19.26
geometric mean	.166E-02	.166E-04	1.44	4.71
arithmetic mean	.275E-02	.275E-04	2.37	7.79

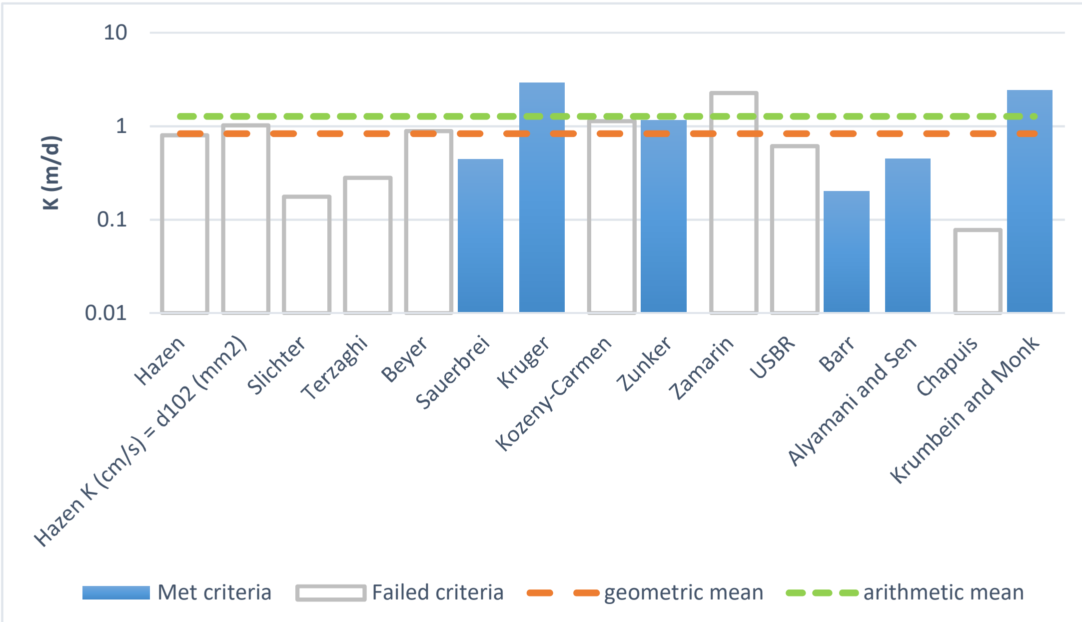

Particle Size Distribution -PW-03-SOIL-6.5-7-20190723
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.35
0.11
0.02
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report   Date: 10/24/2019

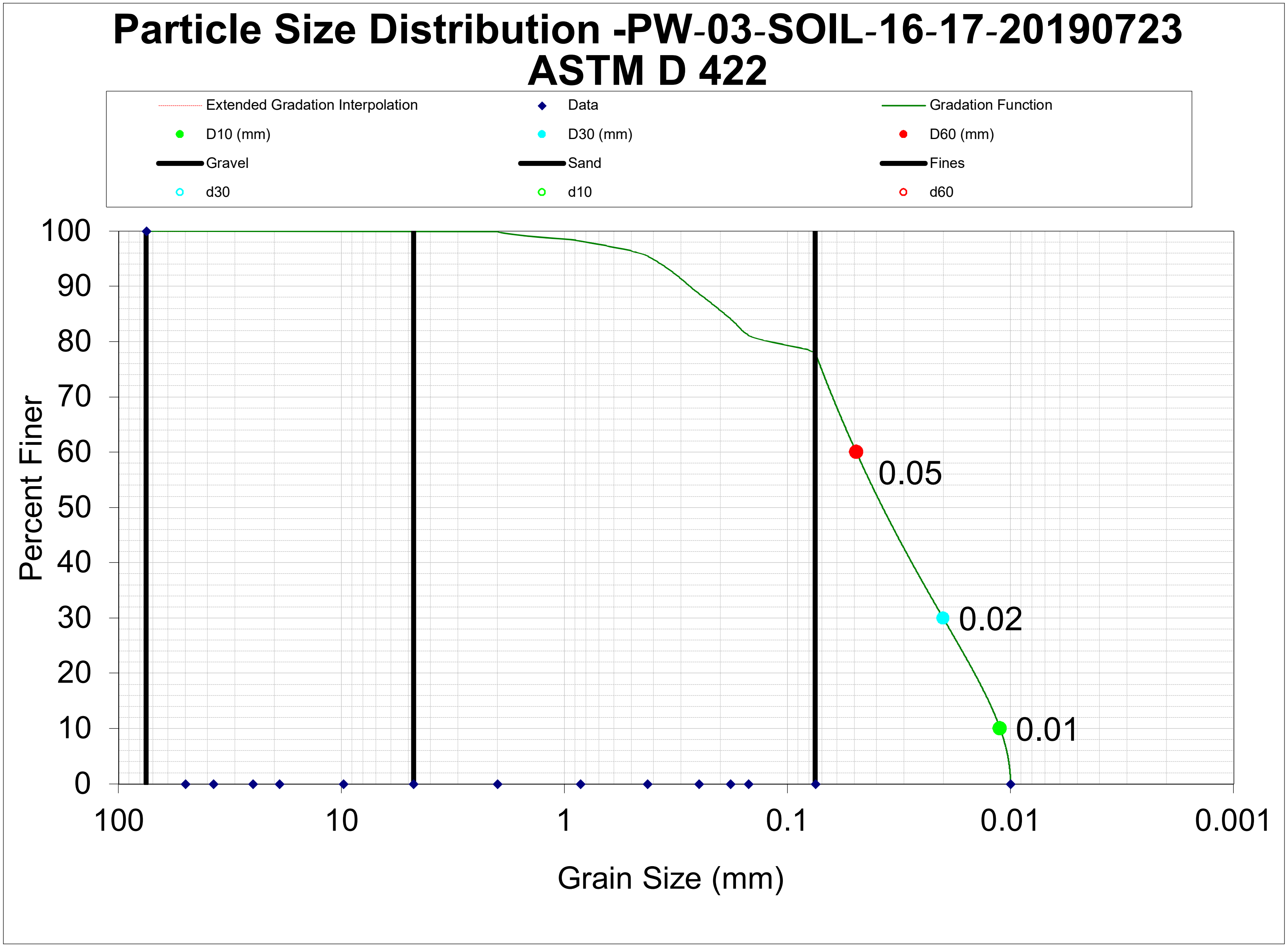
Sample Name: PW-03-SOIL-6.5-7-20190723

Mass Sample (g): 100   T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.927E-03	.927E-05	0.80	2.63
Hazen K (cm/s) = d_{10} (mm)	.119E-02	.119E-04	1.02	3.36
Slichter	.204E-03	.204E-05	0.18	0.58
Terzaghi	.323E-03	.323E-05	0.28	0.92
Beyer	.103E-02	.103E-04	0.89	2.91
Sauerbrei	.512E-03	.512E-05	0.44	1.45
Kruger	.339E-02	.339E-04	2.93	9.61
Kozeny-Carmen	.131E-02	.131E-04	1.13	3.71
Zunker	.134E-02	.134E-04	1.16	3.81
Zamarin	.262E-02	.262E-04	2.26	7.42
USBR	.706E-03	.706E-05	0.61	2.00
Barr	.232E-03	.232E-05	0.20	0.66
Alyamani and Sen	.519E-03	.519E-05	0.45	1.47
Chapuis	.893E-04	.893E-06	0.08	0.25
Krumbein and Monk	.283E-02	.283E-04	2.45	8.03
geometric mean	.963E-03	.963E-05	0.83	2.73
arithmetic mean	.147E-02	.147E-04	1.27	4.17

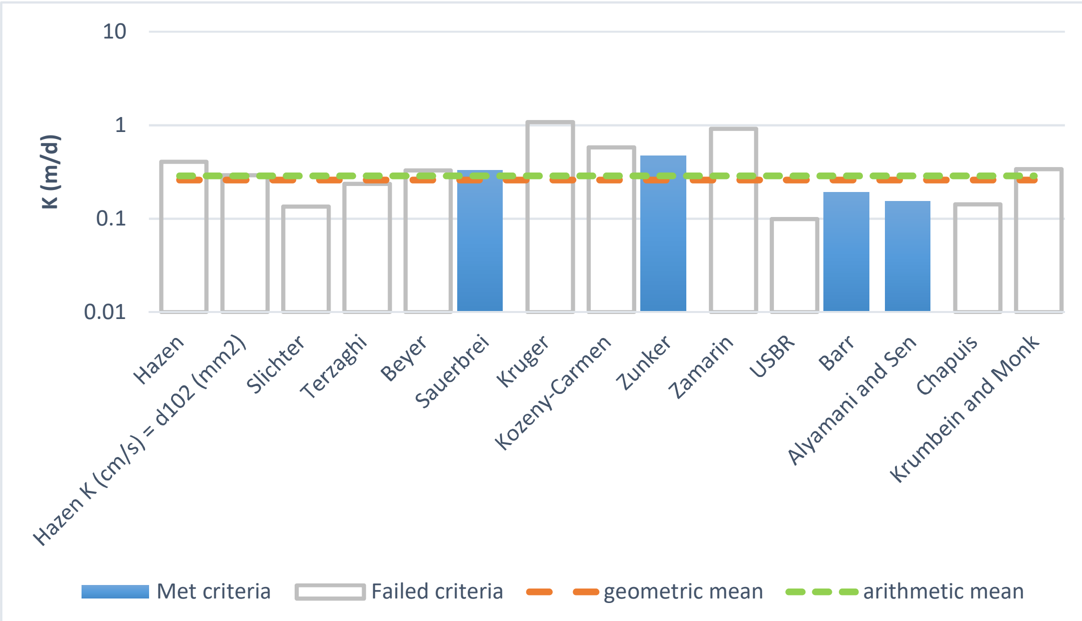

Particle Size Distribution -PW-03-SOIL-16-17-20190723
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.05
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report   Date: 10/24/2019

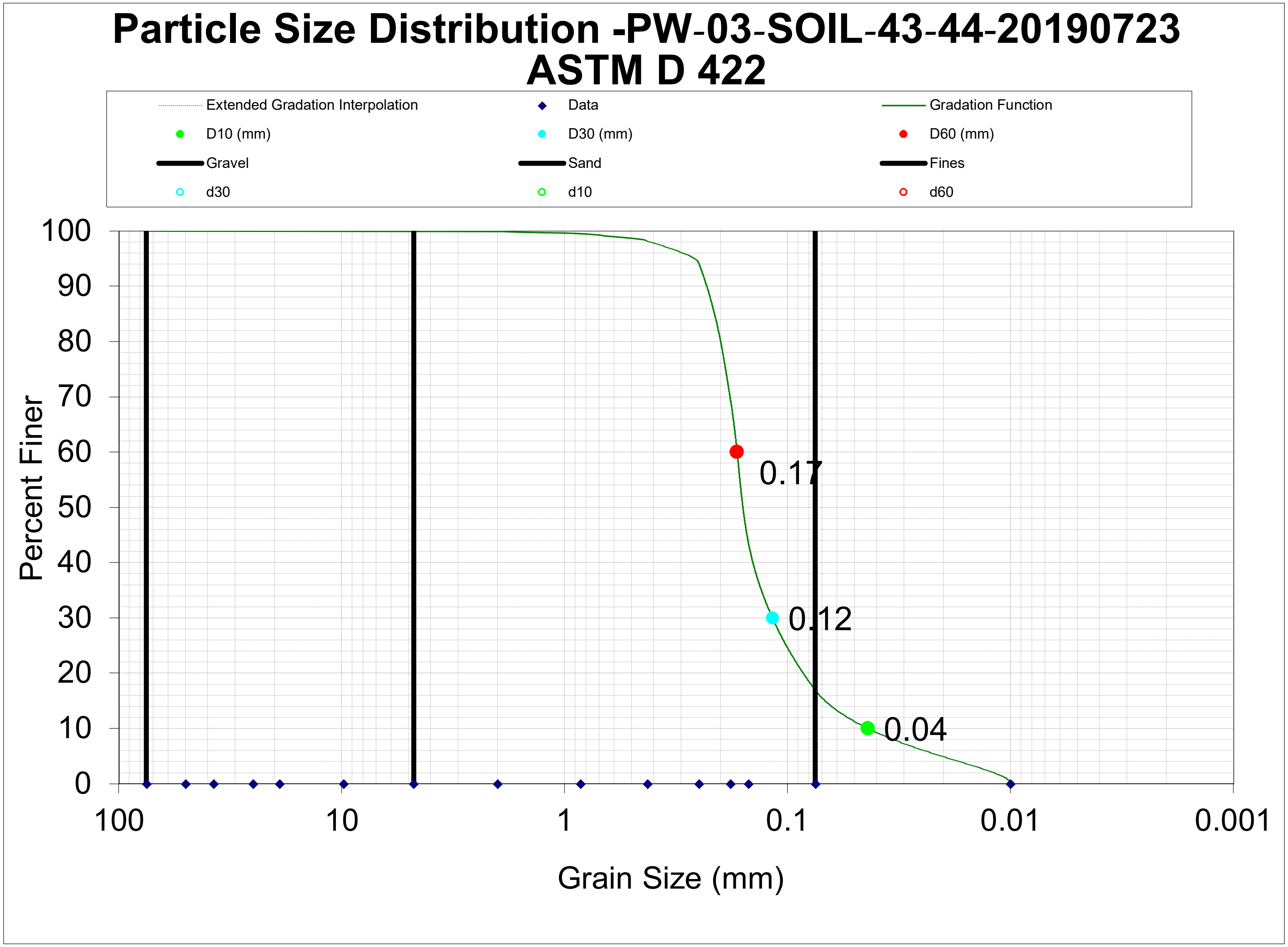
Sample Name: PW-03-SOIL-16-17-20190723

Mass Sample (g): 100   T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.468E-03	.468E-05	0.40	1.33
Hazen K (cm/s) = d_{10} (mm)	.337E-03	.337E-05	0.29	0.95
Slichter	.156E-03	.156E-05	0.13	0.44
Terzaghi	.272E-03	.272E-05	0.24	0.77
Beyer	.380E-03	.380E-05	0.33	1.08
Sauerbrei	.380E-03	.380E-05	0.33	1.08
Kruger	.125E-02	.125E-04	1.08	3.53
Kozeny-Carmen	.670E-03	.670E-05	0.58	1.90
Zunker	.545E-03	.545E-05	0.47	1.54
Zamarin	.106E-02	.106E-04	0.91	3.00
USBR	.115E-03	.115E-05	0.10	0.32
Barr	.223E-03	.223E-05	0.19	0.63
Alyamani and Sen	.177E-03	.177E-05	0.15	0.50
Chapuis	.165E-03	.165E-05	0.14	0.47
Krumbein and Monk	.391E-03	.391E-05	0.34	1.11
geometric mean	.300E-03	.300E-05	0.26	0.85
arithmetic mean	.331E-03	.331E-05	0.29	0.94

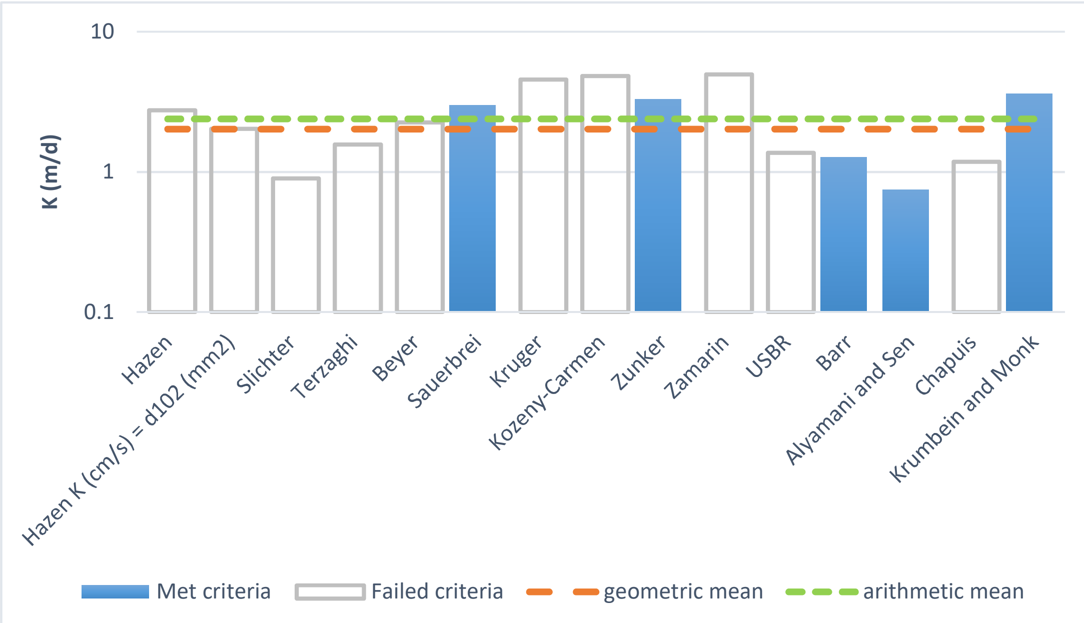

Particle Size Distribution -PW-03-SOIL-43-44-20190723
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.17
0.12
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report   Date: 10/24/2019

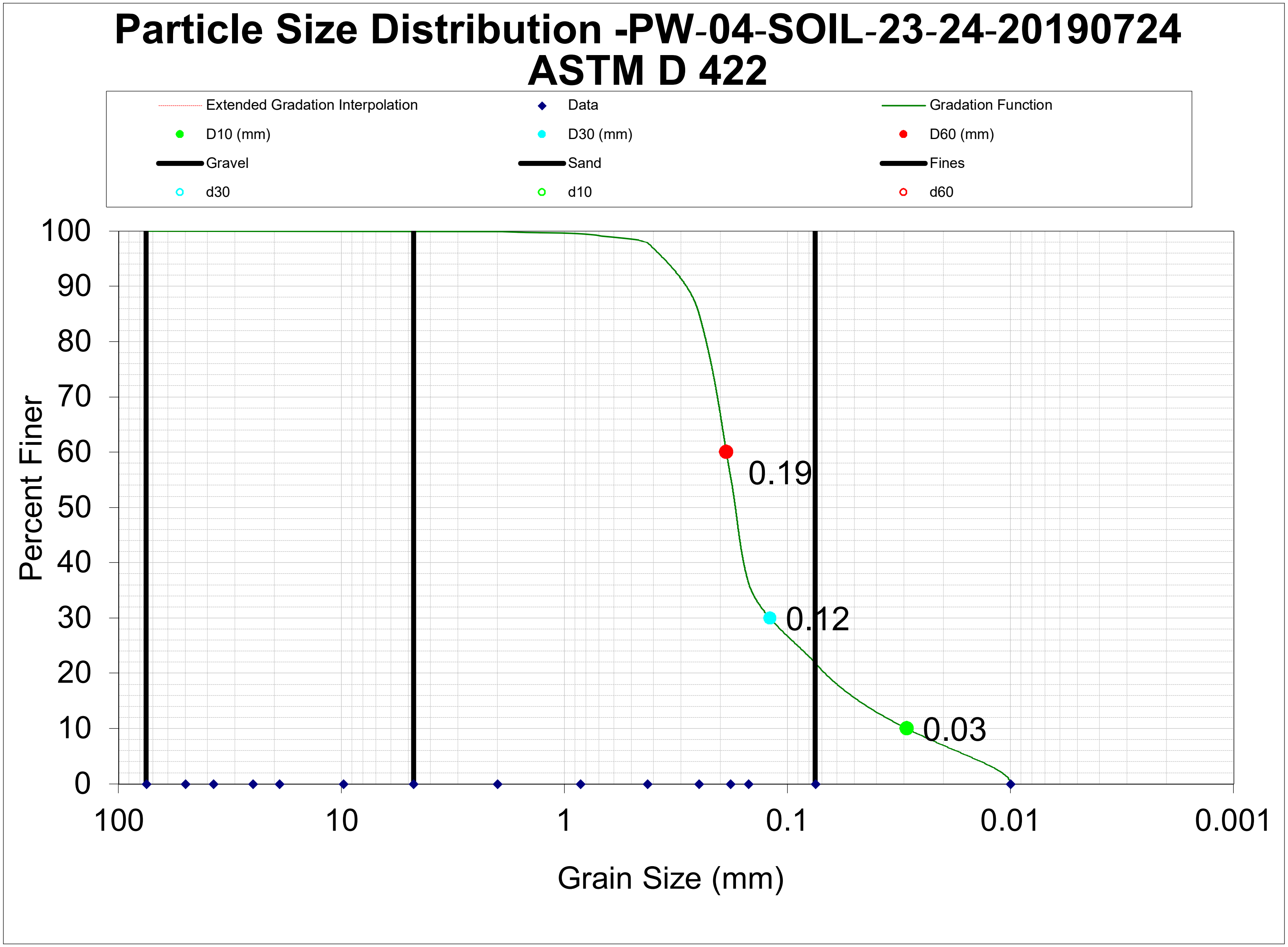
Sample Name: PW-03-SOIL-43-44-20190723

Mass Sample (g): 100   T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.319E-02	.319E-04	2.76	9.05
Hazen K (cm/s) = d_{10} (mm)	.235E-02	.235E-04	2.03	6.66
Slichter	.104E-02	.104E-04	0.90	2.95
Terzaghi	.181E-02	.181E-04	1.56	5.13
Beyer	.262E-02	.262E-04	2.26	7.41
Sauerbrei	.347E-02	.347E-04	3.00	9.84
Kruger	.528E-02	.528E-04	4.56	14.96
Kozeny-Carmen	.560E-02	.560E-04	4.84	15.86
Zunker	.382E-02	.382E-04	3.30	10.82
Zamarin	.575E-02	.575E-04	4.96	16.29
USBR	.159E-02	.159E-04	1.37	4.50
Barr	.146E-02	.146E-04	1.26	4.15
Alyamani and Sen	.863E-03	.863E-05	0.75	2.45
Chapuis	.136E-02	.136E-04	1.18	3.87
Krumbein and Monk	.419E-02	.419E-04	3.62	11.87
geometric mean	.234E-02	.234E-04	2.02	6.63
arithmetic mean	.276E-02	.276E-04	2.39	7.83


Particle Size Distribution -PW-04-SOIL-23-24-20190724
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.19
0.12
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

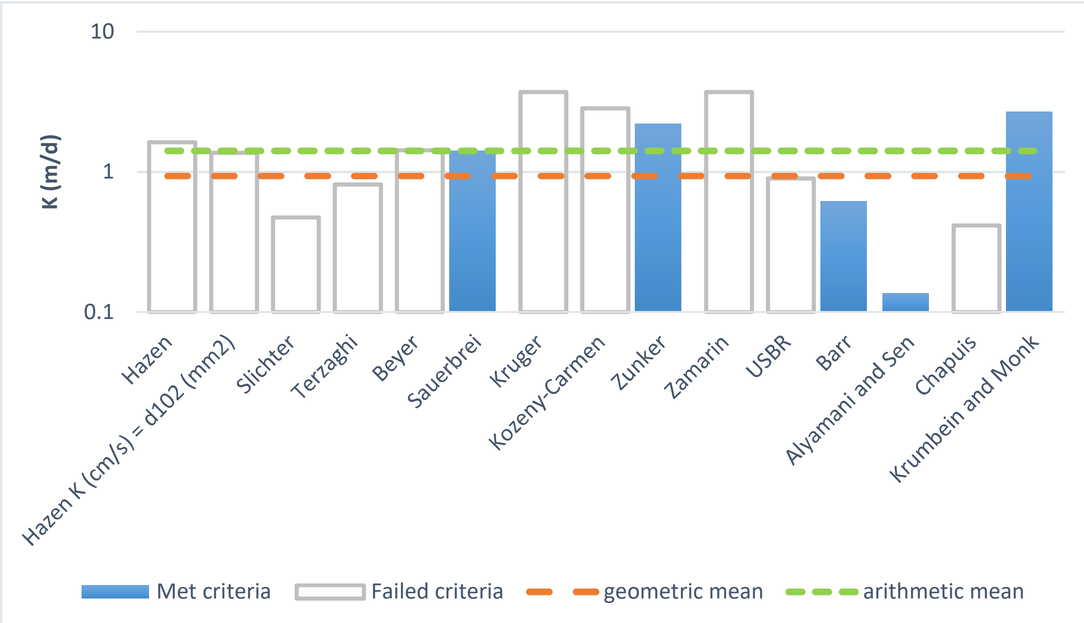
Date: 10/24/2019

Sample Name: PW-04-SOIL-23-24-20190724

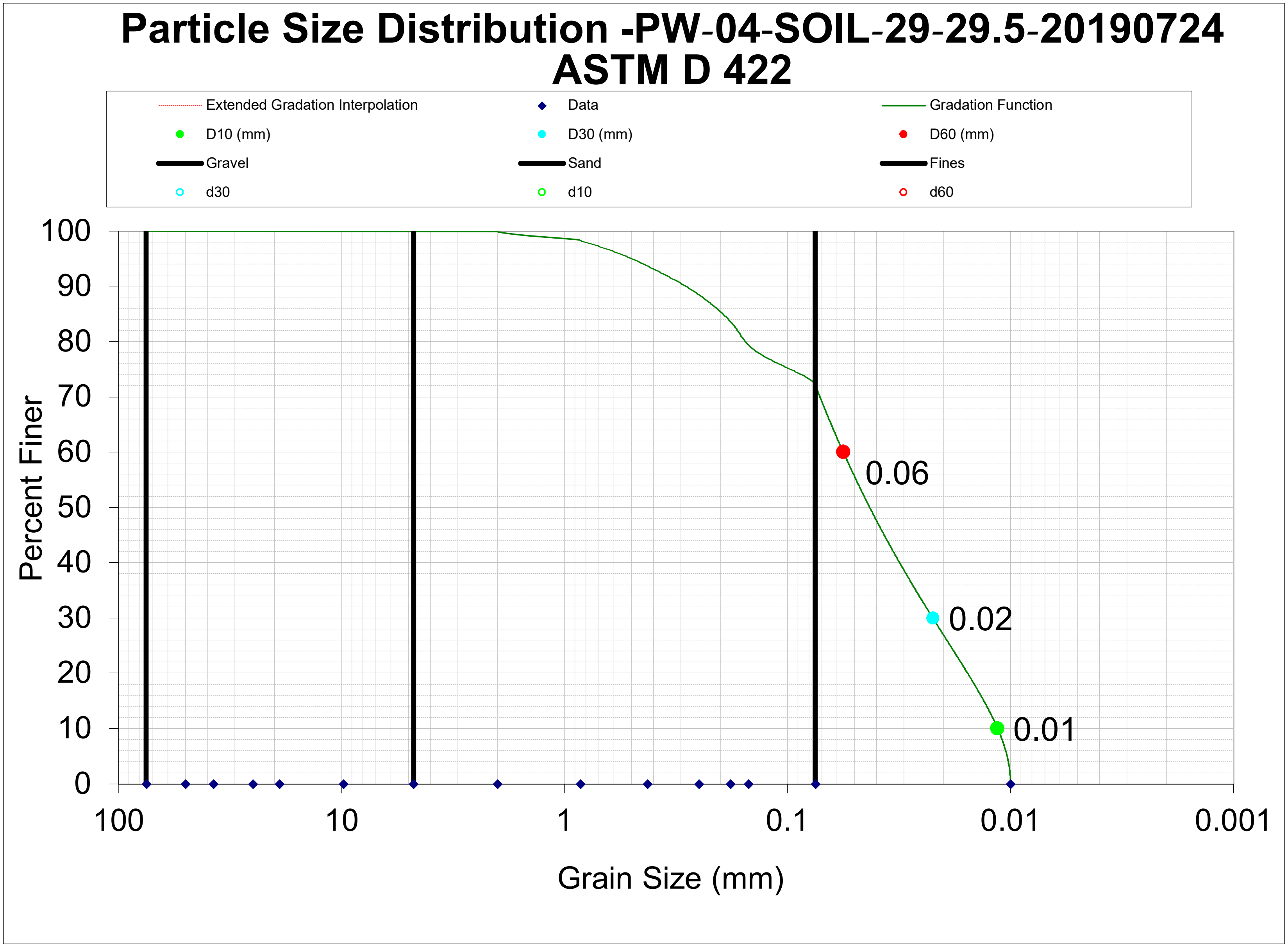
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.189E-02	.189E-04	1.63	5.35
Hazen K (cm/s) = d_{10} (mm)	.159E-02	.159E-04	1.37	4.49
Slichter	.546E-03	.546E-05	0.47	1.55
Terzaghi	.939E-03	.939E-05	0.81	2.66
Beyer	.165E-02	.165E-04	1.43	4.69
Sauerbrei	.164E-02	.164E-04	1.42	4.64
Kruger	.431E-02	.431E-04	3.72	12.22
Kozeny-Carmen	.330E-02	.330E-04	2.85	9.34
Zunker	.256E-02	.256E-04	2.21	7.25
Zamarin	.429E-02	.429E-04	3.71	12.17
USBR	.104E-02	.104E-04	0.90	2.95
Barr	.718E-03	.718E-05	0.62	2.03
Alyamani and Sen	.158E-03	.158E-05	0.14	0.45
Chapuis	.479E-03	.479E-05	0.41	1.36
Krumbein and Monk	.310E-02	.310E-04	2.68	8.80
geometric mean	.108E-02	.108E-04	0.93	3.06
arithmetic mean	.163E-02	.163E-04	1.41	4.63


Particle Size Distribution -PW-04-SOIL-29-29.5-20190724
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.06
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

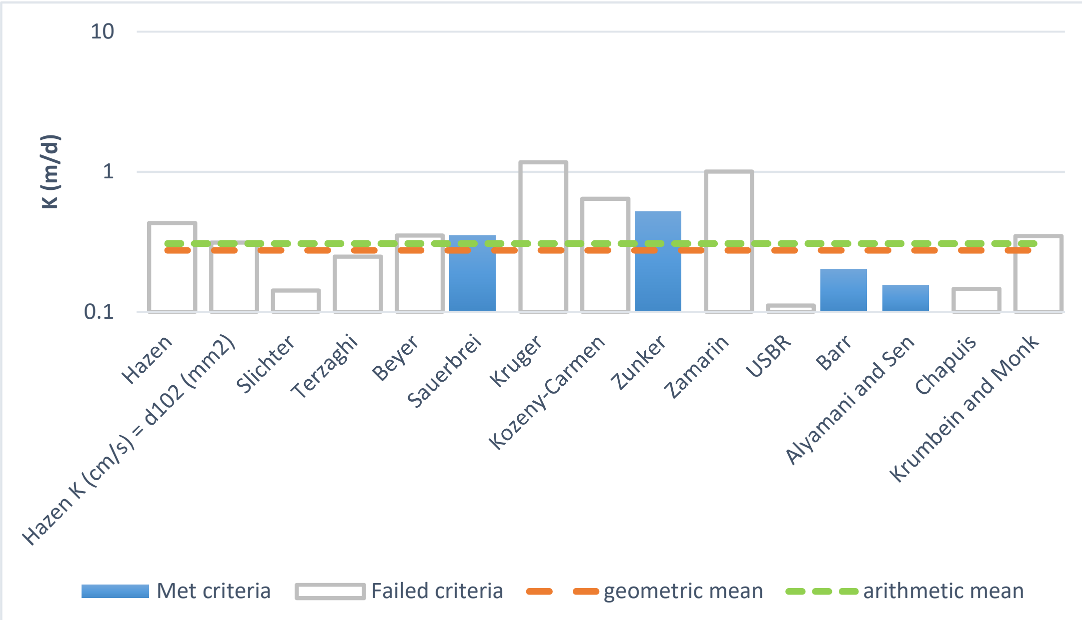
Date: 10/24/2019

Sample Name: PW-04-SOIL-29-29.5-20190724

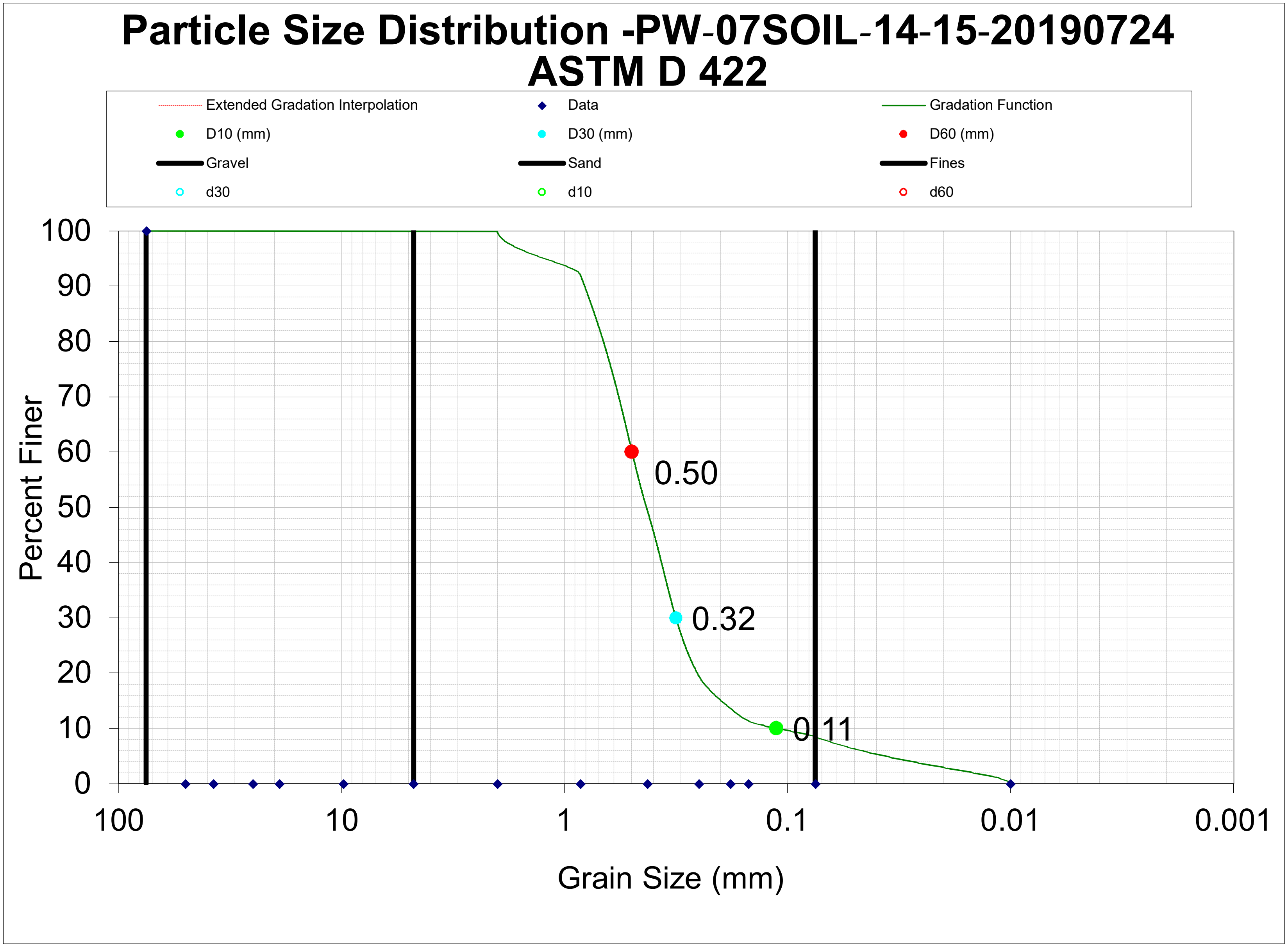
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.498E-03	.498E-05	0.43	1.41
Hazen K (cm/s) = d_{10} (mm)	.362E-03	.362E-05	0.31	1.02
Slichter	.164E-03	.164E-05	0.14	0.47
Terzaghi	.286E-03	.286E-05	0.25	0.81
Beyer	.405E-03	.405E-05	0.35	1.15
Sauerbrei	.406E-03	.406E-05	0.35	1.15
Kruger	.136E-02	.136E-04	1.17	3.84
Kozeny-Carmen	.742E-03	.742E-05	0.64	2.10
Zunker	.603E-03	.603E-05	0.52	1.71
Zamarin	.116E-02	.116E-04	1.01	3.30
USBR	.128E-03	.128E-05	0.11	0.36
Barr	.233E-03	.233E-05	0.20	0.66
Alyamani and Sen	.179E-03	.179E-05	0.15	0.51
Chapuis	.169E-03	.169E-05	0.15	0.48
Krumbein and Monk	.402E-03	.402E-05	0.35	1.14
geometric mean	.318E-03	.318E-05	0.27	0.90
arithmetic mean	.355E-03	.355E-05	0.31	1.01

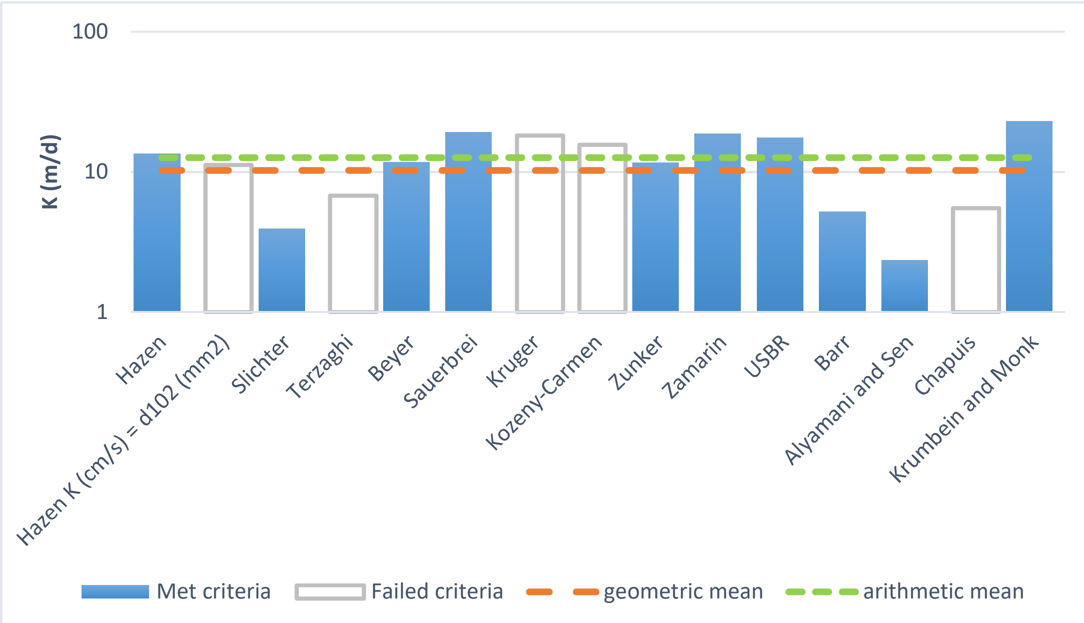

Particle Size Distribution -PW-07SOIL-14-15-20190724
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.50
0.32
0.11
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/24/2019

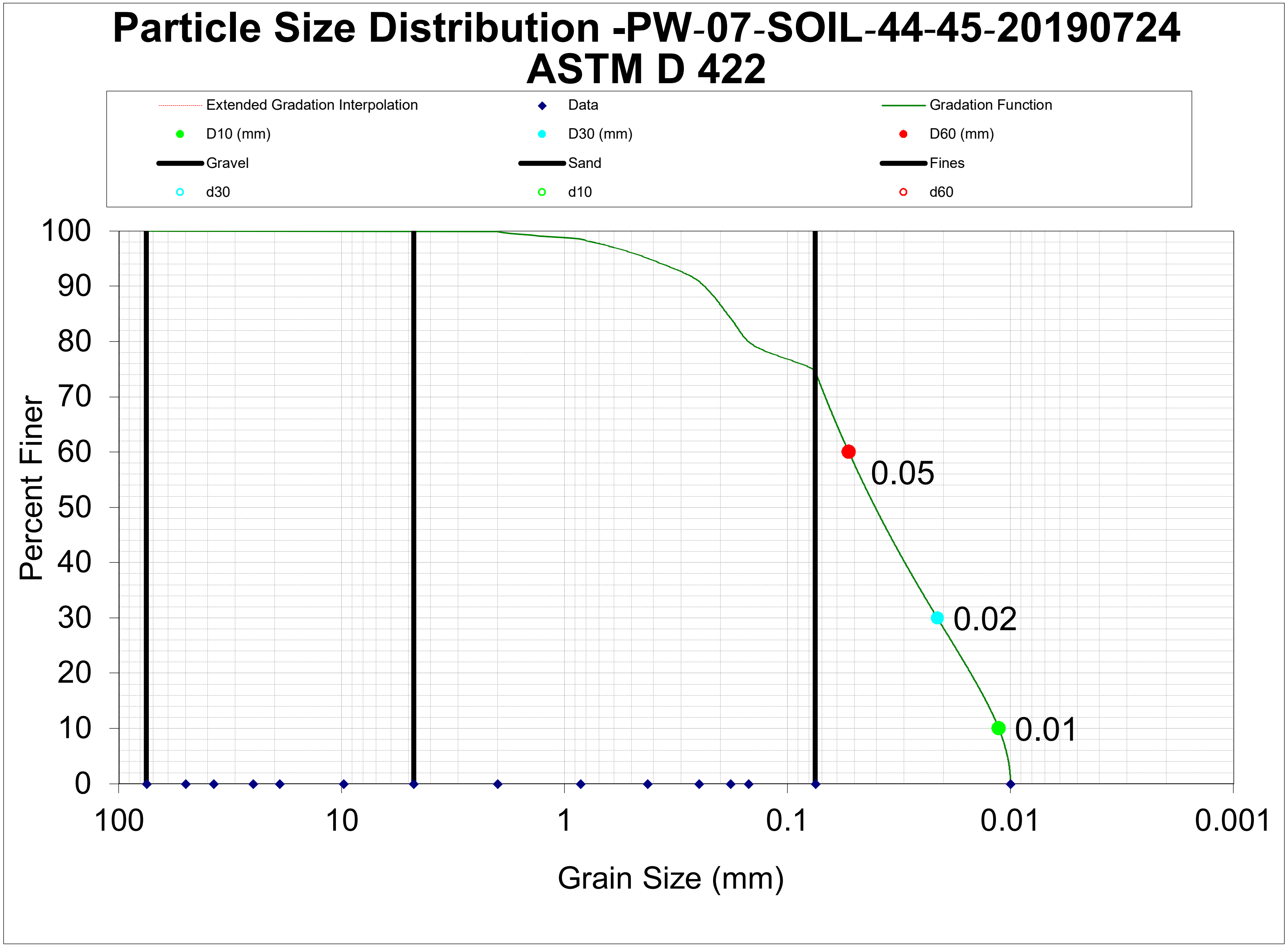
Sample Name: PW-07SOIL-14-15-20190724

Mass Sample (g): 100 — T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.156E-01	.156E-03	13.47	44.18
Hazen K (cm/s) = d_{10} (mm)	.129E-01	.129E-03	11.19	36.71
Slichter	.456E-02	.456E-04	3.94	12.92
Terzaghi	.784E-02	.784E-04	6.78	22.24
Beyer	.136E-01	.136E-03	11.73	38.49
Sauerbrei	.222E-01	.222E-03	19.17	62.89
Kruger	.210E-01	.210E-03	18.15	59.54
Kozeny-Carmen	.181E-01	.181E-03	15.61	51.20
Zunker	.135E-01	.135E-03	11.64	38.20
Zamarin	.217E-01	.217E-03	18.72	61.43
USBR	.202E-01	.202E-03	17.45	57.24
Barr	.602E-02	.602E-04	5.20	17.08
Alyamani and Sen	.271E-02	.271E-04	2.34	7.68
Chapuis	.638E-02	.638E-04	5.51	18.09
Krumbein and Monk	.265E-01	.265E-03	22.93	75.23
geometric mean	.119E-01	.119E-03	10.24	33.59
arithmetic mean	.147E-01	.147E-03	12.66	41.53

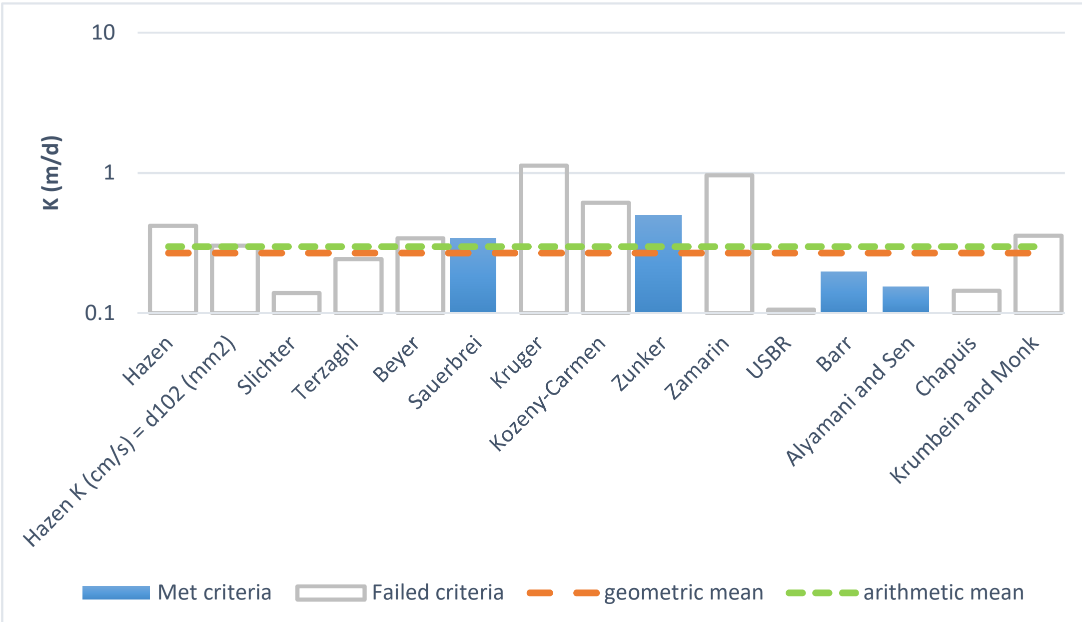

Particle Size Distribution -PW-07-SOIL-44-45-20190724
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
Grain Size (mm)
100
90
80
70
60
50
40
30
20
10
0
100
10
1
0.1
0.01
0.001
0.05
0.02
0.01

K from Grain Size Analysis Report | Date: 10/24/2019

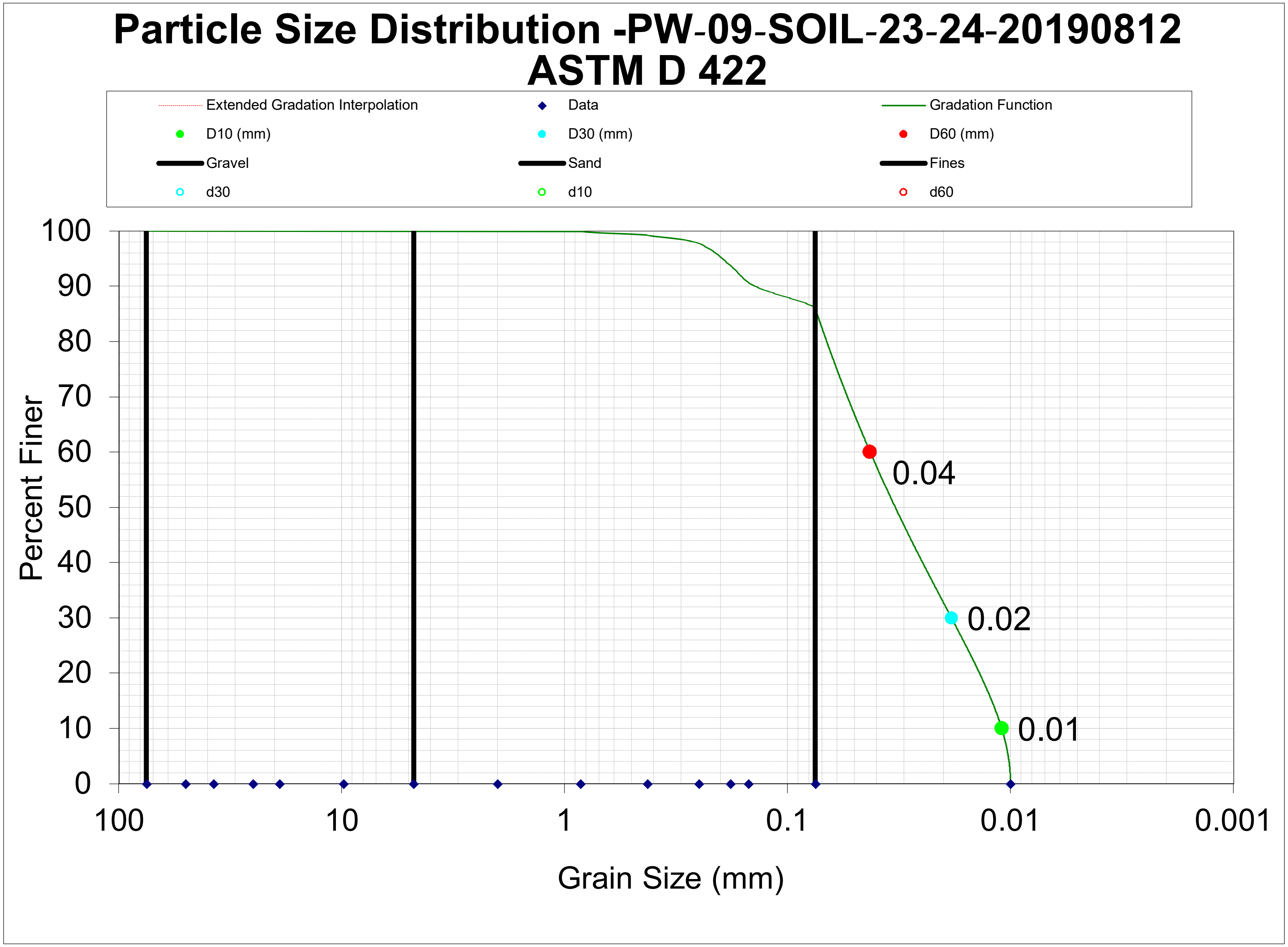
Sample Name: PW-07-SOIL-44-45-20190724

Mass Sample (g): 100 | T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.485E-03	.485E-05	0.42	1.37
Hazen K (cm/s) = d_{10} (mm)	.351E-03	.351E-05	0.30	0.99
Slichter	.160E-03	.160E-05	0.14	0.45
Terzaghi	.280E-03	.280E-05	0.24	0.79
Beyer	.394E-03	.394E-05	0.34	1.12
Sauerbrei	.395E-03	.395E-05	0.34	1.12
Kruger	.130E-02	.130E-04	1.12	3.69
Kozeny-Carmen	.709E-03	.709E-05	0.61	2.01
Zunker	.576E-03	.576E-05	0.50	1.63
Zamarin	.111E-02	.111E-04	0.96	3.16
USBR	.122E-03	.122E-05	0.11	0.35
Barr	.228E-03	.228E-05	0.20	0.65
Alyamani and Sen	.178E-03	.178E-05	0.15	0.50
Chapuis	.167E-03	.167E-05	0.14	0.47
Krumbein and Monk	.412E-03	.412E-05	0.36	1.17
geometric mean	.310E-03	.310E-05	0.27	0.88
arithmetic mean	.344E-03	.344E-05	0.30	0.98


Particle Size Distribution -PW-09-SOIL-23-24-20190812
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.04
0.02
0.01
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

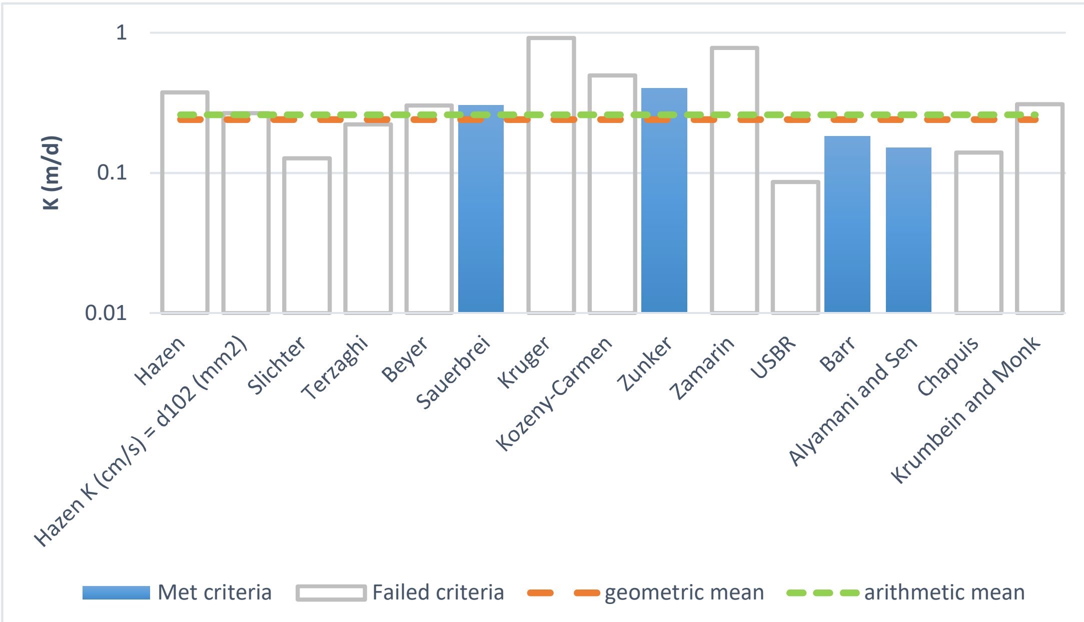
Date: 10/24/2019

Sample Name: PW-09-SOIL-23-24-20190812

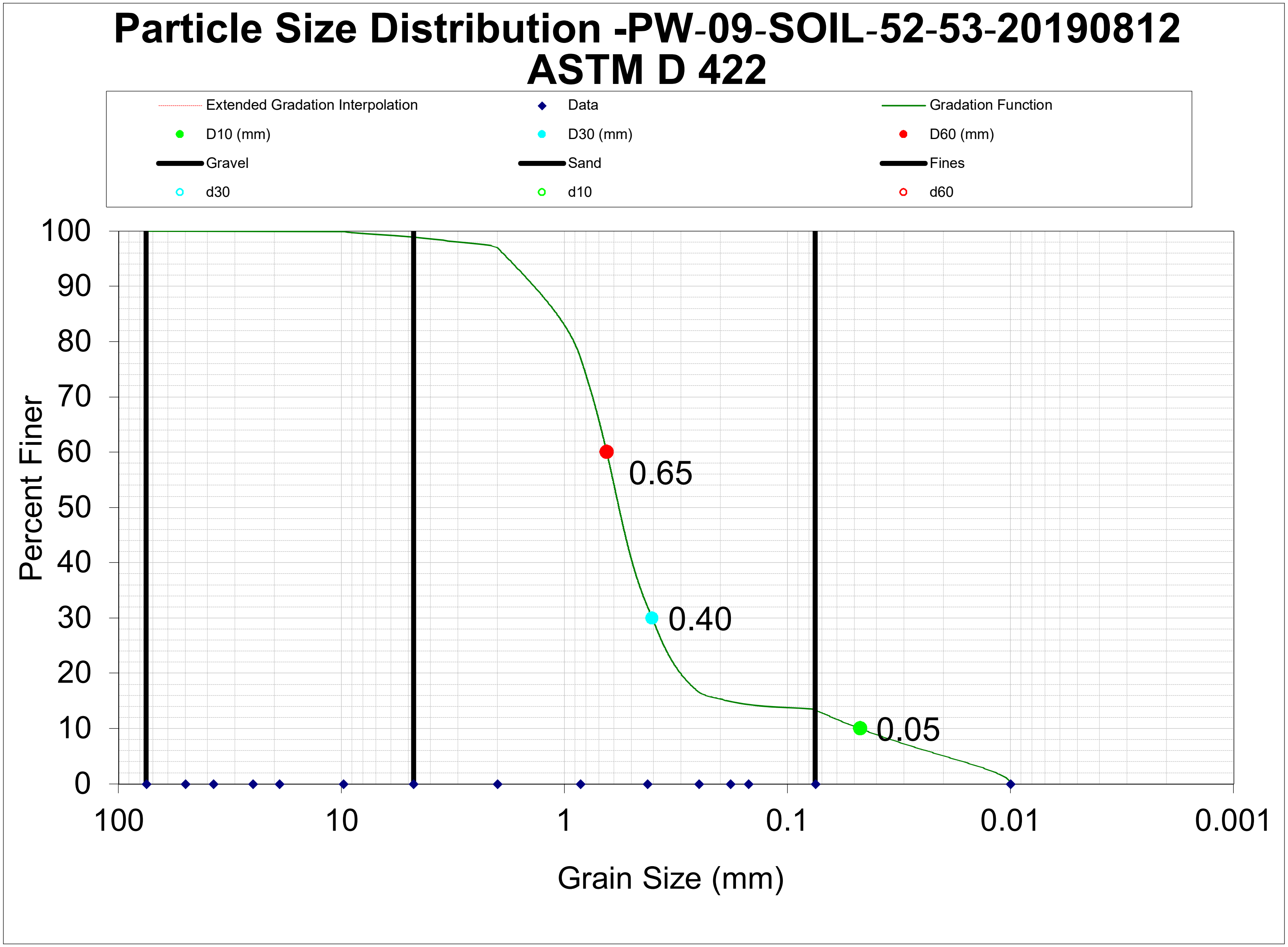
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sandy silt low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.435E-03	.435E-05	0.38	1.23
Hazen K (cm/s) = d_{10} (mm)	.309E-03	.309E-05	0.27	0.87
Slichter	.147E-03	.147E-05	0.13	0.42
Terzaghi	.256E-03	.256E-05	0.22	0.73
Beyer	.351E-03	.351E-05	0.30	0.99
Sauerbrei	.352E-03	.352E-05	0.30	1.00
Kruger	.106E-02	.106E-04	0.92	3.01
Kozeny-Carmen	.575E-03	.575E-05	0.50	1.63
Zunker	.465E-03	.465E-05	0.40	1.32
Zamarin	.901E-03	.901E-05	0.78	2.55
USBR	.997E-04	.997E-06	0.09	0.28
Barr	.211E-03	.211E-05	0.18	0.60
Alyamani and Sen	.174E-03	.174E-05	0.15	0.49
Chapuis	.162E-03	.162E-05	0.14	0.46
Krumbein and Monk	.357E-03	.357E-05	0.31	1.01
geometric mean	.278E-03	.278E-05	0.24	0.79
arithmetic mean	.300E-03	.300E-05	0.26	0.85


Particle Size Distribution -PW-09-SOIL-52-53-20190812
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.65
0.40
0.05
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

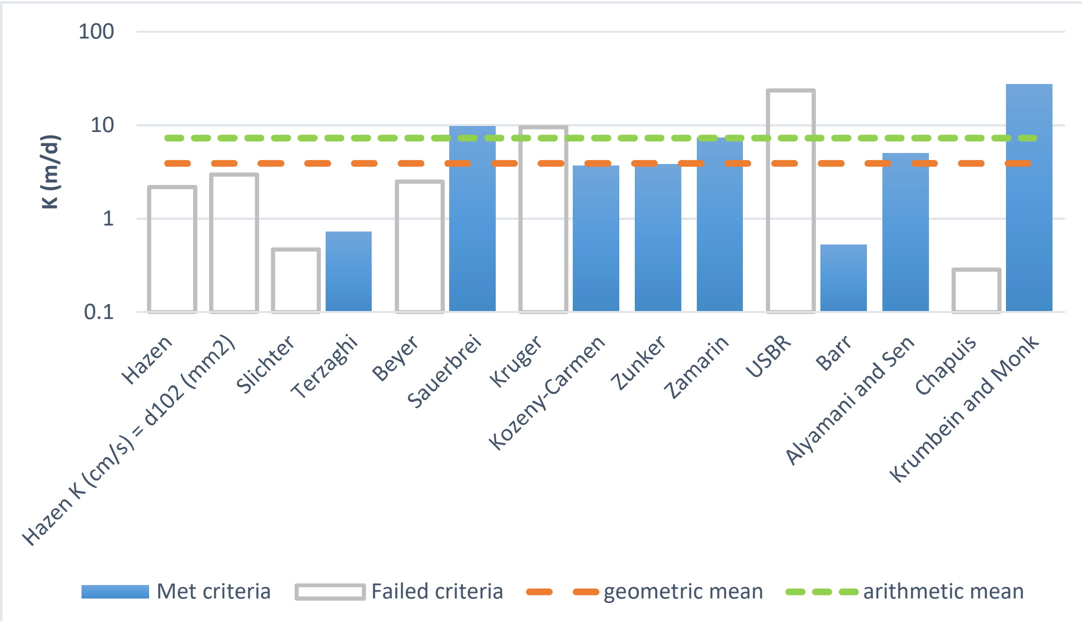
Date: 10/24/2019

Sample Name: PW-09-SOIL-52-53-20190812

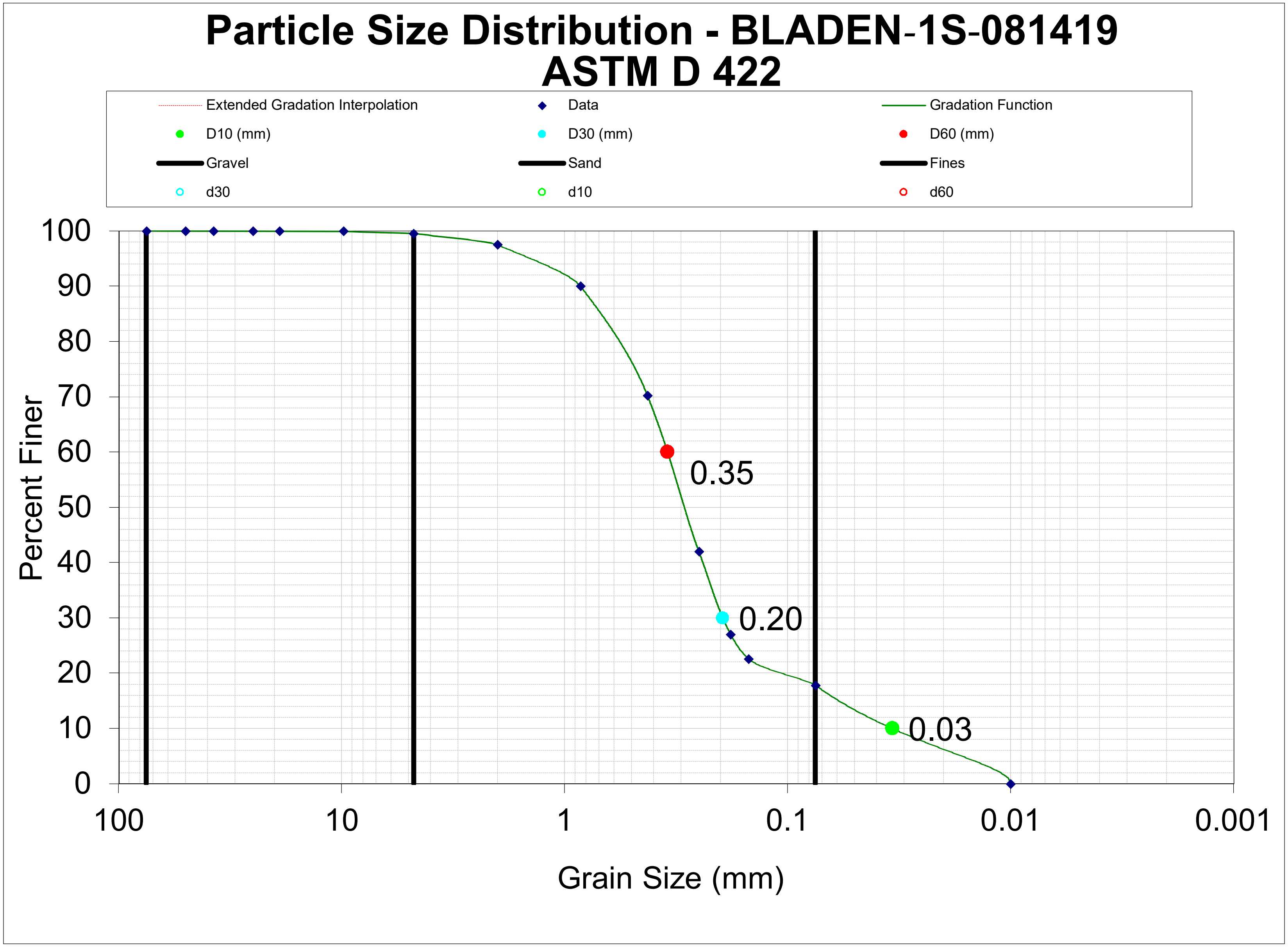
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.252E-02	.252E-04	2.18	7.14
Hazen K (cm/s) = d_{10} (mm)	.342E-02	.342E-04	2.96	9.70
Slichter	.540E-03	.540E-05	0.47	1.53
Terzaghi	.841E-03	.841E-05	0.73	2.38
Beyer	.288E-02	.288E-04	2.49	8.16
Sauerbrei	.113E-01	.113E-03	9.75	31.97
Kruger	.110E-01	.110E-03	9.49	31.13
Kozeny-Carmen	.426E-02	.426E-04	3.68	12.09
Zunker	.443E-02	.443E-04	3.83	12.55
Zamarin	.844E-02	.844E-04	7.29	23.91
USBR	.273E-01	.273E-03	23.59	77.40
Barr	.607E-03	.607E-05	0.52	1.72
Alyamani and Sen	.577E-02	.577E-04	4.98	16.35
Chapuis	.329E-03	.329E-05	0.28	0.93
Krumbein and Monk	.319E-01	.319E-03	27.58	90.50
geometric mean	.450E-02	.450E-04	3.89	12.76
arithmetic mean	.844E-02	.844E-04	7.30	23.93


Particle Size Distribution - BLADEN-1S-081419
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.35
0.20
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

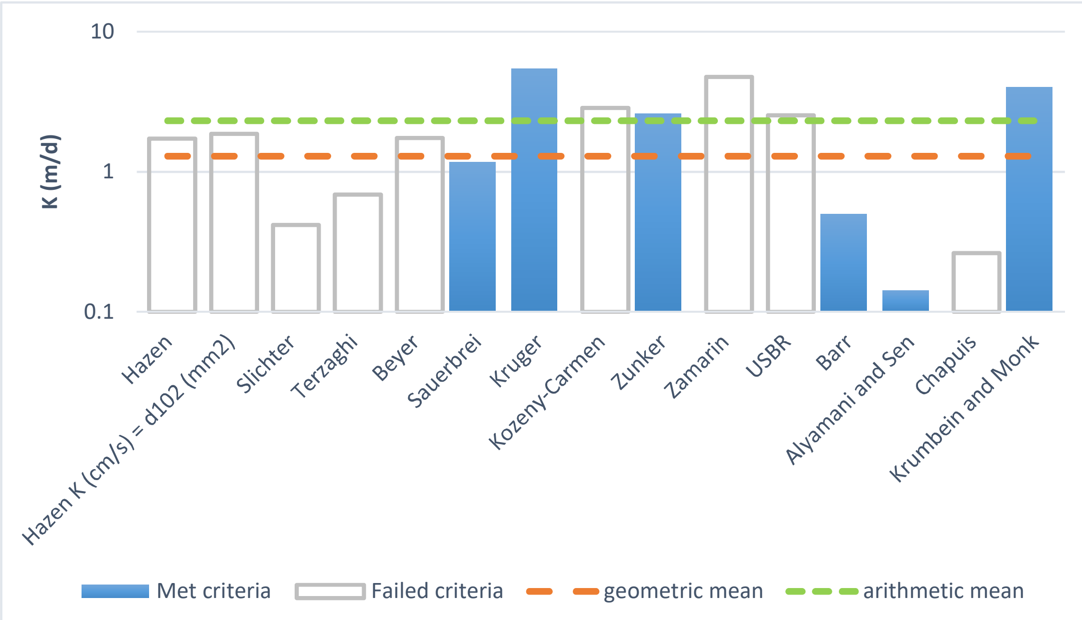
Date: 10/16/2019

Sample Name: BLADEN-1S-081419

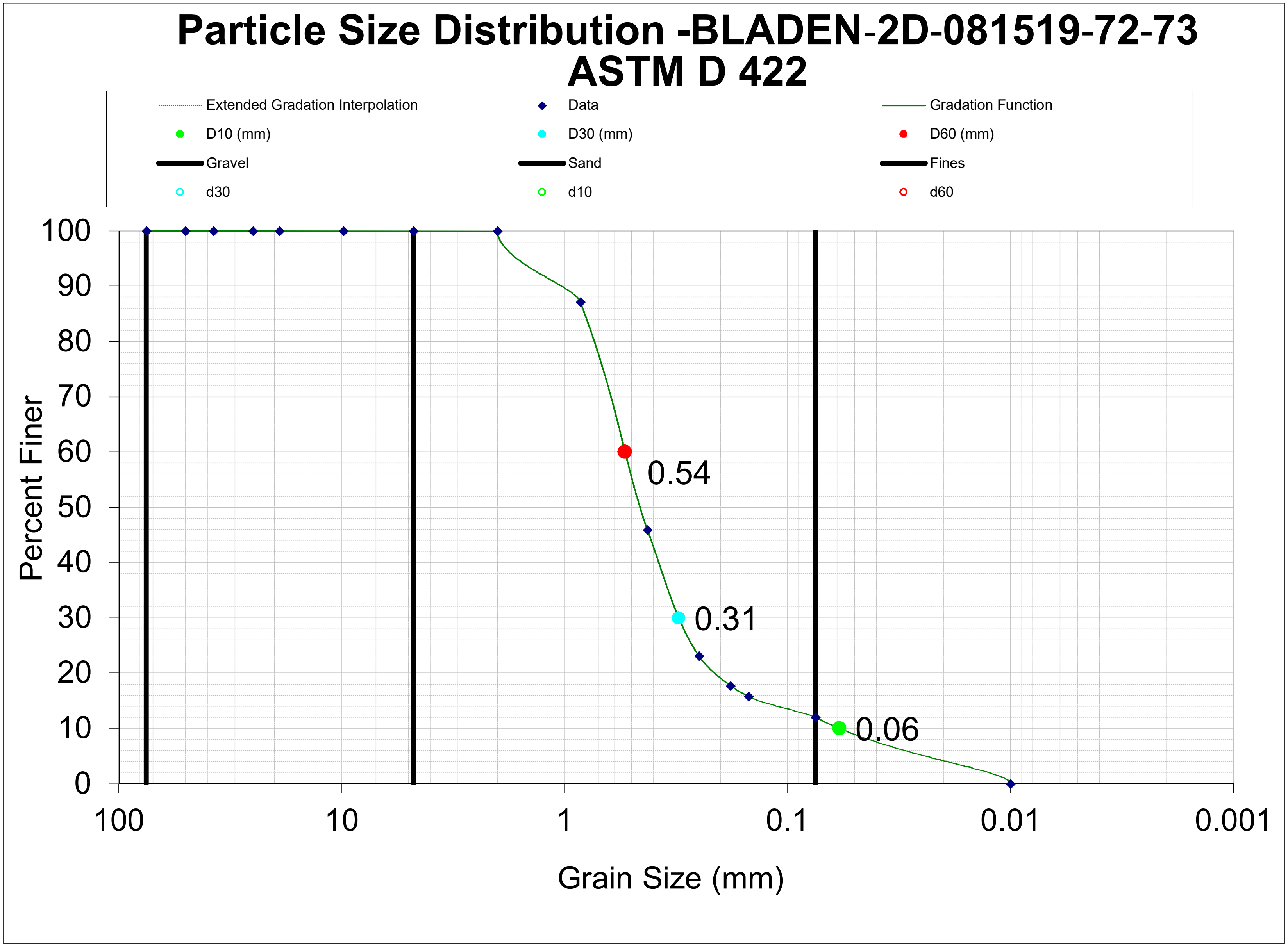
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.200E-02	.200E-04	1.73	5.66
Hazen K (cm/s) = d_{10} (mm)	.216E-02	.216E-04	1.87	6.13
Slichter	.482E-03	.482E-05	0.42	1.37
Terzaghi	.794E-03	.794E-05	0.69	2.25
Beyer	.202E-02	.202E-04	1.75	5.73
Sauerbrei	.136E-02	.136E-04	1.17	3.84
Kruger	.630E-02	.630E-04	5.44	17.85
Kozeny-Carmen	.331E-02	.331E-04	2.86	9.39
Zunker	.302E-02	.302E-04	2.61	8.57
Zamarin	.551E-02	.551E-04	4.76	15.62
USBR	.294E-02	.294E-04	2.54	8.32
Barr	.575E-03	.575E-05	0.50	1.63
Alyamani and Sen	.164E-03	.164E-05	0.14	0.46
Chapuis	.303E-03	.303E-05	0.26	0.86
Krumbein and Monk	.463E-02	.463E-04	4.00	13.13
geometric mean	.150E-02	.150E-04	1.29	4.24
arithmetic mean	.267E-02	.267E-04	2.31	7.58

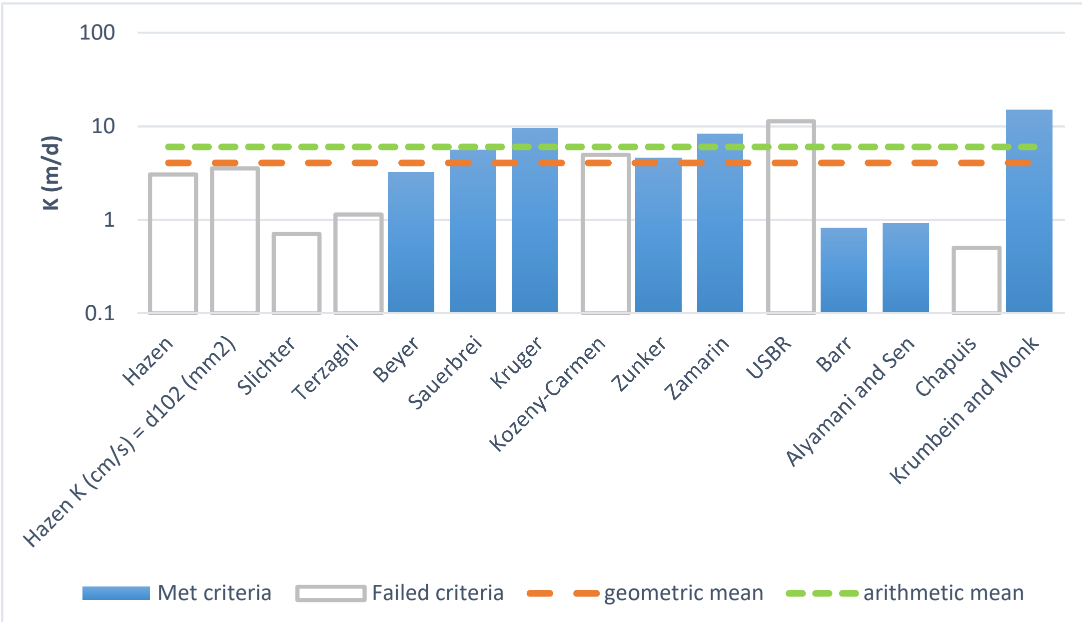

Particle Size Distribution -BLADEN-2D-081519-72-73
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.54
0.31
0.06
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/16/2019

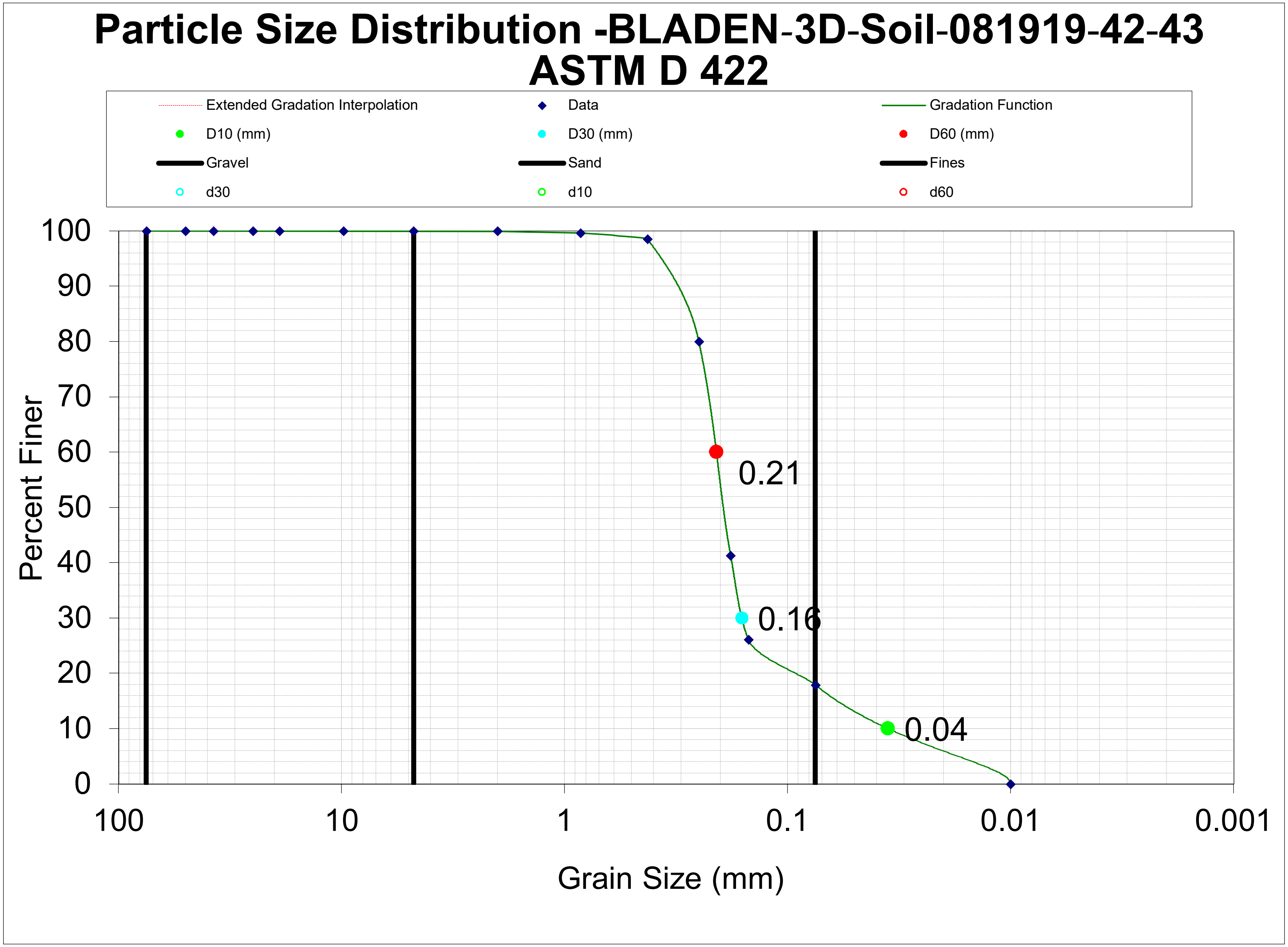
Sample Name: BLADEN-2D-081519-72-73

Mass Sample (g): 100 — T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.353E-02	.353E-04	3.05	9.99
Hazen K (cm/s) = d_{10} (mm)	.412E-02	.412E-04	3.56	11.67
Slichter	.813E-03	.813E-05	0.70	2.31
Terzaghi	.132E-02	.132E-04	1.14	3.74
Beyer	.372E-02	.372E-04	3.22	10.55
Sauerbrei	.646E-02	.646E-04	5.59	18.32
Kruger	.111E-01	.111E-03	9.58	31.43
Kozeny-Carmen	.573E-02	.573E-04	4.95	16.25
Zunker	.534E-02	.534E-04	4.61	15.12
Zamarin	.957E-02	.957E-04	8.27	27.14
USBR	.131E-01	.131E-03	11.35	37.24
Barr	.949E-03	.949E-05	0.82	2.69
Alyamani and Sen	.106E-02	.106E-04	0.92	3.00
Chapuis	.583E-03	.583E-05	0.50	1.65
Krumbein and Monk	.175E-01	.175E-03	15.09	49.52
geometric mean	.470E-02	.470E-04	4.06	13.33
arithmetic mean	.696E-02	.696E-04	6.01	19.72

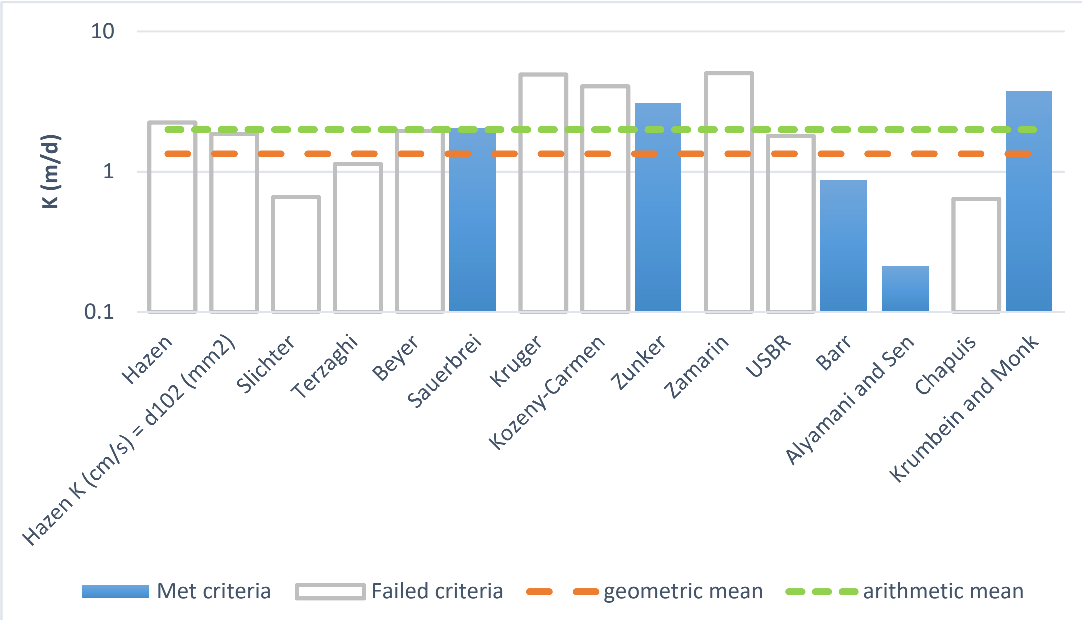

Particle Size Distribution -BLADEN-3D-Soil-081919-42-43
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.21
0.16
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

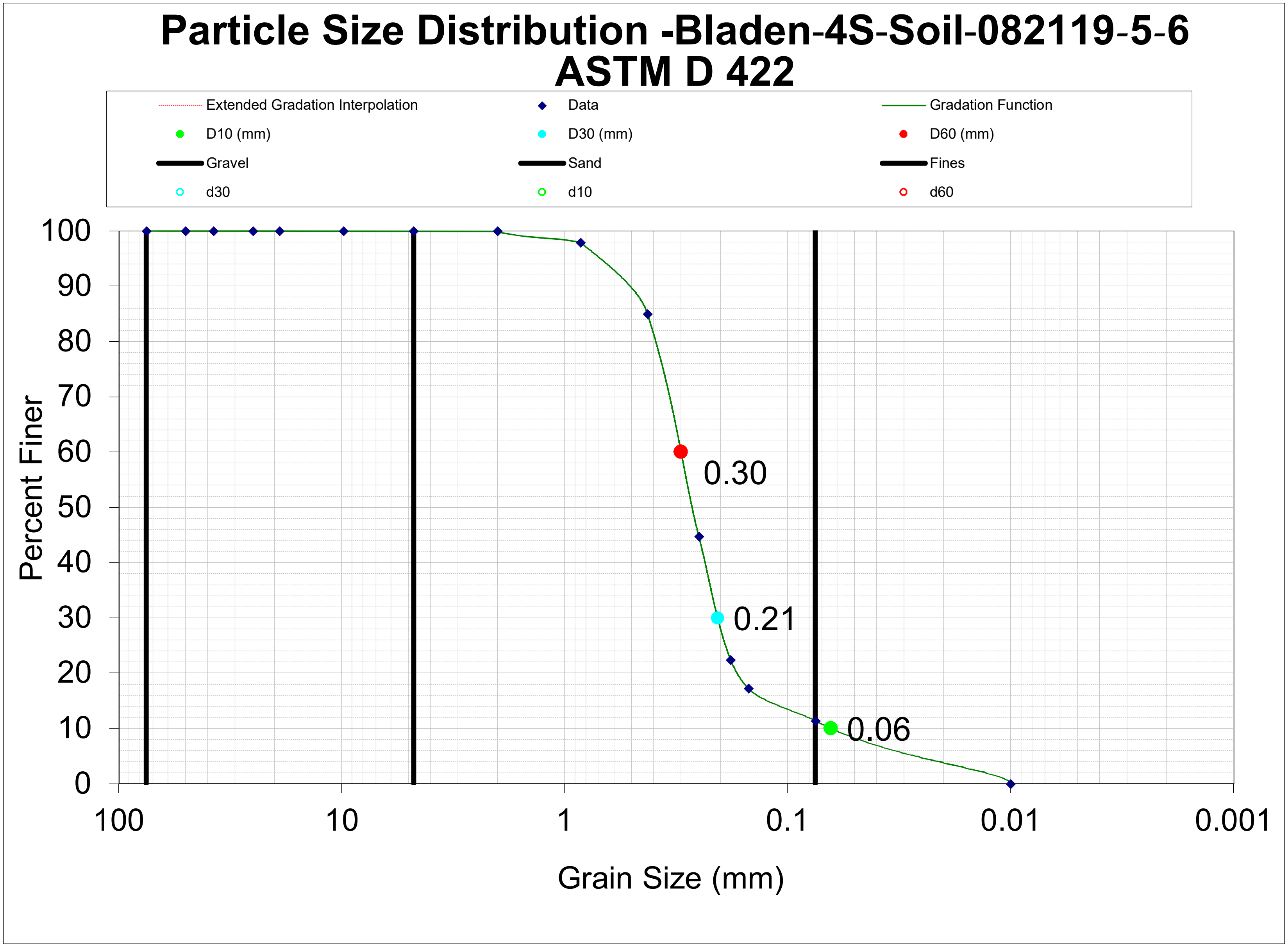
Sample Name: BLADEN-3D-Soil-081919-42-43

Mass Sample (g): 100 T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.259E-02	.259E-04	2.24	7.35
Hazen K (cm/s) = d_{10} (mm)	.214E-02	.214E-04	1.85	6.08
Slichter	.761E-03	.761E-05	0.66	2.16
Terzaghi	.131E-02	.131E-04	1.13	3.72
Beyer	.225E-02	.225E-04	1.95	6.39
Sauerbrei	.238E-02	.238E-04	2.05	6.73
Kruger	.570E-02	.570E-04	4.93	16.16
Kozeny-Carmen	.471E-02	.471E-04	4.07	13.36
Zunker	.356E-02	.356E-04	3.08	10.09
Zamarin	.582E-02	.582E-04	5.03	16.51
USBR	.208E-02	.208E-04	1.80	5.90
Barr	.101E-02	.101E-04	0.87	2.86
Alyamani and Sen	.242E-03	.242E-05	0.21	0.69
Chapuis	.738E-03	.738E-05	0.64	2.09
Krumbein and Monk	.435E-02	.435E-04	3.76	12.33
geometric mean	.155E-02	.155E-04	1.34	4.40
arithmetic mean	.231E-02	.231E-04	1.99	6.54

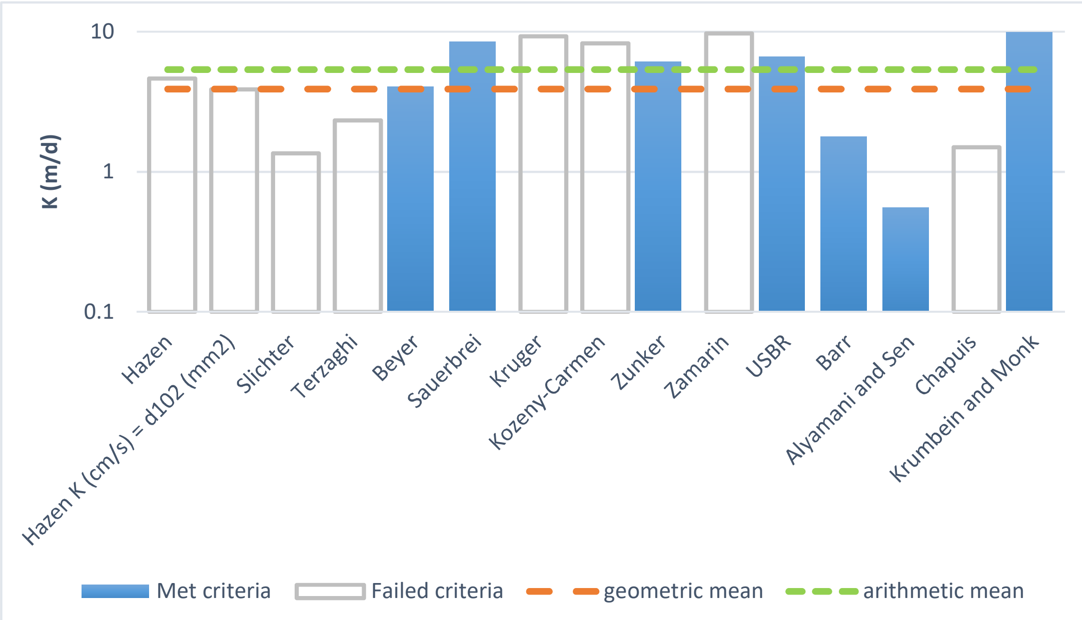

Particle Size Distribution -Bladen-4S-Soil-082119-5-6
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.30
0.21
0.06
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/16/2019

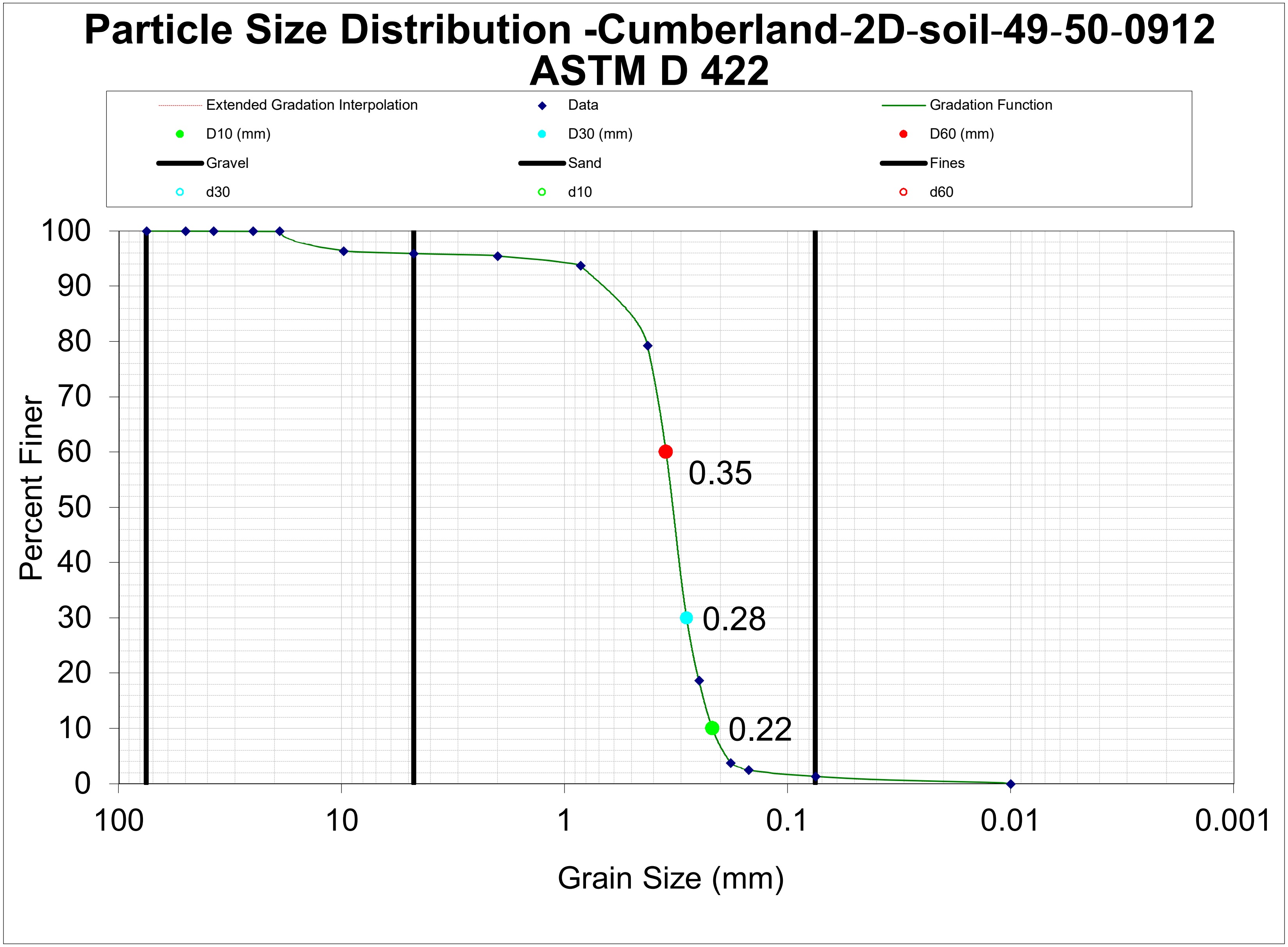
Sample Name: Bladen-4S-Soil-082119-5-6

Mass Sample (g): 100 — T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.537E-02	.537E-04	4.64	15.23
Hazen K (cm/s) = d_{10} (mm)	.449E-02	.449E-04	3.88	12.73
Slichter	.156E-02	.156E-04	1.35	4.43
Terzaghi	.269E-02	.269E-04	2.32	7.62
Beyer	.470E-02	.470E-04	4.06	13.32
Sauerbrei	.980E-02	.980E-04	8.46	27.77
Kruger	.107E-01	.107E-03	9.28	30.43
Kozeny-Carmen	.957E-02	.957E-04	8.27	27.14
Zunker	.708E-02	.708E-04	6.12	20.08
Zamarin	.112E-01	.112E-03	9.71	31.84
USBR	.768E-02	.768E-04	6.64	21.78
Barr	.206E-02	.206E-04	1.78	5.84
Alyamani and Sen	.643E-03	.643E-05	0.56	1.82
Chapuis	.173E-02	.173E-04	1.50	4.92
Krumbein and Monk	.115E-01	.115E-03	9.94	32.62
geometric mean	.451E-02	.451E-04	3.90	12.80
arithmetic mean	.621E-02	.621E-04	5.37	17.60

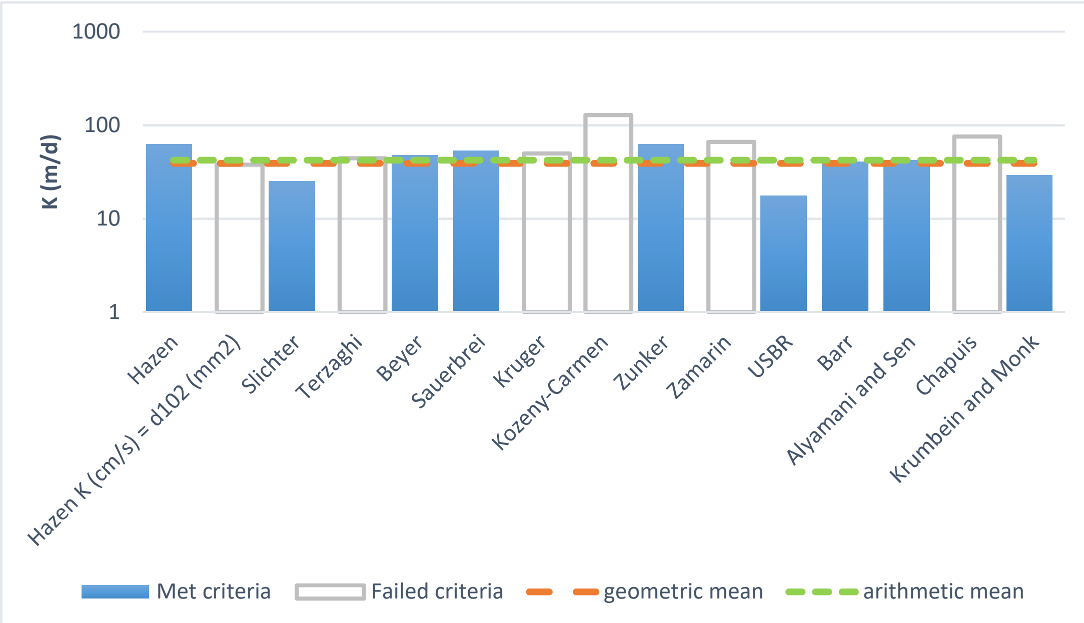

Particle Size Distribution -Cumberland-2D-soil-49-50-0912
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.35
0.28
0.22
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report | Date: 10/16/2019

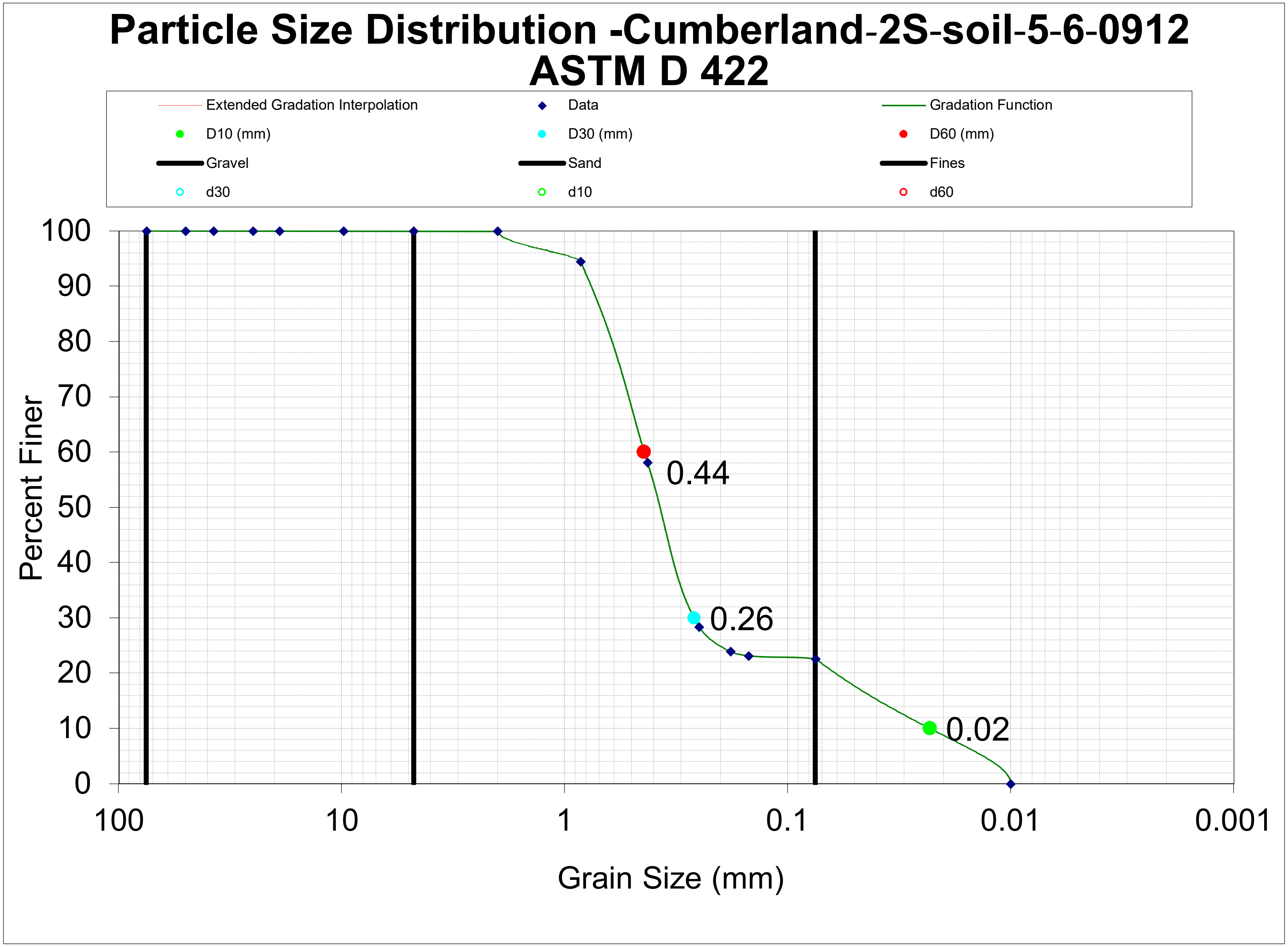
Sample Name: Cumberland-2D-soil-49-50-0912

Mass Sample (g): 100 | T (oC) 20

Uniform sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.726E-01	.726E-03	62.72	205.77
Hazen K (cm/s) = d_{10} (mm)	.437E-01	.437E-03	37.79	123.97
Slichter	.289E-01	.289E-03	24.98	81.95
Terzaghi	.510E-01	.510E-03	44.09	144.64
Beyer	.554E-01	.554E-03	47.86	157.01
Sauerbrei	.614E-01	.614E-03	53.08	174.16
Kruger	.579E-01	.579E-03	49.99	164.01
Kozeny-Carmen	.149E+00	.149E-02	128.71	422.29
Zunker	.723E-01	.723E-03	62.47	204.95
Zamarin	.765E-01	.765E-03	66.11	216.91
USBR	.203E-01	.203E-03	17.58	57.67
Barr	.467E-01	.467E-03	40.35	132.39
Alyamani and Sen	.485E-01	.485E-03	41.93	137.57
Chapuis	.874E-01	.874E-03	75.51	247.74
Krumbein and Monk	.336E-01	.336E-03	29.04	95.27
geometric mean	.453E-01	.453E-03	39.12	128.36
arithmetic mean	.489E-01	.489E-03	42.22	138.53

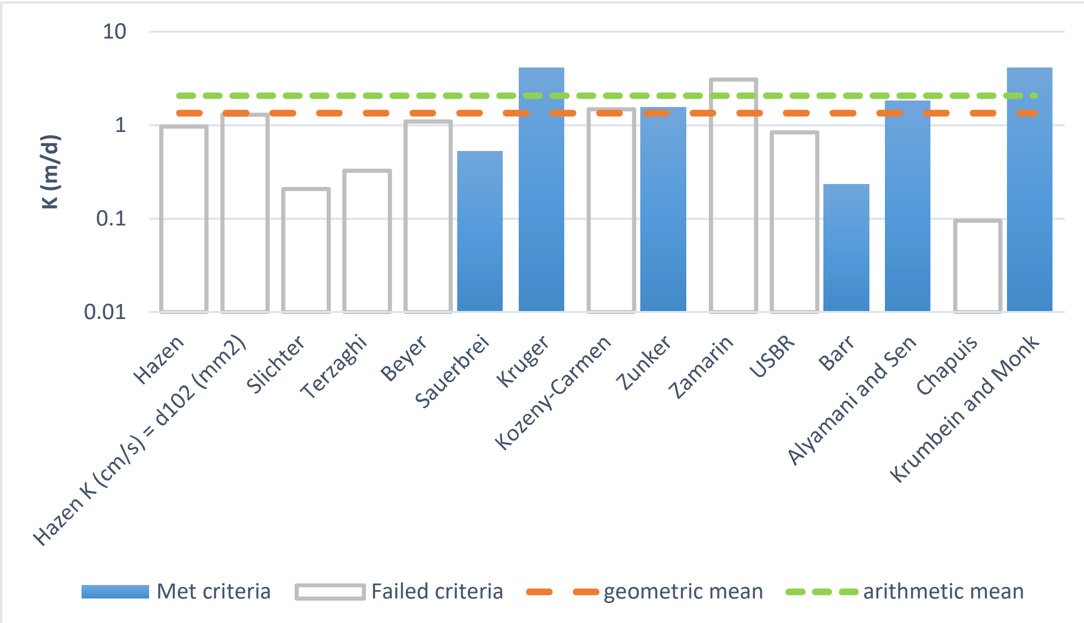

Particle Size Distribution -Cumberland-2S-soil-5-6-0912
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.44
0.26
0.02
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/16/2019

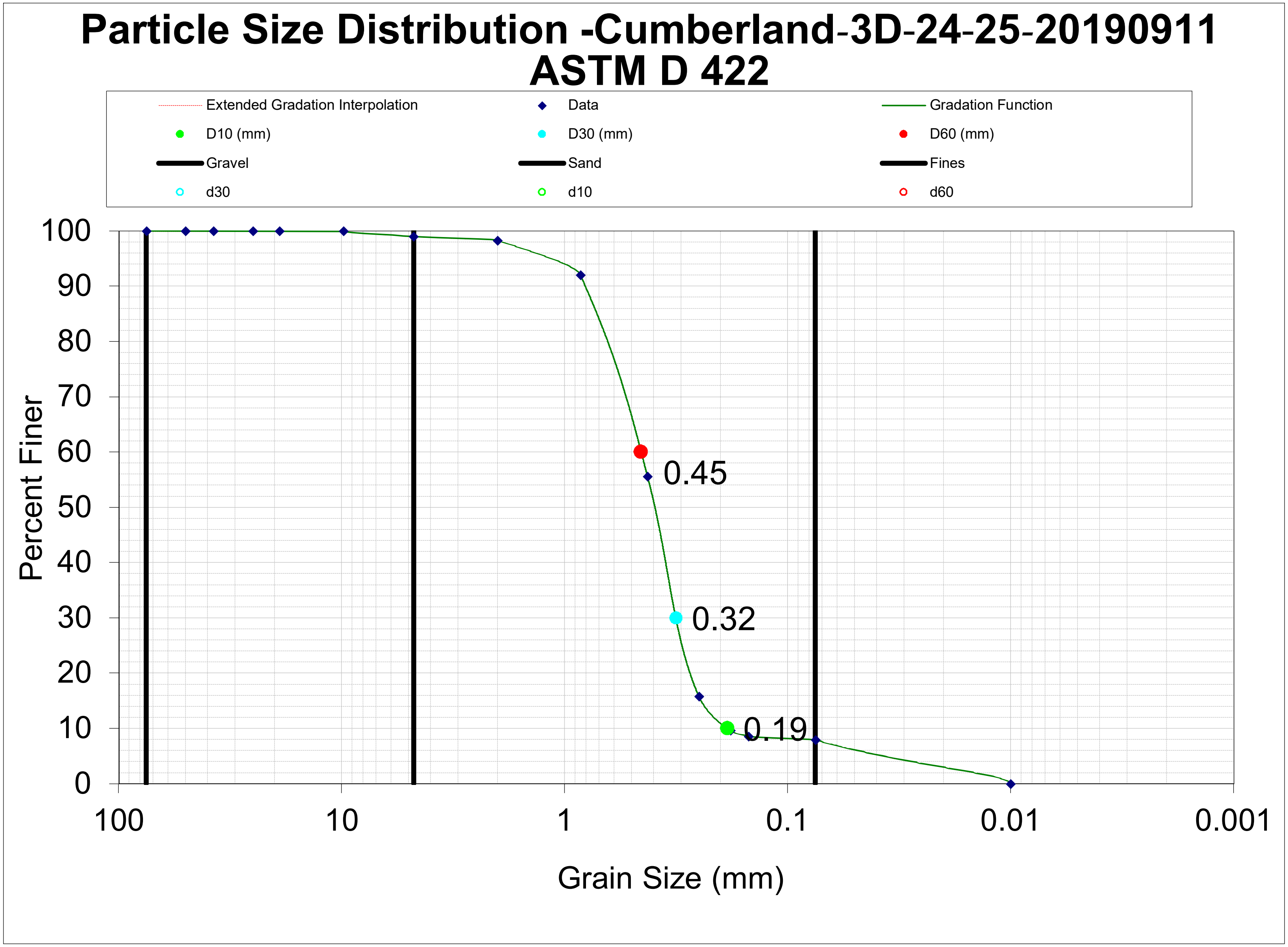
Sample Name: Cumberland-2S-soil-5-6-0912

Mass Sample (g): 100 — T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.112E-02	.112E-04	0.96	3.17
Hazen K (cm/s) = d_{10} (mm)	.150E-02	.150E-04	1.30	4.26
Slichter	.240E-03	.240E-05	0.21	0.68
Terzaghi	.375E-03	.375E-05	0.32	1.06
Beyer	.127E-02	.127E-04	1.10	3.60
Sauerbrei	.614E-03	.614E-05	0.53	1.74
Kruger	.476E-02	.476E-04	4.11	13.48
Kozeny-Carmen	.171E-02	.171E-04	1.48	4.84
Zunker	.181E-02	.181E-04	1.56	5.13
Zamarin	.356E-02	.356E-04	3.08	10.09
USBR	.968E-03	.968E-05	0.84	2.74
Barr	.271E-03	.271E-05	0.23	0.77
Alyamani and Sen	.211E-02	.211E-04	1.82	5.97
Chapuis	.110E-03	.110E-05	0.09	0.31
Krumbein and Monk	.480E-02	.480E-04	4.15	13.61
geometric mean	.156E-02	.156E-04	1.35	4.42
arithmetic mean	.239E-02	.239E-04	2.07	6.78

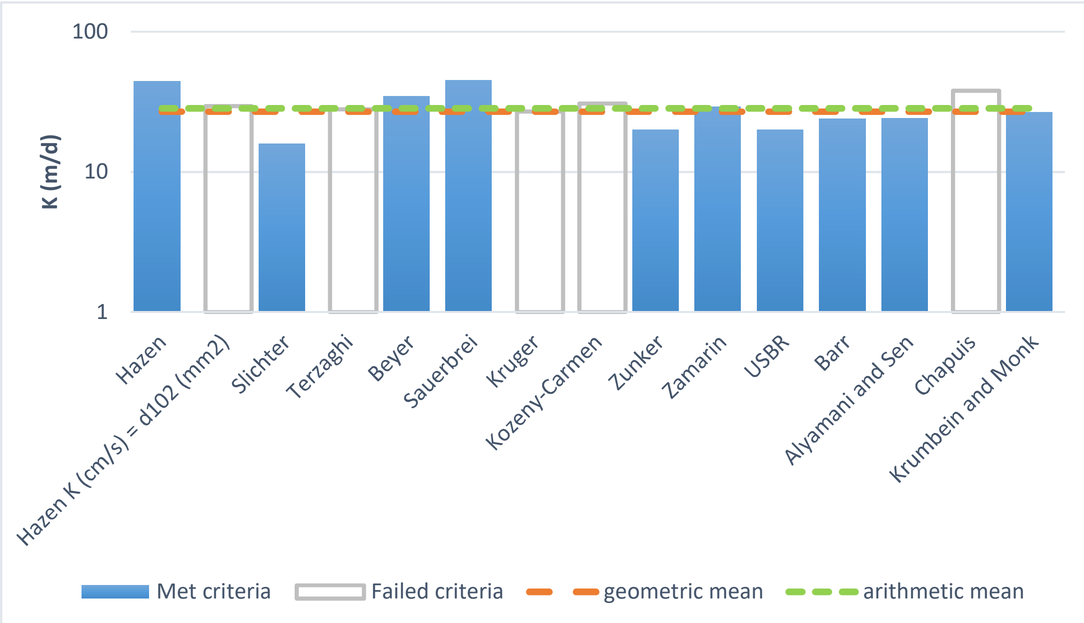

Particle Size Distribution -Cumberland-3D-24-25-20190911
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
100
90
80
70
60
50
40
30
20
10
0
Percent Finer
0.45
0.32
0.19
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/16/2019

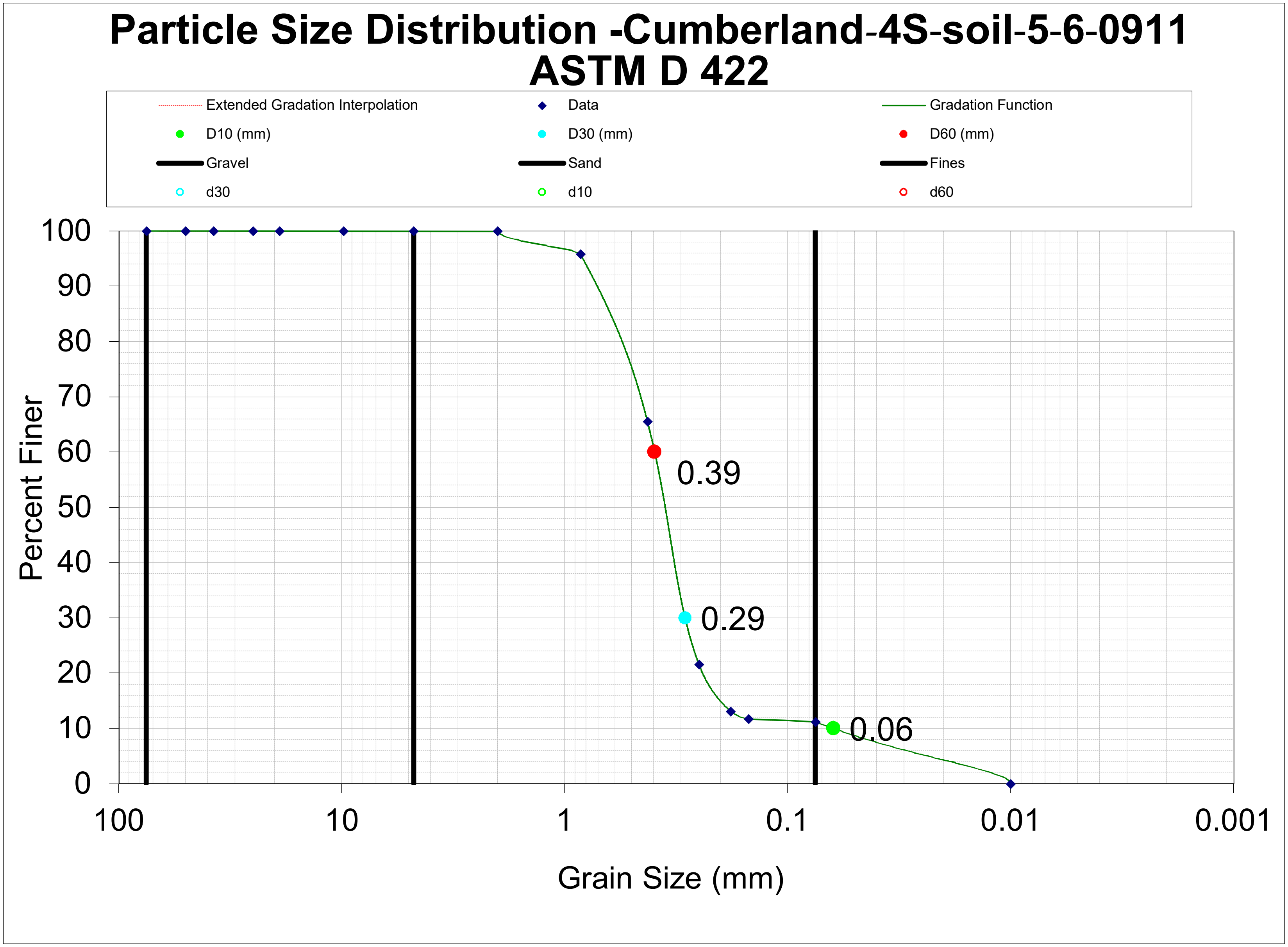
Sample Name: Cumberland-3D-24-25-20190911

Mass Sample (g): 100 — T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.513E-01	.513E-03	44.29	145.30
Hazen K (cm/s) = d_{10} (mm)	.340E-01	.340E-03	29.42	96.51
Slichter	.184E-01	.184E-03	15.92	52.23
Terzaghi	.324E-01	.324E-03	27.95	91.70
Beyer	.402E-01	.402E-03	34.75	114.00
Sauerbrei	.520E-01	.520E-03	44.97	147.53
Kruger	.312E-01	.312E-03	26.98	88.52
Kozeny-Carmen	.356E-01	.356E-03	30.75	100.90
Zunker	.232E-01	.232E-03	20.02	65.67
Zamarin	.339E-01	.339E-03	29.25	95.96
USBR	.232E-01	.232E-03	20.01	65.65
Barr	.277E-01	.277E-03	23.92	78.47
Alyamani and Sen	.278E-01	.278E-03	24.03	78.83
Chapuis	.439E-01	.439E-03	37.93	124.45
Krumbein and Monk	.308E-01	.308E-03	26.60	87.27
geometric mean	.311E-01	.311E-03	26.88	88.21
arithmetic mean	.328E-01	.328E-03	28.37	93.09


Particle Size Distribution -Cumberland-4S-soil-5-6-0911
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.39
0.29
0.06
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

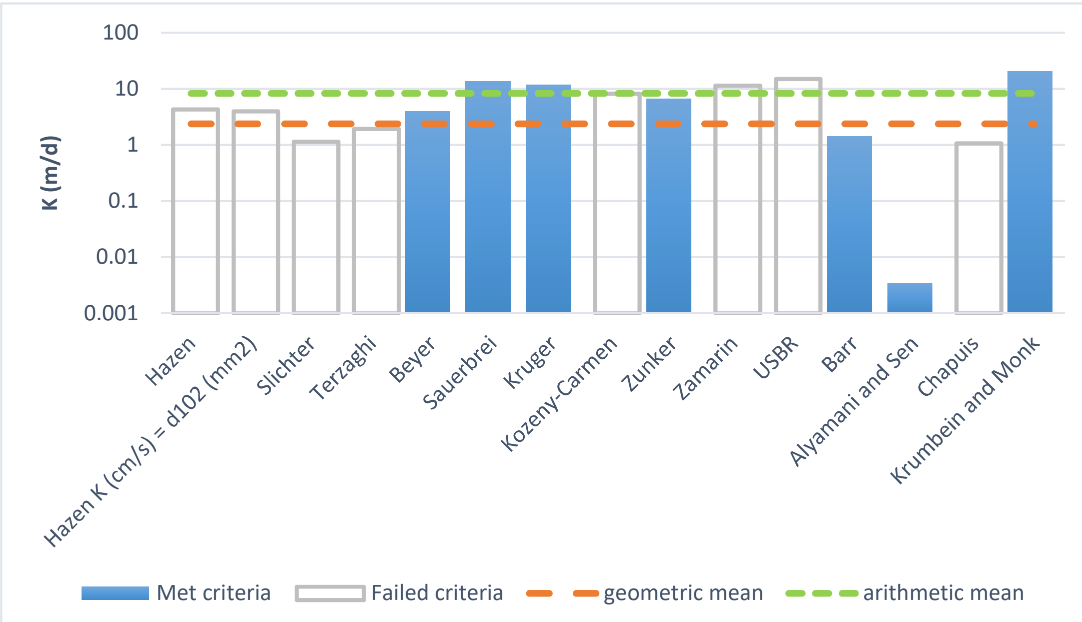
Date: 10/16/2019

Sample Name: Cumberland-4S-soil-5-6-0911

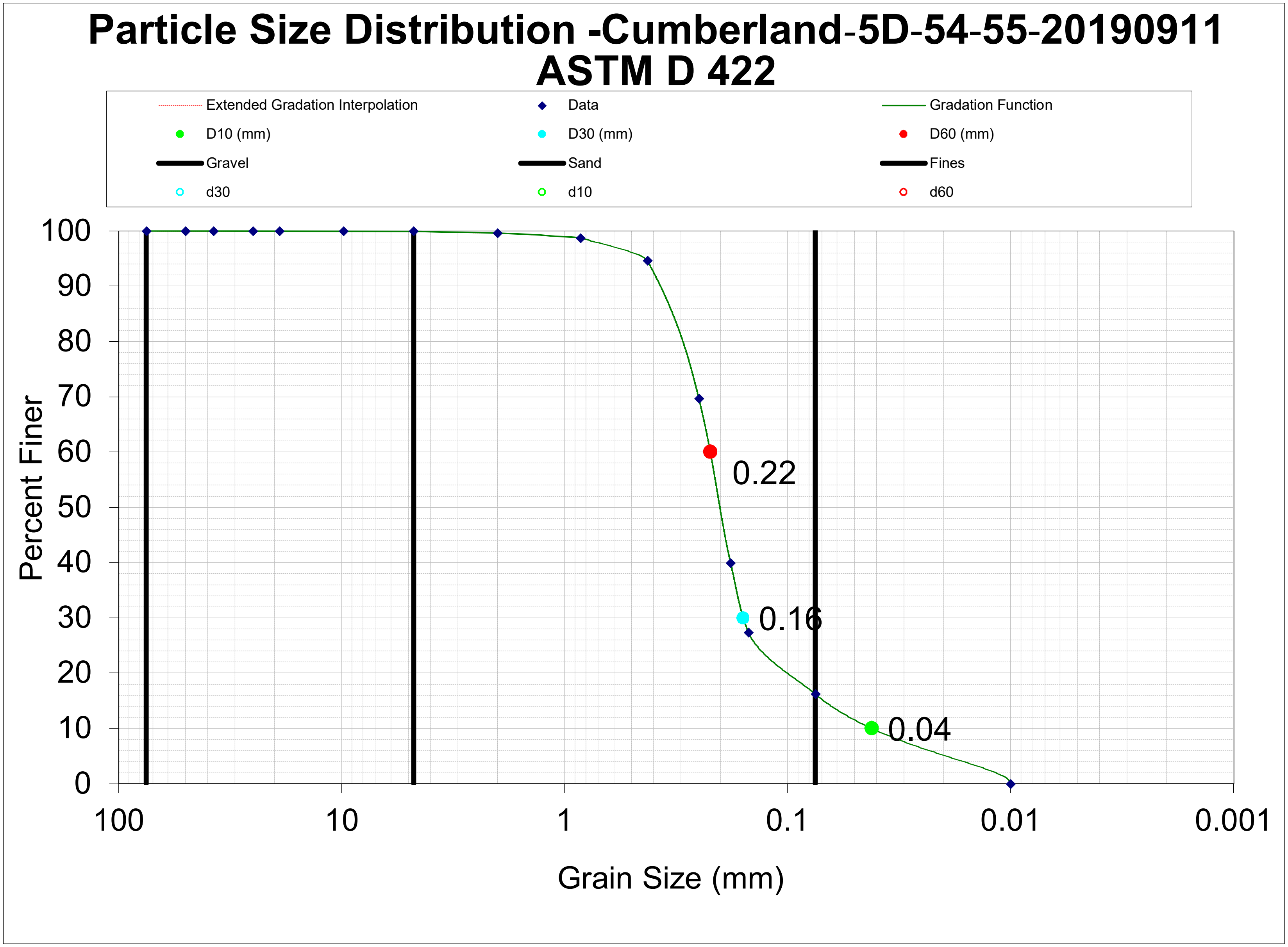
Mass Sample (g): 100

T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.495E-02	.495E-04	4.28	14.04
Hazen K (cm/s) = d_{10} (mm)	.463E-02	.463E-04	4.00	13.12
Slichter	.132E-02	.132E-04	1.14	3.74
Terzaghi	.224E-02	.224E-04	1.93	6.34
Beyer	.461E-02	.461E-04	3.98	13.05
Sauerbrei	.158E-01	.158E-03	13.68	44.90
Kruger	.136E-01	.136E-03	11.79	38.67
Kozeny-Carmen	.944E-02	.944E-04	8.16	26.76
Zunker	.771E-02	.771E-04	6.66	21.86
Zamarin	.132E-01	.132E-03	11.38	37.34
USBR	.174E-01	.174E-03	15.00	49.20
Barr	.166E-02	.166E-04	1.43	4.70
Alyamani and Sen	.395E-05	.395E-07	0.00	0.01
Chapuis	.124E-02	.124E-04	1.07	3.51
Krumbein and Monk	.239E-01	.239E-03	20.68	67.83
geometric mean	.276E-02	.276E-04	2.38	7.81
arithmetic mean	.963E-02	.963E-04	8.32	27.29


Particle Size Distribution -Cumberland-5D-54-55-20190911
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.22
0.16
0.04
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

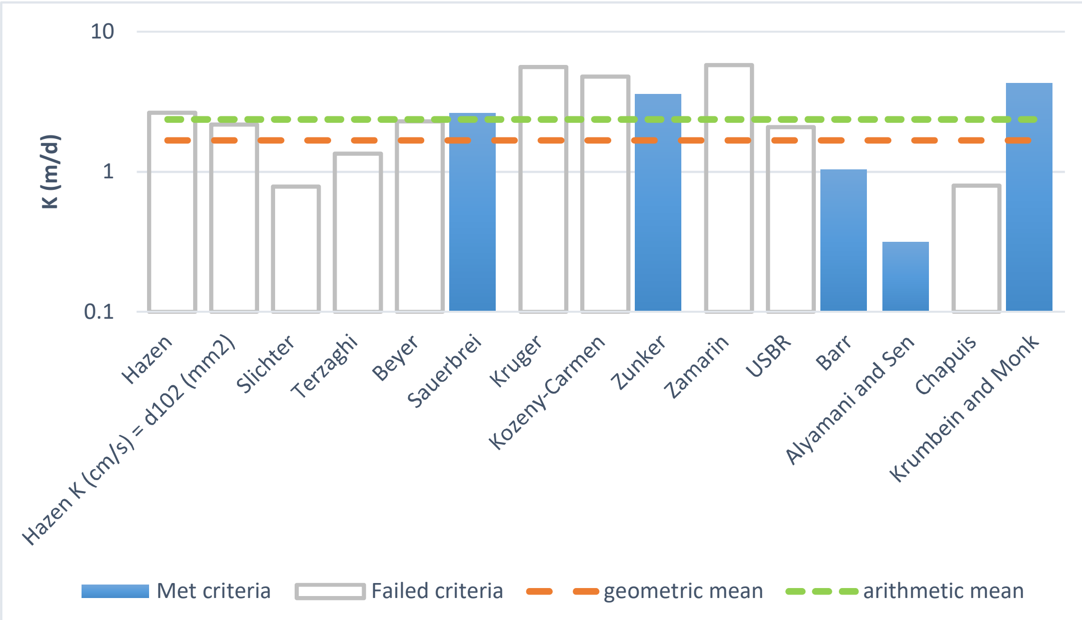
Date: 10/16/2019

Sample Name: Cumberland-5D-54-55-20190911

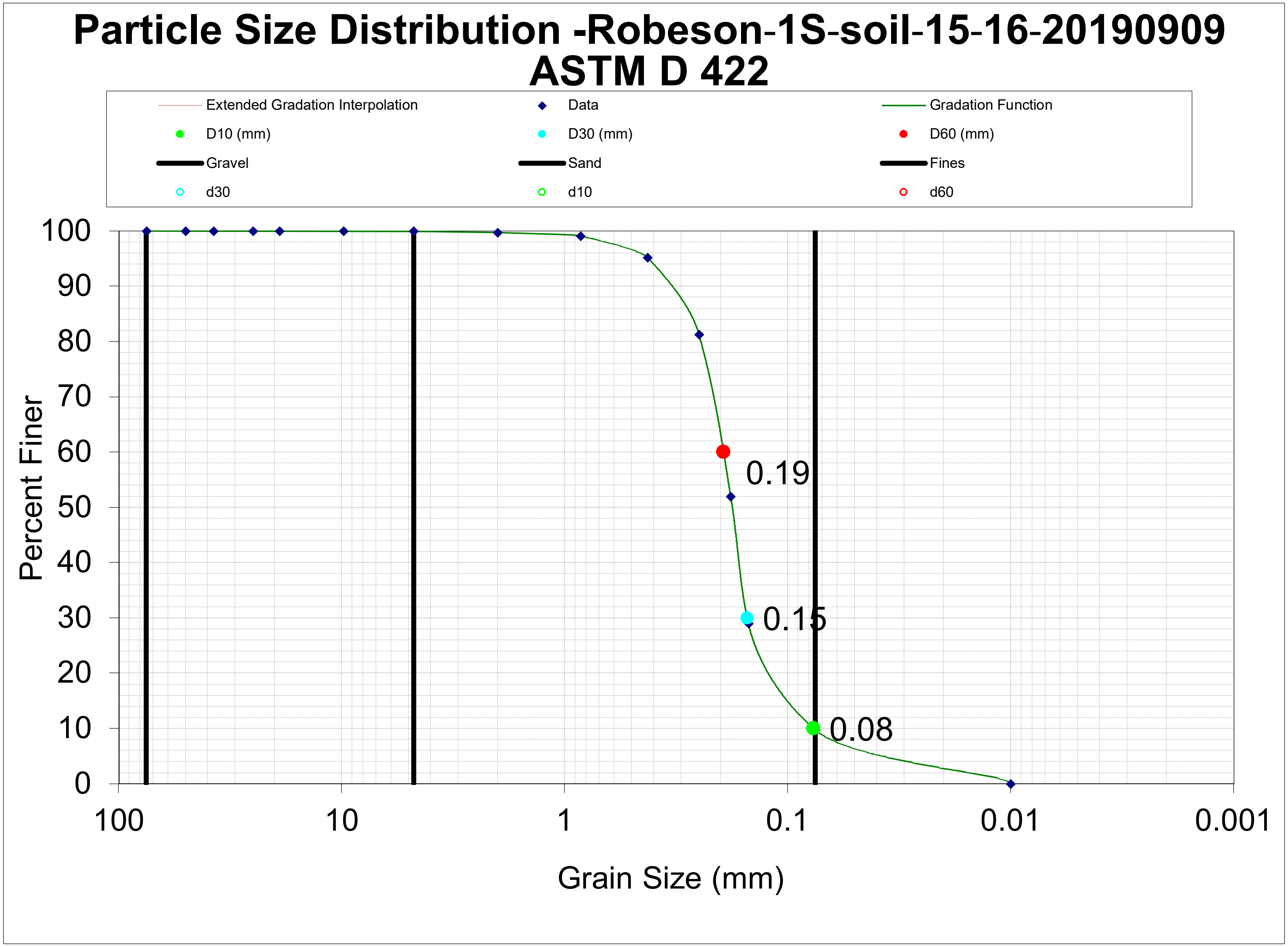
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.306E-02	.306E-04	2.65	8.68
Hazen K (cm/s) = d_{10} (mm)	.251E-02	.251E-04	2.17	7.12
Slichter	.905E-03	.905E-05	0.78	2.57
Terzaghi	.156E-02	.156E-04	1.35	4.42
Beyer	.265E-02	.265E-04	2.29	7.51
Sauerbrei	.304E-02	.304E-04	2.63	8.62
Kruger	.648E-02	.648E-04	5.60	18.36
Kozeny-Carmen	.554E-02	.554E-04	4.79	15.71
Zunker	.414E-02	.414E-04	3.57	11.73
Zamarin	.668E-02	.668E-04	5.77	18.94
USBR	.241E-02	.241E-04	2.09	6.84
Barr	.120E-02	.120E-04	1.04	3.41
Alyamani and Sen	.364E-03	.364E-05	0.31	1.03
Chapuis	.923E-03	.923E-05	0.80	2.62
Krumbein and Monk	.496E-02	.496E-04	4.29	14.07
geometric mean	.194E-02	.194E-04	1.67	5.50
arithmetic mean	.274E-02	.274E-04	2.37	7.77

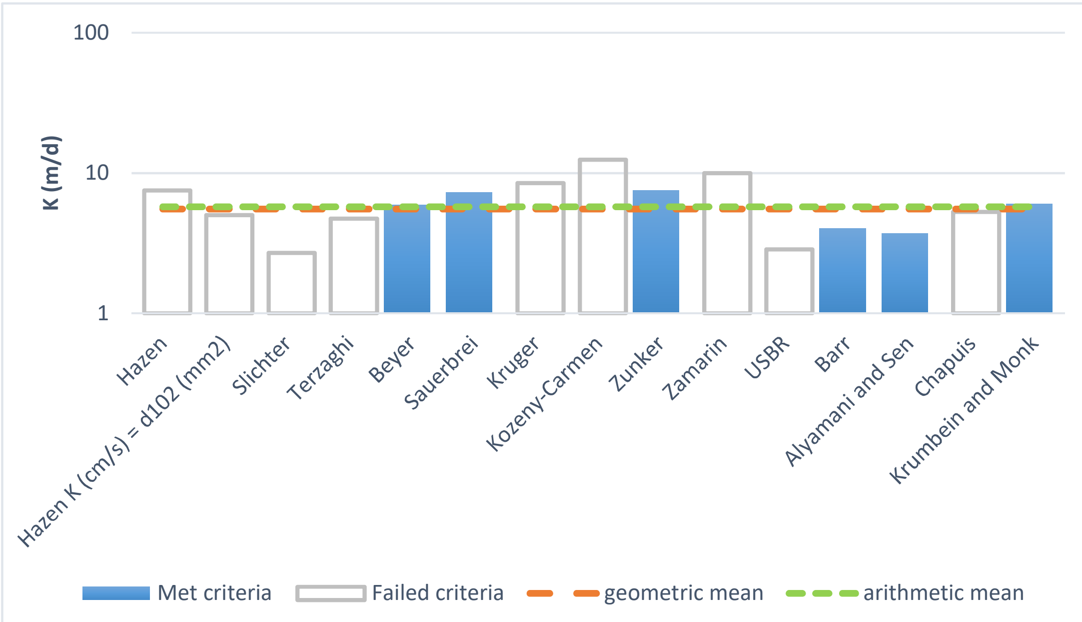

Particle Size Distribution -Robeson-1S-soil-15-16-20190909
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.19
0.15
0.08
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report Date: 10/16/2019

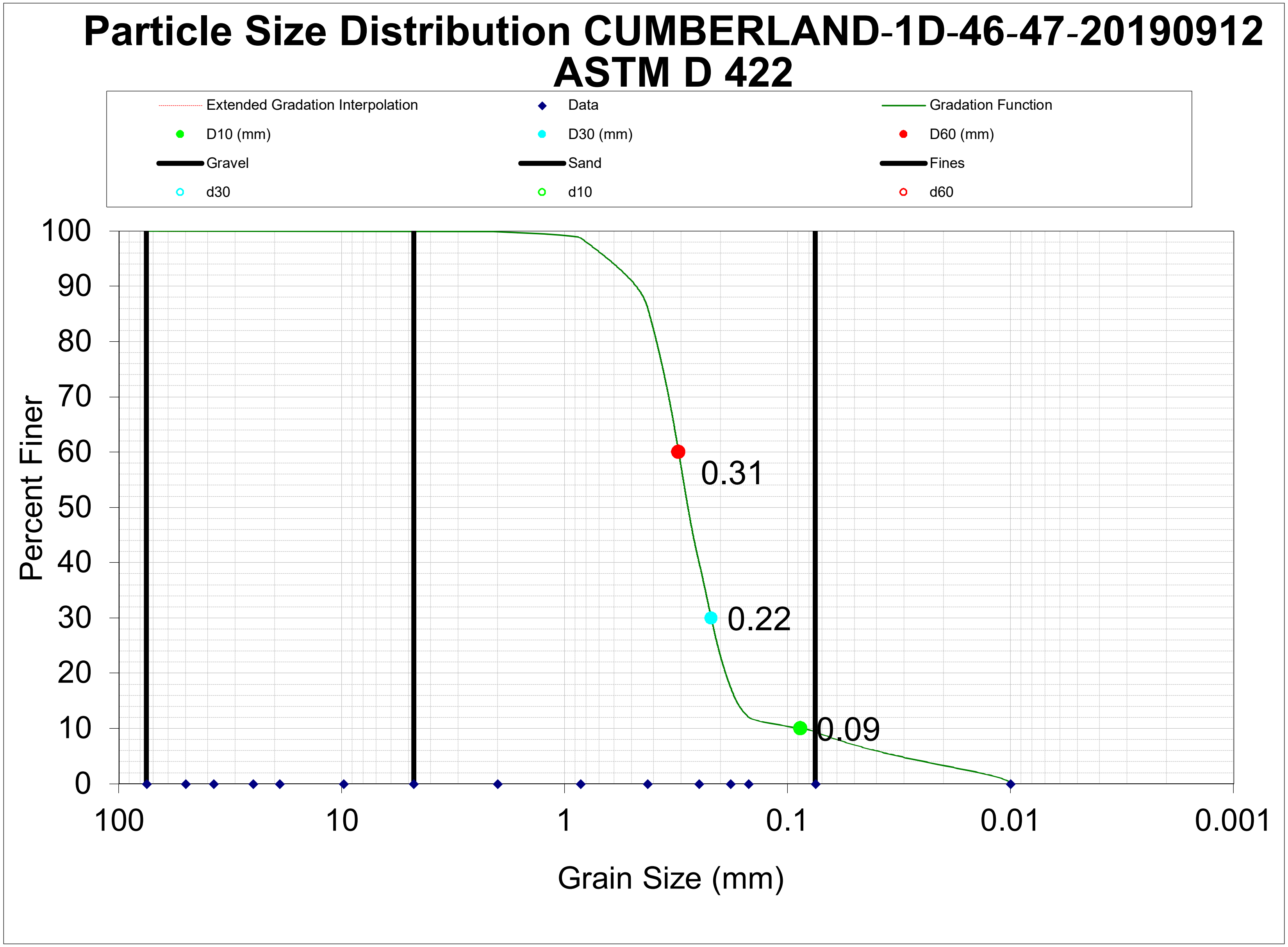
Sample Name: Robeson-1S-soil-15-16-20190909

Mass Sample (g): 100 T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.870E-02	.870E-04	7.52	24.66
Hazen K (cm/s) = d_{10} (mm)	.580E-02	.580E-04	5.01	16.44
Slichter	.312E-02	.312E-04	2.69	8.83
Terzaghi	.547E-02	.547E-04	4.73	15.50
Beyer	.684E-02	.684E-04	5.91	19.38
Sauerbrei	.845E-02	.845E-04	7.30	23.95
Kruger	.982E-02	.982E-04	8.49	27.85
Kozeny-Carmen	.144E-01	.144E-03	12.43	40.77
Zunker	.868E-02	.868E-04	7.50	24.59
Zamarin	.115E-01	.115E-03	9.97	32.72
USBR	.330E-02	.330E-04	2.85	9.35
Barr	.467E-02	.467E-04	4.03	13.24
Alyamani and Sen	.429E-02	.429E-04	3.71	12.16
Chapuis	.611E-02	.611E-04	5.28	17.31
Krumbein and Monk	.694E-02	.694E-04	5.99	19.67
geometric mean	.641E-02	.641E-04	5.54	18.18
arithmetic mean	.664E-02	.664E-04	5.74	18.83


Particle Size Distribution CUMBERLAND-1D-46-47-20190912
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.31
0.22
0.09
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report

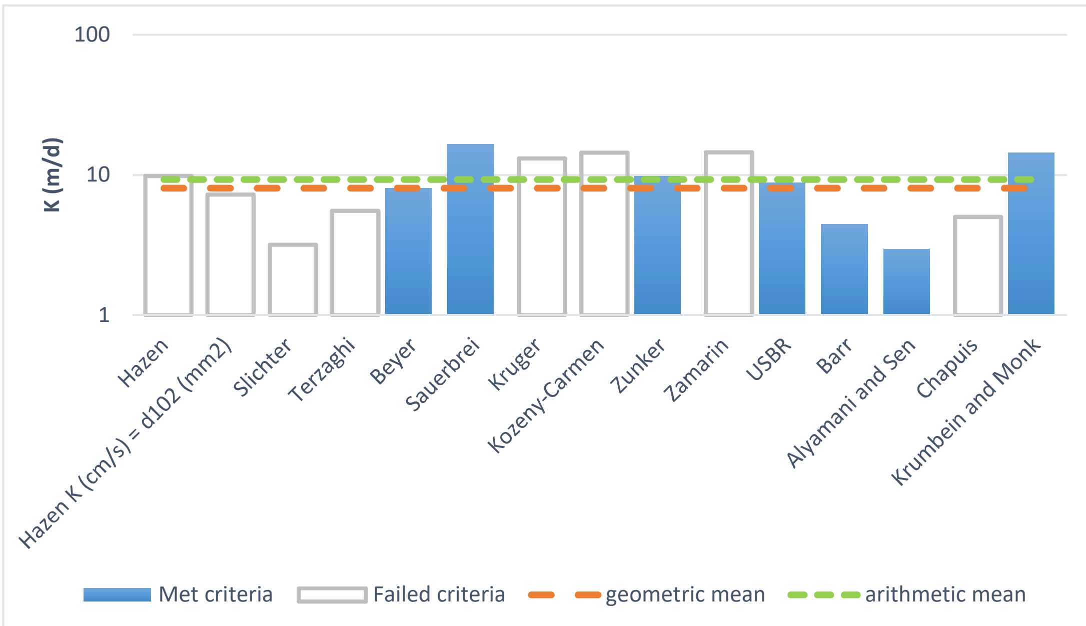
Date: 10/24/2019

Sample Name: CUMBERLAND-1D-46-47-20190912

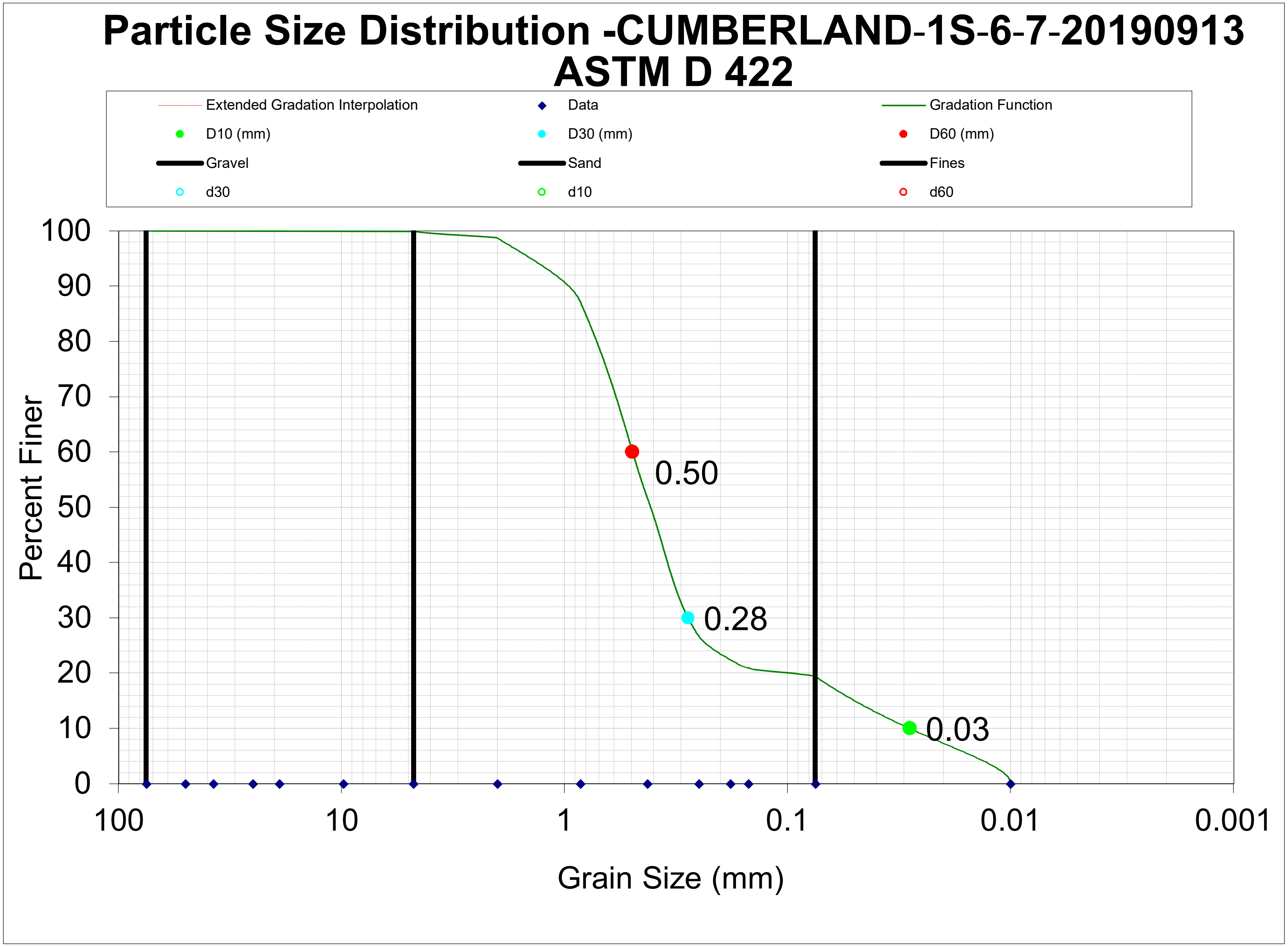
Mass Sample (g): 100

T (oC) 20

Moderately well sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.113E-01	.113E-03	9.81	32.17
Hazen K (cm/s) = d_{10} (mm)	.840E-02	.840E-04	7.26	23.82
Slichter	.367E-02	.367E-04	3.17	10.41
Terzaghi	.640E-02	.640E-04	5.53	18.13
Beyer	.933E-02	.933E-04	8.06	26.44
Sauerbrei	.190E-01	.190E-03	16.44	53.95
Kruger	.152E-01	.152E-03	13.15	43.13
Kozeny-Carmen	.167E-01	.167E-03	14.45	47.40
Zunker	.113E-01	.113E-03	9.77	32.04
Zamarin	.168E-01	.168E-03	14.50	47.57
USBR	.102E-01	.102E-03	8.82	28.93
Barr	.515E-02	.515E-04	4.45	14.61
Alyamani and Sen	.342E-02	.342E-04	2.95	9.69
Chapuis	.580E-02	.580E-04	5.02	16.45
Krumbein and Monk	.166E-01	.166E-03	14.36	47.10
geometric mean	.929E-02	.929E-04	8.03	26.35
arithmetic mean	.107E-01	.107E-03	9.26	30.39

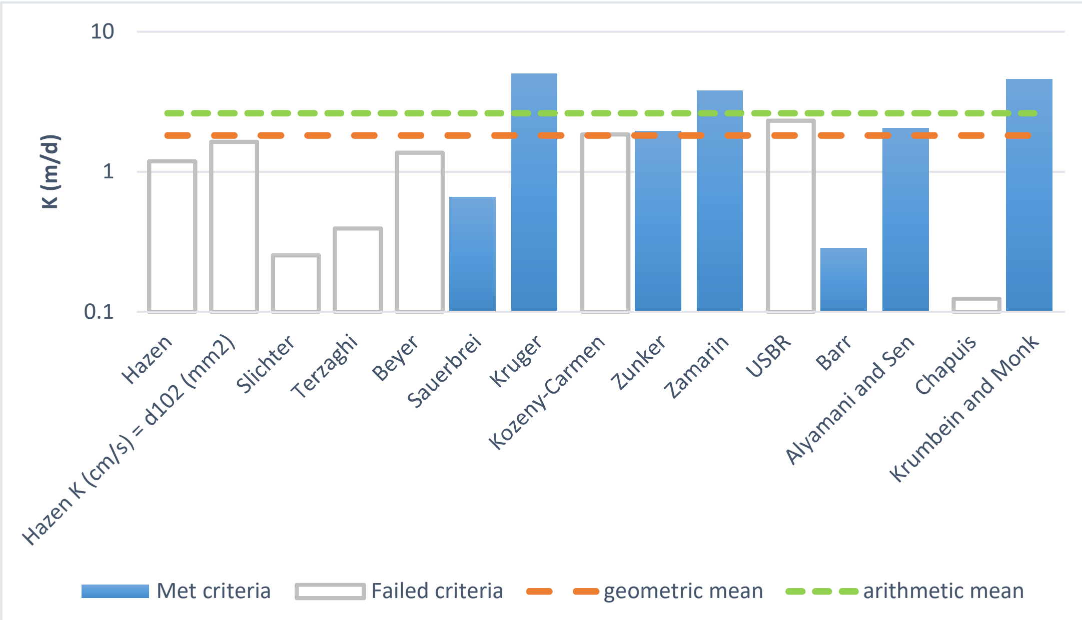

Particle Size Distribution -CUMBERLAND-1S-6-7-20190913
ASTM D 422
Extended Gradation Interpolation
Data
Gradation Function
D10 (mm)
D30 (mm)
D60 (mm)
Gravel
Sand
Fines
d30
d10
d60
Percent Finer
100
90
80
70
60
50
40
30
20
10
0
0.50
0.28
0.03
100
10
1
0.1
0.01
0.001
Grain Size (mm)

K from Grain Size Analysis Report — Date: 10/24/2019

Sample Name: CUMBERLAND-1S-6-7-20190913

Mass Sample (g): 100 — T (oC) 20

Poorly sorted sand low in fines



Estimation of Hydraulic Conductivity	cm/s	m/s	m/d	ft/d
Hazen	.138E-02	.138E-04	1.19	3.90
Hazen K (cm/s) = d_{10} (mm)	.189E-02	.189E-04	1.64	5.37
Slichter	.293E-03	.293E-05	0.25	0.83
Terzaghi	.455E-03	.455E-05	0.39	1.29
Beyer	.158E-02	.158E-04	1.37	4.48
Sauerbrei	.765E-03	.765E-05	0.66	2.17
Kruger	.582E-02	.582E-04	5.03	16.50
Kozeny-Carmen	.213E-02	.213E-04	1.84	6.05
Zunker	.226E-02	.226E-04	1.95	6.40
Zamarin	.438E-02	.438E-04	3.78	12.41
USBR	.267E-02	.267E-04	2.31	7.58
Barr	.329E-03	.329E-05	0.28	0.93
Alyamani and Sen	.237E-02	.237E-04	2.04	6.71
Chapuis	.143E-03	.143E-05	0.12	0.41
Krumbein and Monk	.531E-02	.531E-04	4.58	15.04
geometric mean	.210E-02	.210E-04	1.82	5.96
arithmetic mean	.303E-02	.303E-04	2.62	8.59

APPENDIX I
Historical Groundwater Data

TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-01	BCA-01	BCA-01	BCA-01
Field Sample ID	FAY-GWNEW-BCA-01	FAY-GWNEW-BCA-01-1	FAY-GWNEW-BCA-01-2	BCA-01-030618
Sample Date	12/7/2017	12/7/2017	12/7/2017	3/6/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**9,900 J**	--	--	**7,700**
PFMOAA	--	**58,000**	**58,000**	--
PFO2HxA	--	**18,000**	**18,000**	--
PFO3OA	--	**2,200**	**2,100**	--
PFO4DA	--	<200	<200	--
PFO5DA	--	<200	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	<200	<200	--
PFESA-BP2	--	<200	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	<2	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	<2	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**4.6**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	--
Perfluorohexanoic Acid	**7.4**	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**350**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	<2	--	--	--
PFOA	<2	--	--	--
PFOS	<2	--	--	--

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-01	BCA-01	BCA-02	BCA-02
Field Sample ID	GW0718-BCA-01	GW0619-BCA-01	FAY-GWNEW-BCA-02	FAY-GWNEW-BCA-02-1
Sample Date	7/24/2018	7/8/2019	12/11/2017	12/11/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**7,900 J**	**9,700**	**9,900**	--
PFMOAA	**61,000**	**70,000**	--	**120,000**
PFO2HxA	**19,000**	**22,000**	--	**33,000**
PFO3OA	**2,700**	**3,000**	--	**9,200**
PFO4DA	<200	**79**	--	**3,100**
PFO5DA	<200	<34	--	**790**
PMPA	**4,100**	**5,900**	--	--
PEPA	**830**	**1,400**	--	--
PFESA-BP1	<200	<27	--	<200
PFESA-BP2	<200	<30	--	**340**
Byproduct 4	--	**300**	--	--
Byproduct 5	--	**1,100**	--	--
Byproduct 6	--	<15	--	--
NVHOS	--	**570**	--	--
EVE Acid	--	<24	--	--
Hydro-EVE Acid	--	<28	--	--
R-EVE	--	**230**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<200	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.7	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.2	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6 UJ	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6 UJ	--	--	--
6:2 Fluorotelomer sulfonate	**8.8**	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.85 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<7.7 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.7 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<20	--
Perfluorobutane Sulfonic Acid	<0.86	<2	**4**	--
Perfluorobutanoic Acid	**56**	**70**	--	--
Perfluorodecane Sulfonic Acid	<1.7	<2	--	--
Perfluorodecanoic Acid	<1.7	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<0.86	<2	--	--
Perfluorododecanoic Acid	<1.7	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<2	--	--
Perfluoroheptanoic Acid	**6.4**	**8.7**	**39**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.86	--	--	--
Perfluorohexane Sulfonic Acid	<1.7	<2	**5.3**	--
Perfluorohexanoic Acid	**6.8**	**7.9**	**24**	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	<1.7	<2	**10**	--
Perfluorooctadecanoic acid	<1.7	<2	--	--
Perfluorooctane Sulfonamide	<2.6 UJ	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<2	--	--
Perfluoropentanoic Acid	**300**	**280**	**150**	--
Perfluorotetradecanoic Acid	<0.86	<2	<2	--
Perfluorotridecanoic Acid	<0.86	<2	<2	--
Perfluoroundecanoic Acid	<1.7	<2	<2	--
PFOA	<0.86	<2	**25**	--
PFOS	<1.7	<2	**3.7**	--

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-02	BCA-02	BCA-02	BCA-02
Field Sample ID	FAY-GWNEW-BCA-02-2	BCA-02-030518	GW0718-BCA-02	GW0619-BCA-02-D
Sample Date	12/11/2017	3/5/2018	7/31/2018	7/9/2019
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**11,000**	**15,000 J**	**12,000 J**
PFMOAA	**120,000**	--	**180,000**	**110,000**
PFO2HxA	**33,000**	--	**50,000**	**26,000**
PFO3OA	**9,900**	--	**14,000**	**8,600**
PFO4DA	**3,300**	--	**3,600**	**3,300**
PFO5DA	**740**	--	**970 J**	**610**
PMPA	--	--	**8,700**	**6,700**
PEPA	--	--	**3,000**	**2,300**
PFESA-BP1	<200	--	<580	**60**
PFESA-BP2	**400**	--	**490**	**420**
Byproduct 4	--	--	--	**720**
Byproduct 5	--	--	--	**2,000**
Byproduct 6	--	--	--	**18**
NVHOS	--	--	--	**1,000**
EVE Acid	--	--	--	**24**
Hydro-EVE Acid	--	--	--	**1,400**
R-EVE	--	--	--	**500**
PES	--	--	--	<46
PFECA B	--	--	--	<60
PFECA-G	--	--	<480	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.1	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.4	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	--
6:2 Fluorotelomer sulfonate	--	--	**4.1**	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.92 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
Perfluorobutane Sulfonic Acid	--	--	**3**	**2.9**
Perfluorobutanoic Acid	--	--	**130**	**120**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.9	<2
Perfluorododecanoic Acid	--	--	<1.8	**3.8**
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**50**	**46**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.9	--
Perfluorohexane Sulfonic Acid	--	--	**5.8**	**5.2**
Perfluorohexanoic Acid	--	--	**28**	**24**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	**11**	**11**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.7	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	--	--	**250**	**170**
Perfluorotetradecanoic Acid	--	--	<0.9	<2
Perfluorotridecanoic Acid	--	--	<0.9	**2**
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**33**	**32**
PFOS	--	--	**3.9**	**4.2**

Notes:
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I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-02	BCA-03	BCA-03	BCA-03
Field Sample ID	GW0619-BCA-02	FAY-GWNEW-BCA-03	FAY-GWNEW-BCA-03-1	FAY-GWNEW-BCA-03-2
Sample Date	7/9/2019	12/11/2017	12/11/2017	12/11/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**18,000 J**	**9,700**	--	--
PFMOAA	**120,000**	--	**220,000**	**190,000**
PFO2HxA	**29,000**	--	**78,000**	**74,000**
PFO3OA	**8,600**	--	**18,000**	**17,000**
PFO4DA	**4,000**	--	**2,900**	**2,800**
PFO5DA	**590**	--	<200	<200
PMPA	**7,300**	--	--	--
PEPA	**2,500**	--	--	--
PFESA-BP1	**80**	--	<200	<200
PFESA-BP2	**520**	--	<200	**220**
Byproduct 4	**810**	--	--	--
Byproduct 5	**2,100**	--	--	--
Byproduct 6	**19**	--	--	--
NVHOS	**1,100**	--	--	--
EVE Acid	**27**	--	--	--
Hydro-EVE Acid	**1,600**	--	--	--
R-EVE	**560**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
Perfluorobutane Sulfonic Acid	**2.8**	**2**	--	--
Perfluorobutanoic Acid	**120**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	<2	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**46**	**71**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**5**	**2.4**	--	--
Perfluorohexanoic Acid	**25**	**27**	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	**10**	<2	--	--
Perfluorooctadecanoic acid	<2 UJ	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**170**	**410**	--	--
Perfluorotetradecanoic Acid	<2	<2	--	--
Perfluorotridecanoic Acid	<2	<2	--	--
Perfluoroundecanoic Acid	<2	<2	--	--
PFOA	**30**	**11**	--	--
PFOS	**3.4**	<2	--	--

Notes:
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EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**
LocID	**BCA-03**	**BCA-03**	**BCA-03R**	**BCA-04**
Field Sample ID	**BCA-03-030118**	**GW0718-BCA-03**	**BCA-03R-091219**	**FAY-GWNEW-BCA-04**
Sample Date	**3/1/2018**	**8/1/2018**	**9/12/2019**	**12/7/2017**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**12,000**	**16,000 J**	**12,000**	<130
PFMOAA	--	**410,000**	**330,000**	--
PFO2HxA	--	**99,000**	**69,000**	--
PFO3OA	--	**27,000**	**15,000**	--
PFO4DA	--	**3,700**	**1,200**	--
PFO5DA	--	<1,100	<170	--
PMPA	--	**34,000**	**29,000**	--
PEPA	--	**7,200**	**7,100**	--
PFESA-BP1	--	<1,200	**200**	--
PFESA-BP2	--	<950	**160**	--
Byproduct 4	--	--	**2,000**	--
Byproduct 5	--	--	**19,000**	--
Byproduct 6	--	--	<77	--
NVHOS	--	--	**2,400**	--
EVE Acid	--	--	<120	--
Hydro-EVE Acid	--	--	**200**	--
R-EVE	--	--	**730**	--
PES	--	--	<230	--
PFECA B	--	--	<300	--
PFECA-G	--	<960	<200	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.7	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.1	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	<2	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	<4	--
6:2 Fluorotelomer sulfonate	--	**3.3**	<20	--
ADONA	--	--	<2.1	--
NaDONA	--	<0.92 UJ	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<7.7 UJ	<2	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.7 UJ	<2	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
Perfluorobutane Sulfonic Acid	--	**1.4 J**	<2	<2
Perfluorobutanoic Acid	--	**170**	**160**	--
Perfluorodecane Sulfonic Acid	--	<1.7	<2	--
Perfluorodecanoic Acid	--	<1.7	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	<0.85	<2	--
Perfluorododecanoic Acid	--	<1.7	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.7	<2	--
Perfluoroheptanoic Acid	--	**85**	**72**	<2
Perfluorohexadecanoic acid (PFHxDA)	--	<0.85	<2	--
Perfluorohexane Sulfonic Acid	--	**2.4**	<2	<2
Perfluorohexanoic Acid	--	**36**	**24**	<2
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.7	<2	<2
Perfluorooctadecanoic acid	--	<1.7	<2	--
Perfluorooctane Sulfonamide	--	<2.6	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.7	<2	--
Perfluoropentanoic Acid	--	**740 J**	**600**	<2
Perfluorotetradecanoic Acid	--	<0.85	<2	<2
Perfluorotridecanoic Acid	--	<0.85	<2	<2
Perfluoroundecanoic Acid	--	<1.7	<2	<2
PFOA	--	**19**	**5.8**	<2
PFOS	--	<1.7	<2	<2

Notes:
Bold - Analyte detected above associated reporting limit
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
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SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-04	BCA-04	BCA-04	BCA-04
Field Sample ID	FAY-GWNEW-BCA-04-1	FAY-GWNEW-BCA-04-2	BCA-04-030718	GW0718-BCA-04
Sample Date	12/7/2017	12/7/2017	3/7/2018	7/31/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	<10	**5.5**
PFMOAA	<200	<200	--	--
PFO2HxA	<200	<200	--	--
PFO3OA	<200	<200	--	--
PFO4DA	<200	<200	--	--
PFO5DA	<200	<200	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	<200	<200	--	--
PFESA-BP2	<200	<200	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<7.7
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<5.1
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<2.6
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
6:2 Fluorotelomer sulfonate	--	--	--	<1.7
ADONA	--	--	--	--
NaDONA	--	--	--	<0.87
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<2.6
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<7.7 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<7.7 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<2.6
Perfluorobutane Sulfonic Acid	--	--	--	<0.85
Perfluorobutanoic Acid	--	--	--	<5.1
Perfluorodecane Sulfonic Acid	--	--	--	<1.7
Perfluorodecanoic Acid	--	--	--	<1.7
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<0.85
Perfluorododecanoic Acid	--	--	--	<1.7
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<1.7
Perfluoroheptanoic Acid	--	--	--	<0.85
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.85
Perfluorohexane Sulfonic Acid	--	--	--	<1.7
Perfluorohexanoic Acid	--	--	--	<1.7
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<1.7
Perfluorooctadecanoic acid	--	--	--	<1.7
Perfluorooctane Sulfonamide	--	--	--	<2.6 UJ
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<1.7
Perfluoropentanoic Acid	--	--	--	<5.1
Perfluorotetradecanoic Acid	--	--	--	<0.85
Perfluorotridecanoic Acid	--	--	--	<0.85
Perfluoroundecanoic Acid	--	--	--	<1.7
PFOA	--	--	--	<0.85
PFOS	--	--	--	<1.7

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	BCA-04	LTW-02	LTW-02	LTW-02
Field Sample ID	GW0619-BCA-04	16194459	17652865	19594831
Sample Date	7/9/2019	2/2/2006	2/13/2007	2/27/2008
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**6.9**	--	--	--
PFMOAA	<5	--	--	--
PFO2HxA	<2	--	--	--
PFO3OA	<2	--	--	--
PFO4DA	<2	--	--	--
PFO5DA	<2	--	--	--
PMPA	**20**	--	--	--
PEPA	<20	--	--	--
PFESA-BP1	<2	--	--	--
PFESA-BP2	<2	--	--	--
Byproduct 4	<2	--	--	--
Byproduct 5	<2	--	--	--
Byproduct 6	<2	--	--	--
NVHOS	<2	--	--	--
EVE Acid	<2	--	--	--
Hydro-EVE Acid	<2	--	--	--
R-EVE	<2	--	--	--
PES	<2	--	--	--
PFECA B	<2	--	--	--
PFECA-G	<2	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	<2	--	--	--
Perfluorobutanoic Acid	<2	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	<2	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	<2	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	--
Perfluorohexanoic Acid	<2	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2	--	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	<2	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	<2	--	--	--
PFOA	<2	<2.3	<1	<2.2
PFOS	<2	--	--	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-02	LTW-02	LTW-02	LTW-02
Field Sample ID	21774366	25508009	28515652	P32013-LTW-02
Sample Date	3/25/2009	3/1/2011	3/13/2012	6/6/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<2.6	<2.8	<2.2	**4.5**
PFOS	--	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-02	LTW-02	LTW-02	LTW-02
Field Sample ID	GW0314-LTW-02-D	GW0314-LTW-02	GW0915-LTW-02DIL-D	GW0915-LTW-02
Sample Date	4/3/2014	4/3/2014	9/16/2015	9/16/2015
QA/QC	Field Duplicate	--	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	<2,000	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	<2,000	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	<2,000	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<5	<5	--	<5
PFOS	--	--	--	--

Notes:
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Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-02	LTW-02	LTW-02	LTW-02
Field Sample ID	GW0915-LTW-02DIL	GW0817-LTW-02	FAY-GWASI-LTW-02	FAY-GWASI-LTW-02-1
Sample Date	9/16/2015	8/2/2017	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**9,700**	**6,800**	--
PFMOAA	--	--	--	**31,000**
PFO2HxA	--	--	--	**15,000**
PFO3OA	--	--	--	**3,000**
PFO4DA	--	--	--	<200
PFO5DA	--	--	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	<200
PFESA-BP2	--	--	--	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	<2,000	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	<2,000	**14**	**10**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	**11**	**8.1**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	<2,000	**240**	**240**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	--	<2	<2	--
PFOS	--	<2	<2	--

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-02	LTW-02	LTW-02	LTW-02
Field Sample ID	FAY-GWASI-LTW-02-2	FAY-DRY01-LTW-02	FAY-WET01-LTW-02-012918	FAY-D-LTW-02-050918
Sample Date	11/16/2017	1/16/2018	1/29/2018	5/9/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**650**	**7,200**	**9,400**
PFMOAA	**32,000**	--	--	**31,000**
PFO2HxA	**16,000**	--	--	**14,000**
PFO3OA	**3,100**	--	--	**2,800**
PFO4DA	<200	--	--	**180 J**
PFO5DA	<200	--	--	<110
PMPA	--	--	--	**5,700**
PEPA	--	--	--	**1,700**
PFESA-BP1	<200	--	--	<120
PFESA-BP2	<200	--	--	<95
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	**62**
Perfluorodecane Sulfonic Acid	--	--	--	<2
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<2
Perfluoroheptanoic Acid	--	--	--	**11**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**8.2**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<2
Perfluoropentanoic Acid	--	--	--	**250**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	--	--	--	<2
PFOS	--	--	--	<2

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
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QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-02	LTW-02	LTW-02	LTW-05
Field Sample ID	GW0718-LTW-02	PF1018-LTW-02	GW0619-LTW-02	16194590
Sample Date	7/16/2018	10/31/2018	7/17/2019	2/2/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**7,200 J**	**8,300**	**9,500**	--
PFMOAA	**34,000**	**44,000 J**	**38,000**	--
PFO2HxA	**15,000**	**15,000 J**	**16,000**	--
PFO3OA	**2,900**	<8,800 UJ	**3,000**	--
PFO4DA	**190 J**	<9,700 UJ	**250**	--
PFO5DA	<110	<11,000 UJ	<34	--
PMPA	**6,400**	<8,400 UJ	**6,500**	--
PEPA	**1,800**	<10,000 UJ	**2,100**	--
PFESA-BP1	<120	<12,000 UJ	<27	--
PFESA-BP2	<95	<9,500 UJ	**30**	--
Byproduct 4	--	--	**490 J**	--
Byproduct 5	--	--	**1,200**	--
Byproduct 6	--	--	<15	--
NVHOS	--	--	**370**	--
EVE Acid	--	--	<24	--
Hydro-EVE Acid	--	--	**45**	--
R-EVE	--	--	**420**	--
PES	--	--	<46	--
PFECA B	--	--	<60	--
PFECA-G	<96	<9,600 UJ	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.8	<2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.2	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	<45	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6 UJ	<2,300 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6 UJ	<1,700 UJ	--	--
6:2 Fluorotelomer sulfonate	<1.7	<20	<20	--
ADONA	--	<2.1	--	--
NaDONA	<0.89 UJ	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<7.8 UJ	<8,200 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.8 UJ	<5,200 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<27	--
Perfluorobutane Sulfonic Acid	<0.87	<2	<2	--
Perfluorobutanoic Acid	**55**	**67**	**71**	--
Perfluorodecane Sulfonic Acid	<1.7	<2	<2.7	--
Perfluorodecanoic Acid	<1.7	<2	<2.7	--
Perfluorododecane sulfonic acid (PFDoS)	<0.87	<2	<3.9	--
Perfluorododecanoic Acid	<1.7	<2	<4.7	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<2	<2	--
Perfluoroheptanoic Acid	**10**	**12**	**13**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.87	<2	--	--
Perfluorohexane Sulfonic Acid	<1.7	<2	<2	--
Perfluorohexanoic Acid	**8.4**	**8.6**	**10**	--
Perfluorononanesulfonic acid	--	<2	<2	--
Perfluorononanoic Acid	<1.7	<2	<2.3	--
Perfluorooctadecanoic acid	<1.7	<2	<3.9	--
Perfluorooctane Sulfonamide	<2.6 UJ	<2	<3	--
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<2	<2.6	--
Perfluoropentanoic Acid	**260**	**250**	**290**	--
Perfluorotetradecanoic Acid	<0.87	<2	<2.5	--
Perfluorotridecanoic Acid	<0.87	<2	<11	--
Perfluoroundecanoic Acid	<1.7	<2	<9.4	--
PFOA	<0.87	<2	<7.3	<2.3
PFOS	<1.7	<2	<4.6	--

Notes:
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SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	LTW-05
Field Sample ID	17652871	19594837	21774372	23547870
Sample Date	2/13/2007	2/28/2008	3/26/2009	3/24/2010
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<1	<2.2	<2.6	<3.5
PFOS	--	--	--	--

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	LTW-05
Field Sample ID	25508015	28515658	GW0314-LTW-05	GW0915-LTW-05
Sample Date	3/2/2011	3/14/2012	4/3/2014	9/16/2015
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<2.8	<2.2	<5	<5
PFOS	--	--	--	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	LTW-05
Field Sample ID	GW0915-LTW-05DIL	GW0317-LTW-05-D-DIL	GW0317-LTW-05-DIL	GW0617-LTW-05-D-DIL
Sample Date	9/16/2015	3/9/2017	3/9/2017	6/15/2017
QA/QC	--	Field Duplicate	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	<2,000	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	<2,000	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**11,000**	**3,800**	**2,900**	**4,300**
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	--	--	--	--
PFOS	--	--	--	--

Notes:
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Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	LTW-05
Field Sample ID	GW0617-LTW-05-DIL	GW0817-LTW-05	FAY-GWASI-LTW-05	FAY-GWASI-LTW-05-1
Sample Date	6/15/2017	8/2/2017	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**50,000 J**	**45,000**	--
PFMOAA	--	--	--	**260,000**
PFO2HxA	--	--	--	**140,000**
PFO3OA	--	--	--	**42,000**
PFO4DA	--	--	--	**4,200**
PFO5DA	--	--	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	<200
PFESA-BP2	--	--	--	**390**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**660**	**550**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	**170**	**170**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**5,100**	**3,100**	**3,900**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	--	**3.2**	**3**	--
PFOS	--	<2	<2	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	LTW-05
Field Sample ID	FAY-GWASI-LTW-05-2	FAY-DRY01-LTW-05	FAY-WET01-LTW-05-012918	FAY-D-LTW-05-051018
Sample Date	11/16/2017	1/16/2018	1/29/2018	5/10/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**37,000**	**41,000**	**10,000**
PFMOAA	**260,000**	--	--	**250,000**
PFO2HxA	**130,000**	--	--	**79,000**
PFO3OA	**43,000**	--	--	**32,000**
PFO4DA	**3,900**	--	--	**3,000**
PFO5DA	<200	--	--	<110
PMPA	--	--	--	**7,900**
PEPA	--	--	--	**650**
PFESA-BP1	<200	--	--	<120
PFESA-BP2	**430**	--	--	**270**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	**470**
Perfluorodecane Sulfonic Acid	--	--	--	<2
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<2
Perfluoroheptanoic Acid	--	--	--	**540**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**140**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<2
Perfluoropentanoic Acid	--	--	--	**3,600**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	--	--	--	**2.8**
PFOS	--	--	--	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	LTW-05	LTW-05	LTW-05	PIW-10DR
Field Sample ID	GW0718-LTW05	PF1018-LTW-05	GW0619-LTW-05	PIW-10DR-091019
Sample Date	7/11/2018	11/12/2018	7/16/2019	9/10/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**24,000 J**	**33,000**	**26,000 B**	**19,000**
PFMOAA	**270,000**	**260,000 J**	**240,000**	**45,000**
PFO2HxA	**95,000**	<92,000 UJ	**68,000**	**19,000**
PFO3OA	**35,000**	<88,000 UJ	**22,000**	**6,000**
PFO4DA	**3,800**	<97,000 UJ	**2,900**	**1,200 J**
PFO5DA	<1,100	<110,000 UJ	<340	<34 UJ
PMPA	**9,000 J**	<84,000 UJ	<5,700	**9,100**
PEPA	<1,000	<100,000 UJ	<470	**3,400**
PFESA-BP1	<1,200	<120,000 UJ	<270	<27
PFESA-BP2	<950	<95,000 UJ	**310**	**160 J**
Byproduct 4	--	--	**1,600**	**1,500**
Byproduct 5	--	--	**3,100**	**6,400 J**
Byproduct 6	--	--	<150	**15**
NVHOS	--	--	**1,900**	**510**
EVE Acid	--	--	<240	<24
Hydro-EVE Acid	--	--	**1,400**	**790 J**
R-EVE	--	--	**2,100**	**1,200**
PES	--	--	<460	<46
PFECA B	--	--	<600	<60
PFECA-G	<960	<96,000 UJ	<410	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.9	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	<23,000 UJ	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	<17,000 UJ	--	<4
6:2 Fluorotelomer sulfonate	<1.8	<20	<20	**34**
ADONA	--	<2.1	--	<2.1
NaDONA	<0.9 UJ	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<7.9 UJ	<82,000 UJ	--	<2
N-methyl perfluoro-1-octanesulfonamide	<7.9 UJ	<52,000 UJ	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	<20	<20
Perfluorobutane Sulfonic Acid	<0.88	<2	<2	<2
Perfluorobutanoic Acid	**340**	**400**	**330**	**240**
Perfluorodecane Sulfonic Acid	<1.8	<2	<2	<2
Perfluorodecanoic Acid	<1.8	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<0.88	<2	<2	<2
Perfluorododecanoic Acid	<1.8	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	<2	<2
Perfluoroheptanoic Acid	**440**	**280**	**360**	**120**
Perfluorohexadecanoic acid (PFHxDA)	<0.88	<2	--	<2
Perfluorohexane Sulfonic Acid	<1.8	<2	<2	<2
Perfluorohexanoic Acid	**120**	**120**	**100**	**56**
Perfluorononanesulfonic acid	--	<2	<2	<2
Perfluorononanoic Acid	<1.8	<2	<2	<2
Perfluorooctadecanoic acid	<1.8	<2	<2	<2
Perfluorooctane Sulfonamide	<2.6	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	<2	<2
Perfluoropentanoic Acid	**3,100**	**3,100**	**2,600**	**750**
Perfluorotetradecanoic Acid	<0.88	<2	<2	<2
Perfluorotridecanoic Acid	<0.88	<2	<2	<2
Perfluoroundecanoic Acid	<1.8	<2	<2	<2
PFOA	**4.4**	**3.3**	**3.6**	**2.9**
PFOS	<1.8	<2	<2	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	PIW-2D	PIW-2D	PIW-3D	PIW-4D
Field Sample ID	PIW-2D-091219	PIW-2D-091219-Z	GW0619-PIW-3D	PIW-04D-091119
Sample Date	9/12/2019	9/12/2019	7/18/2019	9/11/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,800**	**1,800**	**9,600**	**6.7**
PFMOAA	**14,000**	**13,000**	**5,400**	<210
PFO2HxA	**2,900**	**3,000**	**9,100**	<81
PFO3OA	**100**	**100**	**1,700**	<58
PFO4DA	<79	<79	**780**	<79
PFO5DA	<34	<34	**95**	<34
PMPA	**1,300**	**1,200**	**12,000**	<570
PEPA	**92**	**89**	**4,400**	<47
PFESA-BP1	<27	<27	<2.7	<27
PFESA-BP2	<30	<30	**150**	<30
Byproduct 4	<160	<160	**500**	<160
Byproduct 5	<58	<58	<5.8	<58
Byproduct 6	<15	<15	**5.1**	<15
NVHOS	**110 J**	**130**	**83**	<54
EVE Acid	<24	<24	<2.4	<24
Hydro-EVE Acid	<28	<28	**52**	<28
R-EVE	<70	<70	**290**	<70
PES	<46	<46	<4.6	<46
PFECA B	<60	<60	<6	<60
PFECA-G	<41	<41	<4.1	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<52	<52	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<8.5	<8.5	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<14	<14	--	<4
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	<2.1	--	<2.1
NaDONA	<2.1	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<8.7	<8.7	--	<2
N-methyl perfluoro-1-octanesulfonamide	<4.3	<4.3	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<31	<31	<20	<20
Perfluorobutane Sulfonic Acid	<2	<2	**2.2**	<2
Perfluorobutanoic Acid	**18**	**19**	**84**	<2
Perfluorodecane Sulfonic Acid	<3.2	<3.2	<2	<2
Perfluorodecanoic Acid	<3.1	<3.1	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<4.5	<4.5	<2	<2
Perfluorododecanoic Acid	<5.5	<5.5	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	<2.5	<2.5	**30**	<2
Perfluorohexadecanoic acid (PFHxDA)	<8.9	<8.9	--	<2
Perfluorohexane Sulfonic Acid	**3**	**3.5**	**3.1**	<2
Perfluorohexanoic Acid	<5.8	<5.8	**21**	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	<2.7	<2.7	**4.2**	<2
Perfluorooctadecanoic acid	<4.6	<4.6	<2	<2
Perfluorooctane Sulfonamide	<3.5	<3.5	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<3	<3	<2	<2
Perfluoropentanoic Acid	**70**	**76**	**130**	<2
Perfluorotetradecanoic Acid	<2.9	**3.1**	<2	<2
Perfluorotridecanoic Acid	<13	<13	<2	<2
Perfluoroundecanoic Acid	<11	<11	<2	<2
PFOA	<8.5	<8.5	**35**	<2
PFOS	<5.4	<5.4	**9.5**	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Floodplain Deposits	Black Creek Aquifer	Black Creek Aquifer
LocID	PIW-7D	PIW-7S	PIW-8D	PIW-9D
Field Sample ID	GW0619-PIW-7D	GW0619-PIW-7S	GW0619-PIW-8D	GW0619-PIW-9D
Sample Date	7/19/2019	7/19/2019	7/19/2019	7/23/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**11,000**	**1,400**	**54,000 J**	**33,000**
PFMOAA	**150,000**	**12,000**	**400,000**	**150,000**
PFO2HxA	**27,000**	**2,400**	**140,000**	**41,000**
PFO3OA	**2,400**	**180**	**51,000**	**12,000**
PFO4DA	**570**	<79	**7,200**	**3,100**
PFO5DA	<34	<34	<340	**84**
PMPA	**3,500**	**1,100**	**15,000**	**9,900**
PEPA	**530**	<47	**4,500**	**3,400**
PFESA-BP1	<27	<27	<270	**29**
PFESA-BP2	**53**	<30	**770**	**370**
Byproduct 4	**280**	<160	**4,400**	**1,900 J**
Byproduct 5	**690**	<58	**10,000**	**2,700**
Byproduct 6	<15	<15	<150	**18**
NVHOS	**810**	**88**	**3,600**	**1,700**
EVE Acid	<24	<24	<240	<24
Hydro-EVE Acid	**170 J**	<28	**3,700**	**1,600**
R-EVE	**350 J**	**130**	**4,500**	**1,700**
PES	<46	<46	<460	<46
PFECA B	<60	<60	<600	<60
PFECA-G	<41	<41	<410	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<38	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<44	<20	<98	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<38	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<36	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<26	<20	<58	<20
Perfluorobutane Sulfonic Acid	<2	<2	<3.8	<2
Perfluorobutanoic Acid	**100**	**26**	**930**	**240**
Perfluorodecane Sulfonic Acid	<2.7	<2	<6	<2
Perfluorodecanoic Acid	<2.6	<2	<5.8	<2
Perfluorododecane sulfonic acid (PFDoS)	<3.8	<2	<8.5	<2
Perfluorododecanoic Acid	<4.6	<2	<10	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<3.6	<2
Perfluoroheptanoic Acid	**41**	<2	**920**	**100**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<3.2	<2
Perfluorohexanoic Acid	**14**	<2	**290**	**81**
Perfluorononanesulfonic acid	<2	<2	<3	<2
Perfluorononanoic Acid	<2.3	<2	<5.1	<2
Perfluorooctadecanoic acid	<3.9	<2	<8.7	<2 UJ
Perfluorooctane Sulfonamide	<2.9	<2	<6.6	<2
Perfluoropentane sulfonic acid (PFPeS)	<2.5	<2	<5.6	<2
Perfluoropentanoic Acid	**820**	**130**	**3,900**	**790**
Perfluorotetradecanoic Acid	<2.4	<2	<5.5	<2
Perfluorotridecanoic Acid	<11	<2	<24	<2
Perfluoroundecanoic Acid	<9.2	<2	<21	<2
PFOA	<7.1	<2	<16	**17**
PFOS	<4.5	<2	<10	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	**PW-09**	**PW-09**	**PW-10R**	**PW-10R**
Field Sample ID	**PW-09-091119**	**PW-09-091119-Z**	**GW0619-PW-10R**	**GW0619-PW-10R-Z**
Sample Date	**9/11/2019**	**9/11/2019**	**9/19/2019**	**9/19/2019**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	<4	<4	**9,900**	**8,400**
PFMOAA	<210	<210	**130,000**	**120,000**
PFO2HxA	**170 J**	**160**	**23,000**	**22,000**
PFO3OA	<58	<58	**1,100**	**980**
PFO4DA	<79	<79	<79	<79
PFO5DA	<34	<34	<34	<34
PMPA	**1,600**	**1,900**	**3,200**	**3,100**
PEPA	**220**	**160**	**440**	**440**
PFESA-BP1	**160 J**	**79**	<27	<27
PFESA-BP2	**81**	**37**	<30	<30
Byproduct 4	<160	<160	<160	<160
Byproduct 5	**94**	**65 J**	**160**	**160**
Byproduct 6	<15	<15	<15	<15
NVHOS	<54	<54	**680**	**640**
EVE Acid	<24	<24	<24	<24
Hydro-EVE Acid	<28	<28	<28	<28
R-EVE	<70	<70	**230**	**210**
PES	<46	<46	<46	<46
PFECA B	<60	<60	<60	<60
PFECA-G	<41	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<22	<19
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<230	<200
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<600	<530
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	<60	<87
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	<110	<140
6:2 Fluorotelomer sulfonate	<20	<20	<230	<200
ADONA	<2.1	<2.1	--	--
NaDONA	<2.1	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<220	<190
N-ethylperfluoro-1-octanesulfonamide	<2	<2	<100	<89
N-methyl perfluoro-1-octanesulfonamide	<2	<2	<49	<35
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<350	<320
Perfluorobutane Sulfonic Acid	<2	<2	**130**	**95**
Perfluorobutanoic Acid	<2	<2	**66**	**67**
Perfluorodecane Sulfonic Acid	<2	<2	<37	<33
Perfluorodecanoic Acid	<2	<2	<35	<32
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<52	<46
Perfluorododecanoic Acid	<2	<2	<63	<56
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<22	<19
Perfluoroheptanoic Acid	<2	<2	<29	<26
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	<100	<91
Perfluorohexane Sulfonic Acid	<2	<2	<19	<17
Perfluorohexanoic Acid	<2	<2	<66	<59
Perfluorononanesulfonic acid	<2	<2	<18	<16
Perfluorononanoic Acid	<2	<2	<31	<28
Perfluorooctadecanoic acid	<2	<2	<53	<47
Perfluorooctane Sulfonamide	<2	<2	<40	<36
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<34	<31
Perfluoropentanoic Acid	<2	<2	**530**	**560**
Perfluorotetradecanoic Acid	<2	<2	<33	<30
Perfluorotridecanoic Acid	<2	<2	<150	<130
Perfluoroundecanoic Acid	<2	<2	<130	<110
PFOA	<2	<2	<97	<87
PFOS	<2	<2	<62	<55

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	PW-11	PW-11	PW-12	PW-12
Field Sample ID	PW-11-091019	PW-11-091019-Z	PW-12-091119	PW-12-091119-Z
Sample Date	9/10/2019	9/10/2019	9/11/2019	9/11/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**16,000**	**20,000**	<4	<4
PFMOAA	**280,000**	**310,000**	<5	<5
PFO2HxA	**56,000 J**	**59,000**	<2	<2
PFO3OA	**32,000 J**	**33,000**	<2	<2
PFO4DA	**16,000**	**16,000**	<2	<2
PFO5DA	**670 J**	**480**	<2	<2
PMPA	**8,200**	**9,000**	**15**	<10
PEPA	**3,100**	**3,200**	<20	<20
PFESA-BP1	**410**	**320**	<2	<2
PFESA-BP2	**910**	**720**	<2	<2
Byproduct 4	**1,400**	**1,700**	<2	<2
Byproduct 5	**3,200**	**3,300**	<2	<2
Byproduct 6	**93**	**78**	<2	<2
NVHOS	**3,000**	**3,100**	<2	<2
EVE Acid	<120	<120	<2	<2
Hydro-EVE Acid	**940**	**820**	<2	<2
R-EVE	**540**	**640**	<2	<2
PES	<230	<230	<2	<2
PFECA B	<300	<300	<2	<2
PFECA-G	<200	<200	<2	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<500	<48	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<82	<7.8	<2	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<13	<13	<4	<4
6:2 Fluorotelomer sulfonate	**21**	<20	<20	<20
ADONA	<2.1	<2.1	<2.1	<2.1
NaDONA	<2.1	<2.1	<2.1	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<84	<7.9	<2	<2
N-methyl perfluoro-1-octanesulfonamide	<4.1	<3.9	<2	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<300	<28	<20	<20
Perfluorobutane Sulfonic Acid	<2	**3.2**	<2	<2
Perfluorobutanoic Acid	**150**	**150**	<2	<2
Perfluorodecane Sulfonic Acid	<3.1	<2.9	<2	<2
Perfluorodecanoic Acid	<3	<2.8	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<4.3	<4.1	<2	<2
Perfluorododecanoic Acid	<5.3	<5	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**430**	**410**	<2	<2
Perfluorohexadecanoic acid (PFHxDA)	<8.6	<8.1	<2 UJ	<2 UJ
Perfluorohexane Sulfonic Acid	**3.5**	**5.1**	<2	<2
Perfluorohexanoic Acid	**39**	**35**	<2	<2
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.2**	**3.1**	<2	<2
Perfluorooctadecanoic acid	<4.4	<4.2	<2 UJ	<2 UJ
Perfluorooctane Sulfonamide	<3.4	<3.2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2.9	<2.7	<2	<2
Perfluoropentanoic Acid	**1,300**	**1,400**	<2	<2
Perfluorotetradecanoic Acid	<2.8	<2.6	<2	<2
Perfluorotridecanoic Acid	<13	<12	<2	<2
Perfluoroundecanoic Acid	<11	<10	<2	<2
PFOA	**25**	**23**	<2	<2
PFOS	<5.2	<4.9	<2	<2

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	**PW-13**	**PW-13**	**PW-14**	**PW-15R**
Field Sample ID	**PW-13-091019**	**PW-13-091019-Z**	**PW-14-091119**	**GW0619-PW-15R-D**
Sample Date	**9/10/2019**	**9/10/2019**	**9/11/2019**	**9/19/2019**
QA/QC	**--**	**--**	**--**	**Field Duplicate**
Table 3+ (ng/L)				
Hfpo Dimer Acid	<15	<15	**22,000**	**11,000 J**
PFMOAA	<210	<2,100	**9,500,000**	**340,000**
PFO2HxA	<81	<810	**3,400,000**	**64,000**
PFO3OA	<58	<580	**1,100,000**	**14,000**
PFO4DA	<79	<790	**610,000**	**2,200**
PFO5DA	<34	<340	**390,000**	<67
PMPA	<570	<5,700	**1,400,000**	**36,000**
PEPA	<47	<470	**390,000**	**9,300**
PFESA-BP1	<27	<270	**6,000**	**4,100**
PFESA-BP2	<30	<300	**250,000**	**670**
Byproduct 4	<160	<1,600	**150,000**	**1,800 J**
Byproduct 5	<58	<580	**190,000**	**21,000**
Byproduct 6	<15	<150	**5,000**	**34**
NVHOS	<54	<540	**96,000**	**3,500**
EVE Acid	<24	<240	<2,400	**190**
Hydro-EVE Acid	<28	<280	**210,000**	**510**
R-EVE	<70	<700	**130,000**	**560**
PES	<46	<460	<4,600	<92
PFECA B	<60	<600	<6,000	<120
PFECA-G	<41	<410	<4,100	<82
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	<2	<18
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<180
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<52	<52	<20	<480
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<8.5	<8.5	<2	<78
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<14	<14	<4	<130
6:2 Fluorotelomer sulfonate	<20	**38**	<20	<180
ADONA	<2.1	<2.1	<2.1	**--**
NaDONA	<2.1	<2.1	<2.1	**--**
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<180
N-ethylperfluoro-1-octanesulfonamide	<8.7	<8.7	<2	<75
N-methyl perfluoro-1-octanesulfonamide	<4.3	<4.3	<2	<40
N-methyl perfluorooctane sulfonamidoacetic acid	<31	<31	<20	<290
Perfluorobutane Sulfonic Acid	<2	**16**	<2	**20**
Perfluorobutanoic Acid	<3.5	<3.5	**420**	**140**
Perfluorodecane Sulfonic Acid	<3.2	<3.2	<2	<30
Perfluorodecanoic Acid	<3.1	<3.1	**2.4**	<29
Perfluorododecane sulfonic acid (PFDoS)	<4.5	<4.5	<2	<42
Perfluorododecanoic Acid	<5.5	<5.5	<2	<51
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<18
Perfluoroheptanoic Acid	<2.5	<2.5	**280**	**56 J**
Perfluorohexadecanoic acid (PFHxDA)	<8.9	<8.9	<2	<82
Perfluorohexane Sulfonic Acid	**2.3**	**2.1**	**4.2**	<16
Perfluorohexanoic Acid	<5.8	<5.8	**130**	<54
Perfluorononanesulfonic acid	<2	<2	<2	<15
Perfluorononanoic Acid	<2.7	<2.7	**190**	<25
Perfluorooctadecanoic acid	<4.6	<4.6	<2	<42
Perfluorooctane Sulfonamide	<3.5	<3.5	<2	<32
Perfluoropentane sulfonic acid (PFPeS)	<3	<3	<2	<28
Perfluoropentanoic Acid	<4.9	<4.9	**1,300**	**580**
Perfluorotetradecanoic Acid	<2.9	**4.8**	<2	<27
Perfluorotridecanoic Acid	<13	<13	<2	<120
Perfluoroundecanoic Acid	<11	<11	<2	<100
PFOA	<8.5	<8.5	**120**	<78
PFOS	<5.4	<5.4	**16**	<50

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	PW-15R	PZ-22	PZ-22	SMW-10
Field Sample ID	GW0619-PW-15R	GW0718-PZ22	GW0619-PZ-22	P32013-SMW-10
Sample Date	9/19/2019	7/11/2018	7/23/2019	6/19/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**8,700 J**	**9,700 J**	**10,000**	--
PFMOAA	**330,000**	**210,000**	**180,000**	--
PFO2HxA	**63,000**	**49,000**	**38,000**	--
PFO3OA	**14,000**	**4,700**	**3,800**	--
PFO4DA	**2,200**	<970	**340**	--
PFO5DA	<67	<1,100	<67	--
PMPA	**36,000**	**6,500**	**4,700**	--
PEPA	**8,900**	**1,300 J**	**1,100**	--
PFESA-BP1	**3,300**	<1,200	<53	--
PFESA-BP2	**640 J**	<950	<61	--
Byproduct 4	**1,500 J**	--	**760 J**	--
Byproduct 5	**19,000**	--	**1,900**	--
Byproduct 6	**270**	--	<31	--
NVHOS	**3,500**	--	**1,200**	--
EVE Acid	**250 J**	--	<49	--
Hydro-EVE Acid	**550 J**	--	**130**	--
R-EVE	**700 J**	--	**680**	--
PES	**210**	--	<92	--
PFECA B	**220**	--	<120	--
PFECA-G	**210**	<960	<82	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<28	<8.4	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<180	<5.6	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<470	<2.8	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	**240**	<2.8	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	**270**	<2.8	--	--
6:2 Fluorotelomer sulfonate	<180	**2.2**	<20	--
ADONA	--	--	--	--
NaDONA	--	<1.7 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<170	<2.8	<20	--
N-ethylperfluoro-1-octanesulfonamide	**210**	<8.4 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	**220**	<8.4 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<280	<2.8	<20	--
Perfluorobutane Sulfonic Acid	<33	<0.94	<2	--
Perfluorobutanoic Acid	**170**	**53**	**140**	--
Perfluorodecane Sulfonic Acid	<36	<1.9	<2	--
Perfluorodecanoic Acid	<36	<1.9	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<41	<0.94	<2	--
Perfluorododecanoic Acid	<50	<1.9	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<31	<1.9	<2	--
Perfluoroheptanoic Acid	**94 J**	**16**	**33**	--
Perfluorohexadecanoic acid (PFHxDA)	<81	<0.94	--	--
Perfluorohexane Sulfonic Acid	<32	<1.9	<2	--
Perfluorohexanoic Acid	<60	**7.1**	**43**	--
Perfluorononanesulfonic acid	<30	--	<2	--
Perfluorononanoic Acid	<39	<1.9	<2	--
Perfluorooctadecanoic acid	<42	<1.9	<2	--
Perfluorooctane Sulfonamide	<32	<2.8	<2	--
Perfluoropentane sulfonic acid (PFPeS)	<33	<1.9	<2	--
Perfluoropentanoic Acid	**660**	**470**	**810**	--
Perfluorotetradecanoic Acid	<36	<0.94	<2	--
Perfluorotridecanoic Acid	<120	<0.94	<2	--
Perfluoroundecanoic Acid	<100	<1.9	<2	--
PFOA	<77	<0.94	**4**	**25**
PFOS	<49	<1.9	<2	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	SMW-10	SMW-10	SMW-10	SMW-10
Field Sample ID	GW0314-SMW-10	GW0915-SMW-10	GW0915-SMW-10DIL	GW0817-SMW-10
Sample Date	4/4/2014	9/16/2015	9/16/2015	8/4/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	<10
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	<2,000	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	<2,000	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	<2
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	<2,000	<2
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	<5	<5	--	<2
PFOS	--	--	--	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	**SMW-10**	**SMW-10**	**SMW-10**	**SMW-10**
Field Sample ID	**FAY-GWASI-SMW-10**	**FAY-GWASI-SMW-10-1**	**FAY-GWASI-SMW-10-2**	**GW0718-SMW-10**
Sample Date	**11/15/2017**	**11/15/2017**	**11/15/2017**	**8/7/2018**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	<10 UJ	--	--	**2.2 J**
PFMOAA	--	<200	<200	<95
PFO2HxA	--	<200	<200	<92
PFO3OA	--	<200	<200	<88
PFO4DA	--	<200	<200	<97
PFO5DA	--	<200	<200	<110
PMPA	--	--	--	<84
PEPA	--	--	--	<100
PFESA-BP1	--	<200	<200	<120
PFESA-BP2	--	<200	<200	<95
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<7.8
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<5.2
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<2.6
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
6:2 Fluorotelomer sulfonate	--	--	--	**5.2**
ADONA	--	--	--	--
NaDONA	--	--	--	<0.86
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.6
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<7.8 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<7.8 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.6
Perfluorobutane Sulfonic Acid	<2	--	--	<0.87
Perfluorobutanoic Acid	--	--	--	<5.2
Perfluorodecane Sulfonic Acid	--	--	--	<1.7
Perfluorodecanoic Acid	<2	--	--	<1.7
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<0.87
Perfluorododecanoic Acid	<2	--	--	<1.7
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<1.7
Perfluoroheptanoic Acid	<2	--	--	<0.87
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.87
Perfluorohexane Sulfonic Acid	<2	--	--	<1.7
Perfluorohexanoic Acid	<2	--	--	<1.7
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	--	--	<1.7
Perfluorooctadecanoic acid	--	--	--	<1.7
Perfluorooctane Sulfonamide	--	--	--	<2.6 UJ
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<1.7
Perfluoropentanoic Acid	<2	--	--	<5.2
Perfluorotetradecanoic Acid	<2	--	--	<0.87
Perfluorotridecanoic Acid	<2	--	--	<0.87
Perfluoroundecanoic Acid	<2	--	--	<1.7
PFOA	<2	--	--	<0.87
PFOS	<2	--	--	<1.7

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	SMW-10	SMW-12	SMW-12	SMW-12
Field Sample ID	GW0619-SMW-10	P32013-SMW-12	GW0314-SMW-12	GW0915-SMW-12
Sample Date	6/27/2019	6/19/2013	4/4/2014	9/17/2015
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	<4	--	--	--
PFMOAA	<210 UJ	--	--	--
PFO2HxA	<81 UJ	--	--	--
PFO3OA	<58 UJ	--	--	--
PFO4DA	<79 UJ	--	--	--
PFO5DA	**51 J**	--	--	--
PMPA	780 UJ	--	--	--
PEPA	<47 UJ	--	--	--
PFESA-BP1	<27 UJ	--	--	--
PFESA-BP2	<30 UJ	--	--	--
Byproduct 4	<160 UJ	--	--	--
Byproduct 5	<58 UJ	--	--	--
Byproduct 6	<15 UJ	--	--	--
NVHOS	<54 UJ	--	--	--
EVE Acid	<24 UJ	--	--	--
Hydro-EVE Acid	<28 UJ	--	--	--
R-EVE	<70 UJ	--	--	--
PES	<46 UJ	--	--	--
PFECA B	<60 UJ	--	--	--
PFECA-G	<41 UJ	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	<2	--	--	--
Perfluorobutanoic Acid	<2	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	<2	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	<2	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	--
Perfluorohexanoic Acid	<2	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2	--	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	<2	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	<2	--	--	--
PFOA	<2	**17**	**9.7**	<5
PFOS	<2	--	--	--

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer	Black Creek Aquifer
LocID	SMW-12	SMW-12	SMW-12	SMW-12
Field Sample ID	GW0915-SMW-12DIL	GW0817-SMW-12	FAY-GWASI-SMW-12	FAY-GWASI-SMW-12-1
Sample Date	9/17/2015	8/2/2017	11/14/2017	11/14/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**1,600**	**1,400 J**	--
PFMOAA	--	--	--	**2,000**
PFO2HxA	--	--	--	**1,300**
PFO3OA	--	--	--	<200
PFO4DA	--	--	--	<200
PFO5DA	--	--	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	<200
PFESA-BP2	--	--	--	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	<2,000	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2 UJ	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	<2,000	<2	<2	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	<2	<2	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	<2,000	**36**	**33**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	--	<2	<2	--
PFOS	--	<2	<2	--

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Black Creek Aquifer**	**Black Creek Aquifer**	**Black Creek Aquifer**	**Floodplain Deposits**
LocID	**SMW-12**	**SMW-12**	**SMW-12**	**LTW-01**
Field Sample ID	**FAY-GWASI-SMW-12-2**	**GW0718-SMW-12**	**GW0619-SMW-12**	**16194457**
Sample Date	**11/14/2017**	**8/6/2018**	**7/11/2019**	**2/2/2006**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**1,300 J**	**1,700**	--
PFMOAA	**2,000**	**2,000**	**3,900**	--
PFO2HxA	**1,100**	**1,000**	**1,300**	--
PFO3OA	<200	<88	**53**	--
PFO4DA	<200	<97	<7.9	--
PFO5DA	<200	<110	<3.4	--
PMPA	--	**2,200**	**1,900**	--
PEPA	--	**430**	**440**	--
PFESA-BP1	<200	<120	<2.7	--
PFESA-BP2	<200	<95	<3	--
Byproduct 4	--	--	**120**	--
Byproduct 5	--	--	<5.8	--
Byproduct 6	--	--	<2	--
NVHOS	--	--	**38**	--
EVE Acid	--	--	<2.4	--
Hydro-EVE Acid	--	--	<2.8	--
R-EVE	--	--	**110**	--
PES	--	--	<4.6	--
PFECA B	--	--	<6	--
PFECA-G	--	<96	<4.1	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.8	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.2	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
6:2 Fluorotelomer sulfonate	--	<1.7	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.87 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
Perfluorobutane Sulfonic Acid	--	<0.87	<2	--
Perfluorobutanoic Acid	--	**14**	**19**	--
Perfluorodecane Sulfonic Acid	--	<1.7	<2	--
Perfluorodecanoic Acid	--	<1.7	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.87	<2	--
Perfluorododecanoic Acid	--	<1.7	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.7	<2	--
Perfluoroheptanoic Acid	--	<0.87	<2	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.87	--	--
Perfluorohexane Sulfonic Acid	--	<1.7	<2	--
Perfluorohexanoic Acid	--	<1.7	<2	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.7	<2	--
Perfluorooctadecanoic acid	--	<1.7	<2	--
Perfluorooctane Sulfonamide	--	<2.6 UJ	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.7	<2	--
Perfluoropentanoic Acid	--	**29**	**41**	--
Perfluorotetradecanoic Acid	--	<0.87	<2	--
Perfluorotridecanoic Acid	--	<0.87	<2	--
Perfluoroundecanoic Acid	--	<1.7	<2	--
PFOA	--	<0.87	<2	**32**
PFOS	--	<1.7	<2	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	17652863	17652862	19594829	19594828
Sample Date	2/13/2007	2/13/2007	2/27/2008	2/27/2008
QA/QC	Field Duplicate	--	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**35**	**36**	**70**	**66**
PFOS	--	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	21774364	21774363	23547861	25508007
Sample Date	3/25/2009	3/25/2009	3/23/2010	3/1/2011
QA/QC	Field Duplicate	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**50**	**55**	**51**	**78**
PFOS	--	--	--	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	25508006	28515650	28515649	P32013-LTW-01
Sample Date	3/1/2011	3/13/2012	3/13/2012	6/6/2013
QA/QC	--	Field Duplicate	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**79**	**78**	**78**	**83**
PFOS	--	--	--	--

Notes:
Bold - Analyte detected above associated reporting limit
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ng/L - nanograms per liter
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	GW0314-LTW-01	GW0915-LTW-01-D	GW0915-LTW-01	GW0817-LTW-01-D
Sample Date	4/3/2014	9/16/2015	9/16/2015	8/3/2017
QA/QC	--	Field Duplicate	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**32,000**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	**4.1**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	**60**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	**14**
Perfluorohexanoic Acid	--	--	--	**31**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	**3.7**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	**290**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	**60**	**78**	**78**	**84**
PFOS	--	--	--	**31**

Notes:
Bold - Analyte detected above associated reporting limit
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	GW0817-LTW-01	FAY-GWASI-LTW-01	FAY-GWASI-LTW-01-1	FAY-GWASI-LTW-01-2
Sample Date	8/3/2017	11/16/2017	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**32,000**	**25,000**	--	--
PFMOAA	--	--	**29,000**	**29,000**
PFO2HxA	--	--	**35,000**	**35,000**
PFO3OA	--	--	**7,200**	**7,300**
PFO4DA	--	--	**1,900**	**1,900**
PFO5DA	--	--	**510**	**410**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	<200
PFESA-BP2	--	--	**430**	**430**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
Perfluorobutane Sulfonic Acid	**4.1**	**3.7**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	<2	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**60**	**55**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**14**	**11**	--	--
Perfluorohexanoic Acid	**32**	**31**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	**4.2**	**3.2**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**290**	**370**	--	--
Perfluorotetradecanoic Acid	<2	<2	--	--
Perfluorotridecanoic Acid	<2	<2	--	--
Perfluoroundecanoic Acid	**2.1**	<2	--	--
PFOA	**85**	**83**	--	--
PFOS	**30**	**26**	--	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-01
Field Sample ID	FAY-DRY01-LTW-01	FAY-WET01-LTW-01-012918	FAY-D-LTW-01-D-050918	FAY-D-LTW-01-050918
Sample Date	1/16/2018	1/29/2018	5/9/2018	5/9/2018
QA/QC	--	--	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**22,000**	**25,000**	**26,000**	**30,000**
PFMOAA	--	--	**34,000**	**32,000**
PFO2HxA	--	--	**31,000**	**31,000**
PFO3OA	--	--	**6,500**	**6,600**
PFO4DA	--	--	**1,500**	**1,700**
PFO5DA	--	--	**310**	**380**
PMPA	--	--	**31,000**	**31,000**
PEPA	--	--	**11,000**	**11,000**
PFESA-BP1	--	--	<120	<120
PFESA-BP2	--	--	**390**	**430**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	<96	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	<20	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<20
Perfluorobutane Sulfonic Acid	--	--	**3.1**	**3.3**
Perfluorobutanoic Acid	--	--	**180**	**180**
Perfluorodecane Sulfonic Acid	--	--	<2	<2
Perfluorodecanoic Acid	--	--	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<2	<2
Perfluoroheptanoic Acid	--	--	**53**	**52**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	**7.6**	**8.7**
Perfluorohexanoic Acid	--	--	**27**	**29**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**2.3**	**2.5**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<2	<2
Perfluoropentanoic Acid	--	--	**370**	**340**
Perfluorotetradecanoic Acid	--	--	<2	<2
Perfluorotridecanoic Acid	--	--	<2	<2
Perfluoroundecanoic Acid	--	--	<2	<2
PFOA	--	--	**61**	**66**
PFOS	--	--	**18**	**20**

Notes:
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Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-01	LTW-01	LTW-01	LTW-03
Field Sample ID	GW0718-LTW-01	PF1018-LTW-01	GW0619-LTW-01	16194588
Sample Date	7/16/2018	10/31/2018	7/17/2019	2/1/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**19,000 J**	**24,000**	**19,000**	--
PFMOAA	**29,000**	**59,000 J**	**45,000**	--
PFO2HxA	**29,000**	**35,000 J**	**30,000**	--
PFO3OA	**6,600**	<18,000 UJ	**6,100**	--
PFO4DA	**1,800**	<19,000 UJ	**1,200**	--
PFO5DA	**460**	<21,000 UJ	**210**	--
PMPA	**34,000**	**22,000 J**	**23,000**	--
PEPA	**12,000**	<20,000 UJ	**8,300**	--
PFESA-BP1	<120	<23,000 UJ	<27	--
PFESA-BP2	**490**	<19,000 UJ	**260**	--
Byproduct 4	--	--	**1,200**	--
Byproduct 5	--	--	**970**	--
Byproduct 6	--	--	<15	--
NVHOS	--	--	**490**	--
EVE Acid	--	--	<24	--
Hydro-EVE Acid	--	--	**140**	--
R-EVE	--	--	**720**	--
PES	--	--	<46	--
PFECA B	--	--	<60	--
PFECA-G	<96	<19,000 UJ	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.3	<2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.5	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.8	<20	<47	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.8	<4,500 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.8 UJ	<3,300 UJ	--	--
6:2 Fluorotelomer sulfonate	**13**	<20	<20	--
ADONA	--	<2.1	--	--
NaDONA	<0.89 UJ	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.8	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<8.3 UJ	<16,000 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.3 UJ	<10,000 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.8	<20	<28	--
Perfluorobutane Sulfonic Acid	**3.7**	**2.2**	**2.4**	--
Perfluorobutanoic Acid	**170**	**190**	**170**	--
Perfluorodecane Sulfonic Acid	<1.8	<2	<2.9	--
Perfluorodecanoic Acid	<1.8	<2	<2.8	--
Perfluorododecane sulfonic acid (PFDoS)	<0.92	<2	<4	--
Perfluorododecanoic Acid	<1.8	<2	<4.9	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	<2	--
Perfluoroheptanoic Acid	**50**	**50**	**43**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.92	<2	--	--
Perfluorohexane Sulfonic Acid	**9.3**	**5.4**	**4.6**	--
Perfluorohexanoic Acid	**31**	**26**	**28**	--
Perfluorononanesulfonic acid	--	<2	<2	--
Perfluorononanoic Acid	**2.9**	**2.1**	<2.4	--
Perfluorooctadecanoic acid	<1.8	<2	<4.1	--
Perfluorooctane Sulfonamide	<2.8	<2	<3.1	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	<2.7	--
Perfluoropentanoic Acid	**350**	**470**	**420**	--
Perfluorotetradecanoic Acid	<0.92	<2	<2.6	--
Perfluorotridecanoic Acid	<0.92	<2	<12	--
Perfluoroundecanoic Acid	<1.8	<2	<9.9	--
PFOA	**74**	**34**	**37**	<2.3
PFOS	**22**	**12**	**11**	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-03	LTW-03	LTW-03	LTW-03
Field Sample ID	17652867	19594833	21774368	23547867
Sample Date	2/13/2007	2/28/2008	3/25/2009	3/24/2010
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<1	<2.2	<2.6	<3.5
PFOS	--	--	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-03	LTW-03	LTW-03	LTW-03
Field Sample ID	25508011	28515654	GW0314-LTW-03	GW0915-LTW-03
Sample Date	3/2/2011	3/14/2012	4/3/2014	9/15/2015
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<2.8	<2.2	<5	<5
PFOS	--	--	--	--

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-03	LTW-03	LTW-03	LTW-03
Field Sample ID	GW0817-LTW-03	FAY-GWASI-LTW-03-D	FAY-GWASI-LTW-03-D-1	FAY-GWASI-LTW-03
Sample Date	8/1/2017	11/30/2017	11/30/2017	11/30/2017
QA/QC	--	Field Duplicate	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**11,000**	**8,900 J**	--	**9,400 J**
PFMOAA	--	--	**140,000**	--
PFO2HxA	--	--	**41,000**	--
PFO3OA	--	--	**5,800**	--
PFO4DA	--	--	<200	--
PFO5DA	--	--	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	--
PFESA-BP2	--	--	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<20
Perfluorobutane Sulfonic Acid	<2	<2	--	<2
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	<2	<2	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**19**	**18**	--	**18**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	--	<2
Perfluorohexanoic Acid	**14**	**14**	--	**15**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	<2	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**730**	**610**	--	**610**
Perfluorotetradecanoic Acid	<2	<2	--	<2
Perfluorotridecanoic Acid	<2	<2	--	<2
Perfluoroundecanoic Acid	<2	<2	--	<2
PFOA	<2	<2	--	<2
PFOS	<2	<2	--	<2

Notes:
Bold - Analyte detected above associated reporting limit
B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-03	LTW-03	LTW-03	LTW-03
Field Sample ID	FAY-GWASI-LTW-03-1	FAY-DRY01-LTW-03	FAY-WET01-LTW-03-012918	FAY-D-LTW-03-050918
Sample Date	11/30/2017	1/16/2018	1/29/2018	5/9/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**7,400**	**9,900**	**7,400**
PFMOAA	**140,000**	--	--	**140,000**
PFO2HxA	**40,000**	--	--	**34,000**
PFO3OA	**5,700**	--	--	**5,200**
PFO4DA	**260**	--	--	**160 J**
PFO5DA	<200	--	--	<110
PMPA	--	--	--	**8,900**
PEPA	--	--	--	**2,500 J**
PFESA-BP1	<200	--	--	<120
PFESA-BP2	<200	--	--	<95
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	**150**
Perfluorodecane Sulfonic Acid	--	--	--	<2
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<2
Perfluoroheptanoic Acid	--	--	--	**17**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**13**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<2
Perfluoropentanoic Acid	--	--	--	**760**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	--	--	--	<2
PFOS	--	--	--	<2

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-03	LTW-03	LTW-04	LTW-04
Field Sample ID	GW0718-LTW-03	GW0619-LTW-03	16194222	23547863
Sample Date	7/13/2018	7/17/2019	1/24/2006	3/24/2010
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	**8,500 J**	**12,000**	--	--
PFMOAA	**150,000**	**150,000**	--	--
PFO2HxA	**37,000 J**	**34,000**	--	--
PFO3OA	**5,600**	**4,900**	--	--
PFO4DA	<970	**160**	--	--
PFO5DA	<1,100	<34	--	--
PMPA	**10,000**	**9,300**	--	--
PEPA	**2,700**	**2,400**	--	--
PFESA-BP1	<1,200	<27	--	--
PFESA-BP2	<950	**33**	--	--
Byproduct 4	--	**600**	--	--
Byproduct 5	--	**2,600**	--	--
Byproduct 6	--	<15	--	--
NVHOS	--	**1,000**	--	--
EVE Acid	--	<24	--	--
Hydro-EVE Acid	--	**42**	--	--
R-EVE	--	**480**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<960	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.3	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.5	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.8	<46	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.8	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.8	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.92 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.8	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<8.3 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.3	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.8	<27	--	--
Perfluorobutane Sulfonic Acid	<0.92	<2	--	--
Perfluorobutanoic Acid	**130**	**140**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2.8	--	--
Perfluorodecanoic Acid	<1.8	<2.7	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.92	<4	--	--
Perfluorododecanoic Acid	<1.8	<4.9	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**15**	**19**	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.92	--	--	--
Perfluorohexane Sulfonic Acid	<1.8	<2	--	--
Perfluorohexanoic Acid	**12**	**15**	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	<1.8	<2.4	--	--
Perfluorooctadecanoic acid	<1.8	<4.1	--	--
Perfluorooctane Sulfonamide	<2.8	<3.1	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2.7	--	--
Perfluoropentanoic Acid	**580**	**700**	--	--
Perfluorotetradecanoic Acid	<0.92	<2.6	--	--
Perfluorotridecanoic Acid	<0.92	<12	--	--
Perfluoroundecanoic Acid	<1.8	<9.8	--	--
PFOA	<0.92	<7.5	<2.3	<3.5
PFOS	<1.8	<4.8	--	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-04	LTW-04	LTW-04	LTW-04
Field Sample ID	23547868	28515656	GW0314-LTW-04	GW0915-LTW-04
Sample Date	3/24/2010	3/14/2012	4/3/2014	9/15/2015
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<3.5	<2.2	<5	<5
PFOS	--	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-04	LTW-04	LTW-04	LTW-04
Field Sample ID	GW0617-LTW-04-DIL	GW0817-LTW-04	FAY-GWASI-LTW-04	FAY-GWASI-LTW-04-1
Sample Date	6/15/2017	8/3/2017	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**19,000**	**17,000**	--
PFMOAA	--	--	--	**100,000**
PFO2HxA	--	--	--	**41,000**
PFO3OA	--	--	--	**7,000**
PFO4DA	--	--	--	**730**
PFO5DA	--	--	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	<200
PFESA-BP2	--	--	--	**330**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**76**	**82**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	**42**	**43**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	<2,000	**1,500**	**1,800**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	--	**6.5**	**7.2**	--
PFOS	--	<2	<2	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits	Floodplain Deposits
LocID	LTW-04	LTW-04	LTW-04	LTW-04
Field Sample ID	FAY-GWASI-LTW-04-2	FAY-DRY01-LTW-04	FAY-WET01-LTW-04-012918	FAY-D-LTW-04-051018
Sample Date	11/16/2017	1/16/2018	1/29/2018	5/10/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**18,000**	**16,000**	**21,000**
PFMOAA	**99,000**	--	--	**110,000**
PFO2HxA	**42,000**	--	--	**35,000**
PFO3OA	**7,000**	--	--	**6,500**
PFO4DA	**790**	--	--	**760**
PFO5DA	<200	--	--	<110
PMPA	--	--	--	**25,000**
PEPA	--	--	--	**9,400**
PFESA-BP1	<200	--	--	<120
PFESA-BP2	**300**	--	--	**200**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	**590**
Perfluorodecane Sulfonic Acid	--	--	--	<2
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<2
Perfluoroheptanoic Acid	--	--	--	**93**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**51**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<2
Perfluoropentanoic Acid	--	--	--	**1,900**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	--	--	--	**8.1**
PFOS	--	--	--	<2

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
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SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Floodplain Deposits**	**Floodplain Deposits**	**Floodplain Deposits**	**Floodplain Deposits**
LocID	**LTW-04**	**LTW-04**	**LTW-04**	**PIW-6S**
Field Sample ID	**GW0718-LTW04**	**PF1018-LTW-04**	**GW0619-LTW-04**	**GW0619-PIW-6S**
Sample Date	**7/11/2018**	**11/12/2018**	**7/17/2019**	**7/17/2019**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**15,000 J**	**18,000**	**16,000**	**13,000**
PFMOAA	**99,000**	**99,000 J**	**96,000**	**160,000**
PFO2HxA	**32,000**	<46,000 UJ	**31,000**	**35,000**
PFO3OA	**7,000**	<44,000 UJ	**5,400**	**5,000**
PFO4DA	**770**	<49,000 UJ	**620**	**150**
PFO5DA	<110	<53,000 UJ	**36**	<34
PMPA	**26,000**	<42,000 UJ	**19,000**	**8,700**
PEPA	**11,000**	<50,000 UJ	**7,100**	**2,300**
PFESA-BP1	<120	<58,000 UJ	<27	<27
PFESA-BP2	**230**	<47,000 UJ	**160**	**31**
Byproduct 4	--	--	**2,000**	**470**
Byproduct 5	--	--	**4,300**	**1,700**
Byproduct 6	--	--	<15	<15
NVHOS	--	--	**1,600**	**1,100**
EVE Acid	--	--	<24	<24
Hydro-EVE Acid	--	--	**510**	**43**
R-EVE	--	--	**2,300**	**490**
PES	--	--	<46	<46
PFECA B	--	--	<60	<60
PFECA-G	<96	<48,000 UJ	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8	<2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.4	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	<46	<47
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	<11,000 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	<8,300 UJ	--	--
6:2 Fluorotelomer sulfonate	**28**	<20	<20	<20
ADONA	--	<2.1	--	--
NaDONA	<0.91 UJ	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<8 UJ	<41,000 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	<8 UJ	<26,000 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<27	<28
Perfluorobutane Sulfonic Acid	<0.89	<2	<2	<2
Perfluorobutanoic Acid	**470**	**370**	**440**	**150**
Perfluorodecane Sulfonic Acid	<1.8	<2	<2.8	<2.9
Perfluorodecanoic Acid	<1.8	<2	<2.7	<2.8
Perfluorododecane sulfonic acid (PFDoS)	<0.89	<2	<4	<4.1
Perfluorododecanoic Acid	<1.8	<2	<4.9	<5
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	<2	<2
Perfluoroheptanoic Acid	**78**	**65**	**68**	**18**
Perfluorohexadecanoic acid (PFHxDA)	<0.89	<2	--	--
Perfluorohexane Sulfonic Acid	<1.8	<2	**2.9**	<2
Perfluorohexanoic Acid	**41**	**37**	**44**	**16**
Perfluorononanesulfonic acid	--	<2	<2	<2
Perfluorononanoic Acid	<1.8	<2	<2.4	<2.4
Perfluorooctadecanoic acid	<1.8	<2	<4.1	<4.2
Perfluorooctane Sulfonamide	<2.7	<2	<3.1	<3.2
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	<2.7	<2.7
Perfluoropentanoic Acid	**1,700**	**1,600**	**1,500**	**830**
Perfluorotetradecanoic Acid	<0.89	<2	<2.6	<2.6
Perfluorotridecanoic Acid	<0.89	<2	<12	<12
Perfluoroundecanoic Acid	<1.8	<2	<9.7	<9.9
PFOA	**8.3**	**6**	**8**	<7.7
PFOS	<1.8	<2	<4.8	<4.9

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	FTA-01	FTA-01	FTA-01	FTA-01
Field Sample ID	FAY-GWASI-FTA-01	FAY-GWASI-FTA-01-1	GW0718-FTA-01	PF1018-FTA-01
Sample Date	11/30/2017	11/30/2017	7/17/2018	10/26/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,800 J**	--	**1,000 J**	**1,800**
PFMOAA	--	**390**	**130 J**	<950 UJ
PFO2HxA	--	**1,900**	**680**	**2,000 J**
PFO3OA	--	<200	<88	<880 UJ
PFO4DA	--	<200	<97	<970 UJ
PFO5DA	--	<200	<110	<1,100 UJ
PMPA	--	--	**1,100**	**2,100 J**
PEPA	--	--	**390**	<1,000 UJ
PFESA-BP1	--	<200	<120	<1,200 UJ
PFESA-BP2	--	<200	<95	<950 UJ
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	<96	<960 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.1	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.4	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	<230 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	<200 UJ
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	<2.1
NaDONA	--	--	<0.89 UJ	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.1 UJ	<820 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.1 UJ	<520 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	<2.7	<20
Perfluorobutane Sulfonic Acid	**3.8**	--	**2**	<2
Perfluorobutanoic Acid	--	--	**12**	**16**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	<2	--	<1.8	**3**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.9	<2
Perfluorododecanoic Acid	<2	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	**11**	--	**9.1**	**7.2**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.9	<2
Perfluorohexane Sulfonic Acid	**4.4**	--	**3**	<2
Perfluorohexanoic Acid	**17**	--	**9.1**	**3.9**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	<2	--	**2**	**2.9**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.7	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	**26**	--	**23**	**34**
Perfluorotetradecanoic Acid	<2	--	<0.9	<2
Perfluorotridecanoic Acid	<2	--	<0.9	<2
Perfluoroundecanoic Acid	<2	--	<1.8	<2
PFOA	**13**	--	**7.5**	**22**
PFOS	**5**	--	**5.6**	**4.5**

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QA/QC - Quality assurance/ quality control
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	FTA-01	FTA-02	FTA-02	FTA-02
Field Sample ID	GW0619-FTA-01	FAY-GWASI-FTA-02	FAY-GWASI-FTA-02-1	GW0718-FTA-02
Sample Date	6/27/2019	11/30/2017	11/30/2017	7/16/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**520**	**11,000 J**	--	**15,000 J**
PFMOAA	<210 UJ	--	**7,000**	**23,000**
PFO2HxA	**390 J**	--	**7,600**	**14,000**
PFO3OA	**58 J**	--	**1,700**	**4,300**
PFO4DA	<79 UJ	--	**1,100**	**1,600**
PFO5DA	**77 J**	--	**1,900**	**1,000**
PMPA	**1,500 J**	--	--	**8,600**
PEPA	**290 J**	--	--	**2,800**
PFESA-BP1	<27 UJ	--	**5,800**	**980**
PFESA-BP2	**32 J**	--	**1,200**	**1,000**
Byproduct 4	<160 UJ	--	--	--
Byproduct 5	<58 UJ	--	--	--
Byproduct 6	<15 UJ	--	--	--
NVHOS	<54 UJ	--	--	--
EVE Acid	<24 UJ	--	--	--
Hydro-EVE Acid	<28 UJ	--	--	--
R-EVE	<70 UJ	--	--	--
PES	<46 UJ	--	--	--
PFECA B	<60 UJ	--	--	--
PFECA-G	<41 UJ	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<8
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	<5.3
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	<2.7
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.7 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.7 UJ
6:2 Fluorotelomer sulfonate	<20	--	--	**170**
ADONA	--	--	--	--
NaDONA	--	--	--	<0.87 UJ
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<2.7
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<8 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<8 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<2.7
Perfluorobutane Sulfonic Acid	<2	**2.5**	--	**3.3**
Perfluorobutanoic Acid	**11**	--	--	**190**
Perfluorodecane Sulfonic Acid	<2	--	--	<1.8
Perfluorodecanoic Acid	<2	**2.6**	--	**8**
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	<0.89
Perfluorododecanoic Acid	<2	<2	--	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	**2.6**
Perfluoroheptanoic Acid	**5.1**	**99**	--	**150**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.89
Perfluorohexane Sulfonic Acid	**2.1**	**11**	--	**32**
Perfluorohexanoic Acid	**4.5**	**130**	--	**160**
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2	**18**	--	**12**
Perfluorooctadecanoic acid	<2	--	--	<1.8
Perfluorooctane Sulfonamide	<2	--	--	<2.7 UJ
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	**2.6**
Perfluoropentanoic Acid	**15**	**270**	--	**380**
Perfluorotetradecanoic Acid	<2	<2	--	<0.89
Perfluorotridecanoic Acid	<2	<2	--	<0.89
Perfluoroundecanoic Acid	<2	<2	--	<1.8
PFOA	**6.7**	**97**	--	**130**
PFOS	**3.8**	**11**	--	**34**

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TABLE I-1
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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	FTA-02	FTA-02	FTA-03	FTA-03
Field Sample ID	PF1018-FTA-02	GW0619-FTA-02	FAY-GWASI-FTA-03	FAY-GWASI-FTA-03-1
Sample Date	10/26/2018	6/27/2019	11/30/2017	11/30/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**24,000**	**22,000**	**8,700 J**	--
PFMOAA	**44,000 J**	**11,000 J**	--	**9,200**
PFO2HxA	**19,000 J**	**8,800 J**	--	**8,000**
PFO3OA	<18,000 UJ	**2,000 J**	--	**1,200**
PFO4DA	<19,000 UJ	**1,700 J**	--	**780**
PFO5DA	<21,000 UJ	**2,400 J**	--	**700**
PMPA	<17,000 UJ	**6,400 J**	--	--
PEPA	<20,000 UJ	**2,400 J**	--	--
PFESA-BP1	<23,000 UJ	**1,300 J**	--	<200
PFESA-BP2	<19,000 UJ	**3,500 J**	--	**590**
Byproduct 4	--	**1,500 J**	--	--
Byproduct 5	--	**950 J**	--	--
Byproduct 6	--	**19 J**	--	--
NVHOS	--	**450 J**	--	--
EVE Acid	--	**24,000 J**	--	--
Hydro-EVE Acid	--	**1,100 J**	--	--
R-EVE	--	**560 J**	--	--
PES	--	<46 UJ	--	--
PFECA B	--	<60 UJ	--	--
PFECA-G	<19,000 UJ	<41 UJ	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<4,500 UJ	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<3,300 UJ	--	--	--
6:2 Fluorotelomer sulfonate	**41**	**120**	--	--
ADONA	<2.1	--	--	--
NaDONA	<2.1	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<16,000 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<10,000 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
Perfluorobutane Sulfonic Acid	**7.6**	**2.5**	**3.1**	--
Perfluorobutanoic Acid	**220**	**140**	--	--
Perfluorodecane Sulfonic Acid	<2	<2	--	--
Perfluorodecanoic Acid	**25**	**2.9**	**4.1**	--
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	--	--
Perfluorododecanoic Acid	<2	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	**2.1**	--	--
Perfluoroheptanoic Acid	**73**	**87**	**29**	--
Perfluorohexadecanoic acid (PFHxDA)	<2	--	--	--
Perfluorohexane Sulfonic Acid	**21**	**21**	**7.1**	--
Perfluorohexanoic Acid	**100**	**110**	**23**	--
Perfluorononanesulfonic acid	<2	<2	--	--
Perfluorononanoic Acid	**18**	**17**	**9.5**	--
Perfluorooctadecanoic acid	<2	<2	--	--
Perfluorooctane Sulfonamide	<2	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	**7.3**	**2.1**	--	--
Perfluoropentanoic Acid	**330**	**270**	**96**	--
Perfluorotetradecanoic Acid	<2	<2	<2	--
Perfluorotridecanoic Acid	<2	<2	<2	--
Perfluoroundecanoic Acid	<2	<2	<2	--
PFOA	**270**	**83**	**57**	--
PFOS	**20**	**24**	**16**	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**FTA-03**	**FTA-03**	**MW-1S**	**MW-1S**
Field Sample ID	**GW0718-FTA-03**	**GW0619-FTA-03**	**16194220**	**17652877**
Sample Date	**7/16/2018**	**6/27/2019**	**1/24/2006**	**2/14/2007**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**7,600 J**	**13,000**	--	--
PFMOAA	**3,800**	**3,200 J**	--	--
PFO2HxA	**6,000**	**6,500 J**	--	--
PFO3OA	**880**	**780 J**	--	--
PFO4DA	**650**	**820 J**	--	--
PFO5DA	**510**	**1,200 J**	--	--
PMPA	**5,900**	**6,500 J**	--	--
PEPA	**2,000**	**2,200 J**	--	--
PFESA-BP1	**280**	**550 J**	--	--
PFESA-BP2	**330**	**610 J**	--	--
Byproduct 4	--	**1,400 J**	--	--
Byproduct 5	--	**1,100 J**	--	--
Byproduct 6	--	<15 UJ	--	--
NVHOS	--	**170 J**	--	--
EVE Acid	--	**97 J**	--	--
Hydro-EVE Acid	--	**150 J**	--	--
R-EVE	--	**2,100 J**	--	--
PES	--	<46 UJ	--	--
PFECA B	--	<60 UJ	--	--
PFECA-G	<96	<41 UJ	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.91 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<8 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
Perfluorobutane Sulfonic Acid	**2.7**	<2	--	--
Perfluorobutanoic Acid	**54**	**68**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	**6.2**	**2.2**	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.89	<2	--	--
Perfluorododecanoic Acid	<1.8	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**26**	**21**	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.89	--	--	--
Perfluorohexane Sulfonic Acid	**7.2**	**5.1**	--	--
Perfluorohexanoic Acid	**22**	**15**	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**9.7**	**11**	--	--
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.7	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**87**	**87**	--	--
Perfluorotetradecanoic Acid	<0.89	<2	--	--
Perfluorotridecanoic Acid	<0.89	<2	--	--
Perfluoroundecanoic Acid	<1.8	<2	--	--
PFOA	**51**	**51**	**36**	**48**
PFOS	**11**	**9.9**	--	--

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-1S	MW-1S	MW-1S	MW-1S
Field Sample ID	19594843	21774378	23547876	25508021
Sample Date	2/27/2008	3/26/2009	3/24/2010	3/1/2011
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**43**	**51**	**66**	**74**
PFOS	--	--	--	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-1S	MW-1S	MW-1S	MW-1S
Field Sample ID	28515664	P32013-MW-1S	GW0414-MW-1S	GW0915-MW-1S
Sample Date	3/14/2012	6/12/2013	4/7/2014	9/17/2015
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**50**	**91**	**76**	**49**
PFOS	--	--	--	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	**MW-1S**	**MW-1S**	**MW-1S**	**MW-1S**
Field Sample ID	**GW0817-MW-1S**	**FAY-GWASI-MW-1S**	**FAY-GWASI-MW-1S-1**	**FAY-GWASI-MW-1S-2**
Sample Date	**8/3/2017**	**11/22/2017**	**11/22/2017**	**11/22/2017**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**15,000**	**12,000**	--	--
PFMOAA	--	--	**14,000**	**14,000**
PFO2HxA	--	--	**9,900**	**9,700**
PFO3OA	--	--	**2,000**	**2,000**
PFO4DA	--	--	**1,800**	**1,800**
PFO5DA	--	--	**910**	**910**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	<200
PFESA-BP2	--	--	**550**	**550**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
Perfluorobutane Sulfonic Acid	<2	<2	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	**6.3**	**3.9**	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**62**	**48**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**3.3**	**2.4**	--	--
Perfluorohexanoic Acid	**26**	**24**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	**31**	**20**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**280**	**240**	--	--
Perfluorotetradecanoic Acid	<2	<2	--	--
Perfluorotridecanoic Acid	<2	<2	--	--
Perfluoroundecanoic Acid	**4.7**	**3.9**	--	--
PFOA	**89**	**100**	--	--
PFOS	**11 B**	**8.2**	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-1S	MW-1S	MW-2S	MW-2S
Field Sample ID	GW0718-MW-1S	GW0619-MW-1S	FAY-GWASI-MW-2S	FAY-GWASI-MW-2S-1
Sample Date	7/11/2018	6/28/2019	11/22/2017	11/22/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**9,500 J**	**14,000**	**13,000**	--
PFMOAA	**20,000**	**21,000**	--	**22,000**
PFO2HxA	**9,900**	**11,000**	--	**14,000**
PFO3OA	**2,400 J**	**1,600**	--	**2,900**
PFO4DA	**2,200**	**1,300 J**	--	**1,800**
PFO5DA	**1,200**	**1,300**	--	**2,000**
PMPA	**9,600**	**9,700**	--	--
PEPA	**3,500**	**3,300**	--	--
PFESA-BP1	<120	**48**	--	<200
PFESA-BP2	**880**	**1,000**	--	**1,300**
Byproduct 4	--	**620**	--	--
Byproduct 5	--	**430**	--	--
Byproduct 6	--	<15	--	--
NVHOS	--	**210**	--	--
EVE Acid	--	<24	--	--
Hydro-EVE Acid	--	**230**	--	--
R-EVE	--	**370**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<96	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.2	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.5	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	--	--	--
6:2 Fluorotelomer sulfonate	**3**	<20	--	--
ADONA	--	--	--	--
NaDONA	<1.1 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<8.2 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.2 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<20	--
Perfluorobutane Sulfonic Acid	**0.98**	<2	<2	--
Perfluorobutanoic Acid	**94**	**140**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	**3**	**18**	**8.2**	--
Perfluorododecane sulfonic acid (PFDoS)	<0.91	<2	--	--
Perfluorododecanoic Acid	<1.8	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**46**	**50**	**74**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.91	--	--	--
Perfluorohexane Sulfonic Acid	<1.8	**2.3**	**4**	--
Perfluorohexanoic Acid	**20**	**26**	**40**	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**19**	**62**	**71**	--
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.7	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**230**	**290**	**420**	--
Perfluorotetradecanoic Acid	<0.91	<2	<2	--
Perfluorotridecanoic Acid	<0.91	<2	<2	--
Perfluoroundecanoic Acid	**3**	**10**	**4.1**	--
PFOA	**110**	**94**	**79**	--
PFOS	**6.2**	**13**	**16**	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-2S	MW-2S	MW-2S	MW-7S
Field Sample ID	FAY-GWASI-MW-2S-2	GW0718-MW-2S	GW0619-MW-2S	16196280
Sample Date	11/22/2017	7/12/2018	7/10/2019	10/18/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**13,000 J**	**17,000**	--
PFMOAA	**22,000**	**26,000**	**28,000**	--
PFO2HxA	**14,000**	**15,000**	**12,000**	--
PFO3OA	**3,000**	**3,400**	**2,500**	--
PFO4DA	**2,200**	**2,200**	**1,600**	--
PFO5DA	**2,100**	**2,500**	**2,500**	--
PMPA	--	**17,000**	**12,000**	--
PEPA	--	**5,300**	**4,100**	--
PFESA-BP1	<200	<120	**27 J**	--
PFESA-BP2	**1,300**	**1,700**	**2,100**	--
Byproduct 4	--	--	**730 J**	--
Byproduct 5	--	--	**320**	--
Byproduct 6	--	--	**19**	--
NVHOS	--	--	**290**	--
EVE Acid	--	--	<24	--
Hydro-EVE Acid	--	--	**450**	--
R-EVE	--	--	**510**	--
PES	--	--	<46	--
PFECA B	--	--	<60	--
PFECA-G	--	<96	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.9	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.3	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	--
ADONA	--	--	--	--
NaDONA	--	<2,500	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<7.9 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.9 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
Perfluorobutane Sulfonic Acid	--	**1.6**	<2	--
Perfluorobutanoic Acid	--	**170**	**200**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	**6.3**	**9**	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.88	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**73**	**77**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.88	--	--
Perfluorohexane Sulfonic Acid	--	**3.6**	**4.2**	--
Perfluorohexanoic Acid	--	**35**	**40**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	**63**	**75**	--
Perfluorooctadecanoic acid	--	<1.8	<2	--
Perfluorooctane Sulfonamide	--	<2.6	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	--	**280**	**340**	--
Perfluorotetradecanoic Acid	--	<0.88	<2	--
Perfluorotridecanoic Acid	--	<0.88	<2	--
Perfluoroundecanoic Acid	--	**4.5**	**4.7**	--
PFOA	--	**73**	**86**	**45**
PFOS	--	**13**	**14**	--

Notes:

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**MW-7S**	**MW-7S**	**MW-7S**	**MW-7S**
Field Sample ID	**FAY-GWASI-MW-7S**	**FAY-GWASI-MW-7S-1**	**GW0718-MW-7S**	**GW0619-MW-7S**
Sample Date	**11/29/2017**	**11/29/2017**	**7/16/2018**	**7/10/2019**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**22,000**	--	**20,000 J**	**17,000**
PFMOAA	--	**6,100**	**8,400**	**4,600**
PFO2HxA	--	**15,000**	**17,000**	**8,700**
PFO3OA	--	**2,300**	**3,700**	**1,500**
PFO4DA	--	**2,100**	**2,800**	**1,200**
PFO5DA	--	**1,500**	**2,000**	**1,800**
PMPA	--	--	**24,000**	**13,000**
PEPA	--	--	**8,900**	**5,200**
PFESA-BP1	--	<200	<120	**58 J**
PFESA-BP2	--	**570**	**1,100**	**830**
Byproduct 4	--	--	--	**1,400**
Byproduct 5	--	--	--	**650**
Byproduct 6	--	--	--	**17**
NVHOS	--	--	--	**260**
EVE Acid	--	--	--	<24
Hydro-EVE Acid	--	--	--	**270**
R-EVE	--	--	--	**1,100**
PES	--	--	--	<46
PFECA B	--	--	--	<60
PFECA-G	--	--	<96	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.5	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.7	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.8	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.8 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.8 UJ	--
6:2 Fluorotelomer sulfonate	--	--	<1.9	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.91 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	<2.8	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.5 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.5 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	<2.8	<20
Perfluorobutane Sulfonic Acid	<2	--	**2**	<2
Perfluorobutanoic Acid	--	--	**170**	**130**
Perfluorodecane Sulfonic Acid	--	--	<1.9	<2
Perfluorodecanoic Acid	**2.6**	--	**4**	**6.2**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.95	<2
Perfluorododecanoic Acid	<2	--	<1.9	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.9	<2
Perfluoroheptanoic Acid	**43**	--	**63**	**43**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.95	--
Perfluorohexane Sulfonic Acid	**2.8**	--	**3.5**	**2.8**
Perfluorohexanoic Acid	**18**	--	**33**	**22**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	**13**	--	**22**	**15**
Perfluorooctadecanoic acid	--	--	<1.9	<2
Perfluorooctane Sulfonamide	--	--	<2.8	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.9	<2
Perfluoropentanoic Acid	**190**	--	**300**	**160**
Perfluorotetradecanoic Acid	<2	--	<0.95	<2
Perfluorotridecanoic Acid	<2	--	<0.95	<2
Perfluoroundecanoic Acid	<2	--	<1.9	<2
PFOA	**99**	--	**120**	**82**
PFOS	**6.9**	--	**9.3**	**7.8**

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-9S	MW-9S	MW-9S	MW-9S
Field Sample ID	FAY-GWASI-MW-9S-1	FAY-GWASI-MW-9S	GW0718-MW-9S	GW0619-MW-9S
Sample Date	11/27/2017	11/29/2017	7/12/2018	6/25/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**6,300**	**6,600 J**	**5,600**
PFMOAA	**1,200**	--	**1,500**	**1,600 J**
PFO2HxA	**4,000**	--	**4,200**	**2,700 J**
PFO3OA	**840**	--	**810**	**360 J**
PFO4DA	**610**	--	**720**	**360 J**
PFO5DA	<200	--	**200 J**	**220 J**
PMPA	--	--	**12,000**	**7,000 J**
PEPA	--	--	**4,400**	**2,800 J**
PFESA-BP1	<200	--	<120	**38 J**
PFESA-BP2	<200	--	**290**	**200 J**
Byproduct 4	--	--	--	**310 J**
Byproduct 5	--	--	--	<58 UJ
Byproduct 6	--	--	--	<15 UJ
NVHOS	--	--	--	<54 UJ
EVE Acid	--	--	--	<24 UJ
Hydro-EVE Acid	--	--	--	**53 J**
R-EVE	--	--	--	**170 J**
PES	--	--	--	<46 UJ
PFECA B	--	--	--	<60 UJ
PFECA-G	--	--	<96	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.3	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.5	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.8	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.8	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.8	--
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.92 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<2.8	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.3 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.3 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<2.8	<20
Perfluorobutane Sulfonic Acid	--	**8.1**	**3.1**	<2
Perfluorobutanoic Acid	--	--	**79**	**140**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	<2	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.92	<2
Perfluorododecanoic Acid	--	<2	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	**15**	**15**	**10**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.92	--
Perfluorohexane Sulfonic Acid	--	<2	<1.8	<2
Perfluorohexanoic Acid	--	**13**	**12**	**5.1**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	<2	**2.3**	**2.2**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.8	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	--	**78**	**75**	**61**
Perfluorotetradecanoic Acid	--	<2	<0.92	<2
Perfluorotridecanoic Acid	--	<2	<0.92	<2
Perfluoroundecanoic Acid	--	<2	<1.8	<2
PFOA	--	**24**	**23**	**16**
PFOS	--	<2	**6.6**	**2.7**

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-12S	MW-12S	MW-12S	MW-12S
Field Sample ID	FAY-GWASI-MW-12S	FAY-GWASI-MW-12S-1	FAY-GWASI-MW-12S-2	GW0718-MW-12S
Sample Date	11/22/2017	11/22/2017	11/22/2017	7/18/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**11,000**	--	--	**10,000 J**
PFMOAA	--	**5,000**	**5,300**	**5,900**
PFO2HxA	--	**7,400**	**7,900**	**7,600**
PFO3OA	--	**1,400**	**1,500**	**1,200**
PFO4DA	--	**1,400**	**1,400**	**1,900 J**
PFO5DA	--	**710**	**840**	**2,600**
PMPA	--	--	--	**11,000**
PEPA	--	--	--	**4,100**
PFESA-BP1	--	<200	<200	<120
PFESA-BP2	--	**470**	**540**	**1,200**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<8
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<5.4
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<2.7
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.7
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.7
6:2 Fluorotelomer sulfonate	--	--	--	<1.8
ADONA	--	--	--	--
NaDONA	--	--	--	<0.87 UJ
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.7
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<8 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<8 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.7
Perfluorobutane Sulfonic Acid	<2	--	--	**1.1**
Perfluorobutanoic Acid	--	--	--	**100**
Perfluorodecane Sulfonic Acid	--	--	--	<1.8
Perfluorodecanoic Acid	**2.2**	--	--	**6.8**
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<0.89
Perfluorododecanoic Acid	<2	--	--	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<1.8
Perfluoroheptanoic Acid	**34**	--	--	**28**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.89
Perfluorohexane Sulfonic Acid	**3.2**	--	--	**3**
Perfluorohexanoic Acid	**27**	--	--	**20**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	**17**	--	--	**44**
Perfluorooctadecanoic acid	--	--	--	<1.8
Perfluorooctane Sulfonamide	--	--	--	<2.7
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<1.8
Perfluoropentanoic Acid	**130**	--	--	**100**
Perfluorotetradecanoic Acid	<2	--	--	<0.89
Perfluorotridecanoic Acid	<2	--	--	<0.89
Perfluoroundecanoic Acid	**2**	--	--	**6.3**
PFOA	**97**	--	--	**150**
PFOS	**7.6**	--	--	**12**

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-12S	MW-23	MW-23	MW-23
Field Sample ID	GW0619-MW-12S	PF1018-Dup-2-MW-23	PF1018-MW-23	GW0419-MW23-040419
Sample Date	7/8/2019	10/24/2018	10/24/2018	4/4/2019
QA/QC	--	Field Duplicate	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**17,000**	**13,000**	**27,000 J**	--
PFMOAA	**6,600**	<1,900 UJ	<9,500 UJ	**680 J**
PFO2HxA	**9,600**	**2,000 J**	<9,200 UJ	**1,900 J**
PFO3OA	**1,500**	<1,800 UJ	<8,800 UJ	**160 J**
PFO4DA	**980**	<1,900 UJ	<9,700 UJ	**210 J**
PFO5DA	**980**	<2,100 UJ	<11,000 UJ	**110 J**
PMPA	**10,000**	**4,600 J**	<8,400 UJ	**3,600 J**
PEPA	**3,900**	<2,000 UJ	<10,000 UJ	**1,300 J**
PFESA-BP1	<27	<2,300 UJ	<12,000 UJ	<27 UJ
PFESA-BP2	**540**	<1,900 UJ	<9,500 UJ	**160 J**
Byproduct 4	**540**	--	--	**360 J**
Byproduct 5	**63**	--	--	<58 UJ
Byproduct 6	<15	--	--	<15 UJ
NVHOS	**140**	--	--	<54 UJ
EVE Acid	<24	--	--	<24 UJ
Hydro-EVE Acid	**120**	--	--	**34 J**
R-EVE	**330**	--	--	**240 J**
PES	<46	--	--	<46 UJ
PFECA B	<60	--	--	<60 UJ
PFECA-G	<41	<1,900 UJ	<9,600 UJ	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<450 UJ	<2,300 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<330 UJ	<1,700 UJ	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	--
ADONA	--	<2.1	<2.1	--
NaDONA	--	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<1,600 UJ	<8,200 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	<1,000 UJ	<5,200 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
Perfluorobutane Sulfonic Acid	<2	<2	<2	--
Perfluorobutanoic Acid	**130**	**51**	**52**	--
Perfluorodecane Sulfonic Acid	<2	<2	<2	--
Perfluorodecanoic Acid	**3.8**	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	--
Perfluorododecanoic Acid	<2	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	--
Perfluoroheptanoic Acid	**30**	**13**	**12**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<2	<2	--
Perfluorohexane Sulfonic Acid	**2**	**2.1**	<2	--
Perfluorohexanoic Acid	**23**	**11**	**11**	--
Perfluorononanesulfonic acid	<2	<2	<2	--
Perfluorononanoic Acid	**16**	<2	<2	--
Perfluorooctadecanoic acid	<2	<2	<2	--
Perfluorooctane Sulfonamide	<2	<2	<2	--
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	--
Perfluoropentanoic Acid	**150**	**44**	**43**	--
Perfluorotetradecanoic Acid	<2	<2	<2	--
Perfluorotridecanoic Acid	<2	<2	<2	--
Perfluoroundecanoic Acid	**6.9**	<2	<2	--
PFOA	**63**	**31**	**27**	--
PFOS	**7.7**	**3.5**	**2.1**	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-23	MW-24	MW-24	MW-24
Field Sample ID	GW0619-MW-23	FAY-D-MW-24-081518	FAY-D-MW-24-092018	FAY-D-MW-24-101718
Sample Date	6/25/2019	8/15/2018	9/20/2018	10/17/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**17,000**	**350,000 J**	**20,000 J**	**30,000**
PFMOAA	**790 J**	**2,800,000**	**3,200,000**	**1,600,000**
PFO2HxA	**2,200 J**	**520,000**	**660,000**	**350,000**
PFO3OA	**180 J**	**150,000**	**190,000**	**100,000**
PFO4DA	**250 J**	**36,000**	**41,000**	**22,000**
PFO5DA	**130 J**	**6,500**	<20,000	<20,000
PMPA	**4,400 J**	**39,000**	**39,000**	**22,000**
PEPA	**1,600 J**	**8,700**	<20,000	<20,000
PFESA-BP1	<27 UJ	**5,900**	<20,000	<20,000
PFESA-BP2	**150 J**	**5,900**	<20,000	<20,000
Byproduct 4	**450 J**	--	--	--
Byproduct 5	<58 UJ	--	--	--
Byproduct 6	<15 UJ	--	--	--
NVHOS	<54 UJ	--	--	--
EVE Acid	<24 UJ	--	--	--
Hydro-EVE Acid	**41 J**	--	--	--
R-EVE	**290 J**	--	--	--
PES	<46 UJ	--	--	--
PFECA B	<60 UJ	--	--	--
PFECA-G	<41 UJ	<2,000	<20,000	<20,000
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.3	<2.7	<2.7
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<5.5	<5.3	<5.3
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<2.8	<2.7	<2.7
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.8	<2.7	<2.7
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.8	<2.7	<2.7
6:2 Fluorotelomer sulfonate	<20	<1.8	<1.8	**8.7**
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<2.8	<2.7	<2.7
N-ethylperfluoro-1-octanesulfonamide	--	<8.3	<8	<8
N-methyl perfluoro-1-octanesulfonamide	--	<8.3	<8	<8
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<2.8	<2.7	<2.7
Perfluorobutane Sulfonic Acid	<2	<0.92	<0.89	<0.89
Perfluorobutanoic Acid	**45**	<550	**350**	**390**
Perfluorodecane Sulfonic Acid	<2	<1.8	<1.8	<1.8
Perfluorodecanoic Acid	<2	**3.9**	**6.7**	**3.5**
Perfluorododecane sulfonic acid (PFDoS)	<2	<0.92	<0.89	<0.89 UJ
Perfluorododecanoic Acid	<2	<1.8	<1.8	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	<2	<1.8	<1.8	<1.8
Perfluoroheptanoic Acid	**7.7**	**260**	**190**	**180**
Perfluorohexadecanoic acid (PFHxDA)	--	<0.92	<0.89	<0.89
Perfluorohexane Sulfonic Acid	<2	<1.8	<1.8	<1.8
Perfluorohexanoic Acid	**6.5**	**42**	**35**	**36**
Perfluorononanesulfonic acid	<2	--	<1.8	<1.8
Perfluorononanoic Acid	<2	**48**	**52**	**30**
Perfluorooctadecanoic acid	<2	<1.8	<1.8	<1.8
Perfluorooctane Sulfonamide	<2	<2.8	<2.7	<2.7
Perfluoropentane sulfonic acid (PFPeS)	<2	<1.8	<1.8	<1.8
Perfluoropentanoic Acid	**35**	**3,300**	**1,800 J**	**2,300**
Perfluorotetradecanoic Acid	<2	<0.92	<0.89	<0.89
Perfluorotridecanoic Acid	<2	<0.92	<0.89	<0.89
Perfluoroundecanoic Acid	<2	**4.6 J**	**6.4**	**3.2**
PFOA	**23**	**120 J**	**150**	**130**
PFOS	<2	**5**	**7.9**	**4.1**

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TABLE I-1
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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-24	MW-24	MW-24	MW-24
Field Sample ID	PF1018-MW-24	FAY-D-MW-24-111518	FAY-D-MW-24-121918	FAY-D-MW-24-011619
Sample Date	10/25/2018	11/15/2018	12/19/2018	1/16/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**34,000**	**32,000**	**50,000 J**	**16,000**
PFMOAA	**1,700,000 J**	**17,000,000**	**2,000,000**	**1,600,000**
PFO2HxA	<1,400,000 UJ	**3,100,000**	**420,000**	**320,000**
PFO3OA	<1,300,000 UJ	**970,000**	**130,000**	**83,000**
PFO4DA	<1,500,000 UJ	**230,000**	**26,000**	**20,000**
PFO5DA	<1,600,000 UJ	**40,000**	<10,000	**3,500**
PMPA	<1,300,000 UJ	**210,000**	**28,000**	**19,000**
PEPA	<1,500,000 UJ	**63,000**	**8,100**	**6,000**
PFESA-BP1	<1,700,000 UJ	**27,000**	<5,000	**2,300**
PFESA-BP2	<1,400,000 UJ	**33,000**	<5,000	**2,800**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<1,400,000 UJ	<5,000	<5,000	<50
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2.6	<2.6	<26
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<5.3	<5.2	<53
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<2.6	<2.6	<26
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<340,000 UJ	<2.6	<2.6	<26
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<250,000 UJ	<2.6	<2.6	<26
6:2 Fluorotelomer sulfonate	<20	<1.8	<1.7	<18
ADONA	<2.1	--	--	--
NaDONA	<2.1	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<2.6	<2.6	<26
N-ethylperfluoro-1-octanesulfonamide	<1,200,000 UJ	<7.9	<7.8	<79
N-methyl perfluoro-1-octanesulfonamide	<780,000 UJ	<7.9	<7.8	<79
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<2.6	<2.6	<26
Perfluorobutane Sulfonic Acid	<2	<0.88	<0.87	<8.8
Perfluorobutanoic Acid	**400**	**180**	**250**	**240**
Perfluorodecane Sulfonic Acid	<2	<1.8	<1.7	<18
Perfluorodecanoic Acid	**4.6**	**2.8**	**2.6**	<18
Perfluorododecane sulfonic acid (PFDoS)	<2	<0.88 UJ	<0.87	<8.8
Perfluorododecanoic Acid	<2	<1.8	<1.7	<18
Perfluoroheptane sulfonic acid (PFHpS)	<2	<1.8	<1.7	<18
Perfluoroheptanoic Acid	**230**	**100**	**130**	**120**
Perfluorohexadecanoic acid (PFHxDA)	<2	<0.88	<0.87	<8.8
Perfluorohexane Sulfonic Acid	<2	<1.8	<1.7	<18
Perfluorohexanoic Acid	**49**	**16**	**28**	**26**
Perfluorononanesulfonic acid	<2	<1.8	<1.7	<18
Perfluorononanoic Acid	**37**	**16**	**22**	**20**
Perfluorooctadecanoic acid	<2	<1.8	<1.7	<18
Perfluorooctane Sulfonamide	<2	<2.6	<2.6	<26
Perfluoropentane sulfonic acid (PFPeS)	<2	<1.8	<1.7	<18
Perfluoropentanoic Acid	**2,700**	**1,000**	**1,100**	**1,400**
Perfluorotetradecanoic Acid	<2	<0.88	<0.87	<8.8
Perfluorotridecanoic Acid	<2	<0.88	<0.87	<8.8
Perfluoroundecanoic Acid	**5.5**	**3.5**	**2.8**	<18
PFOA	**150**	**110**	**100**	**86**
PFOS	**5**	**3.5**	**3**	<18

Notes:
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I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	MW-24	MW-24	MW-24	MW-24
Field Sample ID	FAY-D-MW-24-021319	FAY-D-MW-24-031319	FAY-D-MW-24-041519	FAY-D-MW-24-051319
Sample Date	2/13/2019	3/13/2019	4/15/2019	5/13/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**15,000 J**	**11,000**	**30,000 J**	**24,000 J**
PFMOAA	**1,100,000**	**1,100,000 J**	**1,600,000 J**	**1,500,000 J**
PFO2HxA	**200,000**	**190,000 J**	**280,000 J**	**280,000 J**
PFO3OA	**52,000**	**47,000 J**	**68,000 J**	**66,000 J**
PFO4DA	**11,000**	**12,000 J**	**16,000 J**	**16,000 J**
PFO5DA	**2,100**	**2,300 J**	**3,100 J**	**3,200 J**
PMPA	**16,000**	**14,000 J**	**19,000 J**	**18,000 J**
PEPA	**4,400**	**5,200 J**	**7,000 J**	**6,500 J**
PFESA-BP1	**1,800**	**1,500 J**	**2,200 J**	**2,100 J**
PFESA-BP2	**2,100**	**2,300 J**	**3,000 J**	**2,900 J**
Byproduct 4	--	**3,700 J**	**5,100 J**	3,900 UJ
Byproduct 5	--	**9,700 J**	**16,000 J**	**14,000 J**
Byproduct 6	--	<150 UJ	<310 UJ	<310 UJ
NVHOS	--	**11,000 J**	**16,000 J**	**16,000 J**
EVE Acid	--	<240 UJ	<490 UJ	<490 UJ
Hydro-EVE Acid	--	**630 J**	**880 J**	**880 J**
R-EVE	--	**1,100 J**	**1,700 J**	<1,400 UJ
PES	--	<460 UJ	<920 UJ	<920 UJ
PFECA B	--	<600 UJ	<1,200 UJ	<1,200 UJ
PFECA-G	<50	<410 UJ	<820 UJ	<820 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2.7	<28	<2.7	<27
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<55	<5.3	<54
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<28	<2.7	<27
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	<28	<2.7	<27
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	<28	<2.7	<27
6:2 Fluorotelomer sulfonate	<1.8	<18	<1.8	<18
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<28	<2.7	<27
N-ethylperfluoro-1-octanesulfonamide	<8	<83	<8	<81
N-methyl perfluoro-1-octanesulfonamide	<8	<83	<8	<81
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<28	<2.7	<27
Perfluorobutane Sulfonic Acid	<0.89	<9.2	<0.89	<8.9
Perfluorobutanoic Acid	**230**	**180**	**380**	**430**
Perfluorodecane Sulfonic Acid	<1.8	<18	<1.8	<18
Perfluorodecanoic Acid	**1.9**	<18	**2.4**	<18
Perfluorododecane sulfonic acid (PFDoS)	<0.89	<9.2	<0.89	<8.9
Perfluorododecanoic Acid	<1.8	<18	<1.8	<18
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<18	<1.8	<18
Perfluoroheptanoic Acid	**120**	**100**	**220**	**260**
Perfluorohexadecanoic acid (PFHxDA)	<0.89	<9.2	<0.89	<8.9
Perfluorohexane Sulfonic Acid	<1.8	<18	<1.8	<18
Perfluorohexanoic Acid	**27**	**21**	**42**	**45**
Perfluorononanesulfonic acid	<1.8	<18	<1.8	<18
Perfluorononanoic Acid	**20**	<18	**31**	**35**
Perfluorooctadecanoic acid	<1.8	<18	<1.8	<18
Perfluorooctane Sulfonamide	<2.7	<28	<2.7	<27
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<18	<1.8	<18
Perfluoropentanoic Acid	**1,400**	**1,100**	**2,400**	**2,800**
Perfluorotetradecanoic Acid	<0.89	<9.2	<0.89	<8.9
Perfluorotridecanoic Acid	<0.89	<9.2	<0.89	<8.9
Perfluoroundecanoic Acid	**4.2**	<18	**5.2**	<18
PFOA	**100**	**77**	**100**	**110**
PFOS	**2.6**	<18	**3.5**	<18

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**MW-24**	**MW-24**	**MW-24**	**MW-25**
Field Sample ID	**FAY-D-MW-24-061819**	**FAY-D-MW-24-071719**	**GW0619-MW-24**	**GW1018-MW-25**
Sample Date	**6/18/2019**	**7/17/2019**	**7/17/2019**	**11/13/2018**
QA/QC	**--**	**--**	**--**	**--**
Table 3+ (ng/L)				
Hfpo Dimer Acid	**16,000 B**	**21,000 J**	**15,000**	**24,000**
PFMOAA	**870,000 J**	**2,200,000**	**720,000**	<9,500 UJ
PFO2HxA	**150,000 J**	**380,000**	**130,000**	<9,200 UJ
PFO3OA	**36,000 J**	**91,000**	**31,000**	<8,800 UJ
PFO4DA	**7,800 J**	**21,000**	**7,400**	<9,700 UJ
PFO5DA	2,200 UJ	**4,500**	**1,400**	<11,000 UJ
PMPA	**14,000 J**	**28,000**	**8,100**	**28,000 J**
PEPA	<20,000 UJ	<20,000	**3,200**	**10,000 J**
PFESA-BP1	<2,000 UJ	**3,100**	**1,400**	<12,000 UJ
PFESA-BP2	<2,000 UJ	**4,000**	**1,200**	<9,500 UJ
Byproduct 4	**2,100 J**	**6,700**	**2,100**	**--**
Byproduct 5	**7,400 J**	**25,000 J**	**8,200**	**--**
Byproduct 6	<2,000 UJ	<2,000	<150	**--**
NVHOS	**7,900 J**	**24,000**	**7,100**	**--**
EVE Acid	<2,000 UJ	<2,000	<240	**--**
Hydro-EVE Acid	<2,000 UJ	<2,000	**420**	**--**
R-EVE	<2,000 UJ	<2,000	<700	**--**
PES	<2,000 UJ	<2,000	<460	**--**
PFECA B	<2,000 UJ	<2,000	<600	**--**
PFECA-G	<2,000 UJ	<2,000	<410	<9,600 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<25	<4.6	**--**	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<50	<2.7	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<25	<1.8	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<25	<2.7 UJ	**--**	<2,300 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<25	<2.7	**--**	<1,700 UJ
6:2 Fluorotelomer sulfonate	<17	<4.6	<20	<20
ADONA	**--**	**--**	**--**	<2.1
NaDONA	**--**	**--**	**--**	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<25	<2.7	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<76	<4.6 UJ	**--**	<8,200 UJ
N-methyl perfluoro-1-octanesulfonamide	<76	<2.7	**--**	<5,200 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<25	<1.8	<20	<20
Perfluorobutane Sulfonic Acid	<8.4	<1.8	<2	<2
Perfluorobutanoic Acid	**220**	**390**	**200**	**190**
Perfluorodecane Sulfonic Acid	<17	<1.8	<2	<2
Perfluorodecanoic Acid	<17	**2.2**	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<8.4	<2.7	<2	<2
Perfluorododecanoic Acid	<17	<1.8	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<17	<1.8	<2	<2
Perfluoroheptanoic Acid	**120**	**200**	**110**	**30**
Perfluorohexadecanoic acid (PFHxDA)	<8.4	<2.7	**--**	<2
Perfluorohexane Sulfonic Acid	<17	<1.8	<2	**2.6**
Perfluorohexanoic Acid	**21**	**37**	**21**	**15**
Perfluorononanesulfonic acid	<17	<1.8	<2	<2
Perfluorononanoic Acid	<17	**28**	**16**	**4.5**
Perfluorooctadecanoic acid	<17	<2.7	<2	<2
Perfluorooctane Sulfonamide	<25	<1.8	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<17	<1.8	<2	<2
Perfluoropentanoic Acid	**1,300**	**2,300**	**1,100**	**150**
Perfluorotetradecanoic Acid	<8.4	<1.8	<2	<2
Perfluorotridecanoic Acid	<8.4	<1.8	<2	<2
Perfluoroundecanoic Acid	<17	**5.7**	**6.1**	<2
PFOA	**70**	**89**	**89**	**62**
PFOS	<17	**2.2**	**2.2**	**4.6**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	**MW-25**	**MW-27**	**MW-27**	**MW-28**
Field Sample ID	**GW0619-MW-25**	**GW1018-MW-27**	**GW0619-MW-27**	**GW1018-MW-28**
Sample Date	**6/25/2019**	**11/13/2018**	**6/25/2019**	**11/13/2018**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**17,000**	**8,700**	**11,000**	**4,400**
PFMOAA	**2,700 J**	**180,000 J**	**240,000 J**	<2,400 UJ
PFO2HxA	**8,100 J**	<92,000 UJ	**62,000 J**	**3,700 J**
PFO3OA	**1,400 J**	<88,000 UJ	**17,000 J**	<2,200 UJ
PFO4DA	**1,400 J**	<97,000 UJ	**4,500 J**	<2,400 UJ
PFO5DA	**750 J**	<110,000 UJ	**260 J**	<2,600 UJ
PMPA	**25,000 J**	<84,000 UJ	**7,800 J**	**4,600 J**
PEPA	**9,800 J**	<100,000 UJ	**2,900 J**	<2,500 UJ
PFESA-BP1	<27 UJ	<120,000 UJ	<53 UJ	<2,900 UJ
PFESA-BP2	**410 J**	<95,000 UJ	**550 J**	<2,400 UJ
Byproduct 4	**1,700 J**	--	**570 J**	--
Byproduct 5	**360 J**	--	**810 J**	--
Byproduct 6	<15 UJ	--	**35 J**	--
NVHOS	**180 J**	--	**3,100 J**	--
EVE Acid	<24 UJ	--	<49 UJ	--
Hydro-EVE Acid	**190 J**	--	**240 J**	--
R-EVE	**1,400 J**	--	**220 J**	--
PES	<46 UJ	--	<92 UJ	--
PFECA B	<60 UJ	--	<120 UJ	--
PFECA-G	<41 UJ	<96,000 UJ	<82 UJ	<2,400 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<23,000 UJ	--	<570 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<17,000 UJ	--	<420 UJ
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	<2.1	--	<2.1
NaDONA	--	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<82,000 UJ	--	<2,100 UJ
N-methyl perfluoro-1-octanesulfonamide	--	<52,000 UJ	--	<1,300 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	<2	**2**	<2	<2
Perfluorobutanoic Acid	**190**	**96**	**110**	**40**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	<2	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**33**	**23**	**23**	**11**
Perfluorohexadecanoic acid (PFHxDA)	--	<2	--	<2
Perfluorohexane Sulfonic Acid	**2.4**	**2.6**	**2.8**	<2
Perfluorohexanoic Acid	**15**	**15**	**16**	**6**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**4.2**	<2	<2	<2
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**160**	**120**	**130**	**52**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**80**	**24**	**23**	**36**
PFOS	**4.2**	<2	<2	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**MW-28**	**MW-30**	**MW-30**	**NAF-01**
Field Sample ID	**GW0619-MW-28**	**GW1018-MW-30**	**GW0619-MW-30**	**11281533**
Sample Date	**6/26/2019**	**11/13/2018**	**7/2/2019**	**1/27/2003**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,900**	**25,000**	**18,000**	--
PFMOAA	<210 UJ	<9,500 UJ	**3,300**	--
PFO2HxA	<81 UJ	**9,800 J**	**9,400**	--
PFO3OA	<58 UJ	<8,800 UJ	**1,000 J**	--
PFO4DA	<79 UJ	<9,700 UJ	**1,600 J**	--
PFO5DA	<34 UJ	<11,000 UJ	**2,100 J**	--
PMPA	<570 UJ	**35,000 J**	**29,000**	--
PEPA	<47 UJ	**15,000 J**	**11,000**	--
PFESA-BP1	<27 UJ	<12,000 UJ	<27	--
PFESA-BP2	<30 UJ	<9,500 UJ	**480**	--
Byproduct 4	<160 UJ	--	**640**	--
Byproduct 5	<58 UJ	--	<58	--
Byproduct 6	<15 UJ	--	<15	--
NVHOS	<54 UJ	--	**95**	--
EVE Acid	<24 UJ	--	<24	--
Hydro-EVE Acid	<28 UJ	--	**150**	--
R-EVE	<70 UJ	--	**270**	--
PES	<46 UJ	--	<46	--
PFECA B	<60 UJ	--	<60	--
PFECA-G	<41 UJ	<9,600 UJ	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2,300 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<1,700 UJ	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	--
ADONA	--	<2.1	--	--
NaDONA	--	<2.1	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<8,200 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<5,200 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	--
Perfluorobutane Sulfonic Acid	<2	<2	<2	--
Perfluorobutanoic Acid	**28**	**230**	**190**	--
Perfluorodecane Sulfonic Acid	<2	<2	<2	--
Perfluorodecanoic Acid	<2	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	--
Perfluorododecanoic Acid	<2	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	--
Perfluoroheptanoic Acid	**7.3**	**40**	**33**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<2	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<2	--
Perfluorohexanoic Acid	**4.3**	**14**	**10**	--
Perfluorononanesulfonic acid	<2	<2	<2	--
Perfluorononanoic Acid	<2	**8.2**	**6.3**	--
Perfluorooctadecanoic acid	<2	<2	<2	--
Perfluorooctane Sulfonamide	<2	<2	<2	--
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	--
Perfluoropentanoic Acid	**35**	**180**	**160**	--
Perfluorotetradecanoic Acid	<2	<2	<2	--
Perfluorotridecanoic Acid	<2	<2	<2	--
Perfluoroundecanoic Acid	<2	<2	<2	--
PFOA	**20**	**83**	**61**	**62**
PFOS	<2	**3**	**3**	--

Notes:
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E - result exceeded calibration range
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-01	NAF-01	NAF-01	NAF-01
Field Sample ID	11281490	11281494	13056227	15175583
Sample Date	3/27/2003	3/27/2003	2/4/2004	6/15/2005
QA/QC	Field Duplicate	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**60**	**66**	**60**	**100**
PFOS	--	--	--	--

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-01	NAF-01	NAF-01	NAF-01
Field Sample ID	15699063	16194421	P32013-NAF-01-D	P32013-NAF-01
Sample Date	10/13/2005	2/1/2006	6/12/2013	6/12/2013
QA/QC	--	--	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**150**	**110**	**1,500**	**1,500**
PFOS	--	--	--	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-01	NAF-01	NAF-01	NAF-01
Field Sample ID	P313RE-NAF-01-D	P313RE-NAF-01	FAY-GWASI-NAF-01-D	FAY-GWASI-NAF-01-D-1
Sample Date	10/4/2013	10/4/2013	11/15/2017	11/15/2017
QA/QC	Field Duplicate	--	Field Duplicate	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**51,000 J**	--
PFMOAA	--	--	--	**43,000**
PFO2HxA	--	--	--	**47,000**
PFO3OA	--	--	--	**20,000**
PFO4DA	--	--	--	**19,000**
PFO5DA	--	--	--	**13,000**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	**2,900**
PFESA-BP2	--	--	--	**16,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
Perfluorobutane Sulfonic Acid	--	--	**2.2**	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	**16**	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	**2.6**	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	**170**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	**4.1**	--
Perfluorohexanoic Acid	--	--	**52**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**66**	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	**970**	--
Perfluorotetradecanoic Acid	--	--	<2	--
Perfluorotridecanoic Acid	--	--	<2	--
Perfluoroundecanoic Acid	--	--	**18**	--
PFOA	**1,200**	**1,200**	**430**	--
PFOS	--	--	**12**	--

Notes:
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ng/L - nanograms per liter
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-01	NAF-01	NAF-01	NAF-01
Field Sample ID	FAY-GWASI-NAF-01-D-2	FAY-GWASI-NAF-01	FAY-GWASI-NAF-01-1	FAY-GWASI-NAF-01-2
Sample Date	11/15/2017	11/15/2017	11/15/2017	11/15/2017
QA/QC	Field Duplicate	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**51,000 J**	--	--
PFMOAA	**43,000**	--	**42,000**	**44,000**
PFO2HxA	**46,000**	--	**48,000**	**46,000**
PFO3OA	**20,000**	--	**20,000**	**20,000**
PFO4DA	**19,000**	--	**18,000**	**18,000**
PFO5DA	**12,000**	--	**12,000**	**12,000**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	**2,800**	--	**3,100**	**2,800**
PFESA-BP2	**16,000**	--	**16,000**	**16,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	**2.2**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	**16**	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	**2.1**	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**170**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**3.7**	--	--
Perfluorohexanoic Acid	--	**53**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**63**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**890**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	**21**	--	--
PFOA	--	**450**	--	--
PFOS	--	**12**	--	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-01	NAF-01	NAF-02	NAF-02
Field Sample ID	GW0718-NAF-01	GW0619-NAF-01	13056229	15175585
Sample Date	7/17/2018	7/10/2019	2/4/2004	6/15/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**26,000 J**	**22,000**	--	--
PFMOAA	**38,000**	**20,000**	--	--
PFO2HxA	**41,000**	**20,000**	--	--
PFO3OA	**15,000**	**5,000**	--	--
PFO4DA	**12,000**	**6,200**	--	--
PFO5DA	**7,800**	**6,000 J**	--	--
PMPA	**16,000**	**17,000**	--	--
PEPA	**5,900**	**7,400**	--	--
PFESA-BP1	**880**	**840**	--	--
PFESA-BP2	**5,100**	**2,900**	--	--
Byproduct 4	--	**2,700**	--	--
Byproduct 5	--	**1,700**	--	--
Byproduct 6	--	**70**	--	--
NVHOS	--	**750**	--	--
EVE Acid	--	**480**	--	--
Hydro-EVE Acid	--	**820**	--	--
R-EVE	--	**5,600**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<96	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.9	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
6:2 Fluorotelomer sulfonate	**3**	<20	--	--
ADONA	--	--	--	--
NaDONA	<88	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<7.9 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.9 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	--
Perfluorobutane Sulfonic Acid	**2.6 J**	**2.4**	--	--
Perfluorobutanoic Acid	**280**	**490**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	**9.1**	**6.8**	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.88	<2	--	--
Perfluorododecanoic Acid	**2.4**	**2.4**	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**90**	**73**	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.88	--	--	--
Perfluorohexane Sulfonic Acid	**3.9**	**2.9**	--	--
Perfluorohexanoic Acid	**41**	**54**	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**50**	**49**	--	--
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.6	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**430 J**	**330**	--	--
Perfluorotetradecanoic Acid	<0.88	<2	--	--
Perfluorotridecanoic Acid	<0.88	<2	--	--
Perfluoroundecanoic Acid	**14**	**10**	--	--
PFOA	**240**	**130**	**290**	**330**
PFOS	**12**	**8.5**	--	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-02	NAF-02	NAF-02	NAF-02
Field Sample ID	15699076	16194423	FAY-GWASI-NAF-02	FAY-GWASI-NAF-02-1
Sample Date	10/14/2005	2/1/2006	11/15/2017	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**59,000 J**	--
PFMOAA	--	--	--	**390,000**
PFO2HxA	--	--	--	**19,000**
PFO3OA	--	--	--	**61,000**
PFO4DA	--	--	--	**46,000**
PFO5DA	--	--	--	**27,000**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	**3,700**
PFESA-BP2	--	--	--	**10,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
Perfluorobutane Sulfonic Acid	--	--	**2.2**	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	**12**	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	**6.6**	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	**300**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	**3.1**	--
Perfluorohexanoic Acid	--	--	**180**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**310**	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	**1,500**	--
Perfluorotetradecanoic Acid	--	--	<2	--
Perfluorotridecanoic Acid	--	--	**7.1**	--
Perfluoroundecanoic Acid	--	--	**28**	--
PFOA	**240**	**300**	**170**	--
PFOS	--	--	**9.7**	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-02	NAF-02	NAF-02	NAF-03
Field Sample ID	FAY-GWASI-NAF-02-2	GW0718-NAF-02	GW0619-NAF-02	13056231
Sample Date	11/15/2017	7/16/2018	6/27/2019	2/4/2004
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**12,000 J**	**160,000 J**	--
PFMOAA	**410,000**	**99,000**	**2,900,000 J**	--
PFO2HxA	**190,000**	**37,000**	**780,000 J**	--
PFO3OA	**61,000**	**13,000**	**240,000 J**	--
PFO4DA	**49,000**	**15,000**	**100,000 J**	--
PFO5DA	**28,000**	**11,000**	**36,000 J**	--
PMPA	--	**16,000**	**74,000 J**	--
PEPA	--	**5,400**	**32,000 J**	--
PFESA-BP1	**3,600**	**2,300**	**23,000 J**	--
PFESA-BP2	**7,200**	**3,700**	**17,000 J**	--
Byproduct 4	--	--	**21,000 J**	--
Byproduct 5	--	--	**210,000 J**	--
Byproduct 6	--	--	<770 UJ	--
NVHOS	--	--	**27,000 J**	--
EVE Acid	--	--	**7,300 J**	--
Hydro-EVE Acid	--	--	**14,000 J**	--
R-EVE	--	--	**12,000 J**	--
PES	--	--	<2,300 UJ	--
PFECA B	--	--	<3,000 UJ	--
PFECA-G	--	<96	<2,000 UJ	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.8	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.2	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
6:2 Fluorotelomer sulfonate	--	<1.7	<20	--
ADONA	--	--	--	--
NaDONA	--	<880	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
Perfluorobutane Sulfonic Acid	--	**2.4 J**	**2.4**	--
Perfluorobutanoic Acid	--	**210**	**3,300**	--
Perfluorodecane Sulfonic Acid	--	<1.7	<2	--
Perfluorodecanoic Acid	--	**6.8**	**48**	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.87	<2	--
Perfluorododecanoic Acid	--	**2.1**	**41**	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.7	<2	--
Perfluoroheptanoic Acid	--	**75**	**1,000**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.87	--	--
Perfluorohexane Sulfonic Acid	--	**4.3**	**2.9**	--
Perfluorohexanoic Acid	--	**57**	**610**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	**110**	**400**	--
Perfluorooctadecanoic acid	--	<1.7	<2	--
Perfluorooctane Sulfonamide	--	<2.6	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.7	<2	--
Perfluoropentanoic Acid	--	**270**	**8,000**	--
Perfluorotetradecanoic Acid	--	<0.87	<2	--
Perfluorotridecanoic Acid	--	**2.8**	**44**	--
Perfluoroundecanoic Acid	--	**7.5**	**170**	--
PFOA	--	**47**	**260**	**1,500**
PFOS	--	**10**	**6.5**	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	15175587	15699068	16194337	P32013-NAF-03
Sample Date	6/15/2005	10/14/2005	1/25/2006	6/12/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**640**	**840**	**420**	**610**
PFOS	--	--	--	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	FAY-GWASI-NAF-03	FAY-GWASI-NAF-03-1	FAY-GWASI-NAF-03-2	NAF-03-031918
Sample Date	11/15/2017	11/15/2017	11/15/2017	3/19/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**160,000 J**	--	--	**250,000 J**
PFMOAA	--	**470,000**	**540,000**	--
PFO2HxA	--	**250,000**	**300,000**	--
PFO3OA	--	**86,000**	**96,000**	--
PFO4DA	--	**46,000**	**53,000**	--
PFO5DA	--	**31,000**	**33,000**	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	**16,000**	**17,000**	--
PFESA-BP2	--	**7,600**	**8,200**	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<28
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<19
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<9
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<9
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<9
6:2 Fluorotelomer sulfonate	--	--	--	<28
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<9
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<28
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<28
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<9
Perfluorobutane Sulfonic Acid	<2	--	--	<3
Perfluorobutanoic Acid	--	--	--	**1,100**
Perfluorodecane Sulfonic Acid	--	--	--	<6
Perfluorodecanoic Acid	**20**	--	--	**11 J**
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<3
Perfluorododecanoic Acid	**8.4**	--	--	**5 J**
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<4
Perfluoroheptanoic Acid	**290**	--	--	**230**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<3 UJ
Perfluorohexane Sulfonic Acid	<2	--	--	<4
Perfluorohexanoic Acid	**400**	--	--	**170**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	**81**	--	--	**70**
Perfluorooctadecanoic acid	--	--	--	<3
Perfluorooctane Sulfonamide	--	--	--	<9
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<4
Perfluoropentanoic Acid	**2,000**	--	--	**1,800**
Perfluorotetradecanoic Acid	<2	--	--	<3
Perfluorotridecanoic Acid	**2.2**	--	--	<3
Perfluoroundecanoic Acid	**41**	--	--	**23**
PFOA	**120**	--	--	**73**
PFOS	**5.3**	--	--	<4

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	FAY-D-NAF03-041818	FAY-D-NAF-03-051618	FAY-D-NAF-03-061918	FAY-D-NAF-03-071318
Sample Date	4/18/2018	5/16/2018	6/19/2018	7/13/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**260,000**	**210,000**	**140,000 J**	**140,000 J**
PFMOAA	**1,200,000**	**530,000**	**730,000**	**460,000**
PFO2HxA	**480,000 B**	**250,000**	**360,000**	**240,000**
PFO3OA	**150,000 B**	**77,000**	**120,000**	**69,000**
PFO4DA	**59,000 B**	**36,000**	**48,000**	**31,000**
PFO5DA	**43,000 B**	**30,000**	**30,000**	**27,000**
PMPA	**76,000 B**	**53,000**	**68,000**	**61,000**
PEPA	**24,000 B**	**17,000**	**22,000**	**20,000**
PFESA-BP1	**35,000 B**	**25,000**	**34,000**	**37,000**
PFESA-BP2	**21,000 B**	**13,000**	**18,000**	**22,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<10,000	<200	<2,000	<200
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<450	<8.3	<81	<8
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<300	<5.6	<54	<5.3
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<150	<2.8	<27	<2.7
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<150	<2.8	<27	<2.7
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<150	<2.8	<27 UJ	<2.7
6:2 Fluorotelomer sulfonate	<100	**16 J**	<18	**3.5**
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<150	<2.8	<27	<2.7
N-ethylperfluoro-1-octanesulfonamide	<450	<8.3 UJ	<81	<8 UJ
N-methyl perfluoro-1-octanesulfonamide	<450	<8.3 UJ	<81	<8 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<150	<2.8	<27	<2.7
Perfluorobutane Sulfonic Acid	<50	**1.3 J**	<9	**0.99 J**
Perfluorobutanoic Acid	**1,900**	**1,600 J**	**2,100**	**1,300**
Perfluorodecane Sulfonic Acid	<100	<1.9 UJ	<18	<1.8
Perfluorodecanoic Acid	<100	**25 J**	**26**	**21**
Perfluorododecane sulfonic acid (PFDoS)	<50	<0.93	<9	<0.88
Perfluorododecanoic Acid	<50	**9.7 J**	**21**	**11**
Perfluoroheptane sulfonic acid (PFHpS)	<100	<1.9	<18	<1.8
Perfluoroheptanoic Acid	**360**	**210**	**400**	**320**
Perfluorohexadecanoic acid (PFHxDA)	<50	<0.93	<9	<0.88
Perfluorohexane Sulfonic Acid	<100	<1.9	<18	<1.8
Perfluorohexanoic Acid	**280**	**220**	**280**	**230**
Perfluorononanesulfonic acid	--	<1.9 UJ	--	--
Perfluorononanoic Acid	**130**	**72**	**110**	**81**
Perfluorooctadecanoic acid	<50	<0.93 UJ	<9	<1.8
Perfluorooctane Sulfonamide	<150	<2.8 UJ	<27	<2.7
Perfluoropentane sulfonic acid (PFPeS)	<100	<1.9 UJ	<18	<1.8
Perfluoropentanoic Acid	**2,600**	**1,500 J**	**2,700**	**1,800 B**
Perfluorotetradecanoic Acid	<50	<0.93	<9	<0.88
Perfluorotridecanoic Acid	<50	**1.9 J**	<9	**2.4**
Perfluoroundecanoic Acid	<100	**57 J**	**59**	**44**
PFOA	**130**	**160**	**140**	**100**
PFOS	<100	**3.2 J**	<18	**2.3**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	GW0718-NAF-03	FAY-D-NAF-03-081518	FAY-D-NAF-03-092018	FAY-D-NAF-03-101718
Sample Date	7/17/2018	8/15/2018	9/20/2018	10/17/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**250,000 J**	**270,000 J**	**240,000 J**	**320,000**
PFMOAA	**930,000**	**1,700,000**	**1,200,000**	**1,500,000**
PFO2HxA	**390,000**	**590,000**	**470,000**	**630,000**
PFO3OA	**130,000**	**210,000**	**160,000**	**230,000**
PFO4DA	**53,000**	**76,000**	**65,000**	**100,000**
PFO5DA	**47,000**	**40,000**	**50,000**	**79,000**
PMPA	**84,000**	**84,000**	**70,000**	**84,000**
PEPA	**31,000**	**24,000**	**27,000**	**39,000**
PFESA-BP1	**41,000**	**35,000**	**34,000**	**45,000**
PFESA-BP2	**27,000**	**20,000**	<20,000	**23,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<1,900	<2,000	<20,000	<20,000
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8	<82	<2.6	<37
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<55	<5.2	<75
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<27	<2.6	<37
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	<27	<2.6	<37
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	<27	<2.6	<37
6:2 Fluorotelomer sulfonate	**4**	<18	**3**	<25
ADONA	--	--	--	--
NaDONA	<91	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<27	<2.6	<37
N-ethylperfluoro-1-octanesulfonamide	<8	<82	<7.8	<110
N-methyl perfluoro-1-octanesulfonamide	<8	<82	<7.8	<110
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<27	<2.6	<37
Perfluorobutane Sulfonic Acid	**1.1 J**	<9.1	**1 J**	<12
Perfluorobutanoic Acid	**2,400**	**3,400**	**2,200**	**3,600**
Perfluorodecane Sulfonic Acid	<1.8	<18	<1.7	<25
Perfluorodecanoic Acid	**40**	**39**	**29**	**28**
Perfluorododecane sulfonic acid (PFDoS)	<0.89	<9.1	<0.87	<12 UJ
Perfluorododecanoic Acid	**15**	**20**	**41**	<25
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<18	<1.7	<25
Perfluoroheptanoic Acid	**470**	**760**	**470**	**810 J**
Perfluorohexadecanoic acid (PFHxDA)	<0.89	<9.1	<0.87	<12
Perfluorohexane Sulfonic Acid	<1.8	<18	<1.7	<25
Perfluorohexanoic Acid	**340**	**490**	**320**	**910 J**
Perfluorononanesulfonic acid	--	--	<1.7 UJ	<25
Perfluorononanoic Acid	**160**	**240**	**140**	**250 J**
Perfluorooctadecanoic acid	<1.8	<18	<1.7	<25
Perfluorooctane Sulfonamide	<2.7	<27	<2.6	<37
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<18	<1.7 UJ	<25
Perfluoropentanoic Acid	**4,300 J**	**6,100**	**4,100 J**	**6,800 J**
Perfluorotetradecanoic Acid	<0.89	<9.1	<0.87	<12
Perfluorotridecanoic Acid	**2.9**	<9.1	**20 J**	<12
Perfluoroundecanoic Acid	**84**	**84 J**	**66**	**65**
PFOA	**140**	**210**	**160**	**240**
PFOS	**3.6**	<18	**2.8**	<25

Notes:
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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	PF1018-NAF-03	FAY-D-NAF-03-111518	FAY-D-NAF-03-121918	FAY-D-NAF-03-011619
Sample Date	10/30/2018	11/15/2018	12/19/2018	1/16/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**250,000**	**140,000**	**2,200,000 J**	**190,000**
PFMOAA	**830,000 J**	**2,900,000**	**800,000**	**820,000 J**
PFO2HxA	**340,000 J**	**1,700,000**	**370,000**	**370,000 J**
PFO3OA	<180,000 UJ	**620,000**	**160,000**	**160,000**
PFO4DA	<190,000 UJ	**370,000**	**68,000**	**68,000 J**
PFO5DA	<210,000 UJ	**390,000**	**57,000**	**45,000**
PMPA	<170,000 UJ	**760,000**	**95,000**	**67,000**
PEPA	<200,000 UJ	**300,000**	**41,000**	**34,000**
PFESA-BP1	<230,000 UJ	**650,000**	**56,000**	**63,000**
PFESA-BP2	<190,000 UJ	**220,000**	**20,000**	**19,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<190,000 UJ	<5,000	<5,000	<50
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2.6	<26	<260
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<5.3	<52	<530
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<2.6	<26	<260
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<45,000 UJ	<2.6	<26	<260
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<33,000 UJ	<2.6	<26	<260
6:2 Fluorotelomer sulfonate	<20	**5 J**	<17	<180
ADONA	<2.1	--	--	--
NaDONA	<2.1	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<2.6	<26	<260
N-ethylperfluoro-1-octanesulfonamide	<160,000 UJ	<7.9	<79	<790
N-methyl perfluoro-1-octanesulfonamide	<100,000 UJ	<7.9	<79	<790
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<2.6 UJ	<26	<260
Perfluorobutane Sulfonic Acid	<2	**1.4 J**	<8.7	<88
Perfluorobutanoic Acid	**2,500**	**2,600**	**3,200**	**2,800**
Perfluorodecane Sulfonic Acid	<2	<1.8	<17	<180
Perfluorodecanoic Acid	**50**	**26**	**30**	<180
Perfluorododecane sulfonic acid (PFDoS)	<2	<0.88 UJ	<8.7	<88
Perfluorododecanoic Acid	**11**	**20**	<17	<180
Perfluoroheptane sulfonic acid (PFHpS)	<2	<1.8	<17	<180
Perfluoroheptanoic Acid	**500**	**230**	**320**	**400**
Perfluorohexadecanoic acid (PFHxDA)	<2	**4.5 J**	<8.7	<88
Perfluorohexane Sulfonic Acid	<2	<1.8	<17	<180
Perfluorohexanoic Acid	**380**	**330**	**550**	**420**
Perfluorononanesulfonic acid	<2	<1.8 UJ	<17	<180
Perfluorononanoic Acid	**140**	**76**	**120 J**	<180
Perfluorooctadecanoic acid	<2	**2.5 J**	<17	<180
Perfluorooctane Sulfonamide	<2	<2.6	<26	<260
Perfluoropentane sulfonic acid (PFPeS)	<2	<1.8 UJ	<17	<180
Perfluoropentanoic Acid	**3,200**	**1,500**	**2,200**	**2,800 J**
Perfluorotetradecanoic Acid	<2	**5.1 J**	<8.7	<88
Perfluorotridecanoic Acid	**3**	**9.4 J**	<8.7	<88
Perfluoroundecanoic Acid	**62**	**41**	**53**	<180
PFOA	**170**	**170**	**420 J**	**300**
PFOS	**3.7**	**3**	<17	<180

Notes:
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QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-03
Field Sample ID	FAY-D-NAF-03-021319	FAY-D-NAF-03-031319	FAY-D-NAF-03-041519	FAY-D-NAF-03-051319
Sample Date	2/13/2019	3/13/2019	4/15/2019	5/13/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**60,000 J**	**140,000 J**	**67,000 J**	**66,000 J**
PFMOAA	**320,000**	**450,000 J**	**380,000 J**	**630,000 J**
PFO2HxA	**160,000**	**190,000 J**	**150,000 J**	**230,000 J**
PFO3OA	**59,000**	**64,000 J**	**48,000 J**	**72,000 J**
PFO4DA	**31,000**	**33,000 J**	**26,000 J**	**34,000 J**
PFO5DA	**28,000**	**32,000 J**	**21,000 J**	**30,000 J**
PMPA	**58,000**	**57,000 J**	**44,000 J**	**52,000 J**
PEPA	**27,000**	**27,000 J**	**20,000 J**	**24,000 J**
PFESA-BP1	**82,000**	**73,000 J**	**56,000 J**	**69,000 J**
PFESA-BP2	**17,000**	**16,000 J**	**10,000 J**	**13,000 J**
Byproduct 4	--	**7,800 J**	**6,100 J**	**7,000 J**
Byproduct 5	--	**64,000 J**	**40,000 J**	**56,000 J**
Byproduct 6	--	**1,500 J**	**850 J**	**1,100 J**
NVHOS	--	**8,000 J**	**6,200 J**	**9,200 J**
EVE Acid	--	**16,000 J**	**10,000 J**	**11,000 J**
Hydro-EVE Acid	--	**6,300 J**	**4,300 J**	**4,900 J**
R-EVE	--	**6,000 J**	**4,100 J**	**5,600 J**
PES	--	<140 UJ	<92 UJ	<230 UJ
PFECA B	--	<180 UJ	<120 UJ	<300 UJ
PFECA-G	<50	<120 UJ	<82 UJ	<200 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<27	<27	<2.6	<27
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<53	<55	<5.2	<54
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<27	<27	<2.6	<27
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<27	<27	<2.6	<27
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<27	<27	<2.6	<27
6:2 Fluorotelomer sulfonate	<18	<18	**4**	<18
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<27	<27	<2.6	<27
N-ethylperfluoro-1-octanesulfonamide	<80	<82	<7.8	<81
N-methyl perfluoro-1-octanesulfonamide	<80	<82	<7.8	<81
N-methyl perfluorooctane sulfonamidoacetic acid	<27	<27	<2.6	<27
Perfluorobutane Sulfonic Acid	<8.8	<9.1	**1.2 J**	<9
Perfluorobutanoic Acid	**1,800**	**2,800**	**1,300**	**1,300**
Perfluorodecane Sulfonic Acid	<18	<18	<1.7	<18
Perfluorodecanoic Acid	**32**	**25**	**22**	**37**
Perfluorododecane sulfonic acid (PFDoS)	<8.8	<9.1	<0.87	<9
Perfluorododecanoic Acid	<18	<18	**16**	<18
Perfluoroheptane sulfonic acid (PFHpS)	<18	<18	<1.7	<18
Perfluoroheptanoic Acid	**200**	**550 J**	**170**	**230 J**
Perfluorohexadecanoic acid (PFHxDA)	<8.8	<9.1	**1.7 J**	<9
Perfluorohexane Sulfonic Acid	<18	<18	<1.7	<18
Perfluorohexanoic Acid	**310**	**450**	**200**	**190**
Perfluorononanesulfonic acid	<18	<18	<1.7 UJ	<18
Perfluorononanoic Acid	**76**	**140**	**62**	**90**
Perfluorooctadecanoic acid	<18	<18	<1.7	<18
Perfluorooctane Sulfonamide	<27	<27	<2.6	<27
Perfluoropentane sulfonic acid (PFPeS)	<18	<18	<1.7 UJ	<18
Perfluoropentanoic Acid	**1,200**	<5,500	**1,200**	**1,600 J**
Perfluorotetradecanoic Acid	<8.8	<9.1	**2.3**	<9
Perfluorotridecanoic Acid	<8.8	<9.1	**7.3**	<9
Perfluoroundecanoic Acid	**66**	**57**	**63**	**120 J**
PFOA	**260**	**290**	**200**	**170**
PFOS	<18	<18	**2.7**	<18

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-03	NAF-03	NAF-03	NAF-04
Field Sample ID	FAY-D-NAF-03-061819	GW0619-NAF-03	FAY-D-NAF-03-071719	13056233
Sample Date	6/18/2019	6/27/2019	7/17/2019	2/4/2004
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**74,000 B**	**54,000 J**	**90,000 J**	--
PFMOAA	**360,000 J**	**260,000 J**	**310,000**	--
PFO2HxA	**150,000 J**	**110,000 J**	**130,000**	--
PFO3OA	**46,000 J**	**39,000 J**	**52,000**	--
PFO4DA	**23,000 J**	**21,000 J**	**40,000**	--
PFO5DA	**28,000 J**	**19,000 J**	**60,000**	--
PMPA	**56,000 J**	**47,000 J**	**50,000**	--
PEPA	**26,000 J**	**23,000 J**	**27,000**	--
PFESA-BP1	**66,000 J**	**57,000 J**	**82,000**	--
PFESA-BP2	**11,000 J**	**9,200 J**	**15,000**	--
Byproduct 4	**7,200 J**	**6,000 J**	**8,000**	--
Byproduct 5	**47,000 J**	**37,000 J**	**49,000 J**	--
Byproduct 6	**740 J**	**600 J**	**710**	--
NVHOS	**6,400 J**	**4,900 J**	**5,600**	--
EVE Acid	**9,900 J**	**6,800 J**	**9,400**	--
Hydro-EVE Acid	**3,800 J**	**3,300 J**	**4,800**	--
R-EVE	**5,000 J**	**4,400 J**	**5,200**	--
PES	<200 UJ	<230 UJ	<200	--
PFECA B	<200 UJ	<300 UJ	<200	--
PFECA-G	<200 UJ	<200 UJ	<200	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<27	--	<430	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<54	<20	<260	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<27	<20	<170	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<27	--	<260 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<27	--	<260	--
6:2 Fluorotelomer sulfonate	<18	<20	<430	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<27	<20	<260	--
N-ethylperfluoro-1-octanesulfonamide	<81	--	<430 UJ	--
N-methyl perfluoro-1-octanesulfonamide	<81	--	<260	--
N-methyl perfluorooctane sulfonamidoacetic acid	<27	<20	<170	--
Perfluorobutane Sulfonic Acid	<9	<2	<170	--
Perfluorobutanoic Acid	**1,400**	**1,100**	**1,600**	--
Perfluorodecane Sulfonic Acid	<18	<2	<170	--
Perfluorodecanoic Acid	**33**	**18**	<170	--
Perfluorododecane sulfonic acid (PFDoS)	<9	<2	<260	--
Perfluorododecanoic Acid	**64 J**	**6.8**	<170	--
Perfluoroheptane sulfonic acid (PFHpS)	<18	<2	<170	--
Perfluoroheptanoic Acid	**200 J**	**140**	**210**	--
Perfluorohexadecanoic acid (PFHxDA)	<9	--	<260	--
Perfluorohexane Sulfonic Acid	<18	<2	<170	--
Perfluorohexanoic Acid	**210 J**	**190**	**290**	--
Perfluorononanesulfonic acid	<18	<2	<170	--
Perfluorononanoic Acid	**61 J**	**47**	<170	--
Perfluorooctadecanoic acid	<18	<2	<260	--
Perfluorooctane Sulfonamide	<27	<2	<170	--
Perfluoropentane sulfonic acid (PFPeS)	<18	<2	<170	--
Perfluoropentanoic Acid	**1,600 J**	**870**	**1,400 J**	--
Perfluorotetradecanoic Acid	<9	<25	<170	--
Perfluorotridecanoic Acid	**17**	<2	<170	--
Perfluoroundecanoic Acid	**140 J**	**46**	<170	--
PFOA	**160**	**140**	**190**	**120**
PFOS	<18	**2.7**	<170	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-04	NAF-04	NAF-04	NAF-04
Field Sample ID	15175602	15699078	16194425	FAY-GWASI-NAF-04
Sample Date	6/17/2005	10/18/2005	2/1/2006	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**130,000 J**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	**31**
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	**5.4**
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	**780**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**300**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	**320**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	**5,700**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	**2.3**
Perfluoroundecanoic Acid	--	--	--	**78**
PFOA	**90**	**200**	**63**	**140**
PFOS	--	--	--	**6.5**

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-04	NAF-04	NAF-04	NAF-04
Field Sample ID	FAY-GWASI-NAF-04-1	FAY-GWASI-NAF-04-2	GW0718-NAF-04	GW0619-NAF-04
Sample Date	11/15/2017	11/15/2017	7/17/2018	7/15/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**120,000 J**	**270,000 J**
PFMOAA	**1,700,000**	**1,700,000**	**280,000**	**240,000**
PFO2HxA	**910,000**	**900,000**	**270,000**	**420,000**
PFO3OA	**260,000**	**250,000**	**89,000**	**110,000 J**
PFO4DA	**110,000**	**110,000**	**57,000**	**49,000**
PFO5DA	**48,000**	**48,000**	**36,000 J**	**32,000 J**
PMPA	--	--	**50,000**	**85,000**
PEPA	--	--	**13,000**	**28,000**
PFESA-BP1	**63,000**	**67,000**	**58,000**	**1,100,000**
PFESA-BP2	**18,000**	**18,000**	**13,000**	**110,000**
Byproduct 4	--	--	--	**100,000**
Byproduct 5	--	--	--	**1,200,000**
Byproduct 6	--	--	--	**6,500**
NVHOS	--	--	--	**60,000**
EVE Acid	--	--	--	**340,000**
Hydro-EVE Acid	--	--	--	**160,000**
R-EVE	--	--	--	**36,000**
PES	--	--	--	<920
PFECA B	--	--	--	<1,200
PFECA-G	--	--	<960	<820
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<7.8	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.2	<170
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.6	<450
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6	--
6:2 Fluorotelomer sulfonate	--	--	**2.2**	<170
ADONA	--	--	--	--
NaDONA	--	--	<87	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<160
N-ethylperfluoro-1-octanesulfonamide	--	--	<7.8 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<7.8 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<270
Perfluorobutane Sulfonic Acid	--	--	**2.9 J**	<17
Perfluorobutanoic Acid	--	--	**1,500**	**4,800**
Perfluorodecane Sulfonic Acid	--	--	<1.7	<27
Perfluorodecanoic Acid	--	--	**27**	**77**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.87	<39
Perfluorododecanoic Acid	--	--	**3.5**	<47
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.7	<16
Perfluoroheptanoic Acid	--	--	**510**	**7,700**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.87	--
Perfluorohexane Sulfonic Acid	--	--	**2.5**	<15
Perfluorohexanoic Acid	--	--	**170**	**980**
Perfluorononanesulfonic acid	--	--	--	<14
Perfluorononanoic Acid	--	--	**290**	**1,900**
Perfluorooctadecanoic acid	--	--	<1.7	<39 UJ
Perfluorooctane Sulfonamide	--	--	<2.6	<30
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.7	<26
Perfluoropentanoic Acid	--	--	**2,700 J**	**34,000 J**
Perfluorotetradecanoic Acid	--	--	<0.87	<25
Perfluorotridecanoic Acid	--	--	**1.4**	<110
Perfluoroundecanoic Acid	--	--	**27**	<94
PFOA	--	--	**210**	**540**
PFOS	--	--	**12**	<46

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ng/L - nanograms per liter
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SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-06	NAF-06	NAF-06	NAF-06
Field Sample ID	15175590	15699065	16194427	P313RE-NAF-06
Sample Date	6/16/2005	10/14/2005	1/31/2006	10/3/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**250 J**	**510**	**290**	**390**
PFOS	--	--	--	--

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-06	NAF-06	NAF-06	NAF-06
Field Sample ID	FAY-GWASI-NAF-06	FAY-GWASI-NAF-06-1	FAY-GWASI-NAF-06-2	'AY-GWNEW-NAF-06-121317-
Sample Date	11/14/2017	11/14/2017	11/14/2017	12/13/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**140,000 J**	--	--	--
PFMOAA	--	**970,000**	**990,000**	**360**
PFO2HxA	--	**510,000**	**500,000**	**14,000**
PFO3OA	--	**190,000**	**180,000**	**580**
PFO4DA	--	**110,000**	**99,000**	**3,600**
PFO5DA	--	**69,000**	**69,000**	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	**47,000**	**47,000**	<200
PFESA-BP2	--	**22,000**	**23,000**	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	**4.3**	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	**25**	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	**3.7**	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**760**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**3.6**	--	--	--
Perfluorohexanoic Acid	**540**	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	**320**	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**3,500**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	**48**	--	--	--
PFOA	**260**	--	--	--
PFOS	**9.9**	--	--	--

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-06	NAF-06	NAF-06	NAF-06
Field Sample ID	AY-GWNEW-NAF-06-121317-	GW0718-NAF-06	PF1018-NAF-06	GW0619-NAF-06
Sample Date	12/13/2017	7/17/2018	10/23/2018	7/11/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**94,000 B**	**240,000**	**100,000 J**
PFMOAA	**1,600**	**840,000**	**1,100,000 J**	**810,000**
PFO2HxA	**17,000**	**350,000**	<460,000 UJ	**300,000**
PFO3OA	**1,500**	**150,000**	<440,000 UJ	**120,000**
PFO4DA	**2,800**	**84,000**	<490,000 UJ	**66,000**
PFO5DA	<200	**61,000**	<530,000 UJ	**45,000 J**
PMPA	--	**53,000**	<420,000 UJ	**47,000**
PEPA	--	**24,000**	<500,000 UJ	**20,000**
PFESA-BP1	<200	**57,000**	<580,000 UJ	**78,000 J**
PFESA-BP2	<200	**27,000**	<470,000 UJ	**29,000**
Byproduct 4	--	--	--	**6,800**
Byproduct 5	--	--	--	**92,000**
Byproduct 6	--	--	--	**600**
NVHOS	--	--	--	**8,600**
EVE Acid	--	--	--	**6,100**
Hydro-EVE Acid	--	--	--	**5,500**
R-EVE	--	--	--	**4,700 J**
PES	--	--	--	<230
PFECA B	--	--	--	<300
PFECA-G	--	<1,900	<480,000 UJ	<200
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.1	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.4	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	<110,000 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	<83,000 UJ	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	<20
ADONA	--	--	<2.1	--
NaDONA	--	<89	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<8.1 UJ	<410,000 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.1 UJ	<260,000 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	<20
Perfluorobutane Sulfonic Acid	--	**3.3 J**	**4.1**	**2.3**
Perfluorobutanoic Acid	--	**1,700**	**2,100**	**1,400**
Perfluorodecane Sulfonic Acid	--	<1.8	<2	<2
Perfluorodecanoic Acid	--	**25**	**43**	**20**
Perfluorododecane sulfonic acid (PFDoS)	--	<0.9	<2	<2
Perfluorododecanoic Acid	--	**5.1 J**	**7.1**	**4.3**
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	<2
Perfluoroheptanoic Acid	--	**580**	**830**	**480**
Perfluorohexadecanoic acid (PFHxDA)	--	<0.9	<2	--
Perfluorohexane Sulfonic Acid	--	**3.4**	**3.2**	**3.2**
Perfluorohexanoic Acid	--	**440**	**480**	**350**
Perfluorononanesulfonic acid	--	--	<2	<2
Perfluorononanoic Acid	--	**300**	**320**	**270**
Perfluorooctadecanoic acid	--	<1.8	<2	<2 UJ
Perfluorooctane Sulfonamide	--	<2.7	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	<2
Perfluoropentanoic Acid	--	**2,700 J**	**3,600**	**2,300**
Perfluorotetradecanoic Acid	--	<0.9	<2	<2
Perfluorotridecanoic Acid	--	<0.9	<2	<2
Perfluoroundecanoic Acid	--	**40**	**67**	**39**
PFOA	--	**310**	**280**	**230**
PFOS	--	**9.8**	**12**	**12**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-07	NAF-07	NAF-07	NAF-07
Field Sample ID	15699072	16194429	FAY-GWASI-NAF-07	FAY-GWASI-NAF-07-1
Sample Date	10/14/2005	1/31/2006	11/15/2017	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**29,000**	--
PFMOAA	--	--	--	**120,000**
PFO2HxA	--	--	--	**66,000**
PFO3OA	--	--	--	**21,000**
PFO4DA	--	--	--	**9,200**
PFO5DA	--	--	--	**5,200**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	**390**
PFESA-BP2	--	--	--	**1,600**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
Perfluorobutane Sulfonic Acid	--	--	**2.5**	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	**5.6**	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	**120**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	**2.7**	--
Perfluorohexanoic Acid	--	--	**65**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**42**	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	**480**	--
Perfluorotetradecanoic Acid	--	--	<2	--
Perfluorotridecanoic Acid	--	--	<2	--
Perfluoroundecanoic Acid	--	--	**2.7**	--
PFOA	**82**	**62**	**130**	--
PFOS	--	--	**11**	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-07	NAF-07	NAF-07	NAF-08A
Field Sample ID	FAY-GWASI-NAF-07-2	GW0718-NAF-07	GW0619-NAF-07	15175606
Sample Date	11/15/2017	7/17/2018	6/27/2019	6/17/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**24,000 J**	**37,000 J**	--
PFMOAA	**110,000**	**95,000**	**93,000 J**	--
PFO2HxA	**62,000**	**43,000**	**46,000 J**	--
PFO3OA	**21,000**	**18,000**	**14,000 J**	--
PFO4DA	**9,000**	**9,000**	**7,800 J**	--
PFO5DA	**5,100**	**4,800**	**4,300 J**	--
PMPA	--	**24,000**	**26,000 J**	--
PEPA	--	**8,200**	**10,000 J**	--
PFESA-BP1	**280**	**1,400**	**610 J**	--
PFESA-BP2	**1,600**	**2,300**	**2,000 J**	--
Byproduct 4	--	--	**5,100 J**	--
Byproduct 5	--	--	**32,000 J**	--
Byproduct 6	--	--	**63 J**	--
NVHOS	--	--	**1,800 J**	--
EVE Acid	--	--	**270 J**	--
Hydro-EVE Acid	--	--	**850 J**	--
R-EVE	--	--	**2,400 J**	--
PES	--	--	<46 UJ	--
PFECA B	--	--	<60 UJ	--
PFECA-G	--	<96	<41 UJ	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.1	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.4	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
6:2 Fluorotelomer sulfonate	--	**2.2**	<20	--
ADONA	--	--	--	--
NaDONA	--	<89	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<8.1 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.1 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
Perfluorobutane Sulfonic Acid	--	**3.8 J**	**2.4**	--
Perfluorobutanoic Acid	--	**270**	**220**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	**11**	**8.8**	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.9	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**150**	**110**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.9	--	--
Perfluorohexane Sulfonic Acid	--	**3.5**	**2.6**	--
Perfluorohexanoic Acid	--	**89**	**60**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	**43**	**34**	--
Perfluorooctadecanoic acid	--	<1.8	<2	--
Perfluorooctane Sulfonamide	--	<2.7	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	--	**550 J**	**430**	--
Perfluorotetradecanoic Acid	--	<0.9	<2	--
Perfluorotridecanoic Acid	--	<0.9	<2	--
Perfluoroundecanoic Acid	--	**2.9**	**3.8**	--
PFOA	--	**140**	**110**	**69**
PFOS	--	**14**	**12**	--

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-08A	NAF-08A	NAF-08A	NAF-08A
Field Sample ID	15699055	16194431	P313RE-NAF-08A	FAY-GWASI-NAF-08A
Sample Date	10/13/2005	1/31/2006	10/4/2013	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**110,000 J**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	**3.7**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	**26**
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	**960**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	**7.3**
Perfluorohexanoic Acid	--	--	--	**170**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	**170**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	**5,300**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	**5.5**
PFOA	**170**	**51**	**110**	**200**
PFOS	--	--	--	**18**

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-08A	NAF-08A	NAF-08A	NAF-08A
Field Sample ID	FAY-GWASI-NAF-08A-1	FAY-GWASI-NAF-08A-2	GW0718-NAF-8A	PF1018-NAF-08A
Sample Date	11/15/2017	11/15/2017	7/18/2018	10/25/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**42,000 J**	**75,000**
PFMOAA	**16,000**	**15,000**	**4,000**	<9,500 UJ
PFO2HxA	**43,000**	**41,000**	**12,000**	<9,200 UJ
PFO3OA	**18,000**	**17,000**	**5,200**	<8,800 UJ
PFO4DA	**10,000**	**10,000**	**3,500**	<9,700 UJ
PFO5DA	**5,900**	**5,400**	**2,400**	<11,000 UJ
PMPA	--	--	**66,000**	<8,400 UJ
PEPA	--	--	**43,000**	<10,000 UJ
PFESA-BP1	**61,000**	**72,000**	**16,000**	<12,000 UJ
PFESA-BP2	**10,000**	**9,700**	**3,200**	<9,500 UJ
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	<96	<9,600 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<7.9	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.3	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.6	<20 UJ
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6	<2,300 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6	<1,700 UJ
6:2 Fluorotelomer sulfonate	--	--	**3.8**	<20
ADONA	--	--	--	<2.1
NaDONA	--	--	<0.92 UJ	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<7.9 UJ	<8,200 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	<7.9	<5,200 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	**4.7**	<20
Perfluorobutane Sulfonic Acid	--	--	**2.7 J**	**2.7 J**
Perfluorobutanoic Acid	--	--	**1,100**	**2,600**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	**9.4**	**16**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.88	<2
Perfluorododecanoic Acid	--	--	<1.8	**2.3**
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**160**	**320**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.88	<2
Perfluorohexane Sulfonic Acid	--	--	**5.3**	**5.2**
Perfluorohexanoic Acid	--	--	**56**	**120**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	**32**	**69**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	**3.6**	**5.2**
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	**3 J**
Perfluoropentanoic Acid	--	--	**1,100 J**	**2,300**
Perfluorotetradecanoic Acid	--	--	<0.88	<2
Perfluorotridecanoic Acid	--	--	<0.88	<2
Perfluoroundecanoic Acid	--	--	**6.4**	**8**
PFOA	--	--	**40**	**84**
PFOS	--	--	**17**	**19**

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-08A	NAF-09	NAF-09	NAF-09
Field Sample ID	GW0619-NAF-08A	15175594	15699059	16194435
Sample Date	7/15/2019	6/16/2005	10/13/2005	2/1/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**37,000 J**	--	--	--
PFMOAA	**7,400**	--	--	--
PFO2HxA	**17,000**	--	--	--
PFO3OA	**5,100 J**	--	--	--
PFO4DA	**4,400**	--	--	--
PFO5DA	**2,700 J**	--	--	--
PMPA	**200,000**	--	--	--
PEPA	**110,000**	--	--	--
PFESA-BP1	**5,500**	--	--	--
PFESA-BP2	**2,100**	--	--	--
Byproduct 4	**3,000**	--	--	--
Byproduct 5	**21,000**	--	--	--
Byproduct 6	<77	--	--	--
NVHOS	**790**	--	--	--
EVE Acid	**4,400**	--	--	--
Hydro-EVE Acid	**2,600**	--	--	--
R-EVE	**1,800**	--	--	--
PES	<230	--	--	--
PFECA B	<300	--	--	--
PFECA-G	<200	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	<2	--	--	--
Perfluorobutanoic Acid	**3,300**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	**4.3**	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**200**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**2.2**	--	--	--
Perfluorohexanoic Acid	**89**	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	**38**	--	--	--
Perfluorooctadecanoic acid	<2 UJ	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**1,300**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	**3.8**	--	--	--
PFOA	**54**	**77**	**120**	**83**
PFOS	**7.6**	--	--	--

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	**NAF-09**	**NAF-09**	**NAF-09**	**NAF-09**
Field Sample ID	**P32013-NAF-09**	**FAY-GWASI-NAF-09**	**FAY-GWASI-NAF-09-1**	**FAY-GWASI-NAF-09-2**
Sample Date	**6/11/2013**	**11/16/2017**	**11/16/2017**	**11/16/2017**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**29,000 J**	--	--
PFMOAA	--	--	**4,700**	**4,800**
PFO2HxA	--	--	**21,000**	**22,000**
PFO3OA	--	--	**11,000**	**12,000**
PFO4DA	--	--	**9,700**	**9,700**
PFO5DA	--	--	**1,700**	**1,700**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	**2,700**	**2,400**
PFESA-BP2	--	--	**850**	**790**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	**7.5**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	**8.4**	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**96**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**3.9**	--	--
Perfluorohexanoic Acid	--	**78**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**17**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**710**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	**3.3**	--	--
PFOA	**180**	**120**	--	--
PFOS	--	**13**	--	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-09	NAF-09	NAF-10	NAF-10
Field Sample ID	GW0718-NAF-09	GW0619-NAF-09	15175596	15699061
Sample Date	7/17/2018	7/2/2019	6/16/2005	10/13/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**20,000 J**	**42,000 J**	--	--
PFMOAA	**4,600**	**5,900**	--	--
PFO2HxA	**18,000**	**22,000**	--	--
PFO3OA	**7,400**	**9,400**	--	--
PFO4DA	**3,800**	**11,000**	--	--
PFO5DA	**5,500**	**2,200 J**	--	--
PMPA	**37,000**	**54,000**	--	--
PEPA	**23,000**	**35,000**	--	--
PFESA-BP1	**150 J**	**480**	--	--
PFESA-BP2	**1,100**	**1,100**	--	--
Byproduct 4	--	**1,100 J**	--	--
Byproduct 5	--	**1,300**	--	--
Byproduct 6	--	**42**	--	--
NVHOS	--	**800**	--	--
EVE Acid	--	**52**	--	--
Hydro-EVE Acid	--	**520**	--	--
R-EVE	--	**860**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<96	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.7	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.2	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
6:2 Fluorotelomer sulfonate	<1.7	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.9 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<7.7 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.7 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	--
Perfluorobutane Sulfonic Acid	**8.8 J**	**10**	--	--
Perfluorobutanoic Acid	**880**	**1,300**	--	--
Perfluorodecane Sulfonic Acid	<1.7	<2	--	--
Perfluorodecanoic Acid	**4.2**	**7**	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.86	<2	--	--
Perfluorododecanoic Acid	<1.7	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<2	--	--
Perfluoroheptanoic Acid	**70**	**120**	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.86	--	--	--
Perfluorohexane Sulfonic Acid	**2.2**	**4.4**	--	--
Perfluorohexanoic Acid	**41**	**85**	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**24**	**19**	--	--
Perfluorooctadecanoic acid	<1.7	<2	--	--
Perfluorooctane Sulfonamide	<2.6	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<2	--	--
Perfluoropentanoic Acid	**580**	**610**	--	--
Perfluorotetradecanoic Acid	<0.86	<2	--	--
Perfluorotridecanoic Acid	<0.86	<2	--	--
Perfluoroundecanoic Acid	**1.8**	<2	--	--
PFOA	**110**	**100**	**120**	**130**
PFOS	**8.8**	**10**	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-10	NAF-10	NAF-10	NAF-10
Field Sample ID	16194437	FAY-GWASI-NAF-10	FAY-GWASI-NAF-10-1	FAY-GWASI-NAF-10-2
Sample Date	2/1/2006	11/14/2017	11/14/2017	11/14/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**17,000 J**	--	--
PFMOAA	--	--	**4,800**	**4,600**
PFO2HxA	--	--	**17,000**	**17,000**
PFO3OA	--	--	**4,100**	**4,500**
PFO4DA	--	--	**2,500**	**2,200**
PFO5DA	--	--	**2,000**	**1,800**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	<200
PFESA-BP2	--	--	**890**	**820**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	**4.2**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	**7.9**	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**55**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**2.5**	--	--
Perfluorohexanoic Acid	--	**30**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**20**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**310**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	**3.1**	--	--
PFOA	**85**	**61**	--	--
PFOS	--	**15**	--	--

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TABLE I-1
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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-10	NAF-10	NAF-12	NAF-12
Field Sample ID	GW0718-NAF-10	GW0619-NAF-10	P32013-NAF-12	FAY-GWASI-NAF-12
Sample Date	7/16/2018	7/3/2019	6/11/2013	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**13,000 J**	**23,000**	--	**640,000 J**
PFMOAA	**4,800**	**4,700**	--	--
PFO2HxA	**13,000**	**10,000**	--	--
PFO3OA	**3,300 J**	**1,600 J**	--	--
PFO4DA	**1,900**	**1,200**	--	--
PFO5DA	**1,700**	**1,000 J**	--	--
PMPA	**22,000**	**28,000**	--	--
PEPA	**8,200**	**9,800**	--	--
PFESA-BP1	**150 J**	**88**	--	--
PFESA-BP2	**870**	**740**	--	--
Byproduct 4	--	**2,700**	--	--
Byproduct 5	--	**410**	--	--
Byproduct 6	--	**21**	--	--
NVHOS	--	**470**	--	--
EVE Acid	--	**67**	--	--
Hydro-EVE Acid	--	**480**	--	--
R-EVE	--	**1,600**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<96	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.9	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.3	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.6	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.6	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.93 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	<20 UJ
N-ethylperfluoro-1-octanesulfonamide	<7.9 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.9 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.6	<20	--	<20 UJ
Perfluorobutane Sulfonic Acid	**4.3**	**4.6**	--	<2 UJ
Perfluorobutanoic Acid	**160**	**240**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	**8.7**	**4.1**	--	**7.9 J**
Perfluorododecane sulfonic acid (PFDoS)	<0.88	<2	--	--
Perfluorododecanoic Acid	<1.8	<2	--	<2 UJ
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**47**	**46**	--	**16,000**
Perfluorohexadecanoic acid (PFHxDA)	<0.88	--	--	--
Perfluorohexane Sulfonic Acid	**2.5**	<2	--	**4.6 J**
Perfluorohexanoic Acid	**25**	**24**	--	**1,000**
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**18**	**16**	--	**1,800**
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.6	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**260**	**270**	--	**80,000**
Perfluorotetradecanoic Acid	<0.88	<2	--	<2 UJ
Perfluorotridecanoic Acid	<0.88	<2	--	<2 UJ
Perfluoroundecanoic Acid	**2.9**	<2	--	<2 UJ
PFOA	**53**	**99**	**220**	**310 J**
PFOS	**16**	**11**	--	**6.3 J**

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**NAF-12**	**NAF-12**	**NAF-12**	**NAF-12**
Field Sample ID	**FAY-GWASI-NAF-12-1**	**FAY-GWASI-NAF-12-2**	**NAF-12-031918**	**FAY-D-NAF12-041818**
Sample Date	**11/16/2017**	**11/16/2017**	**3/19/2018**	**4/18/2018**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**2,900,000 J**	**2,700,000 J**
PFMOAA	**69,000**	**69,000**	--	**320,000**
PFO2HxA	**280,000**	**300,000**	--	**570,000**
PFO3OA	**110,000**	**110,000**	--	**290,000 B**
PFO4DA	**61,000**	**61,000**	--	**140,000 B**
PFO5DA	**28,000**	**28,000**	--	**86,000 B**
PMPA	--	--	--	**530,000**
PEPA	--	--	--	**32,000 B**
PFESA-BP1	**130,000**	**140,000**	--	**950,000**
PFESA-BP2	**76,000**	**76,000**	--	**370,000 B**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<10,000
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<280	<450
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<190	<300
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<93	<150
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<93	<150
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<93	<150
6:2 Fluorotelomer sulfonate	--	--	<280	<99
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<93	<150
N-ethylperfluoro-1-octanesulfonamide	--	--	<280	<450
N-methyl perfluoro-1-octanesulfonamide	--	--	<280	<450
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<93	<150
Perfluorobutane Sulfonic Acid	--	--	<28	<50
Perfluorobutanoic Acid	--	--	**4,400**	**5,400**
Perfluorodecane Sulfonic Acid	--	--	<56	<99
Perfluorodecanoic Acid	--	--	<93	**110**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<28	<50
Perfluorododecanoic Acid	--	--	<28	<50
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<37	<99
Perfluoroheptanoic Acid	--	--	**24,000**	**38,000**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<28 UJ	<50
Perfluorohexane Sulfonic Acid	--	--	<37	<99
Perfluorohexanoic Acid	--	--	**1,300**	**1,500**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**4,200**	**5,000**
Perfluorooctadecanoic acid	--	--	<28	<50
Perfluorooctane Sulfonamide	--	--	<93	<150
Perfluoropentane sulfonic acid (PFPeS)	--	--	<37	<99
Perfluoropentanoic Acid	--	--	**120,000**	**190,000**
Perfluorotetradecanoic Acid	--	--	<28	<50
Perfluorotridecanoic Acid	--	--	<28	<50
Perfluoroundecanoic Acid	--	--	<37	<99
PFOA	--	--	**550**	**670**
PFOS	--	--	<37	<99

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-12	NAF-12	NAF-12	NAF-12
Field Sample ID	FAY-D-NAF-12-051618	FAY-D-NAF-12-061918	FAY-D-NAF-12-071218	GW0718-NAF-12
Sample Date	5/16/2018	6/19/2018	7/12/2018	7/12/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,200,000**	**1,300,000 J**	**2,000,000 J**	**1,600,000 J**
PFMOAA	**240,000**	**280,000**	**240,000**	**270,000**
PFO2HxA	**420,000**	**510,000**	**420,000 J**	**440,000**
PFO3OA	**220,000**	**260,000**	**220,000**	**250,000**
PFO4DA	**74,000**	**110,000**	**79,000**	**110,000**
PFO5DA	**61,000**	**65,000**	**62,000**	**72,000**
PMPA	**380,000**	**430,000**	**380,000 J**	**440,000**
PEPA	**25,000**	**29,000**	**23,000**	**36,000**
PFESA-BP1	**610,000**	**690,000**	**680,000 J**	**530,000**
PFESA-BP2	**220,000**	**240,000**	**240,000**	**240,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<200	<2,000	<200	<1,900
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<830	<800	<790	<810
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<550	<530	<520	<540
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<280	<270	<260	<270
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<280	<270	<260	<270
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<280	<270	<260	<270
6:2 Fluorotelomer sulfonate	<180	<180	<170	<180
ADONA	--	--	--	--
NaDONA	--	--	--	<900
N-ethyl perfluorooctane sulfonamidoacetic acid	<280	<270	<260	<270
N-ethylperfluoro-1-octanesulfonamide	<830	<800	<790	<810
N-methyl perfluoro-1-octanesulfonamide	<830	<800	<790	<810
N-methyl perfluorooctane sulfonamidoacetic acid	<280	<270	<260	<270
Perfluorobutane Sulfonic Acid	<92	<89	<87	<90
Perfluorobutanoic Acid	**5,500**	**1,300**	**6,300**	**5,400**
Perfluorodecane Sulfonic Acid	<180	<180	<170	<180
Perfluorodecanoic Acid	<180	<180	<170	<180
Perfluorododecane sulfonic acid (PFDoS)	<92	<89	<87	<90
Perfluorododecanoic Acid	<92	<89	<170	<180
Perfluoroheptane sulfonic acid (PFHpS)	<180	<180	<170	<180
Perfluoroheptanoic Acid	**32,000**	**5,800**	**30,000**	**24,000**
Perfluorohexadecanoic acid (PFHxDA)	<92	<89	<87	<90
Perfluorohexane Sulfonic Acid	<180	<180	<170	<180
Perfluorohexanoic Acid	**1,300**	**360**	**1,800**	**1,500**
Perfluorononanesulfonic acid	<180	--	--	--
Perfluorononanoic Acid	**5,100**	**1,100**	**6,200**	**5,000**
Perfluorooctadecanoic acid	<92 UJ	<89	<170	<180
Perfluorooctane Sulfonamide	<280	<270	<260	<270
Perfluoropentane sulfonic acid (PFPeS)	<180	<180	<170	<180
Perfluoropentanoic Acid	**180,000**	**33,000**	**160,000 B**	**1,400,000**
Perfluorotetradecanoic Acid	<92	<89	<87	<90
Perfluorotridecanoic Acid	<92	<89	<87	<90
Perfluoroundecanoic Acid	<180	<180	<170	<180
PFOA	**700**	**140**	**780**	**620**
PFOS	<180	<180	<170	<180

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Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**NAF-12**	**NAF-12**	**NAF-12**	**NAF-12**
Field Sample ID	**FAY-D-NAF-12-081518**	**FAY-D-NAF-12-092018**	**FAY-D-NAF-12-101718**	**PF1018-NAF-12**
Sample Date	**8/15/2018**	**9/20/2018**	**10/17/2018**	**10/31/2018**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,000,000 J**	**2,100,000 J**	**1,900,000**	**3,000,000**
PFMOAA	**230,000**	**240,000**	**210,000**	**260,000 J**
PFO2HxA	**420,000**	**430,000**	**410,000**	**390,000 J**
PFO3OA	**210,000**	**220,000**	**210,000**	**190,000 J**
PFO4DA	**91,000**	**110,000**	**110,000**	<190,000 UJ
PFO5DA	**20,000**	**71,000**	**78,000**	<210,000 UJ
PMPA	**350,000**	**330,000**	**310,000**	**350,000 J**
PEPA	**22,000**	**29,000**	**27,000**	<200,000 UJ
PFESA-BP1	**640,000**	**700,000**	**670,000**	**570,000 J**
PFESA-BP2	**210,000**	**250,000**	**220,000**	**220,000 J**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<2,000	<20,000	<20,000	<190,000 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8,000	<140	<260	<3.4
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5,300	<290	<510	<36
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2,700	<140	<260	<92
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2,700	<140	<260	<45,000 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2,700	<140	<260	<33,000 UJ
6:2 Fluorotelomer sulfonate	<1,800	<96	<170	<36
ADONA	--	--	--	<3.4
NaDONA	--	--	--	<3.4
N-ethyl perfluorooctane sulfonamidoacetic acid	<2,700	<140	<260	<34
N-ethylperfluoro-1-octanesulfonamide	<8,000	<430	<770	<160,000 UJ
N-methyl perfluoro-1-octanesulfonamide	<8,000	<430	<770	<100,000 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<2,700	<140	<260	<55
Perfluorobutane Sulfonic Acid	<890	<48	<86	<3.6
Perfluorobutanoic Acid	**6,700**	**5,000**	**5,000**	**7,500**
Perfluorodecane Sulfonic Acid	<1,800	<96	<170	<5.7
Perfluorodecanoic Acid	<1,800	**120**	<170	**200**
Perfluorododecane sulfonic acid (PFDoS)	<890	<48	<86 UJ	<8
Perfluorododecanoic Acid	<1,800	<96	<170	<9.8
Perfluoroheptane sulfonic acid (PFHpS)	<1,800	<96	<170	<3.4
Perfluoroheptanoic Acid	**33,000**	**18,000**	**19,000**	**33,000**
Perfluorohexadecanoic acid (PFHxDA)	<890	<48	<86	<16
Perfluorohexane Sulfonic Acid	<1,800	<96	<170	<15
Perfluorohexanoic Acid	**1,800**	**1,600**	**1,300**	**2,000**
Perfluorononanesulfonic acid	--	<96	<170	<2.8
Perfluorononanoic Acid	**3,000**	**5,500**	**4,900**	**5,400**
Perfluorooctadecanoic acid	<1,800	<96	<170	<8.2
Perfluorooctane Sulfonamide	<2,700	<140	<260	<6.2
Perfluoropentane sulfonic acid (PFPeS)	<1,800	<96	<170	<5.3
Perfluoropentanoic Acid	**170,000**	**98,000**	**140,000**	**180,000**
Perfluorotetradecanoic Acid	<890	<48	<86	<5.2
Perfluorotridecanoic Acid	<890	<48	<86	<23
Perfluoroundecanoic Acid	<1,800	<96	<170	**37**
PFOA	**920**	**700**	**570**	**710**
PFOS	<1,800	<96	<170	**37**

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-12	NAF-12	NAF-12	NAF-12
Field Sample ID	FAY-D-NAF-12-111518	FAY-D-NAF-12-121918	FAY-D-NAF-12-011619	FAY-D-NAF-12-021319
Sample Date	11/15/2018	12/19/2018	1/16/2019	2/13/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,600,000**	**46,000,000 J**	**1,600,000**	**1,300,000 J**
PFMOAA	**2,300,000**	**220,000**	**220,000**	**210,000**
PFO2HxA	**3,800,000**	**410,000**	**390,000**	**360,000**
PFO3OA	**2,100,000**	**220,000**	**220,000**	**170,000**
PFO4DA	**1,100,000**	**110,000**	**110,000**	**86,000**
PFO5DA	**610,000**	**66,000**	**72,000**	**47,000**
PMPA	**3,200,000**	**350,000**	**340,000**	**300,000**
PEPA	**270,000**	**26,000**	**31,000**	**26,000**
PFESA-BP1	**6,700,000**	**660,000**	**650,000**	**690,000**
PFESA-BP2	**2,200,000**	**220,000**	**210,000**	**220,000**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	<5,000	<5,000	<500	**86**
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<270	<270	<270	<270
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<550	<540	<530	<530
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<270	<270	<270	<270
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<270	<270	<270	<270
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<270	<270	<270	<270
6:2 Fluorotelomer sulfonate	<180	<180	<180	<180
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<270	<270	<270	<270
N-ethylperfluoro-1-octanesulfonamide	<820	<810	<800	<800
N-methyl perfluoro-1-octanesulfonamide	<820	<810	<800	<800
N-methyl perfluorooctane sulfonamidoacetic acid	<270	<270	<270	<270
Perfluorobutane Sulfonic Acid	<91	<90	<89	<89
Perfluorobutanoic Acid	**5,100**	**3,900**	**5,500**	**5,800**
Perfluorodecane Sulfonic Acid	<180	<180	<180	<180
Perfluorodecanoic Acid	<180	<180	<180	<180
Perfluorododecane sulfonic acid (PFDoS)	<91 UJ	<90	<89	<89
Perfluorododecanoic Acid	<180	<180	<180	<180
Perfluoroheptane sulfonic acid (PFHpS)	<180	<180	<180	<180
Perfluoroheptanoic Acid	**22,000**	**20,000**	**26,000**	**28,000**
Perfluorohexadecanoic acid (PFHxDA)	<91	<90	<89	<89
Perfluorohexane Sulfonic Acid	<180	<180	<180	<180
Perfluorohexanoic Acid	**1,700**	**1,400**	**1,600**	**1,800**
Perfluorononanesulfonic acid	<180	<180	<180	<180
Perfluorononanoic Acid	**4,900**	**4,700**	**5,400**	**6,300**
Perfluorooctadecanoic acid	<180	<180	<180	<180
Perfluorooctane Sulfonamide	<270	<270	<270	<270
Perfluoropentane sulfonic acid (PFPeS)	<180	<180	<180	<180
Perfluoropentanoic Acid	**120,000**	**130,000**	**140,000**	**140,000**
Perfluorotetradecanoic Acid	<91	<90	<89	<89
Perfluorotridecanoic Acid	<91	<90	<89	<89
Perfluoroundecanoic Acid	<180	<180	<180	<180
PFOA	**650**	**550**	**710**	**870**
PFOS	<180	<180	<180	<180

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Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-12	NAF-12	NAF-12	NAF-12
Field Sample ID	FAY-D-NAF-12-031319	FAY-D-NAF-12-041519	FAY-D-NAF-12-051319	FAY-D-NAF-12-061819
Sample Date	3/13/2019	4/15/2019	5/13/2019	6/18/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,600,000**	**1,900,000**	**1,300,000 J**	**2,300,000 J**
PFMOAA	**230,000 J**	**190,000 J**	**220,000 J**	**230,000 J**
PFO2HxA	**400,000 J**	**330,000 J**	**370,000 J**	**400,000 J**
PFO3OA	**170,000 J**	**140,000 J**	**140,000 J**	**180,000 J**
PFO4DA	**88,000 J**	**76,000 J**	**63,000 J**	**86,000 J**
PFO5DA	**62,000 J**	**54,000 J**	**47,000 J**	**61,000 J**
PMPA	**340,000 J**	**280,000 J**	**320,000 J**	**300,000 J**
PEPA	**30,000 J**	**26,000 J**	**29,000 J**	**31,000 J**
PFESA-BP1	**600,000 J**	**530,000 J**	**410,000 J**	**670,000 J**
PFESA-BP2	**240,000 J**	**200,000 J**	**150,000 J**	**220,000 J**
Byproduct 4	**190,000 J**	**160,000 J**	**190,000 J**	**200,000 J**
Byproduct 5	**1,000,000 J**	**860,000 J**	**990,000 J**	**1,100,000 J**
Byproduct 6	**11,000 J**	**8,900 J**	**8,500 J**	**10,000 J**
NVHOS	**600,000 J**	**490,000 J**	**540,000 J**	**560,000 J**
EVE Acid	**660,000 J**	**600,000 J**	**500,000 J**	**950,000 J**
Hydro-EVE Acid	**360,000 J**	**320,000 J**	**240,000 J**	**370,000 J**
R-EVE	**120,000 J**	**97,000 J**	**120,000 J**	**120,000 J**
PES	<460 UJ	<460 UJ	<460 UJ	<2,000 UJ
PFECA B	<600 UJ	<600 UJ	<600 UJ	<2,000 UJ
PFECA-G	<410 UJ	<410 UJ	<410 UJ	<2,000 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<270	<270	<270	<27
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<530	<550	<550	<55
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<270	<270	<270	<27
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<270	<270	<270	<27
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<270	<270	<270	<27
6:2 Fluorotelomer sulfonate	<180	<180	<180	<18
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<270	<270	<270	<27
N-ethylperfluoro-1-octanesulfonamide	<800	<820	<820	<82
N-methyl perfluoro-1-octanesulfonamide	<800	<820	<820	<82
N-methyl perfluorooctane sulfonamidoacetic acid	<270	<270	<270	<27
Perfluorobutane Sulfonic Acid	<89	<91	<91	<9.1
Perfluorobutanoic Acid	**4,500**	**5,400**	**5,700**	**7,200 J**
Perfluorodecane Sulfonic Acid	<180	<180	<180	<18
Perfluorodecanoic Acid	<180	**200**	<180	**280**
Perfluorododecane sulfonic acid (PFDoS)	<89	<91	<91	<9.1
Perfluorododecanoic Acid	<180	<180	<180	<18
Perfluoroheptane sulfonic acid (PFHpS)	<180	<180	<180	<18
Perfluoroheptanoic Acid	**21,000**	**24,000**	**22,000**	**22,000**
Perfluorohexadecanoic acid (PFHxDA)	<89	<91	<91	<9.1
Perfluorohexane Sulfonic Acid	<180	<180	<180	<18
Perfluorohexanoic Acid	**1,400**	**1,700**	**1,500**	**2,400**
Perfluorononanesulfonic acid	<180	<180	<180	<18
Perfluorononanoic Acid	**4,200**	**5,800**	**4,200**	**4,700**
Perfluorooctadecanoic acid	<180	<180	<180	<18
Perfluorooctane Sulfonamide	<270	<270	<270	<27
Perfluoropentane sulfonic acid (PFPeS)	<180	<180	<180	<18
Perfluoropentanoic Acid	**120,000**	**120,000**	**160,000**	**130,000**
Perfluorotetradecanoic Acid	<89	<91	<91	<9.1
Perfluorotridecanoic Acid	<89	<91	<91	<9.1
Perfluoroundecanoic Acid	<180	<180	<180	**59**
PFOA	**660**	**740**	**520**	**960**
PFOS	<180	<180	<180	**37**

Notes:
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I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	NAF-12	NAF-12	PW-01	PW-01
Field Sample ID	FAY-D-NAF-12-071719	GW0619-NAF-12	16194323	PW-01-090919-D
Sample Date	7/17/2019	7/17/2019	1/25/2006	9/9/2019
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,600,000**	**120,000 J**	--	**7,500**
PFMOAA	**240,000**	**230,000**	--	**23,000**
PFO2HxA	**390,000**	**400,000**	--	**9,400**
PFO3OA	**160,000**	**160,000**	--	**1,900**
PFO4DA	**87,000**	**90,000**	--	**960**
PFO5DA	**81,000**	**59,000**	--	**540**
PMPA	**280,000**	**330,000**	--	**3,600**
PEPA	**32,000**	**31,000**	--	**1,200**
PFESA-BP1	**760,000**	**670,000**	--	**410**
PFESA-BP2	**270,000**	**230,000**	--	**400**
Byproduct 4	**210,000**	**200,000**	--	**470**
Byproduct 5	**960,000 J**	**1,100,000**	--	**880 J**
Byproduct 6	**12,000**	**11,000**	--	<15
NVHOS	**600,000**	**560,000**	--	**270**
EVE Acid	**920,000**	**710,000**	--	**100**
Hydro-EVE Acid	**390,000**	**380,000**	--	**110**
R-EVE	**120,000**	**120,000**	--	**260**
PES	<2,000	<460	--	<46
PFECA B	<2,000	<600	--	<60
PFECA-G	<2,000	<410	--	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<460	--	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<270	<20	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<180	<20	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<270 UJ	--	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<270	--	--	<4
6:2 Fluorotelomer sulfonate	<460	<20	--	<20
ADONA	--	--	--	<2.1
NaDONA	--	--	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<270	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	<460 UJ	--	--	<2
N-methyl perfluoro-1-octanesulfonamide	<270	--	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<180	<20	--	<20
Perfluorobutane Sulfonic Acid	<180	<2	--	<2
Perfluorobutanoic Acid	**6,900**	**6,500 J**	--	**58**
Perfluorodecane Sulfonic Acid	<180	<2	--	<2
Perfluorodecanoic Acid	**300**	**220**	--	<2
Perfluorododecane sulfonic acid (PFDoS)	<270	<2	--	<2
Perfluorododecanoic Acid	<180	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	<180	<2	--	<2
Perfluoroheptanoic Acid	**28,000**	**9,300**	--	**25**
Perfluorohexadecanoic acid (PFHxDA)	<270	--	--	<2
Perfluorohexane Sulfonic Acid	<180	**5.3 J**	--	<2
Perfluorohexanoic Acid	**2,000**	**1,700 J**	--	**12**
Perfluorononanesulfonic acid	<180	<2	--	<2
Perfluorononanoic Acid	**7,400**	**4,600 J**	--	**6.4**
Perfluorooctadecanoic acid	<270	<2	--	<2
Perfluorooctane Sulfonamide	<180	<2	--	<2
Perfluoropentane sulfonic acid (PFPeS)	<180	<2	--	<2
Perfluoropentanoic Acid	**180,000**	**18,000 J**	--	**100**
Perfluorotetradecanoic Acid	<180	<2	--	<2
Perfluorotridecanoic Acid	<180	<2	--	<2
Perfluoroundecanoic Acid	<180	**42 J**	--	<2
PFOA	**980**	**750 J**	<2.3	**100**
PFOS	<180	**42**	--	**6.4**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PW-01	PZ-11	PZ-11	PZ-11
Field Sample ID	PW-01-090919	GW0718-PZ-11	PF1018-PZ-11	GW0619-PZ-11-D
Sample Date	9/9/2019	7/13/2018	10/25/2018	7/16/2019
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	**8,300**	**2,400 J**	**2,500**	**6,200 B**
PFMOAA	**25,000**	**15,000**	<9,500 UJ	**7,500**
PFO2HxA	**10,000**	**6,500**	<9,200 UJ	**5,000**
PFO3OA	**2,000 J**	**1,500 J**	<8,800 UJ	**910**
PFO4DA	**1,000 J**	**680**	<9,700 UJ	**710**
PFO5DA	**660 J**	**490**	<11,000 UJ	**920**
PMPA	**4,100 J**	**2,000**	<8,400 UJ	**3,600**
PEPA	**1,300**	**670**	<10,000 UJ	**1,200**
PFESA-BP1	**490**	**19,000**	<12,000 UJ	**560**
PFESA-BP2	**490 J**	**620**	<9,500 UJ	**350**
Byproduct 4	**610**	--	--	**260**
Byproduct 5	**900 J**	--	--	**1,200**
Byproduct 6	<15	--	--	<15
NVHOS	**280 J**	--	--	**130**
EVE Acid	**110 J**	--	--	**30**
Hydro-EVE Acid	**130 J**	--	--	**110**
R-EVE	**310**	--	--	**110 J**
PES	<46	--	--	<46
PFECA B	<60	--	--	<60
PFECA-G	<41	<96	<9,600 UJ	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<8.2	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<5.5	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<2.7	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2.7	<2,300 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<2.7	<1,700 UJ	--
6:2 Fluorotelomer sulfonate	<20	**2.7**	<20	<20
ADONA	<2.1	--	<2.1	--
NaDONA	<2.1	<0.94 UJ	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<2.7	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<8.2 UJ	<8,200 UJ	--
N-methyl perfluoro-1-octanesulfonamide	<2	<8.2 UJ	<5,200 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<2.7	<20	<20
Perfluorobutane Sulfonic Acid	<2	**3.2 J**	**3.9**	**2.6**
Perfluorobutanoic Acid	**61**	**26**	**26**	**43**
Perfluorodecane Sulfonic Acid	<2	<1.8	<2	<2
Perfluorodecanoic Acid	<2	**2.5**	**3.2**	**3.2**
Perfluorododecane sulfonic acid (PFDoS)	<2	<0.91	<2	<2
Perfluorododecanoic Acid	<2	<1.8	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<1.8	<2	<2
Perfluoroheptanoic Acid	**25**	**22**	**28**	**23**
Perfluorohexadecanoic acid (PFHxDA)	<2	<0.91	<2	--
Perfluorohexane Sulfonic Acid	<2	**5.5**	**6.6**	**4.9**
Perfluorohexanoic Acid	**13**	**24**	**29**	**20**
Perfluorononanesulfonic acid	<2	--	<2	<2
Perfluorononanoic Acid	**6.4**	**4.1**	**4.6**	**6**
Perfluorooctadecanoic acid	<2	<1.8	<2	<2
Perfluorooctane Sulfonamide	<2	<2.7	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<1.8	<2	<2
Perfluoropentanoic Acid	**110**	**50**	**53**	**65**
Perfluorotetradecanoic Acid	<2	<0.91	<2	<2
Perfluorotridecanoic Acid	<2	<0.91	<2	<2
Perfluoroundecanoic Acid	<2	<1.8	**2.2**	<2
PFOA	**95**	**24**	**29**	**43**
PFOS	**6.6**	**12**	**17**	**15**

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-11	PZ-12	PZ-12	PZ-12
Field Sample ID	GW0619-PZ-11	16196285	16196428	16194592
Sample Date	7/16/2019	10/17/2005	12/13/2005	1/26/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**4,900 B**	--	--	--
PFMOAA	**7,100**	--	--	--
PFO2HxA	**4,800**	--	--	--
PFO3OA	**830**	--	--	--
PFO4DA	**650**	--	--	--
PFO5DA	**800**	--	--	--
PMPA	**3,300**	--	--	--
PEPA	**1,100**	--	--	--
PFESA-BP1	**530**	--	--	--
PFESA-BP2	**320**	--	--	--
Byproduct 4	**220**	--	--	--
Byproduct 5	**1,200**	--	--	--
Byproduct 6	<15	--	--	--
NVHOS	**140**	--	--	--
EVE Acid	**29**	--	--	--
Hydro-EVE Acid	**120**	--	--	--
R-EVE	**110 J**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	**2.8**	--	--	--
Perfluorobutanoic Acid	**43**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	**3**	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**23**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**5.2**	--	--	--
Perfluorohexanoic Acid	**20**	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	**6.2**	--	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**64**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	**2.2**	--	--	--
PFOA	**42**	**20**	**14**	**17**
PFOS	**16**	--	--	--

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TABLE I-1
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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-12	PZ-12	PZ-13	PZ-13
Field Sample ID	GW0718-PZ-12	GW0619-PZ-12	GW0718-PZ-13	GW0619-PZ-13
Sample Date	7/17/2018	7/11/2019	7/17/2018	6/25/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**3,700 J**	**6,800**	**54,000 J**	**44,000 J**
PFMOAA	**47,000**	**63,000 J**	**8,500**	**8,000 J**
PFO2HxA	**12,000**	**13,000**	**20,000**	**20,000 J**
PFO3OA	**3,600**	**3,000**	**4,500**	**3,200 J**
PFO4DA	**1,000**	**990**	**3,900**	**3,300 J**
PFO5DA	**330**	**360**	**4,100**	**4,600 J**
PMPA	**4,500**	**5,300**	**130,000**	**110,000 J**
PEPA	**1,100**	**1,200**	**75,000**	**62,000 J**
PFESA-BP1	**8,900**	**7,600**	<1,200	**320 J**
PFESA-BP2	**700**	**770**	**1,800 J**	**1,300 J**
Byproduct 4	--	**480**	--	**3,200 J**
Byproduct 5	--	**5,800 J**	--	**1,600 J**
Byproduct 6	--	**18**	--	**28 J**
NVHOS	--	**450**	--	**290 J**
EVE Acid	--	**150**	--	**200 J**
Hydro-EVE Acid	--	**210**	--	**320 J**
R-EVE	--	**200 J**	--	**2,300 J**
PES	--	<46	--	<46 UJ
PFECA B	--	<60	--	<60 UJ
PFECA-G	<96	<41	<960	<41 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.2	--	<8.2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.4	<20	<5.5	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	<2.7	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	<2.7	--
6:2 Fluorotelomer sulfonate	<1.8	<20	<1.8	<20
ADONA	--	--	--	--
NaDONA	<0.92 UJ	--	<91	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	<8.2 UJ	--	<8.2 UJ	--
N-methyl perfluoro-1-octanesulfonamide	<8.2 UJ	--	<8.2 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	<2.7	<20
Perfluorobutane Sulfonic Acid	**1.3 J**	<2	**1 J**	<2
Perfluorobutanoic Acid	**57**	**67**	**2,700**	**2,400**
Perfluorodecane Sulfonic Acid	<1.8	<2	<1.8	<2
Perfluorodecanoic Acid	<1.8	<2	**4.5**	**3.1**
Perfluorododecane sulfonic acid (PFDoS)	<0.91	<2	<0.91	<2
Perfluorododecanoic Acid	<1.8	<2	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	<1.8	<2
Perfluoroheptanoic Acid	**38**	**38**	**160**	**120**
Perfluorohexadecanoic acid (PFHxDA)	<0.91	--	<0.91	--
Perfluorohexane Sulfonic Acid	**3.3**	**3.2**	<1.8	<2
Perfluorohexanoic Acid	**27**	**24**	**68**	**55**
Perfluorononanesulfonic acid	--	<2	--	<2
Perfluorononanoic Acid	**3.5**	**4.4**	**62**	**55**
Perfluorooctadecanoic acid	<1.8	<2 UJ	<1.8	<2
Perfluorooctane Sulfonamide	<2.7	<2	<2.7	<2
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	<1.8	<2
Perfluoropentanoic Acid	**150**	**150**	**1,300 J**	**910**
Perfluorotetradecanoic Acid	<0.91	<2	<0.91	<2
Perfluorotridecanoic Acid	<0.91	<2	<0.91	<2
Perfluoroundecanoic Acid	<1.8	<2	**3.1**	**3.5**
PFOA	**180**	**120**	**65**	**78**
PFOS	**7.6**	**8.9**	**5.8**	**6.9**

Notes:
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EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-14	PZ-14	PZ-15	PZ-15
Field Sample ID	GW0718-PZ-14	GW0619-PZ-14	16194594	FAY-GWASI-PZ-15
Sample Date	7/16/2018	7/3/2019	1/26/2006	11/29/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**24,000 J**	**32,000**	--	**9,600**
PFMOAA	**5,100**	**5,300**	--	--
PFO2HxA	**16,000**	**14,000**	--	--
PFO3OA	**3,800 J**	**2,800 J**	--	--
PFO4DA	**2,700**	**2,100 J**	--	--
PFO5DA	**3,400 J**	**3,100 J**	--	--
PMPA	**53,000**	**48,000**	--	--
PEPA	**22,000**	**17,000**	--	--
PFESA-BP1	<120	<27	--	--
PFESA-BP2	**680**	**620**	--	--
Byproduct 4	--	**980**	--	--
Byproduct 5	--	**72**	--	--
Byproduct 6	--	**22**	--	--
NVHOS	--	**380**	--	--
EVE Acid	--	<24	--	--
Hydro-EVE Acid	--	**410**	--	--
R-EVE	--	**280**	--	--
PES	--	<46	--	--
PFECA B	--	<60	--	--
PFECA-G	<96	<41	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.1	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.4	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.9 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	<20
Perfluorobutane Sulfonic Acid	**1.2**	<2	--	<2
Perfluorobutanoic Acid	**510**	**460**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	<1.8	<2	--	<2
Perfluorododecane sulfonic acid (PFDoS)	<0.9	<2	--	--
Perfluorododecanoic Acid	<1.8	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**54**	**52**	--	**23**
Perfluorohexadecanoic acid (PFHxDA)	<0.9	--	--	--
Perfluorohexane Sulfonic Acid	<1.8	<2	--	<2
Perfluorohexanoic Acid	**28**	**22**	--	**10**
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**17**	**20**	--	**3.3**
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.7 UJ	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**390**	**310**	--	**120**
Perfluorotetradecanoic Acid	<0.9	<2	--	<2
Perfluorotridecanoic Acid	<0.9	<2	--	<2
Perfluoroundecanoic Acid	<1.8	<2	--	<2
PFOA	**150**	**130**	**30**	**32**
PFOS	**4.9**	**6.5**	--	**3.5**

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-15	PZ-15	PZ-15	PZ-19
Field Sample ID	FAY-GWASI-PZ-15-1	GW0718-PZ-15	GW0619-PZ-15	FAY-GWASI-PZ-19
Sample Date	11/29/2017	7/12/2018	6/25/2019	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**7,400 J**	**10,000**	**14,000**
PFMOAA	**2,200**	**2,100**	**2,800 J**	--
PFO2HxA	**7,900**	**7,600**	**9,000 J**	--
PFO3OA	**1,800**	**1,700**	**1,300 J**	--
PFO4DA	**1,400**	**1,200**	**1,100 J**	--
PFO5DA	**510**	**840**	**1,000 J**	--
PMPA	--	**19,000**	**19,000 J**	--
PEPA	--	**7,200**	**7,600 J**	--
PFESA-BP1	<200	<120	<27 UJ	--
PFESA-BP2	**230**	**290**	**550 J**	--
Byproduct 4	--	--	**970 J**	--
Byproduct 5	--	--	**180 J**	--
Byproduct 6	--	--	<15 UJ	--
NVHOS	--	--	**130 J**	--
EVE Acid	--	--	<24 UJ	--
Hydro-EVE Acid	--	--	**140 J**	--
R-EVE	--	--	**620 J**	--
PES	--	--	<46 UJ	--
PFECA B	--	--	<60 UJ	--
PFECA-G	--	<96	<41 UJ	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.3	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.5	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.8	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.8	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.8	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.92 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.8	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<8.3 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.3	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.8	<20	<20
Perfluorobutane Sulfonic Acid	--	<0.92	<2	**2.8**
Perfluorobutanoic Acid	--	**1,200**	**160**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	<1.8	<2	**3**
Perfluorododecane sulfonic acid (PFDoS)	--	<0.92	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**19**	**27**	**48**
Perfluorohexadecanoic acid (PFHxDA)	--	<0.92	--	--
Perfluorohexane Sulfonic Acid	--	<1.8	<2	**9.9**
Perfluorohexanoic Acid	--	**8.2**	**11**	**22**
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	**3.2**	**5.2**	**11**
Perfluorooctadecanoic acid	--	<1.8	<2	--
Perfluorooctane Sulfonamide	--	<2.8	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	--	**110 J**	**160**	**170**
Perfluorotetradecanoic Acid	--	<0.92	<2	<2
Perfluorotridecanoic Acid	--	<0.92	<2	<2
Perfluoroundecanoic Acid	--	<1.8	<2	<2
PFOA	--	**35**	**44**	**51**
PFOS	--	**2.9**	**4.9**	**9.5**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-19	PZ-19	PZ-19	PZ-19R
Field Sample ID	FAY-GWASI-PZ-19-1	FAY-GWASI-PZ-19-2	GW0718-PZ19	GW0619-PZ-19R
Sample Date	11/16/2017	11/16/2017	7/11/2018	7/1/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**11,000 J**	**6,500**
PFMOAA	**11,000**	**11,000**	**8,600**	**3,000**
PFO2HxA	**17,000**	**17,000**	**16,000**	**6,100**
PFO3OA	**2,300**	**2,400**	**1,600**	**720**
PFO4DA	**2,400**	**2,300**	**1,600**	**740**
PFO5DA	**810**	**920**	**660**	**450 J**
PMPA	--	--	**7,800**	**4,400**
PEPA	--	--	**2,700**	**1,900**
PFESA-BP1	<200	<200	<120	**31**
PFESA-BP2	**490**	**520**	**390**	**230**
Byproduct 4	--	--	--	**390**
Byproduct 5	--	--	--	**70**
Byproduct 6	--	--	--	**5**
NVHOS	--	--	--	**76**
EVE Acid	--	--	--	**23**
Hydro-EVE Acid	--	--	--	**57**
R-EVE	--	--	--	**250**
PES	--	--	--	<4.6
PFECA B	--	--	--	<6
PFECA-G	--	--	<96	<4.1
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.1	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.4	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7 UJ	--
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	--
NaDONA	--	--	<1.9 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
Perfluorobutane Sulfonic Acid	--	--	**2.6 J**	**4.2**
Perfluorobutanoic Acid	--	--	**60**	**63**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	**2.5**	**3.7**
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.89	<2
Perfluorododecanoic Acid	--	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**37**	**34**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.89	--
Perfluorohexane Sulfonic Acid	--	--	**8.9**	**6.9**
Perfluorohexanoic Acid	--	--	**23**	**31**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	**6.7**	**7.5**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.7 UJ	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	--	--	**140**	**90**
Perfluorotetradecanoic Acid	--	--	<0.89	<2
Perfluorotridecanoic Acid	--	--	<0.89	<2
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**32**	**32**
PFOS	--	--	**9**	**16**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-20	PZ-20	PZ-20	PZ-20
Field Sample ID	P313RE-PZ-20	FAY-GWASI-PZ-20	FAY-GWASI-PZ-20-1	FAY-GWASI-PZ-20-2
Sample Date	10/4/2013	11/16/2017	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**780**	--	--
PFMOAA	--	--	**420**	**430**
PFO2HxA	--	--	**1,000**	**1,100**
PFO3OA	--	--	<200	<200
PFO4DA	--	--	<200	<200
PFO5DA	--	--	<200	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	<200
PFESA-BP2	--	--	<200	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	**3.8**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	**5.9**	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**24**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**7.5**	--	--
Perfluorohexanoic Acid	--	**32**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**4.8**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**42**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	<2	--	--
PFOA	**57**	**19**	--	--
PFOS	--	**21**	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-20	PZ-20R	PZ-21	PZ-21
Field Sample ID	GW0718-PZ20	GW0619-PZ-20R	FAY-GWASI-PZ-21	FAY-GWASI-PZ-21-1
Sample Date	7/11/2018	7/1/2019	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**840 J**	**3,500**	**440**	--
PFMOAA	**270**	**820**	--	**700**
PFO2HxA	**970**	**2,600**	--	**710**
PFO3OA	<88	**240**	--	<200
PFO4DA	<97	**190**	--	**840**
PFO5DA	<110	**160 J**	--	<200
PMPA	**770**	**2,000**	--	--
PEPA	**330**	**870**	--	--
PFESA-BP1	<120	<2	--	<200
PFESA-BP2	<95	**98**	--	<200
Byproduct 4	--	**75**	--	--
Byproduct 5	--	**3.2**	--	--
Byproduct 6	--	<2	--	--
NVHOS	--	**20**	--	--
EVE Acid	--	<2	--	--
Hydro-EVE Acid	--	**17**	--	--
R-EVE	--	**38**	--	--
PES	--	<2.3	--	--
PFECA B	--	<3	--	--
PFECA-G	<96	<2	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<15	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<10	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<5	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<5	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<5	--	--	--
6:2 Fluorotelomer sulfonate	**3.8**	<20	--	--
ADONA	--	--	--	--
NaDONA	<1.7 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<5	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<15 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<15 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<5	<20	<20	--
Perfluorobutane Sulfonic Acid	**3.7**	**5**	**3.1**	--
Perfluorobutanoic Acid	**16**	**28**	--	--
Perfluorodecane Sulfonic Acid	<3.3	<2	--	--
Perfluorodecanoic Acid	<3.3	**6**	**2.7**	--
Perfluorododecane sulfonic acid (PFDoS)	<1.7	<2	--	--
Perfluorododecanoic Acid	<3.3	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<3.3	<2	--	--
Perfluoroheptanoic Acid	**26**	**36**	**23**	--
Perfluorohexadecanoic acid (PFHxDA)	<1.7	--	--	--
Perfluorohexane Sulfonic Acid	**5.9**	**8.2**	**6.6**	--
Perfluorohexanoic Acid	**34**	**38**	**24**	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	**3.4**	**5.8**	**3.6**	--
Perfluorooctadecanoic acid	<3.3	<2	--	--
Perfluorooctane Sulfonamide	<5	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<3.3	<2	--	--
Perfluoropentanoic Acid	**43**	**67**	**27**	--
Perfluorotetradecanoic Acid	<1.7	<2	<2	--
Perfluorotridecanoic Acid	<1.7	<2	<2	--
Perfluoroundecanoic Acid	<3.3	<2	<2	--
PFOA	**15**	**24**	**15**	--
PFOS	**14**	**22**	**13**	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-21	PZ-21	PZ-21R	PZ-24
Field Sample ID	FAY-GWASI-PZ-21-2	GW0718-PZ21	GW0619-PZ-21R	GW1018-PZ-24
Sample Date	11/16/2017	7/11/2018	7/2/2019	11/14/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**850 J**	**2,100**	**66,000**
PFMOAA	**780**	**590**	**920**	<4,700 UJ
PFO2HxA	**820**	**1,100**	**1,800**	<4,600 UJ
PFO3OA	<200	**160 J**	**190 J**	<4,400 UJ
PFO4DA	<200	**130 J**	**220 J**	<4,900 UJ
PFO5DA	<200	**120 J**	**150 J**	<5,300 UJ
PMPA	--	**710**	**1,000**	**14,000 J**
PEPA	--	**290**	**410**	**5,200 J**
PFESA-BP1	<200	<120	**4.3**	<5,800 UJ
PFESA-BP2	<200	<95	**97**	<4,700 UJ
Byproduct 4	--	--	**88**	--
Byproduct 5	--	--	**15 J**	--
Byproduct 6	--	--	**2.3**	--
NVHOS	--	--	**22**	--
EVE Acid	--	--	**12**	--
Hydro-EVE Acid	--	--	**20**	--
R-EVE	--	--	**41**	--
PES	--	--	<2.3	--
PFECA B	--	--	<3	--
PFECA-G	--	<96	<2	<4,800 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<9.1	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<6.1	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<3	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<3	--	<1,100 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<3	--	<830 UJ
6:2 Fluorotelomer sulfonate	--	<2	<20	<20
ADONA	--	--	--	<2.1
NaDONA	--	<1.6 UJ	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<3	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<9.1 UJ	--	<4,100 UJ
N-methyl perfluoro-1-octanesulfonamide	--	<9.1 UJ	--	<2,600 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	<3	<20	<20
Perfluorobutane Sulfonic Acid	--	**3.4**	**4**	**2.4**
Perfluorobutanoic Acid	--	**38**	**20**	**120**
Perfluorodecane Sulfonic Acid	--	<2	<2	<2
Perfluorodecanoic Acid	--	**8.5**	**4**	<2
Perfluorododecane sulfonic acid (PFDoS)	--	<1	<2	<2
Perfluorododecanoic Acid	--	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<2	<2	<2
Perfluoroheptanoic Acid	--	**47**	**27**	**30**
Perfluorohexadecanoic acid (PFHxDA)	--	<1	--	<2
Perfluorohexane Sulfonic Acid	--	**6.2**	**7.1**	<2
Perfluorohexanoic Acid	--	**98**	**29**	**16**
Perfluorononanesulfonic acid	--	--	<2	<2
Perfluorononanoic Acid	--	**9.4**	**6.9**	**6.6**
Perfluorooctadecanoic acid	--	<2	<2	<2
Perfluorooctane Sulfonamide	--	<3	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	--	<2	<2	<2
Perfluoropentanoic Acid	--	**100**	**46**	**96**
Perfluorotetradecanoic Acid	--	<1	<2	<2
Perfluorotridecanoic Acid	--	<1	<2	<2
Perfluoroundecanoic Acid	--	<2	<2	<2
PFOA	--	**56**	**28**	**250**
PFOS	--	**15**	**19**	**18**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-24	PZ-26	PZ-26	PZ-27
Field Sample ID	GW0619-PZ-24	GW1018-PZ-26	GW0619-PZ-26	GW1018-PZ-27-D
Sample Date	6/25/2019	10/29/2018	6/25/2019	11/14/2018
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	**36,000**	**2,900**	**240**	**990**
PFMOAA	**1,300 J**	**560**	<210 UJ	**9,800 J**
PFO2HxA	**4,100 J**	**1,800**	**190 J**	<4,600 UJ
PFO3OA	**810 J**	**300**	<58 UJ	<4,400 UJ
PFO4DA	**710 J**	**330**	<79 UJ	<4,900 UJ
PFO5DA	**190 J**	<200	**58 J**	<5,300 UJ
PMPA	**14,000 J**	**3,800**	<570 UJ	<4,200 UJ
PEPA	**5,200 J**	**1,400**	**140 J**	<5,000 UJ
PFESA-BP1	<27 UJ	<200	<27 UJ	<5,800 UJ
PFESA-BP2	**180 J**	<200	<30 UJ	<4,700 UJ
Byproduct 4	**330 J**	--	<160 UJ	--
Byproduct 5	<58 UJ	--	<58 UJ	--
Byproduct 6	<15 UJ	--	<15 UJ	--
NVHOS	**93 J**	--	<54 UJ	--
EVE Acid	<24 UJ	--	<24 UJ	--
Hydro-EVE Acid	**82 J**	--	<28 UJ	--
R-EVE	**280 J**	--	<70 UJ	--
PES	<46 UJ	--	<46 UJ	--
PFECA B	<60 UJ	--	<60 UJ	--
PFECA-G	<41 UJ	<200	<41 UJ	<4,800 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<200	--	<1,100 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<200	--	<830 UJ
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	--	<2.1	--	<2.1
NaDONA	--	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<200	--	<4,100 UJ
N-methyl perfluoro-1-octanesulfonamide	--	<200	--	<2,600 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**2.3**	**4.1**	**5.5**	**4**
Perfluorobutanoic Acid	**140**	**36**	**15**	**18**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	<2	**2**	**4.4**	**2.4**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**25**	**20**	**19**	**20**
Perfluorohexadecanoic acid (PFHxDA)	--	<2	--	<2
Perfluorohexane Sulfonic Acid	<2	**5.7**	**7.6**	**5.7**
Perfluorohexanoic Acid	**16**	**23**	**27**	**25**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**2.4**	**3.7**	**3.2**	**3.1**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	<2	<2
Perfluoropentanoic Acid	**110**	**51**	**28**	**37**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**160**	**29**	**14**	**17**
PFOS	**3.9**	**9.6**	**23**	**13**

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-27	PZ-27	PZ-28	PZ-28
Field Sample ID	GW1018-PZ-27	GW0619-PZ-27	GW1018-PZ-28	GW0619-PZ-28
Sample Date	11/14/2018	6/25/2019	10/29/2018	6/25/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,100**	**500**	**620**	**1,400**
PFMOAA	**8,300 J**	**5,800 J**	**270**	**460 J**
PFO2HxA	<4,600 UJ	**1,300 J**	**710**	**1,300 J**
PFO3OA	<4,400 UJ	**310 J**	<200	**160 J**
PFO4DA	<4,900 UJ	**150 J**	<200	**190 J**
PFO5DA	<5,300 UJ	**120 J**	<200	**46 J**
PMPA	<4,200 UJ	**660 J**	**1,200**	**3,200 J**
PEPA	<5,000 UJ	**270 J**	**420**	**1,100 J**
PFESA-BP1	<5,800 UJ	**29 J**	<200	<2 UJ
PFESA-BP2	<4,700 UJ	**180 J**	<200	**54 J**
Byproduct 4	--	<160 UJ	--	**150 J**
Byproduct 5	--	**440 J**	--	<2.9 UJ
Byproduct 6	--	<15 UJ	--	<2 UJ
NVHOS	--	**110 J**	--	**30 J**
EVE Acid	--	<24 UJ	--	<2 UJ
Hydro-EVE Acid	--	<28 UJ	--	**16 J**
R-EVE	--	<70 UJ	--	**82 J**
PES	--	<46 UJ	--	<2.3 UJ
PFECA B	--	<60 UJ	--	<3 UJ
PFECA-G	<4,800 UJ	<41 UJ	<200	<2 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	--	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	<20	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<1,100 UJ	--	<200	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<830 UJ	--	<200	--
6:2 Fluorotelomer sulfonate	<20	<20	<20	<20
ADONA	<2.1	--	<2.1	--
NaDONA	<2.1	--	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
N-ethylperfluoro-1-octanesulfonamide	<4,100 UJ	--	<200	--
N-methyl perfluoro-1-octanesulfonamide	<2,600 UJ	--	<200	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	<20	<20
Perfluorobutane Sulfonic Acid	**4.4**	**3.6**	**6.9**	<2
Perfluorobutanoic Acid	**18**	**12**	**24**	**28**
Perfluorodecane Sulfonic Acid	<2	<2	<2	<2
Perfluorodecanoic Acid	**2.2**	<2	**4.7**	**2.6**
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	<2	<2
Perfluorododecanoic Acid	<2	<2	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<2	<2
Perfluoroheptanoic Acid	**18**	**11**	**27**	**11**
Perfluorohexadecanoic acid (PFHxDA)	<2	--	<2	--
Perfluorohexane Sulfonic Acid	**5.6**	**5.2**	**12**	**3**
Perfluorohexanoic Acid	**24**	**13**	**37**	**11**
Perfluorononanesulfonic acid	<2	<2	<2	<2
Perfluorononanoic Acid	**3.2**	**2**	**6.5**	**4.3**
Perfluorooctadecanoic acid	<2	<2	<2	<2
Perfluorooctane Sulfonamide	<2	<2	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	**2.4**	<2
Perfluoropentanoic Acid	**34**	**27**	**45**	**35**
Perfluorotetradecanoic Acid	<2	<2	<2	<2
Perfluorotridecanoic Acid	<2	<2	<2	<2
Perfluoroundecanoic Acid	<2	<2	<2	<2
PFOA	**16**	**13**	**25**	**14**
PFOS	**12**	**12**	**19**	**8.9**

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	PZ-35	SMW-02	SMW-02	SMW-02
Field Sample ID	GW0619-PZ-35	11281509	13056221	15211595
Sample Date	7/2/2019	3/27/2003	2/3/2004	6/20/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,600**	--	--	--
PFMOAA	**560**	--	--	--
PFO2HxA	**1,500**	--	--	--
PFO3OA	**260**	--	--	--
PFO4DA	**390**	--	--	--
PFO5DA	**410 J**	--	--	--
PMPA	**1,100**	--	--	--
PEPA	**530**	--	--	--
PFESA-BP1	**11**	--	--	--
PFESA-BP2	**140**	--	--	--
Byproduct 4	**92 J**	--	--	--
Byproduct 5	**33 J**	--	--	--
Byproduct 6	**2.1**	--	--	--
NVHOS	**18**	--	--	--
EVE Acid	**6.1**	--	--	--
Hydro-EVE Acid	**29**	--	--	--
R-EVE	**53 J**	--	--	--
PES	<2	--	--	--
PFECA B	<2	--	--	--
PFECA-G	<2	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	**3.7**	--	--	--
Perfluorobutanoic Acid	**23**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	**4**	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**24**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**5.5**	--	--	--
Perfluorohexanoic Acid	**26**	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	**9**	--	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**43**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	<2	--	--	--
PFOA	**26**	<50	<10	<10
PFOS	**16**	--	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	SMW-02	SMW-02	SMW-02	SMW-02
Field Sample ID	16196291	FAY-GWASI-SMW-02	FAY-GWASI-SMW-02-1	FAY-GWASI-SMW-02-2
Sample Date	10/17/2005	11/21/2017	11/21/2017	11/21/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**15,000 J**	--	--
PFMOAA	--	--	**1,600**	**1,100**
PFO2HxA	--	--	**18,000**	**13,000**
PFO3OA	--	--	**4,600**	**3,600**
PFO4DA	--	--	**2,500**	**1,600**
PFO5DA	--	--	<200	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	<200
PFESA-BP2	--	--	**230**	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	<2	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**28**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	--	--
Perfluorohexanoic Acid	--	**16**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**170**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	<2	--	--
PFOA	<2.2	**17**	--	--
PFOS	--	<2	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Perched Zone	Perched Zone	Perched Zone
LocID	SMW-02	SMW-07	SMW-07	SMW-07
Field Sample ID	GW0619-SMW-02	16196283	P32013-SMW-07	FAY-GWASI-SMW-07
Sample Date	7/17/2019	10/17/2005	6/19/2013	11/21/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**18,000**	--	--	**9,300**
PFMOAA	**2,900**	--	--	--
PFO2HxA	**20,000**	--	--	--
PFO3OA	**3,200**	--	--	--
PFO4DA	**1,100**	--	--	--
PFO5DA	**56**	--	--	--
PMPA	**21,000**	--	--	--
PEPA	**9,900**	--	--	--
PFESA-BP1	<27	--	--	--
PFESA-BP2	**120**	--	--	--
Byproduct 4	**810**	--	--	--
Byproduct 5	<58	--	--	--
Byproduct 6	**17**	--	--	--
NVHOS	**320**	--	--	--
EVE Acid	<24	--	--	--
Hydro-EVE Acid	**67**	--	--	--
R-EVE	**510**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<46	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<27	--	--	<20
Perfluorobutane Sulfonic Acid	**2.1**	--	--	**2.7**
Perfluorobutanoic Acid	**88**	--	--	--
Perfluorodecane Sulfonic Acid	<2.8	--	--	--
Perfluorodecanoic Acid	<2.7	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	<4	--	--	--
Perfluorododecanoic Acid	<4.9	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**41**	--	--	**92**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	**11**
Perfluorohexanoic Acid	**22**	--	--	**42**
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2.4	--	--	<2
Perfluorooctadecanoic acid	<4.1	--	--	--
Perfluorooctane Sulfonamide	<3.1	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2.7	--	--	--
Perfluoropentanoic Acid	**230**	--	--	**24**
Perfluorotetradecanoic Acid	<2.6	--	--	<2
Perfluorotridecanoic Acid	<12	--	--	<2
Perfluoroundecanoic Acid	<9.7	--	--	<2
PFOA	**34**	**19**	**860**	**1,400**
PFOS	<4.8	--	--	<2

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Perched Zone**	**Perched Zone**	**Perched Zone**	**Perched Zone**
LocID	**SMW-07**	**SMW-07**	**SMW-07**	**SMW-07**
Field Sample ID	**FAY-GWASI-SMW-07-1**	**FAY-GWASI-SMW-07-2**	**GW0718-SMW-07**	**PF1018-SMW-07**
Sample Date	**11/21/2017**	**11/21/2017**	**7/16/2018**	**10/24/2018**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**7,700 J**	**10,000**
PFMOAA	**820**	**720**	**710**	<9,500 UJ
PFO2HxA	**1,100**	**1,900**	**1,800**	<9,200 UJ
PFO3OA	**330**	**220**	**220**	<8,800 UJ
PFO4DA	**330**	**340**	**240**	<9,700 UJ
PFO5DA	<200	<200	<110	<11,000 UJ
PMPA	--	--	**2,100**	<8,400 UJ
PEPA	--	--	**660**	<10,000 UJ
PFESA-BP1	<200	<200	<120	<12,000 UJ
PFESA-BP2	<200	<200	**110 J**	<9,500 UJ
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	<96	<9,600 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<7.9	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.3	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.6	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6 UJ	<2,300 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6 UJ	<1,700 UJ
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	<2.1
NaDONA	--	--	<90	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<7.9 UJ	<8,200 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	<7.9 UJ	<5,200 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<20
Perfluorobutane Sulfonic Acid	--	--	**2.3**	**3.3**
Perfluorobutanoic Acid	--	--	**23**	**26**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.88	<2
Perfluorododecanoic Acid	--	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**74**	**80**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.88	<2
Perfluorohexane Sulfonic Acid	--	--	**13**	**16**
Perfluorohexanoic Acid	--	--	**36**	**30**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	<1.8	<2
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.6 UJ	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	**1.8**	**2.4**
Perfluoropentanoic Acid	--	--	**24**	**26**
Perfluorotetradecanoic Acid	--	--	<0.88	<2
Perfluorotridecanoic Acid	--	--	<0.88	<2
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**960**	**1,300**
PFOS	--	--	<1.8	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Perched Zone	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-07	INSITU-01	INSITU-01	INSITU-01
Field Sample ID	GW0619-SMW-07	17652873	19594839	21774374
Sample Date	7/8/2019	2/13/2007	2/27/2008	3/25/2009
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**12,000**	--	--	--
PFMOAA	**750**	--	--	--
PFO2HxA	**2,200**	--	--	--
PFO3OA	**220**	--	--	--
PFO4DA	**280**	--	--	--
PFO5DA	**72 J**	--	--	--
PMPA	**2,700**	--	--	--
PEPA	**770**	--	--	--
PFESA-BP1	<27	--	--	--
PFESA-BP2	**150**	--	--	--
Byproduct 4	**180**	--	--	--
Byproduct 5	<58	--	--	--
Byproduct 6	<15	--	--	--
NVHOS	<54	--	--	--
EVE Acid	<24	--	--	--
Hydro-EVE Acid	**43**	--	--	--
R-EVE	**130**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	--
Perfluorobutane Sulfonic Acid	**5**	--	--	--
Perfluorobutanoic Acid	**25**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	<2	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**48**	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	**25**	--	--	--
Perfluorohexanoic Acid	**23**	--	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2	--	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	**3.9**	--	--	--
Perfluoropentanoic Acid	**27**	--	--	--
Perfluorotetradecanoic Acid	<2	--	--	--
Perfluorotridecanoic Acid	<2	--	--	--
Perfluoroundecanoic Acid	<2	--	--	--
PFOA	**1,300**	<1	<2.2	<2.6
PFOS	**2.2**	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	INSITU-01	INSITU-01	INSITU-01	INSITU-01
Field Sample ID	23547872	25508017	28515660	GW0414-INSITU 1 SHALLOW
Sample Date	3/24/2010	3/1/2011	3/13/2012	4/7/2014
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<3.5	<2.8	<2.2	<5
PFOS	--	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	INSITU-01	INSITU-01	INSITU-01	INSITU-01
Field Sample ID	GW0915-INSITU 1 SHALLOW	GW0817-INSITU 1 SHALLOW	FAY-GWASI-INSITU1	FAY-GWASI-INSITU-1
Sample Date	9/15/2015	8/1/2017	11/28/2017	11/28/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**470**	--	**400**
PFMOAA	--	--	<200	--
PFO2HxA	--	--	**370**	--
PFO3OA	--	--	<200	--
PFO4DA	--	--	<200	--
PFO5DA	--	--	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	--
PFESA-BP2	--	--	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	<20
Perfluorobutane Sulfonic Acid	--	<2	--	<2
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	<2	--	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	<2	--	<2
Perfluorohexanoic Acid	--	**2.2**	--	**2.3**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**10**	--	**9.8**
Perfluorotetradecanoic Acid	--	<2	--	<2
Perfluorotridecanoic Acid	--	<2	--	<2
Perfluoroundecanoic Acid	--	<2	--	<2
PFOA	<5	<2	--	<2
PFOS	--	<2	--	<2

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	INSITU-01	INSITU-01	MW-13D	MW-13D
Field Sample ID	GW0718-INSITU1	GW0619-INSITU-01	FAY-GWASI-MW-13D	FAY-GWASI-MW-13D-1
Sample Date	7/16/2018	6/20/2019	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**400 J**	**580**	**45,000**	--
PFMOAA	**180 J**	**210 J**	--	**320,000**
PFO2HxA	**410**	**460 J**	--	**130,000**
PFO3OA	<88	**36 J**	--	**12,000**
PFO4DA	<97	**5.1 J**	--	**810**
PFO5DA	<110	<5 UJ	--	<200
PMPA	**900**	**800 J**	--	--
PEPA	**230**	**230 J**	--	--
PFESA-BP1	<120	<2 UJ	--	<200
PFESA-BP2	<95	**17 J**	--	**210**
Byproduct 4	--	**38 J**	--	--
Byproduct 5	--	<2 UJ	--	--
Byproduct 6	--	<2 UJ	--	--
NVHOS	--	**5 J**	--	--
EVE Acid	--	<2 UJ	--	--
Hydro-EVE Acid	--	<2 UJ	--	--
R-EVE	--	**25 J**	--	--
PES	--	<2 UJ	--	--
PFECA B	--	<2 UJ	--	--
PFECA-G	<96	<2 UJ	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.2	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.5	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	<2 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	<2 UJ	--	--
6:2 Fluorotelomer sulfonate	<1.8	--	--	--
ADONA	--	--	--	--
NaDONA	<0.92	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	<8.2 UJ	<2 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.2 UJ	<2 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	--	<20	--
Perfluorobutane Sulfonic Acid	<0.91	<2	<2	--
Perfluorobutanoic Acid	**6.5**	--	--	--
Perfluorodecane Sulfonic Acid	<1.8	--	--	--
Perfluorodecanoic Acid	<1.8	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<0.91	--	--	--
Perfluorododecanoic Acid	<1.8	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	--	--	--
Perfluoroheptanoic Acid	<0.91	<2	**43**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.91	--	--	--
Perfluorohexane Sulfonic Acid	<1.8	<2	<2	--
Perfluorohexanoic Acid	**2.8**	**4.1**	**77**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<1.8	<2	<2	--
Perfluorooctadecanoic acid	<1.8	--	--	--
Perfluorooctane Sulfonamide	<2.7 UJ	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	--	--	--
Perfluoropentanoic Acid	**11**	**11**	**4,700**	--
Perfluorotetradecanoic Acid	<0.91	<2	<2	--
Perfluorotridecanoic Acid	<0.91	<2	<2	--
Perfluoroundecanoic Acid	<1.8	<2	<2	--
PFOA	**1.4**	<2	**2.5**	--
PFOS	<1.8	<2	<2	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-13D	MW-13D	MW-13D	MW-14D
Field Sample ID	FAY-GWASI-MW-13D-2	GW0718-MW-13D	GW0619-MW-13D	P32013-MW-14D-D
Sample Date	11/16/2017	8/3/2018	7/11/2019	6/6/2013
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**28,000 J**	**37,000 J**	--
PFMOAA	**310,000**	**190,000**	**180,000**	--
PFO2HxA	**130,000**	**71,000**	**66,000**	--
PFO3OA	**11,000**	**17,000 J**	**16,000**	--
PFO4DA	**540**	**4,200**	**5,200**	--
PFO5DA	<200	<530	**400**	--
PMPA	--	**21,000**	**21,000**	--
PEPA	--	**5,100**	**5,900**	--
PFESA-BP1	<200	<580	<270	--
PFESA-BP2	**210**	**1,400**	**2,100**	--
Byproduct 4	--	--	**1,600**	--
Byproduct 5	--	--	**3,000 J**	--
Byproduct 6	--	--	<150	--
NVHOS	--	--	**1,500**	--
EVE Acid	--	--	<240	--
Hydro-EVE Acid	--	--	**1,700**	--
R-EVE	--	--	**2,800**	--
PES	--	--	<460	--
PFECA B	--	--	<600	--
PFECA-G	--	<480	<410	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.5	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.87 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<8.2 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.2 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
Perfluorobutane Sulfonic Acid	--	<0.91	<2	--
Perfluorobutanoic Acid	--	**500**	**590**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	<1.8	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.91	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**240**	**270**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.91	--	--
Perfluorohexane Sulfonic Acid	--	**1.9**	**2.8**	--
Perfluorohexanoic Acid	--	**110**	**120**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.8	**5.8**	--
Perfluorooctadecanoic acid	--	<1.8	<2 UJ	--
Perfluorooctane Sulfonamide	--	<2.7	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	--	**2,200**	**2,400**	--
Perfluorotetradecanoic Acid	--	<0.91	<2	--
Perfluorotridecanoic Acid	--	<0.91	<2	--
Perfluoroundecanoic Acid	--	<1.8	<2	--
PFOA	--	**21 J**	**29**	**420**
PFOS	--	<1.8	<2	--

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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-14D	MW-14D	MW-14D	MW-14D
Field Sample ID	P32013-MW-14D	FAY-GWASI-MW-14D-D	FAY-GWASI-MW-14D-D-1	FAY-GWASI-MW-14D
Sample Date	6/6/2013	11/30/2017	11/30/2017	11/30/2017
QA/QC	--	Field Duplicate	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**8,300**	--	**8,300**
PFMOAA	--	--	**96,000**	--
PFO2HxA	--	--	**27,000**	--
PFO3OA	--	--	**7,900**	--
PFO4DA	--	--	**2,800**	--
PFO5DA	--	--	**580**	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	--
PFESA-BP2	--	--	**360**	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	<20
Perfluorobutane Sulfonic Acid	--	**2.3**	--	**2.2**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**110**	--	**100**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**5**	--	**4.7**
Perfluorohexanoic Acid	--	**78**	--	**78**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**11**	--	**11**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**370**	--	**380**
Perfluorotetradecanoic Acid	--	<2	--	<2
Perfluorotridecanoic Acid	--	<2	--	<2
Perfluoroundecanoic Acid	--	<2	--	<2
PFOA	**450**	**620**	--	**620**
PFOS	--	**7.7**	--	**7.7**

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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-14D	MW-14D	MW-14D	MW-15D
Field Sample ID	FAY-GWASI-MW-14D-1	GW0718-MW-14D	GW0619-MW-14D	P32013-MW-15D
Sample Date	11/30/2017	8/3/2018	7/11/2019	6/6/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**7,900 J**	**9,700**	--
PFMOAA	**93,000**	**39,000**	**180,000**	--
PFO2HxA	**26,000**	**12,000**	**35,000**	--
PFO3OA	**7,600**	**4,100**	**8,600**	--
PFO4DA	**2,800**	**2,000**	**3,000**	--
PFO5DA	**600**	**450**	**700**	--
PMPA	--	**8,300**	**7,900**	--
PEPA	--	**2,700**	**3,100**	--
PFESA-BP1	**250**	**120 J**	**660**	--
PFESA-BP2	**360**	**380**	**450**	--
Byproduct 4	--	--	<1,600	--
Byproduct 5	--	--	**2,300**	--
Byproduct 6	--	--	<150	--
NVHOS	--	--	**1,700**	--
EVE Acid	--	--	<240	--
Hydro-EVE Acid	--	--	**540**	--
R-EVE	--	--	<700	--
PES	--	--	<460	--
PFECA B	--	--	<600	--
PFECA-G	--	<96	<410	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.8	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.2	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
6:2 Fluorotelomer sulfonate	--	**30**	**38**	--
ADONA	--	--	--	--
NaDONA	--	<0.87 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	--
Perfluorobutane Sulfonic Acid	--	**1.8**	<2	--
Perfluorobutanoic Acid	--	**100**	**160**	--
Perfluorodecane Sulfonic Acid	--	<1.7	<2	--
Perfluorodecanoic Acid	--	<1.7	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.86	<2	--
Perfluorododecanoic Acid	--	<1.7	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.7	<2	--
Perfluoroheptanoic Acid	--	**76**	**120**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.86	--	--
Perfluorohexane Sulfonic Acid	--	**4.2**	**3.3**	--
Perfluorohexanoic Acid	--	**52**	**90**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	**9**	**11**	--
Perfluorooctadecanoic acid	--	<1.7	<2 UJ	--
Perfluorooctane Sulfonamide	--	<2.6	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.7	<2	--
Perfluoropentanoic Acid	--	**280**	**560**	--
Perfluorotetradecanoic Acid	--	<0.86	<2	--
Perfluorotridecanoic Acid	--	<0.86	<2	--
Perfluoroundecanoic Acid	--	<1.7	<2	--
PFOA	--	**490**	**400**	**52**
PFOS	--	**9.5**	**7.3**	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-15DRR	MW-16D	MW-16D	MW-16D
Field Sample ID	MW-15DRR-091119	P32013-MW-16D	FAY-GWASI-MW-16D	FAY-GWASI-MW-16D-1
Sample Date	9/12/2019	6/12/2013	11/16/2017	11/16/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**3,500**	--	**720**	--
PFMOAA	**31,000**	--	--	**2,400**
PFO2HxA	**6,300**	--	--	**880**
PFO3OA	**940**	--	--	**230**
PFO4DA	**320**	--	--	<200
PFO5DA	**130**	--	--	<200
PMPA	**3,600**	--	--	--
PEPA	**1,000**	--	--	--
PFESA-BP1	**8,800**	--	--	<200
PFESA-BP2	**1,200**	--	--	**240**
Byproduct 4	**960**	--	--	--
Byproduct 5	**21,000**	--	--	--
Byproduct 6	**30**	--	--	--
NVHOS	**320**	--	--	--
EVE Acid	**1,100**	--	--	--
Hydro-EVE Acid	**370**	--	--	--
R-EVE	**170**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	<2.1	--	--	--
NaDONA	<2.1	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	<2	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<2	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	<20	--
Perfluorobutane Sulfonic Acid	**8.2**	--	<2	--
Perfluorobutanoic Acid	**41**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	**3.3**	--	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	--	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**18**	--	**3.4**	--
Perfluorohexadecanoic acid (PFHxDA)	<2	--	--	--
Perfluorohexane Sulfonic Acid	**13**	--	<2	--
Perfluorohexanoic Acid	**18**	--	**3.7**	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	**5.8**	--	<2	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**85**	--	**17**	--
Perfluorotetradecanoic Acid	<2	--	<2	--
Perfluorotridecanoic Acid	<2	--	<2	--
Perfluoroundecanoic Acid	<2	--	<2	--
PFOA	**62**	**16**	**12**	--
PFOS	**35**	--	<2	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-16D	MW-16D	MW-16D	MW-17D
Field Sample ID	FAY-GWASI-MW-16D-2	GW0718-MW-16D	GW0619-MW-16D	FAY-GWASI-MW-17D-D
Sample Date	11/16/2017	7/31/2018	7/15/2019	11/17/2017
QA/QC	--	--	--	Field Duplicate
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**1,100 J**	**1,300**	**610**
PFMOAA	**2,400**	**960**	**500**	--
PFO2HxA	**1,100**	**510**	**430 J**	--
PFO3OA	**210**	<88	**76 J**	--
PFO4DA	<200	<97	**39**	--
PFO5DA	<200	<110	**12 J**	--
PMPA	--	**1,100**	**1,300**	--
PEPA	--	**320**	**330**	--
PFESA-BP1	<200	<120	**38**	--
PFESA-BP2	<200	<95	**22**	--
Byproduct 4	--	--	**31**	--
Byproduct 5	--	--	**65**	--
Byproduct 6	--	--	<2	--
NVHOS	--	--	**12**	--
EVE Acid	--	--	<2	--
Hydro-EVE Acid	--	--	**12**	--
R-EVE	--	--	**17**	--
PES	--	--	<2.3	--
PFECA B	--	--	<3	--
PFECA-G	--	<96	<2	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.8	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.2	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6	--	--
6:2 Fluorotelomer sulfonate	--	<1.7	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.85 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.8 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
Perfluorobutane Sulfonic Acid	--	<0.86	<2	<2
Perfluorobutanoic Acid	--	**7.6**	**10**	--
Perfluorodecane Sulfonic Acid	--	<1.7	<2	--
Perfluorodecanoic Acid	--	<1.7	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	<0.86	<2	--
Perfluorododecanoic Acid	--	<1.7	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.7	<2	--
Perfluoroheptanoic Acid	--	**3**	**3.9**	**3.3**
Perfluorohexadecanoic acid (PFHxDA)	--	<0.86	--	--
Perfluorohexane Sulfonic Acid	--	<1.7	<2	<2
Perfluorohexanoic Acid	--	**3.3**	**4.2**	**4.1**
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.7	<2	<2
Perfluorooctadecanoic acid	--	<1.7	<2 UJ	--
Perfluorooctane Sulfonamide	--	<2.6	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.7	<2	--
Perfluoropentanoic Acid	--	**13**	**13**	**17**
Perfluorotetradecanoic Acid	--	<0.86	<2	<2
Perfluorotridecanoic Acid	--	<0.86	<2	<2
Perfluoroundecanoic Acid	--	<1.7	<2	<2
PFOA	--	**12**	**21**	**3.2**
PFOS	--	<1.7	<2	<2

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-17D	MW-17D	MW-17D	MW-17D
Field Sample ID	FAY-GWASI-MW-17D-D-1	FAY-GWASI-MW-17D-D-2	FAY-GWASI-MW-17D	FAY-GWASI-MW-17D-1
Sample Date	11/17/2017	11/17/2017	11/17/2017	11/17/2017
QA/QC	Field Duplicate	Field Duplicate	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**610**	--
PFMOAA	**220**	**230**	--	**220**
PFO2HxA	**500**	**570**	--	**510**
PFO3OA	<200	<200	--	<200
PFO4DA	<200	<200	--	<200
PFO5DA	<200	<200	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	<200	<200	--	<200
PFESA-BP2	<200	<200	--	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	--
Perfluorobutane Sulfonic Acid	--	--	<2	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	**3.5**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	<2	--
Perfluorohexanoic Acid	--	--	**4.3**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	**17**	--
Perfluorotetradecanoic Acid	--	--	<2	--
Perfluorotridecanoic Acid	--	--	<2	--
Perfluoroundecanoic Acid	--	--	<2	--
PFOA	--	--	**3.4**	--
PFOS	--	--	<2	--

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
LocID	**MW-17D**	**MW-17D**	**MW-17D**	**MW-18D**
Field Sample ID	**FAY-GWASI-MW-17D-2**	**GW0718-MW-17D**	**GW0619-MW-17D**	**FAY-GWNEW-MW-18D**
Sample Date	**11/17/2017**	**7/31/2018**	**7/15/2019**	**12/6/2017**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**530 J**	**690**	**170 J**
PFMOAA	<200	<200	**260**	--
PFO2HxA	**590**	**490**	**490**	--
PFO3OA	<200	<200	**81 J**	--
PFO4DA	<200	<200	**14**	--
PFO5DA	<200	<200	<2	--
PMPA	--	**1,700**	**1,700**	--
PEPA	--	**490**	**510**	--
PFESA-BP1	<200	<200	<2	--
PFESA-BP2	<200	<200	**20**	--
Byproduct 4	--	--	**25**	--
Byproduct 5	--	--	<2.9	--
Byproduct 6	--	--	<2	--
NVHOS	--	--	**7.4**	--
EVE Acid	--	--	<2	--
Hydro-EVE Acid	--	--	**5.9**	--
R-EVE	--	--	**10**	--
PES	--	--	<2.3	--
PFECA B	--	--	<3	--
PFECA-G	--	<200	<2	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<7.9	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.3	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.6	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.6 UJ	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.88 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<7.9 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<7.9 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.6	<20	<20
Perfluorobutane Sulfonic Acid	--	<0.88	<2	<2
Perfluorobutanoic Acid	--	**9.6**	**11**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	<1.8	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	<0.88	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**2.4**	**2.9**	<2
Perfluorohexadecanoic acid (PFHxDA)	--	<0.88	--	--
Perfluorohexane Sulfonic Acid	--	<1.8	<2	<2
Perfluorohexanoic Acid	--	**3.2**	**4.1**	<2
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.8	<2	<2
Perfluorooctadecanoic acid	--	<1.8	<2 UJ	--
Perfluorooctane Sulfonamide	--	<2.6 UJ	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	--	**15**	**16**	**3.2**
Perfluorotetradecanoic Acid	--	<0.88	<2	<2
Perfluorotridecanoic Acid	--	<0.88	<2	<2
Perfluoroundecanoic Acid	--	<1.8	<2	<2
PFOA	--	**3.1**	**3.6**	<2
PFOS	--	<1.8	<2	<2

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-18D	MW-18D	MW-18D	MW-18D
Field Sample ID	FAY-GWNEW-MW-18D-1	FAY-GWNEW-MW-18D-2	GW0718-MW-18D	GW0619-MW-18D
Sample Date	12/6/2017	12/6/2017	7/16/2018	7/15/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**230 J**	**810**
PFMOAA	<200	<200	<95	**58**
PFO2HxA	<200	<200	**110 J**	**110**
PFO3OA	<200	<200	<88	**4.6 J**
PFO4DA	<200	<200	<97	<2
PFO5DA	<200	<200	<110	<2
PMPA	--	--	**460**	**430**
PEPA	--	--	**100 J**	**100**
PFESA-BP1	<200	<200	<120	<2
PFESA-BP2	<200	<200	<95	<2
Byproduct 4	--	--	--	**4.1**
Byproduct 5	--	--	--	<2
Byproduct 6	--	--	--	<2
NVHOS	--	--	--	**2.9**
EVE Acid	--	--	--	<2
Hydro-EVE Acid	--	--	--	<2
R-EVE	--	--	--	**2.1**
PES	--	--	--	<2
PFECA B	--	--	--	<2
PFECA-G	--	--	<96	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.7	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.8	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.9	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.9 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.9	--
6:2 Fluorotelomer sulfonate	--	--	<1.9	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.91	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.9	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.7 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.7 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.9	<20
Perfluorobutane Sulfonic Acid	--	--	<0.97	<2
Perfluorobutanoic Acid	--	--	<5.8	**3.8**
Perfluorodecane Sulfonic Acid	--	--	<1.9	<2
Perfluorodecanoic Acid	--	--	<1.9	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.97	<2
Perfluorododecanoic Acid	--	--	<1.9	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.9	<2
Perfluoroheptanoic Acid	--	--	<0.97	<2
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.97	--
Perfluorohexane Sulfonic Acid	--	--	<1.9	<2
Perfluorohexanoic Acid	--	--	<1.9	<2
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	<1.9	<2
Perfluorooctadecanoic acid	--	--	<1.9	<2 UJ
Perfluorooctane Sulfonamide	--	--	<2.9	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.9	<2
Perfluoropentanoic Acid	--	--	<5.8	**9**
Perfluorotetradecanoic Acid	--	--	<0.97	<2
Perfluorotridecanoic Acid	--	--	<0.97	<2
Perfluoroundecanoic Acid	--	--	<1.9	<2
PFOA	--	--	<0.97	<2
PFOS	--	--	<1.9	<2

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-19D	MW-19D	MW-19D	MW-19D
Field Sample ID	FAY-GWNEW-MW-19D-D	FAY-GWNEW-MW-19D-D-1	FAY-GWNEW-MW-19D-D-2	FAY-GWNEW-MW-19D
Sample Date	12/6/2017	12/6/2017	12/6/2017	12/6/2017
QA/QC	Field Duplicate	Field Duplicate	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**840 J**	--	--	**840 J**
PFMOAA	--	**520**	**580**	--
PFO2HxA	--	**1,100**	**1,100**	--
PFO3OA	--	**260**	<200	--
PFO4DA	--	<200	<200	--
PFO5DA	--	<200	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	<200	<200	--
PFESA-BP2	--	<200	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<20
Perfluorobutane Sulfonic Acid	<2	--	--	<2
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	<2	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**4.5**	--	--	**4.8**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	<2
Perfluorohexanoic Acid	**5.8**	--	--	**5.6**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**23**	--	--	**24**
Perfluorotetradecanoic Acid	<2	--	--	<2
Perfluorotridecanoic Acid	<2	--	--	<2
Perfluoroundecanoic Acid	<2	--	--	<2
PFOA	**7.2**	--	--	**7.1**
PFOS	<2	--	--	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
LocID	**MW-19D**	**MW-19D**	**MW-19D**	**MW-19D**
Field Sample ID	**FAY-GWNEW-MW-19D-1**	**FAY-GWNEW-MW-19D-2**	**GW0718-MW-19D**	**GW0619-MW-19D**
Sample Date	**12/6/2017**	**12/6/2017**	**8/7/2018**	**7/9/2019**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**1,300 J**	**1,100**
PFMOAA	**660**	**470**	**640**	**720**
PFO2HxA	**1,100**	**970**	**850**	**830**
PFO3OA	<200	**210**	**200**	**170**
PFO4DA	<200	<200	<97	**78**
PFO5DA	<200	<200	<110	<2
PMPA	--	--	**1,200**	**1,100**
PEPA	--	--	**360**	**360**
PFESA-BP1	<200	<200	<120	<2
PFESA-BP2	<200	<200	<95	**15**
Byproduct 4	--	--	--	**27**
Byproduct 5	--	--	--	<2
Byproduct 6	--	--	--	<2
NVHOS	--	--	--	**12**
EVE Acid	--	--	--	<2
Hydro-EVE Acid	--	--	--	**4.8**
R-EVE	--	--	--	**18**
PES	--	--	--	<2
PFECA B	--	--	--	<2
PFECA-G	--	--	<96	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<7.9	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.3	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.6	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.6 UJ	--
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.93 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<7.9 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<7.9 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.6	<20
Perfluorobutane Sulfonic Acid	--	--	<0.88	<2
Perfluorobutanoic Acid	--	--	**9.9**	**11**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.88	<2
Perfluorododecanoic Acid	--	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**4.3**	**4.7**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.88	--
Perfluorohexane Sulfonic Acid	--	--	<1.8	<2
Perfluorohexanoic Acid	--	--	**4.4**	**5.6**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	<1.8	<2
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.6 UJ	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	--	--	**20**	**21**
Perfluorotetradecanoic Acid	--	--	<0.88	<2
Perfluorotridecanoic Acid	--	--	<0.88	<2
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**9.1**	**21**
PFOS	--	--	<1.8	<2

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-20D	MW-20D	MW-20D	MW-20D
Field Sample ID	FAY-GWNEW-MW-20D-1	FAY-GWNEW-MW-20D-2	FAY-GWNEW-MW-20D	GW0718-MW-20-D
Sample Date	12/6/2017	12/6/2017	12/7/2017	8/6/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**1,400**	**1,400 J**
PFMOAA	**6,600**	**6,700**	--	**6,200**
PFO2HxA	**2,700**	**2,700**	--	**2,500**
PFO3OA	**550**	**560**	--	**530**
PFO4DA	<200	<200	--	<97
PFO5DA	<200	<200	--	<110
PMPA	--	--	--	**2,500**
PEPA	--	--	--	**660**
PFESA-BP1	<200	<200	--	<120
PFESA-BP2	<200	<200	--	<95
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<7.9
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<5.3
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<2.6
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6 UJ
6:2 Fluorotelomer sulfonate	--	--	--	<1.8
ADONA	--	--	--	--
NaDONA	--	--	--	<0.86 UJ
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<2.6
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<7.9 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<7.9 UJ
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<2.6
Perfluorobutane Sulfonic Acid	--	--	<2	<0.88
Perfluorobutanoic Acid	--	--	--	**17**
Perfluorodecane Sulfonic Acid	--	--	--	<1.8
Perfluorodecanoic Acid	--	--	<2	<1.8
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<0.88
Perfluorododecanoic Acid	--	--	<2	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<1.8
Perfluoroheptanoic Acid	--	--	**9.4**	**8**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.88
Perfluorohexane Sulfonic Acid	--	--	<2	<1.8
Perfluorohexanoic Acid	--	--	**11**	**10**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	<2	<1.8
Perfluorooctadecanoic acid	--	--	--	<1.8
Perfluorooctane Sulfonamide	--	--	--	<2.6 UJ
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<1.8
Perfluoropentanoic Acid	--	--	**46**	**40**
Perfluorotetradecanoic Acid	--	--	<2	<0.88
Perfluorotridecanoic Acid	--	--	<2	<0.88
Perfluoroundecanoic Acid	--	--	<2	<1.8
PFOA	--	--	**35**	**36**
PFOS	--	--	<2	<1.8

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-20D	MW-21D	MW-21D	MW-21D
Field Sample ID	GW0619-MW-20D	FAY-GWNEW-MW-21D	FAY-GWNEW-MW-21D-1	FAY-GWNEW-MW-21D-2
Sample Date	7/9/2019	12/6/2017	12/6/2017	12/6/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**1,900**	**390 J**	--	--
PFMOAA	**14,000**	--	<200	<200
PFO2HxA	**3,300**	--	**270**	**230**
PFO3OA	**600**	--	<200	<200
PFO4DA	**120**	--	<200	<200
PFO5DA	<34	--	<200	<200
PMPA	**2,700**	--	--	--
PEPA	**650**	--	--	--
PFESA-BP1	<27	--	<200	<200
PFESA-BP2	<30	--	<200	<200
Byproduct 4	<160	--	--	--
Byproduct 5	**87**	--	--	--
Byproduct 6	<15	--	--	--
NVHOS	**110**	--	--	--
EVE Acid	<24	--	--	--
Hydro-EVE Acid	<28	--	--	--
R-EVE	**82**	--	--	--
PES	<46	--	--	--
PFECA B	<60	--	--	--
PFECA-G	<41	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	--
Perfluorobutane Sulfonic Acid	<2	<2	--	--
Perfluorobutanoic Acid	**21**	--	--	--
Perfluorodecane Sulfonic Acid	<2	--	--	--
Perfluorodecanoic Acid	<2	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	<2	--	--	--
Perfluorododecanoic Acid	<2	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<2	--	--	--
Perfluoroheptanoic Acid	**11**	<2	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	--	--
Perfluorohexanoic Acid	**13**	<2	--	--
Perfluorononanesulfonic acid	<2	--	--	--
Perfluorononanoic Acid	<2	<2	--	--
Perfluorooctadecanoic acid	<2	--	--	--
Perfluorooctane Sulfonamide	<2	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	<2	--	--	--
Perfluoropentanoic Acid	**44**	**9.5**	--	--
Perfluorotetradecanoic Acid	<2	<2	--	--
Perfluorotridecanoic Acid	<2	<2	--	--
Perfluoroundecanoic Acid	<2	<2	--	--
PFOA	**68**	<2	--	--
PFOS	<2	<2	--	--

Notes:
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B - analyte detected in an associated blank
E - result exceeded calibration range
EPA - Environmental Protection Agency
I - Value is estimated maximum possible concentration
J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
SOP - standard operating procedure
UJ – Analyte not detected. Reporting limit may not be accurate or precise.
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-21D	MW-21D	MW-22D	MW-22D
Field Sample ID	GW0718-MW-21D	GW0619-MW-21D	FAY-GWNEW-MW-22D	FAY-GWNEW-MW-22D-1
Sample Date	7/31/2018	7/11/2019	12/8/2017	12/8/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**440 J**	**380**	**990**	--
PFMOAA	<200	**110**	--	**340**
PFO2HxA	**270**	**290**	--	**490**
PFO3OA	<200	**28**	--	<200
PFO4DA	<200	<2	--	<200
PFO5DA	<200	<2	--	<200
PMPA	**830**	**860**	--	--
PEPA	**250**	**290**	--	--
PFESA-BP1	<200	<2	--	<200
PFESA-BP2	<200	**6.1**	--	<200
Byproduct 4	--	**8.3 J**	--	--
Byproduct 5	--	<2	--	--
Byproduct 6	--	<2	--	--
NVHOS	--	**6**	--	--
EVE Acid	--	<2	--	--
Hydro-EVE Acid	--	<2	--	--
R-EVE	--	**4.6**	--	--
PES	--	<2	--	--
PFECA B	--	<2	--	--
PFECA-G	<200	<2	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<7.6	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.1	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.5	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.5 UJ	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.5 UJ	--	--	--
6:2 Fluorotelomer sulfonate	<1.7	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.88 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.5	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	<7.6 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<7.6 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.5	<20	<20	--
Perfluorobutane Sulfonic Acid	<0.84	<2	<2	--
Perfluorobutanoic Acid	**6.5**	**7.1**	--	--
Perfluorodecane Sulfonic Acid	<1.7	<2	--	--
Perfluorodecanoic Acid	<1.7	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	<0.84	<2	--	--
Perfluorododecanoic Acid	<1.7	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.7	<2	--	--
Perfluoroheptanoic Acid	<0.84	<2	**3.7**	--
Perfluorohexadecanoic acid (PFHxDA)	<0.84	--	--	--
Perfluorohexane Sulfonic Acid	<1.7	<2	<2	--
Perfluorohexanoic Acid	**2.2**	**2.4**	**4.6**	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	<1.7	<2	<2	--
Perfluorooctadecanoic acid	<1.7	<2 UJ	--	--
Perfluorooctane Sulfonamide	<2.5 UJ	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.7	<2	--	--
Perfluoropentanoic Acid	**10**	**11**	**15**	--
Perfluorotetradecanoic Acid	<0.84	<2	<2	--
Perfluorotridecanoic Acid	<0.84	<2	<2	--
Perfluoroundecanoic Acid	<1.7	<2	<2	--
PFOA	<0.84	<2	**10**	--
PFOS	<1.7	<2	<2	--

Notes:
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ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	MW-22D	MW-22D	MW-22D	PIW-10S
Field Sample ID	FAY-GWNEW-MW-22D-2	GW0718-MW-22D	GW0619-MW-22D	GW0619-PIW-10S
Sample Date	12/8/2017	7/31/2018	7/15/2019	7/22/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**1,800 J**	**1,800**	**4,400**
PFMOAA	**270**	**230**	**290**	**1,500**
PFO2HxA	**450**	**570**	**580**	**3,000**
PFO3OA	<200	<88	**83 J**	**520**
PFO4DA	<200	<97	**49**	**210**
PFO5DA	<200	<110	**5.5 J**	<34
PMPA	--	**1,600**	**1,400**	**5,700**
PEPA	--	**500**	**450**	**2,100**
PFESA-BP1	**300**	<120	<2	<27
PFESA-BP2	<200	<95	**18**	**150**
Byproduct 4	--	--	**29**	**190**
Byproduct 5	--	--	<2.9	<58
Byproduct 6	--	--	<2	<15
NVHOS	--	--	**12**	<54
EVE Acid	--	--	<2	<24
Hydro-EVE Acid	--	--	**11**	<28
R-EVE	--	--	**17**	**130**
PES	--	--	<2.3	<46
PFECA B	--	--	<3	<60
PFECA-G	--	<96	<2	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.2	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.5	<20	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<20	<24
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	<20
ADONA	--	--	--	--
NaDONA	--	<0.86 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	<8.2 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.2 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	<20
Perfluorobutane Sulfonic Acid	--	**0.91**	<2	<2
Perfluorobutanoic Acid	--	**12**	**12**	**49**
Perfluorodecane Sulfonic Acid	--	<1.8	<2	<2
Perfluorodecanoic Acid	--	<1.8	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	<0.91	<2	<2.1
Perfluorododecanoic Acid	--	<1.8	<2	<2.6
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	<2
Perfluoroheptanoic Acid	--	**5.4**	**5.5**	**7.9**
Perfluorohexadecanoic acid (PFHxDA)	--	<0.91	--	--
Perfluorohexane Sulfonic Acid	--	<1.8	<2	<2
Perfluorohexanoic Acid	--	**6.2**	**5.7**	**6.6**
Perfluorononanesulfonic acid	--	--	<2	<2
Perfluorononanoic Acid	--	<1.8	<2	<2
Perfluorooctadecanoic acid	--	<1.8	<2 UJ	<2.1
Perfluorooctane Sulfonamide	--	<2.7	<2	<2
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	<2
Perfluoropentanoic Acid	--	**18**	**16**	**47**
Perfluorotetradecanoic Acid	--	<0.91	<2	<2
Perfluorotridecanoic Acid	--	<0.91	<2	<6.1
Perfluoroundecanoic Acid	--	<1.8	<2	<5.1
PFOA	--	**21**	**20**	**12**
PFOS	--	<1.8	<2	<2.5

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	PIW-1D	PIW-1D	PIW-5S	PIW-9S
Field Sample ID	GW0619-PIW-1D-D	GW0619-PIW-1D	GW0619-PIW-5S	GW0619-PIW-9S
Sample Date	7/19/2019	7/19/2019	7/19/2019	7/18/2019
QA/QC	Field Duplicate	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**8,700 J**	**11,000 J**	**79,000 J**	**7,300**
PFMOAA	**15,000**	**14,000**	**35,000**	**150,000**
PFO2HxA	**9,700**	**9,700**	**38,000**	**34,000**
PFO3OA	**1,800**	**1,800**	**10,000**	**8,400**
PFO4DA	**320**	**300**	**8,700**	**1,500**
PFO5DA	<34	<34	**4,800**	<34
PMPA	**10,000**	**9,900**	**100,000**	**7,500**
PEPA	**3,600**	**3,600**	**44,000**	**2,700**
PFESA-BP1	<27	<27	**4,300**	<27
PFESA-BP2	**51**	**48**	**1,300**	**170**
Byproduct 4	**480**	**420**	**4,700**	**800**
Byproduct 5	<58	<58	**16,000**	**800**
Byproduct 6	<15	<15	**65**	<15
NVHOS	**160**	**150**	**770**	**1,500**
EVE Acid	<24	<24	**1,800**	<24
Hydro-EVE Acid	**33**	**37**	**1,600**	**690**
R-EVE	**350 J**	**290 J**	**3,000**	**650**
PES	<46	<46	<46	<46
PFECA B	<60	<60	<60	<60
PFECA-G	<41	<41	<41	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	<180	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<24	<46	<470	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	<20	<20	<180	<20
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	<170	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<27	<280	<20
Perfluorobutane Sulfonic Acid	<2	<2	<18	<2
Perfluorobutanoic Acid	**70**	**70**	**1,100**	**120**
Perfluorodecane Sulfonic Acid	<2	<2.8	<29	<2
Perfluorodecanoic Acid	<2	<2.7	<28	<2
Perfluorododecane sulfonic acid (PFDoS)	<2.1	<4	<41	<2
Perfluorododecanoic Acid	<2.6	<4.9	<50	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	<17	<2
Perfluoroheptanoic Acid	**14**	**14**	**140**	**43**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	<2	<15	<2
Perfluorohexanoic Acid	**11**	**11**	**58**	**23**
Perfluorononanesulfonic acid	<2	<2	<14	<2
Perfluorononanoic Acid	<2	<2.4	<24	<2
Perfluorooctadecanoic acid	<2.2	<4.1	<42	<2
Perfluorooctane Sulfonamide	<2	<3.1	<32	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2.6	<27	<2
Perfluoropentanoic Acid	**140**	**140**	**910**	**250**
Perfluorotetradecanoic Acid	<2	<2.6	<26	<2
Perfluorotridecanoic Acid	<6.1	<11	<120	<2
Perfluoroundecanoic Acid	<5.1	<9.7	<99	<2
PFOA	**4.4**	<7.5	<77	**13**
PFOS	<2.5	<4.8	<49	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	PW-02	PW-02	PW-02	PW-03
Field Sample ID	16194325	PW-02-091119	PW-02-091119-Z	16194327
Sample Date	1/25/2006	9/11/2019	9/11/2019	1/25/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**7,400**	**8,100**	--
PFMOAA	--	**9,500,000**	**9,900,000**	--
PFO2HxA	--	**2,800,000**	**3,000,000**	--
PFO3OA	--	**750,000**	**800,000**	--
PFO4DA	--	**250,000**	**270,000**	--
PFO5DA	--	**90,000**	**85,000**	--
PMPA	--	**470,000**	**520,000**	--
PEPA	--	**180,000**	**180,000**	--
PFESA-BP1	--	**35,000**	**39,000**	--
PFESA-BP2	--	**43,000**	**40,000**	--
Byproduct 4	--	**75,000**	**78,000**	--
Byproduct 5	--	**250,000**	**270,000**	--
Byproduct 6	--	**1,900**	**2,600**	--
NVHOS	--	**110,000**	**110,000**	--
EVE Acid	--	**2,200**	**3,600**	--
Hydro-EVE Acid	--	**18,000**	**19,000**	--
R-EVE	--	**36,000**	**33,000**	--
PES	--	<2,300	<4,600	--
PFECA B	--	<3,000	<6,000	--
PFECA-G	--	<2,000	<4,100	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<20	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2	<2	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<4	<4	--
6:2 Fluorotelomer sulfonate	--	<20	<20	--
ADONA	--	<2.1	<2.1	--
NaDONA	--	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<2	<2	--
N-methyl perfluoro-1-octanesulfonamide	--	<2	<2	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	--	**68**	**82**	--
Perfluorodecane Sulfonic Acid	--	<2	<2	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<2	<2	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<2	<2	--
Perfluoroheptanoic Acid	--	**26**	**31**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<2	<2	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	**13**	**16**	--
Perfluorononanesulfonic acid	--	<2	<2	--
Perfluorononanoic Acid	--	**4.7**	**5.4**	--
Perfluorooctadecanoic acid	--	<2	<2	--
Perfluorooctane Sulfonamide	--	<2	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<2	<2	--
Perfluoropentanoic Acid	--	**120**	**140**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	<2.3	**85**	**100**	<2.3
PFOS	--	**3.6**	**2.3**	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
LocID	**PW-03**	**PW-03**	**PW-04**	**PW-04**
Field Sample ID	**PW-03-091119**	**PW-03-091119-Z**	**16194329**	**PW-04-091119**
Sample Date	**9/11/2019**	**9/11/2019**	**1/25/2006**	**9/11/2019**
QA/QC	**--**	**--**	**--**	**--**
Table 3+ (ng/L)				
Hfpo Dimer Acid	**78,000**	**54,000**	--	**940**
PFMOAA	**5,900**	**5,100**	--	**270**
PFO2HxA	**18,000**	**16,000**	--	**770**
PFO3OA	**5,800**	**5,200**	--	**280**
PFO4DA	**1,800**	**1,400**	--	**66**
PFO5DA	**46**	<34	--	<2
PMPA	**130,000**	**120,000**	--	**710**
PEPA	**76,000**	**69,000**	--	**310**
PFESA-BP1	**130**	**93**	--	<2
PFESA-BP2	**750**	**460**	--	**8.4**
Byproduct 4	**11,000**	**9,600**	--	**120**
Byproduct 5	**47,000**	**42,000**	--	**4.4**
Byproduct 6	**93**	**69**	--	<2
NVHOS	**8,000**	**7,100**	--	**6.7**
EVE Acid	**520**	**440**	--	<2
Hydro-EVE Acid	**4,900**	**3,600**	--	**5.9**
R-EVE	**12,000**	**11,000**	--	**47**
PES	<46	<46	--	<2
PFECA B	<60	<60	--	<2
PFECA-G	<41	<41	--	<2
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<52	<52	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<8.5	<8.5 UJ	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<14	<14 UJ	--	<4
6:2 Fluorotelomer sulfonate	<20	<20	--	<20
ADONA	<2.1	<2.1	--	<2.1
NaDONA	<2.1	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	<8.7	<8.7	--	<2 UJ
N-methyl perfluoro-1-octanesulfonamide	<4.3	<4.3	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<31	<31	--	<20
Perfluorobutane Sulfonic Acid	<2	<2	--	<2
Perfluorobutanoic Acid	**5,400**	**4,700**	--	**11**
Perfluorodecane Sulfonic Acid	<3.2	<3.2	--	<2
Perfluorodecanoic Acid	<3.1	<3.1	--	<2
Perfluorododecane sulfonic acid (PFDoS)	<4.5	<4.5	--	<2
Perfluorododecanoic Acid	<5.5	<5.5	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	--	<2
Perfluoroheptanoic Acid	**310**	**260**	--	**5.1**
Perfluorohexadecanoic acid (PFHxDA)	<8.9	<8.9	--	<2
Perfluorohexane Sulfonic Acid	**3.3**	**3.6**	--	<2
Perfluorohexanoic Acid	**150**	**120**	--	**3.5**
Perfluorononanesulfonic acid	<2	<2	--	<2
Perfluorononanoic Acid	<2.7	<2.7	--	<2
Perfluorooctadecanoic acid	<4.6	<4.6	--	<2
Perfluorooctane Sulfonamide	<3.5	<3.5	--	<2
Perfluoropentane sulfonic acid (PFPeS)	<3	<3	--	<2
Perfluoropentanoic Acid	**3,700**	**3,400**	--	**17**
Perfluorotetradecanoic Acid	<2.9	<2.9	--	<2
Perfluorotridecanoic Acid	<13	<13	--	<2
Perfluoroundecanoic Acid	<11	<11	--	<2
PFOA	**16**	**13**	<2.3	<2
PFOS	<5.4	<5.4	--	<2

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	PW-04	PW-05	PW-06	PW-06
Field Sample ID	PW-04-091119-Z	PW-05-090919	16194333	PW-06-091019
Sample Date	9/11/2019	9/9/2019	1/25/2006	9/10/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**880**	**1,600**	--	**950**
PFMOAA	**320**	<210	--	<210
PFO2HxA	**870**	**730**	--	**510**
PFO3OA	**310**	**73**	--	**74**
PFO4DA	**68**	**130**	--	<79
PFO5DA	<2	<34 UJ	--	<34
PMPA	**790**	**1,600**	--	**1,100**
PEPA	**340**	**430**	--	**380**
PFESA-BP1	<2	<27	--	<27
PFESA-BP2	**4.3**	**50**	--	<30
Byproduct 4	**160 J**	<160	--	<160
Byproduct 5	**4.4 J**	<58	--	<58
Byproduct 6	<2	<15	--	<15
NVHOS	**8**	<54	--	<54
EVE Acid	<2	<24	--	<24
Hydro-EVE Acid	**5**	<28	--	<28
R-EVE	**64**	<70	--	<70
PES	<2	<46	--	<46
PFECA B	<2	<60	--	<60
PFECA-G	<2	<41	--	<41
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<2	<2	--	<2
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20	<20	--	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20	<20	--	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2	<2	--	<2
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<4	<4	--	<4
6:2 Fluorotelomer sulfonate	<20	<20	--	<20
ADONA	<2.1	<2.1	--	<2.1
NaDONA	<2.1	<2.1	--	<2.1
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<20
N-ethylperfluoro-1-octanesulfonamide	<2	<2	--	<2
N-methyl perfluoro-1-octanesulfonamide	<2	<2	--	<2
N-methyl perfluorooctane sulfonamidoacetic acid	<20	<20	--	<20
Perfluorobutane Sulfonic Acid	<2	<2	--	<2
Perfluorobutanoic Acid	**11**	**13**	--	**8.8**
Perfluorodecane Sulfonic Acid	<2	<2	--	<2
Perfluorodecanoic Acid	<2	<2	--	<2
Perfluorododecane sulfonic acid (PFDoS)	<2	<2	--	<2
Perfluorododecanoic Acid	<2	<2	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2	<2	--	<2
Perfluoroheptanoic Acid	**6.1**	**4.5**	--	**3.7**
Perfluorohexadecanoic acid (PFHxDA)	<2	<2	--	<2
Perfluorohexane Sulfonic Acid	<2	<2	--	<2
Perfluorohexanoic Acid	**3.7**	**3**	--	**3**
Perfluorononanesulfonic acid	<2	<2	--	<2
Perfluorononanoic Acid	<2	<2	--	<2
Perfluorooctadecanoic acid	<2	<2	--	<2
Perfluorooctane Sulfonamide	<2	<2	--	<2
Perfluoropentane sulfonic acid (PFPeS)	<2	<2	--	<2
Perfluoropentanoic Acid	**17**	**15**	--	**12**
Perfluorotetradecanoic Acid	<2	<2	--	<2
Perfluorotridecanoic Acid	<2	<2	--	<2
Perfluoroundecanoic Acid	<2	<2	--	<2
PFOA	<2	**7.7**	<2.3	**4.1**
PFOS	<2	<2	--	<2

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	PW-07	PW-07	PW-07	SMW-01
Field Sample ID	16445810	PW-07-091319	PW-07-091319-Z	11281543
Sample Date	3/30/2006	9/13/2019	9/13/2019	1/27/2003
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**1,100**	**1,000**	--
PFMOAA	--	**400**	**360**	--
PFO2HxA	--	**1,000**	**960**	--
PFO3OA	--	**140**	**140**	--
PFO4DA	--	**87**	**81**	--
PFO5DA	--	<2	<2	--
PMPA	--	**1,400**	**1,300**	--
PEPA	--	**440**	**420**	--
PFESA-BP1	--	<2	<2	--
PFESA-BP2	--	**5.1**	**3.1**	--
Byproduct 4	--	**41**	**59 J**	--
Byproduct 5	--	<2	<2	--
Byproduct 6	--	<2	<2	--
NVHOS	--	**9.1**	**8.8**	--
EVE Acid	--	<2	<2	--
Hydro-EVE Acid	--	**6.4**	**6**	--
R-EVE	--	**13**	**16 J**	--
PES	--	<2	<2	--
PFECA B	--	<2	<2	--
PFECA-G	--	<2	<2	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<2	<2	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<20	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<20	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2	<2	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<4	<4	--
6:2 Fluorotelomer sulfonate	--	<20	<20	--
ADONA	--	<2.1	<2.1	--
NaDONA	--	<2.1	<2.1	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<2	<2	--
N-methyl perfluoro-1-octanesulfonamide	--	<2	<2	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	<2	<2	--
Perfluorobutanoic Acid	--	**33**	**32**	--
Perfluorodecane Sulfonic Acid	--	<2	<2	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<2	<2	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<2	<2	--
Perfluoroheptanoic Acid	--	**6.2**	**4.4**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<2	<2	--
Perfluorohexane Sulfonic Acid	--	<2	<2	--
Perfluorohexanoic Acid	--	**4.7**	**4.2**	--
Perfluorononanesulfonic acid	--	<2	<2	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	<2	<2	--
Perfluorooctane Sulfonamide	--	<2	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<2	<2	--
Perfluoropentanoic Acid	--	**21**	**21**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	<1.2	**2.7**	<2	<50
PFOS	--	<2	<2	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-01	SMW-01	SMW-01	SMW-01
Field Sample ID	11281504	13056219	15211593	16194216
Sample Date	3/27/2003	2/3/2004	6/20/2005	1/24/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	<50	<10	<10	<2.3
PFOS	--	--	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-01	SMW-01	SMW-01	SMW-01
Field Sample ID	21774376	GW0314-SMW-01	GW0915-SMW-01	GW0817-SMW-01
Sample Date	3/26/2009	4/3/2014	9/15/2015	8/1/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**2,500**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	**2.5**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	**13**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	**3.2**
Perfluorohexanoic Acid	--	--	--	**8.7**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	**26**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	<2.6	<5	<5	**17**
PFOS	--	--	--	**4.5**

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-01	SMW-01	SMW-01	SMW-01
Field Sample ID	FAY-GWASI-SMW-01-D	FAY-GWASI-SMW-01-D-1	FAY-GWASI-SMW-01-D-2	FAY-GWASI-SMW-01
Sample Date	11/21/2017	11/21/2017	11/21/2017	11/21/2017
QA/QC	Field Duplicate	Field Duplicate	Field Duplicate	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**2,100 J**	--	--	**2,100 J**
PFMOAA	--	**260**	**380**	--
PFO2HxA	--	**1,300**	**1,200**	--
PFO3OA	--	**380**	**390**	--
PFO4DA	--	<200	<200	--
PFO5DA	--	<200	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	<200	<200	--
PFESA-BP2	--	<200	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<20
Perfluorobutane Sulfonic Acid	**2.5**	--	--	**2.4**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	<2	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	<2	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	**12**	--	--	**12**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	<2	--	--	<2
Perfluorohexanoic Acid	**8.7**	--	--	**8.9**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	**26**	--	--	**25**
Perfluorotetradecanoic Acid	<2	--	--	<2
Perfluorotridecanoic Acid	<2	--	--	<2
Perfluoroundecanoic Acid	<2	--	--	<2
PFOA	**14**	--	--	**15**
PFOS	**2.3**	--	--	**2.5**

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UJ – Analyte not detected. Reporting limit may not be accurate or precise.
< - Analyte not detected above associated reporting limit.

TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
LocID	**SMW-01**	**SMW-01**	**SMW-01**	**SMW-01**
Field Sample ID	**FAY-GWASI-SMW-01-1**	**FAY-GWASI-SMW-01-2**	**GW0718-SMW-1**	**GW0619-SMW-01**
Sample Date	**11/21/2017**	**11/21/2017**	**7/13/2018**	**6/25/2019**
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**980 J**	**2,100**
PFMOAA	**290**	**270**	**210**	**360 J**
PFO2HxA	**1,200**	**1,200**	**800**	**980 J**
PFO3OA	**300**	**330**	**230 J**	**210 J**
PFO4DA	<200	<200	<97	**54 J**
PFO5DA	<200	<200	<110	**3.1 J**
PMPA	--	--	**2,000**	**1,700 J**
PEPA	--	--	**620**	**570 J**
PFESA-BP1	<200	<200	<120	<2 UJ
PFESA-BP2	<200	<200	<95	**55 J**
Byproduct 4	--	--	--	**110 J**
Byproduct 5	--	--	--	<2 UJ
Byproduct 6	--	--	--	<2 UJ
NVHOS	--	--	--	**11 J**
EVE Acid	--	--	--	<2 UJ
Hydro-EVE Acid	--	--	--	**4.9 J**
R-EVE	--	--	--	**43 J**
PES	--	--	--	<2 UJ
PFECA B	--	--	--	<2 UJ
PFECA-G	--	--	<96	<2 UJ
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.3	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7	--
6:2 Fluorotelomer sulfonate	--	--	<1.8	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.89 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
Perfluorobutane Sulfonic Acid	--	--	**1.5**	**2**
Perfluorobutanoic Acid	--	--	**10**	**17**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.88	<2
Perfluorododecanoic Acid	--	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**6.7**	**9.2**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.88	--
Perfluorohexane Sulfonic Acid	--	--	<1.8	<2
Perfluorohexanoic Acid	--	--	**5.3**	**6.2**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	<1.8	<2
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.7	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	<1.8	<2
Perfluoropentanoic Acid	--	--	**16**	**25**
Perfluorotetradecanoic Acid	--	--	<0.88	<2
Perfluorotridecanoic Acid	--	--	<0.88	<2
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**9**	**9.9**
PFOS	--	--	<1.8	**2.9**

Notes:
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-03B	SMW-03B	SMW-03B	SMW-03B
Field Sample ID	P32013-SMW-03B	FAY-GWASI-SMW-03B-1	FAY-GWASI-SMW-03B-2	FAY-GWASI-SMW-03B
Sample Date	6/18/2013	11/20/2017	11/20/2017	11/21/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**8,900 J**
PFMOAA	--	**290,000**	**290,000**	--
PFO2HxA	--	**94,000**	**100,000**	--
PFO3OA	--	**14,000**	**14,000**	--
PFO4DA	--	**870**	**890**	--
PFO5DA	--	<200	<200	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	<200	<200	--
PFESA-BP2	--	<200	<200	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	**41**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**38**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	**480**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	**4.9**	--	--	**130**
PFOS	--	--	--	<2

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-03B	SMW-03B	SMW-04B	SMW-04B
Field Sample ID	GW0718-SMW-03B	GW0619-SMW-03B	16196295	16196401
Sample Date	7/30/2018	7/12/2019	10/17/2005	11/10/2005
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**7,600 J**	**12,000**	--	--
PFMOAA	**310,000**	**460,000**	--	--
PFO2HxA	**69,000**	**72,000**	--	--
PFO3OA	**14,000**	**10,000 J**	--	--
PFO4DA	<970	<790	--	--
PFO5DA	<1,100	<340	--	--
PMPA	**56,000**	**56,000**	--	--
PEPA	**11,000**	**11,000**	--	--
PFESA-BP1	<1,200	**430**	--	--
PFESA-BP2	<950	<300	--	--
Byproduct 4	--	**2,200**	--	--
Byproduct 5	--	**27,000**	--	--
Byproduct 6	--	<150	--	--
NVHOS	--	**4,800**	--	--
EVE Acid	--	<240	--	--
Hydro-EVE Acid	--	<280	--	--
R-EVE	--	**710**	--	--
PES	--	<460	--	--
PFECA B	--	<600	--	--
PFECA-G	<960	<410	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.1	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.4	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<24	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7 UJ	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.87 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
Perfluorobutane Sulfonic Acid	**0.92 J**	**2.4**	--	--
Perfluorobutanoic Acid	**150**	**210**	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	<1.8	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.9	<2.1	--	--
Perfluorododecanoic Acid	<1.8	<2.6	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	**35**	**41**	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.9	--	--	--
Perfluorohexane Sulfonic Acid	<1.8	<2	--	--
Perfluorohexanoic Acid	**33**	**45**	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	<1.8	<2	--	--
Perfluorooctadecanoic acid	<1.8	<2.2	--	--
Perfluorooctane Sulfonamide	<2.7 UJ	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	<1.8	<2	--	--
Perfluoropentanoic Acid	**430 J**	**600**	--	--
Perfluorotetradecanoic Acid	<0.9	<2	--	--
Perfluorotridecanoic Acid	<0.9	<6.1	--	--
Perfluoroundecanoic Acid	<1.8	<5.2	--	--
PFOA	**140**	**120**	**2,200**	**2,400**
PFOS	<1.8	<2.5	--	--

Notes:
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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-04B	SMW-04B	SMW-04B	SMW-04B
Field Sample ID	16194214	P32013-SMW-04B	FAY-GWASI-SMW-04B-1	FAY-GWASI-SMW-04B-2
Sample Date	1/24/2006	6/19/2013	11/20/2017	11/20/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	**21,000**	**22,000**
PFO2HxA	--	--	**6,100**	**6,100**
PFO3OA	--	--	**1,400**	**1,400**
PFO4DA	--	--	**340**	**290**
PFO5DA	--	--	<200	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	<200	**340**
PFESA-BP2	--	--	<200	<200
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**1,300**	**800**	--	--
PFOS	--	--	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-04B	SMW-04B	SMW-04B	SMW-05P
Field Sample ID	FAY-GWASI-SMW-04B	GW0718-SMW-04B	GW0619-SMW-04B	16153512
Sample Date	11/21/2017	7/31/2018	7/12/2019	2/22/2006
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**4,500**	**5,600 J**	**13,000**	--
PFMOAA	--	**56,000**	**41,000**	--
PFO2HxA	--	**13,000**	**7,000**	--
PFO3OA	--	**3,700 J**	**1,600 J**	--
PFO4DA	--	**570**	**430**	--
PFO5DA	--	<200	**61 J**	--
PMPA	--	**8,600**	**4,800**	--
PEPA	--	**1,500**	**990**	--
PFESA-BP1	--	<200	**46**	--
PFESA-BP2	--	<200	**56**	--
Byproduct 4	--	--	**180**	--
Byproduct 5	--	--	**550**	--
Byproduct 6	--	--	<15	--
NVHOS	--	--	**450**	--
EVE Acid	--	--	<24	--
Hydro-EVE Acid	--	--	**64**	--
R-EVE	--	--	**89**	--
PES	--	--	<46	--
PFECA B	--	--	<60	--
PFECA-G	--	<200	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.3	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<24	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7 UJ	--	--
6:2 Fluorotelomer sulfonate	--	<1.8	<20	--
ADONA	--	--	--	--
NaDONA	--	<0.87 UJ	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	<2.7	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<8 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<33	<2.7	<20	--
Perfluorobutane Sulfonic Acid	**2.3**	**2.9**	**2.9**	--
Perfluorobutanoic Acid	--	**62**	**42**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	<3.3	<1.8	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.89	<2.1	--
Perfluorododecanoic Acid	<5.9	<1.8	<2.6	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	**51**	**50 J**	**46**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.89	--	--
Perfluorohexane Sulfonic Acid	**2.4**	**4.2 J**	**4.2**	--
Perfluorohexanoic Acid	**41**	**37**	**36**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	<2.9	<1.8	<2	--
Perfluorooctadecanoic acid	--	<1.8	<2.2	--
Perfluorooctane Sulfonamide	--	<2.7 UJ	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	<2	--
Perfluoropentanoic Acid	**86**	**140**	**95**	--
Perfluorotetradecanoic Acid	<3.1	<0.89	<2	--
Perfluorotridecanoic Acid	<14	<0.89	<6.1	--
Perfluoroundecanoic Acid	<12	<1.8	<5.2	--
PFOA	**23,000**	**9,200**	**5,800**	**6,300**
PFOS	<5.7	<1.8	<2.5	--

Notes:
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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-05P	SMW-05P	SMW-05P	SMW-05P
Field Sample ID	17652879	19594845	21774380	23547878
Sample Date	2/14/2007	2/28/2008	3/26/2009	3/24/2010
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**16,000**	**2,600**	**5,900**	**8,800**
PFOS	--	--	--	--

Notes:
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J - Analyte detected. Reported value may not be accurate or precise
ng/L - nanograms per liter
QA/QC - Quality assurance/ quality control
SDG - Sample Delivery Group
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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**	**Surficial Aquifer**
LocID	**SMW-05P**	**SMW-05P**	**SMW-05P**	**SMW-05P**
Field Sample ID	**25508023**	**28515670**	**P32013-SMW-05P-D**	**P32013-SMW-05P**
Sample Date	**3/2/2011**	**3/15/2012**	**6/13/2013**	**6/13/2013**
QA/QC	**--**	**--**	**Field Duplicate**	**--**
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	--
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	--
Perfluorobutane Sulfonic Acid	--	--	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	--
Perfluorohexanoic Acid	--	--	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	--	--
Perfluorotetradecanoic Acid	--	--	--	--
Perfluorotridecanoic Acid	--	--	--	--
Perfluoroundecanoic Acid	--	--	--	--
PFOA	**3,600**	**410**	**1,000**	**1,100**
PFOS	--	--	--	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-05P	SMW-05P	SMW-05P	SMW-05P
Field Sample ID	GW0414-SMW-05P	GW0915-SMW-05P	GW0817-SMW-05P	FAY-GWASI-SMW-05P
Sample Date	4/7/2014	9/17/2015	8/4/2017	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**22,000**	**7,700 J**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<20	<20
Perfluorobutane Sulfonic Acid	--	--	**6.2**	**7.7**
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	<2	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	<2	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	**110**	**63**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	**7.7**	**10**
Perfluorohexanoic Acid	--	--	**77**	**42**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	**3**	**2.8**
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	**270**	**280**
Perfluorotetradecanoic Acid	--	--	<2	<2
Perfluorotridecanoic Acid	--	--	<2	<2
Perfluoroundecanoic Acid	--	--	<2	<2
PFOA	**880**	**5,300**	**3,400**	**510**
PFOS	--	--	**4.2 B**	**3.2**

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-05P	SMW-05P	SMW-05P	SMW-05P
Field Sample ID	FAY-GWASI-SMW-05P-1	FAY-GWASI-SMW-05P-2	GW0718-SMW-05P	GW0619-SMW-05P
Sample Date	11/15/2017	11/15/2017	7/24/2018	7/25/2019
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	**12,000 J**	**19,000**
PFMOAA	**67,000**	**67,000**	**63,000**	**220,000**
PFO2HxA	**18,000**	**18,000**	**15,000**	**45,000**
PFO3OA	**5,200**	**5,100**	**4,500**	**13,000**
PFO4DA	**2,200**	**1,800**	**1,400**	**4,700**
PFO5DA	**380**	**350**	**450**	**460**
PMPA	--	--	**4,000**	**27,000**
PEPA	--	--	**1,000**	**5,100**
PFESA-BP1	**280**	<200	**520**	**1,200**
PFESA-BP2	<200	<200	<200	**210**
Byproduct 4	--	--	--	**1,300 J**
Byproduct 5	--	--	--	**6,500**
Byproduct 6	--	--	--	**40**
NVHOS	--	--	--	**3,100**
EVE Acid	--	--	--	**240**
Hydro-EVE Acid	--	--	--	**390**
R-EVE	--	--	--	**500**
PES	--	--	--	<92
PFECA B	--	--	--	<120
PFECA-G	--	--	<200	<82
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	<8.1	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	<5.4	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	<2.7	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7 UJ	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	<2.7 UJ	--
6:2 Fluorotelomer sulfonate	--	--	**2.1**	<20
ADONA	--	--	--	--
NaDONA	--	--	<0.87 UJ	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluoro-1-octanesulfonamide	--	--	<8.1 UJ	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	<2.7	<20
Perfluorobutane Sulfonic Acid	--	--	**7.3**	**3.4**
Perfluorobutanoic Acid	--	--	**50**	**120**
Perfluorodecane Sulfonic Acid	--	--	<1.8	<2
Perfluorodecanoic Acid	--	--	<1.8	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	<0.9	<2
Perfluorododecanoic Acid	--	--	<1.8	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	<1.8	<2
Perfluoroheptanoic Acid	--	--	**54**	**140**
Perfluorohexadecanoic acid (PFHxDA)	--	--	<0.9	--
Perfluorohexane Sulfonic Acid	--	--	**9.3**	**3.5**
Perfluorohexanoic Acid	--	--	**41**	**120**
Perfluorononanesulfonic acid	--	--	--	<2
Perfluorononanoic Acid	--	--	**3.2**	**4.9**
Perfluorooctadecanoic acid	--	--	<1.8	<2
Perfluorooctane Sulfonamide	--	--	<2.7 UJ	<2
Perfluoropentane sulfonic acid (PFPeS)	--	--	**3.7**	<2
Perfluoropentanoic Acid	--	--	**180**	**260**
Perfluorotetradecanoic Acid	--	--	<0.9	<2
Perfluorotridecanoic Acid	--	--	<0.9	<2
Perfluoroundecanoic Acid	--	--	<1.8	<2
PFOA	--	--	**1,000**	**6,900**
PFOS	--	--	**3.2**	**2.7**

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-08B	SMW-08B	SMW-08B	SMW-08B
Field Sample ID	P32013-SMW-08B	FAY-GWASI-SMW-08B	FAY-GWASI-SMW-08B-1	FAY-GWASI-SMW-08B-2
Sample Date	6/19/2013	11/21/2017	11/21/2017	11/21/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**15,000**	--	--
PFMOAA	--	--	**390,000**	**370,000**
PFO2HxA	--	--	**110,000**	**98,000**
PFO3OA	--	--	**23,000**	**23,000**
PFO4DA	--	--	**5,400**	**5,300**
PFO5DA	--	--	**810**	**920**
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	**1,500**	**1,500**
PFESA-BP2	--	--	**300**	**340**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	--	--
Perfluorobutane Sulfonic Acid	--	**4.1**	--	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**130**	--	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**6**	--	--
Perfluorohexanoic Acid	--	**45**	--	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	**5.1**	--	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**1,100**	--	--
Perfluorotetradecanoic Acid	--	<2	--	--
Perfluorotridecanoic Acid	--	<2	--	--
Perfluoroundecanoic Acid	--	<2	--	--
PFOA	**710**	**450**	--	--
PFOS	--	**5.7**	--	--

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HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-08B	SMW-08B	SMW-09	SMW-09
Field Sample ID	GW0718-SMW-8B	GW0619-SMW-08B	P32013-SMW-09	GW0314-SMW-09
Sample Date	8/1/2018	7/16/2019	6/19/2013	4/3/2014
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	13,000 J	8,700 B	--	--
PFMOAA	400,000	260,000	--	--
PFO2HxA	81,000	47,000	--	--
PFO3OA	22,000	12,000	--	--
PFO4DA	5,100	2,900	--	--
PFO5DA	<1,100	540	--	--
PMPA	18,000	7,700	--	--
PEPA	4,500	2,800	--	--
PFESA-BP1	1,200 J	550	--	--
PFESA-BP2	<950	<300	--	--
Byproduct 4	--	<1,600	--	--
Byproduct 5	--	4,400	--	--
Byproduct 6	--	<150	--	--
NVHOS	--	2,900	--	--
EVE Acid	--	<240	--	--
Hydro-EVE Acid	--	300	--	--
R-EVE	--	<700	--	--
PES	--	<460	--	--
PFECA B	--	<600	--	--
PFECA-G	<960	<410	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	<8.1	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<5.4	<20	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<2.7	<20	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	<2.7	--	--	--
6:2 Fluorotelomer sulfonate	<1.8	<20	--	--
ADONA	--	--	--	--
NaDONA	<0.87 UJ	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
N-ethylperfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluoro-1-octanesulfonamide	<8.1 UJ	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	<2.7	<20	--	--
Perfluorobutane Sulfonic Acid	4.1	3.1	--	--
Perfluorobutanoic Acid	150	110	--	--
Perfluorodecane Sulfonic Acid	<1.8	<2	--	--
Perfluorodecanoic Acid	<1.8	<2	--	--
Perfluorododecane sulfonic acid (PFDoS)	<0.9	<2	--	--
Perfluorododecanoic Acid	<1.8	<2	--	--
Perfluoroheptane sulfonic acid (PFHpS)	<1.8	<2	--	--
Perfluoroheptanoic Acid	110	81	--	--
Perfluorohexadecanoic acid (PFHxDA)	<0.9	--	--	--
Perfluorohexane Sulfonic Acid	6.5	4.9	--	--
Perfluorohexanoic Acid	42	34	--	--
Perfluorononanesulfonic acid	--	<2	--	--
Perfluorononanoic Acid	5.8	4.2	--	--
Perfluorooctadecanoic acid	<1.8	<2	--	--
Perfluorooctane Sulfonamide	<2.7	<2	--	--
Perfluoropentane sulfonic acid (PFPeS)	1.9	<2	--	--
Perfluoropentanoic Acid	880	550	--	--
Perfluorotetradecanoic Acid	<0.9	<2	--	--
Perfluorotridecanoic Acid	<0.9	<2	--	--
Perfluoroundecanoic Acid	<1.8	<2	--	--
PFOA	440	360	22	31
PFOS	6.1	6.1	--	--

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Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-09	SMW-09	SMW-09	SMW-09
Field Sample ID	GW0915-SMW-09	GW0817-SMW-09	FAY-GWASI-SMW-09	FAY-GWASI-SMW-09-1
Sample Date	9/16/2015	8/3/2017	11/15/2017	11/15/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**21,000**	**16,000 J**	--
PFMOAA	--	--	--	**3,100**
PFO2HxA	--	--	--	**4,100**
PFO3OA	--	--	--	**1,300**
PFO4DA	--	--	--	**850**
PFO5DA	--	--	--	<200
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	**8,900**
PFESA-BP2	--	--	--	**280**
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<20	<20	--
Perfluorobutane Sulfonic Acid	--	**3.5**	**3**	--
Perfluorobutanoic Acid	--	--	--	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	<2	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	<2	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	**72**	**63**	--
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	**17**	**13**	--
Perfluorohexanoic Acid	--	**100**	**88**	--
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	<2	<2	--
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	**300**	**290**	--
Perfluorotetradecanoic Acid	--	<2	<2	--
Perfluorotridecanoic Acid	--	<2	<2	--
Perfluoroundecanoic Acid	--	<2	<2	--
PFOA	**19**	**57**	**53**	--
PFOS	--	<2	**39**	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-09	SMW-09	SMW-09	SMW-11
Field Sample ID	FAY-GWASI-SMW-09-2	GW0718-SMW-09	GW0619-SMW-09	P32013-SMW-11
Sample Date	11/15/2017	8/9/2018	7/11/2019	6/19/2013
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	**15,000 B**	**14,000**	--
PFMOAA	**2,800**	**1,600**	**1,800**	--
PFO2HxA	**4,100**	**3,000**	**3,100**	--
PFO3OA	**1,200**	**1,100**	**920**	--
PFO4DA	**900**	**790**	**890**	--
PFO5DA	<200	<110	**66**	--
PMPA	--	**4,000 J**	**4,800**	--
PEPA	--	**1,400**	**1,400**	--
PFESA-BP1	**9,000**	**7,400**	**22,000**	--
PFESA-BP2	**230**	**210**	**560**	--
Byproduct 4	--	--	**2,000**	--
Byproduct 5	--	--	**54,000 J**	--
Byproduct 6	--	--	**88**	--
NVHOS	--	--	**260**	--
EVE Acid	--	--	**610**	--
Hydro-EVE Acid	--	--	**2,000**	--
R-EVE	--	--	**360 J**	--
PES	--	--	<46	--
PFECA B	--	--	<60	--
PFECA-G	--	<96	<41	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	<8.1	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	<5.4	<20	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	<2.7	<20	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7 UJ	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	<2.7 UJ	--	--
6:2 Fluorotelomer sulfonate	--	**2.6**	<20	--
ADONA	--	--	--	--
NaDONA	--	<90	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
N-ethylperfluoro-1-octanesulfonamide	--	<8.1 UJ	--	--
N-methyl perfluoro-1-octanesulfonamide	--	<8.1 UJ	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	<2.7	<20	--
Perfluorobutane Sulfonic Acid	--	**1.8 J**	**3.1**	--
Perfluorobutanoic Acid	--	**290**	**340**	--
Perfluorodecane Sulfonic Acid	--	<1.8	<2	--
Perfluorodecanoic Acid	--	<1.8	<2	--
Perfluorododecane sulfonic acid (PFDoS)	--	<0.9	<2	--
Perfluorododecanoic Acid	--	<1.8	<2	--
Perfluoroheptane sulfonic acid (PFHpS)	--	<1.8	<2	--
Perfluoroheptanoic Acid	--	**43**	**66**	--
Perfluorohexadecanoic acid (PFHxDA)	--	<0.9	--	--
Perfluorohexane Sulfonic Acid	--	**9.7**	**16**	--
Perfluorohexanoic Acid	--	**63**	**79**	--
Perfluorononanesulfonic acid	--	--	<2	--
Perfluorononanoic Acid	--	<1.8	<2	--
Perfluorooctadecanoic acid	--	<1.8 UJ	<2 UJ	--
Perfluorooctane Sulfonamide	--	<2.7 UJ	<2	--
Perfluoropentane sulfonic acid (PFPeS)	--	<1.8	**2.6**	--
Perfluoropentanoic Acid	--	**180 J**	**200**	--
Perfluorotetradecanoic Acid	--	<0.9	<2	--
Perfluorotridecanoic Acid	--	<0.9	<2	--
Perfluoroundecanoic Acid	--	<1.8	<2	--
PFOA	--	**39**	**91**	**8.2**
PFOS	--	<1.8	<2	--

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-11	SMW-11	SMW-11	SMW-11
Field Sample ID	GW0414-SMW-11	GW0915-SMW-11	GW0915-SMW-11DIL	GW0817-SMW-11
Sample Date	4/7/2014	9/16/2015	9/16/2015	8/3/2017
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	--	--	--	**4,600**
PFMOAA	--	--	--	--
PFO2HxA	--	--	--	--
PFO3OA	--	--	--	--
PFO4DA	--	--	--	--
PFO5DA	--	--	--	--
PMPA	--	--	--	--
PEPA	--	--	--	--
PFESA-BP1	--	--	--	--
PFESA-BP2	--	--	--	--
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	--
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	--
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	--
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	--
6:2 Fluorotelomer sulfonate	--	--	--	--
ADONA	--	--	--	--
NaDONA	--	--	--	--
N-ethyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
N-ethylperfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluoro-1-octanesulfonamide	--	--	--	--
N-methyl perfluorooctane sulfonamidoacetic acid	--	--	--	<20
Perfluorobutane Sulfonic Acid	--	--	--	<2
Perfluorobutanoic Acid	--	--	<2,000	--
Perfluorodecane Sulfonic Acid	--	--	--	--
Perfluorodecanoic Acid	--	--	--	<2
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	--
Perfluorododecanoic Acid	--	--	--	<2
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	--
Perfluoroheptanoic Acid	--	--	<2,000	**12**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	--
Perfluorohexane Sulfonic Acid	--	--	--	<2
Perfluorohexanoic Acid	--	--	--	**9.3**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	--	--	--	<2
Perfluorooctadecanoic acid	--	--	--	--
Perfluorooctane Sulfonamide	--	--	--	--
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	--
Perfluoropentanoic Acid	--	--	<2,000	**39**
Perfluorotetradecanoic Acid	--	--	--	<2
Perfluorotridecanoic Acid	--	--	--	<2
Perfluoroundecanoic Acid	--	--	--	<2
PFOA	**11**	**25**	--	**36**
PFOS	--	--	--	<2

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer	Surficial Aquifer
LocID	SMW-11	SMW-11	SMW-11	SMW-11
Field Sample ID	FAY-GWASI-SMW-11	FAY-GWASI-SMW-11-1	FAY-GWASI-SMW-11-2	GW0718-SMW-11
Sample Date	11/15/2017	11/15/2017	11/15/2017	7/13/2018
QA/QC	--	--	--	--
Table 3+ (ng/L)				
Hfpo Dimer Acid	**4,400 J**	--	--	**4,700 J**
PFMOAA	--	**2,300**	**3,300**	**1,900**
PFO2HxA	--	**3,500**	**4,000**	**3,400**
PFO3OA	--	**670**	**820**	**720**
PFO4DA	--	**310**	**300**	**340**
PFO5DA	--	<200	<200	<110
PMPA	--	--	--	**4,300**
PEPA	--	--	--	**1,400**
PFESA-BP1	--	<200	<200	<120
PFESA-BP2	--	<200	<200	<95
Byproduct 4	--	--	--	--
Byproduct 5	--	--	--	--
Byproduct 6	--	--	--	--
NVHOS	--	--	--	--
EVE Acid	--	--	--	--
Hydro-EVE Acid	--	--	--	--
R-EVE	--	--	--	--
PES	--	--	--	--
PFECA B	--	--	--	--
PFECA-G	--	--	--	<96
Other PFAS (ng/L)				
10:2 Fluorotelomer sulfonate	--	--	--	<7.9
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	--	--	--	<5.3
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	--	--	--	<2.6
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--	--	--	<2.6
6:2 Fluorotelomer sulfonate	--	--	--	<1.8
ADONA	--	--	--	--
NaDONA	--	--	--	<0.9 UJ
N-ethyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.6
N-ethylperfluoro-1-octanesulfonamide	--	--	--	<7.9 UJ
N-methyl perfluoro-1-octanesulfonamide	--	--	--	<7.9
N-methyl perfluorooctane sulfonamidoacetic acid	<20	--	--	<2.6
Perfluorobutane Sulfonic Acid	<2	--	--	**1**
Perfluorobutanoic Acid	--	--	--	**28**
Perfluorodecane Sulfonic Acid	--	--	--	<1.8
Perfluorodecanoic Acid	<2	--	--	<1.8
Perfluorododecane sulfonic acid (PFDoS)	--	--	--	<0.88
Perfluorododecanoic Acid	<2	--	--	<1.8
Perfluoroheptane sulfonic acid (PFHpS)	--	--	--	<1.8
Perfluoroheptanoic Acid	**11**	--	--	**12**
Perfluorohexadecanoic acid (PFHxDA)	--	--	--	<0.88
Perfluorohexane Sulfonic Acid	<2	--	--	<1.8
Perfluorohexanoic Acid	**10**	--	--	**11**
Perfluorononanesulfonic acid	--	--	--	--
Perfluorononanoic Acid	<2	--	--	<1.8
Perfluorooctadecanoic acid	--	--	--	<1.8
Perfluorooctane Sulfonamide	--	--	--	<2.6
Perfluoropentane sulfonic acid (PFPeS)	--	--	--	<1.8
Perfluoropentanoic Acid	**48**	--	--	**37**
Perfluorotetradecanoic Acid	<2	--	--	<0.88
Perfluorotridecanoic Acid	<2	--	--	<0.88
Perfluoroundecanoic Acid	<2	--	--	<1.8
PFOA	**34**	--	--	**48**
PFOS	<2	--	--	<1.8

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TABLE I-1
HISTORICAL GROUNDWATER ANALYTICAL RESULTS
Chemours Fayetteville Works, North Carolina

Aquifer	Surficial Aquifer
LocID	**SMW-11**
Field Sample ID	**GW0619-SMW-11**
Sample Date	**6/26/2019**
QA/QC	**--**
Table 3+ (ng/L)	
Hfpo Dimer Acid	**4,000**
PFMOAA	**1,600 J**
PFO2HxA	**2,400 J**
PFO3OA	**400 J**
PFO4DA	**190 J**
PFO5DA	**62 J**
PMPA	**2,900 J**
PEPA	**760 J**
PFESA-BP1	<27 UJ
PFESA-BP2	**72 J**
Byproduct 4	180 UJ
Byproduct 5	<58 UJ
Byproduct 6	<15 UJ
NVHOS	<54 UJ
EVE Acid	<24 UJ
Hydro-EVE Acid	**30 J**
R-EVE	**140 J**
PES	<46 UJ
PFECA B	<60 UJ
PFECA-G	<41 UJ
Other PFAS (ng/L)	
10:2 Fluorotelomer sulfonate	--
1H,1H,2H,2H-perfluorodecanesulfonate (8:2 FTS)	<20
1H,1H,2H,2H-perfluorohexanesulfonate (4:2 FTS)	<20
2-(N-ethyl perfluoro-1-octanesulfonamido)-ethanol	--
2-(N-methyl perfluoro-1-octanesulfonamido)-ethanol	--
6:2 Fluorotelomer sulfonate	<20
ADONA	--
NaDONA	--
N-ethyl perfluorooctane sulfonamidoacetic acid	<20
N-ethylperfluoro-1-octanesulfonamide	--
N-methyl perfluoro-1-octanesulfonamide	--
N-methyl perfluorooctane sulfonamidoacetic acid	<20
Perfluorobutane Sulfonic Acid	<2
Perfluorobutanoic Acid	**24**
Perfluorodecane Sulfonic Acid	<2
Perfluorodecanoic Acid	<2
Perfluorododecane sulfonic acid (PFDoS)	<2
Perfluorododecanoic Acid	<2
Perfluoroheptane sulfonic acid (PFHpS)	<2
Perfluoroheptanoic Acid	**9.8**
Perfluorohexadecanoic acid (PFHxDA)	--
Perfluorohexane Sulfonic Acid	<2
Perfluorohexanoic Acid	**7.8**
Perfluorononanesulfonic acid	<2
Perfluorononanoic Acid	<2
Perfluorooctadecanoic acid	<2
Perfluorooctane Sulfonamide	<2
Perfluoropentane sulfonic acid (PFPeS)	<2
Perfluoropentanoic Acid	**29**
Perfluorotetradecanoic Acid	<2
Perfluorotridecanoic Acid	<2
Perfluoroundecanoic Acid	<2
PFOA	**34**
PFOS	<2

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APPENDIX J
PFAS Signature Methods and Results

APPENDIX J: PFAS SIGNATURE METHODS AND RESULTS

1. INTRODUCTION

This appendix provides details on the statistical method used to facilitate identification of PFAS signatures in the onsite and offsite areas and a summary of the results of the analysis (Table J-1).

1.1 Background

PFAS were released from the Facility via aerial deposition from stack emissions and process wastewaters. A method to assess the source of PFAS (aerial versus wastewater) present in the environment is referred to as a PFAS signature. This can be used to refine and connect observations of PFAS chemistry with insights for hydrogeological identified flow paths.

1.2 Objective

Hierarchical cluster analysis (HCA), was used to evaluate the relative proportions of Table 3+ PFAS concentrations in onsite and offsite groundwater to identify: (i) groups of groundwater wells that share similar concentration compositions and (ii) the Total Table 3+ PFAS compounds driving these groupings. The results of the HCA were used to infer PFAS signatures across onsite and offsite areas and provide a line of evidence regarding different PFAS pathways. The analysis was performed using R software (R Core Team, 2018).

2. HIERARCHICAL CLUSTER ANALYSIS

Hierarchical cluster analysis (HCA) is a multivariate statistical method that can identify common groups, i.e., clusters, of wells within a large data set based on their PFAS concentration compositions. HCA builds a hierarchy from the bottom-up and does not require the number of clusters to be specified beforehand (Hastie et al. 2009).

The idea behind the HCA clustering algorithm is as follows:

1. Begin by assuming each groundwater well is in its own cluster.
2. Identify the closest two clusters and combine them into one cluster.
3. Repeat the above step until all the data points are in a single cluster.

To perform step 2 above, a distance metric (to quantify the dissimilarity between clusters) and an agglomeration criterion need to be selected. Many distances are available (Manhattan, Euclidean, etc.) as well as several agglomeration methods (Ward, single, centroid, etc.). For this analysis, the Euclidean distance and Ward's method were used to perform the HCA. The Ward's method minimizes the sum of squares of any two (hypothetical) clusters that can be formed at each step. This method produces compact clusters of similar size and the most common method used for environmental concentration data.

The results of HCA are displayed using a tree-based graphical representation known as a dendrogram. Each leaf of the dendrogram (vertical line) corresponds to a well and wells that are similar to each other are merged into branches (horizontal lines). The height of each merge indicates the similarity between two clusters. Therefore, merges with higher heights represent less similar clusters.

To determine the optimal number of clusters, a "majority rule" approach can be used. This approach involves simultaneously calculating several indices (e.g., Elbow, Silhouette Gap statistics, etc.) to determine the relevant number of clusters and the number proposed by the majority of indices is the optimal number of clusters (Charrad et al., 2014).

3. RESULTS

The HCA identified four clusters of wells with differing Table 3+ PFAS compositions. The PFAS compositions across wells within a cluster were used to infer the following four PFAS signatures:

- Aerial deposition PFAS signature characterized by a predominant proportion of PMPA;
- Aerial deposition PFAS signature characterized by a mixture of PFAS compounds;
- Combined process water PFAS signature characterized with a predominant proportion of PFMOAA; and
- Combined process water PFAS signature characterized by a mixture of PFAS compounds.

For each proposed PFAS signature, the concentration compositions for a select number of wells are shown in Table J-1. The spatial distribution of these PFAS signatures are provided in Figure 9-11 in the main report.

4. REFERENCES

Charrad, Malika, Nadia Ghazzali, Véronique Boiteau, and Azam Niknafs. 2014. "NbClust: An R Package for Determining the Relevant Number of Clusters in a Data Set." Journal of Statistical Software 61: 1–36. http://www.jstatsoft.org/v61/i06/paper.

Hastie, T., Tibshirani, R. and Friedman, J., 2009. The Elements of Statistical Learning: Data Mining, Inference, and Prediction. Biometrics.

R Core Team. 2018. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available at: https://www.R-project.org/.

TABLE J-1
MONITORING WELL LOCATIONS SHOWING PROPOSED PFAS SIGNATURES
Chemours Fayetteville Works, North Carolina

Proposed PFAS Signature	Area	Aquifer	Location ID	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PFESA-BP1	PFESA-BP2	Byproduct 4	Byproduct 5	Byproduct 6	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	Total Table 3+ (ng/L)
Aerial - Predominant PMPA	Onsite	Black Creek Aquifer	BCA-04	26%	0%	0%	0%	0%	0%	74%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	27
Aerial - Predominant PMPA	Onsite	Black Creek Aquifer	PW-09	0%	0%	7%	0%	0%	0%	69%	9%	7%	3%	0%	4%	0%	0%	0%	0%	0%	2,300
Aerial - Predominant PMPA	Onsite	Black Creek Aquifer	PW-12	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15
Aerial - Predominant PMPA	Onsite	Surficial Aquifer	SMW-10	0%	0%	0%	0%	0%	6%	94%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	830
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	BLADEN-2D	10%	0%	6%	1%	0%	0%	69%	11%	0%	4%	0%	0%	0%	0%	0%	0%	0%	110
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	BLADEN-3D	11%	0%	6%	0%	0%	0%	69%	10%	0%	3%	0%	0%	0%	0%	0%	0%	0%	20
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	CUMBERLAND-2D	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	CUMBERLAND-4D	0%	0%	0%	0%	0%	0%	82%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	15
Aerial - Predominant PMPA	Offsite	Black Creek Aquifer	ROBESON-1D	13%	0%	6%	0%	0%	0%	75%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	47
Aerial - Predominant PMPA	Offsite	Surficial Aquifer	BLADEN-2S	4%	9%	15%	1%	1%	0%	53%	5%	0%	11%	0%	0%	0%	1%	0%	0%	0%	130
Aerial - Predominant PMPA	Offsite	Surficial Aquifer	BLADEN-4S	0%	0%	18%	0%	0%	0%	73%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	17
Aerial - Predominant PMPA	Offsite	Surficial Aquifer	ROBESON-1S	0%	12%	12%	0%	0%	0%	63%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	54
Aerial - Mixture of PFAS	Onsite	Black Creek Aquifer	PIW-3D	22%	12%	21%	4%	2%	0%	27%	10%	0%	0%	1%	0%	0%	0%	0%	0%	1%	44,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	FTA-01	18%	0%	14%	2%	0%	3%	52%	10%	0%	1%	0%	0%	0%	0%	0%	0%	0%	2,900
Aerial - Mixture of PFAS	Onsite	Perched Zone	FTA-02	24%	12%	10%	2%	2%	3%	7%	3%	1%	4%	2%	1%	0%	0%	27%	1%	1%	90,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	FTA-03	32%	8%	16%	2%	2%	3%	16%	5%	1%	2%	3%	3%	0%	0%	0%	0%	5%	40,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	MW-12S	33%	13%	18%	3%	2%	2%	19%	7%	0%	1%	1%	0%	0%	0%	0%	0%	1%	52,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	MW-25	24%	4%	12%	2%	2%	1%	36%	14%	0%	1%	2%	1%	0%	0%	0%	0%	2%	70,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	MW-30	23%	4%	12%	1%	2%	3%	38%	14%	0%	1%	1%	0%	0%	0%	0%	0%	0%	77,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	MW-7S	30%	8%	15%	3%	2%	3%	23%	9%	0%	1%	2%	1%	0%	0%	0%	0%	2%	58,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	MW-9S	26%	7%	13%	2%	2%	1%	33%	13%	0%	1%	1%	0%	0%	0%	0%	0%	1%	21,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-01	18%	17%	17%	4%	5%	5%	14%	6%	1%	2%	2%	1%	0%	1%	0%	1%	5%	120,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-04	6%	6%	10%	3%	1%	1%	2%	1%	25%	3%	2%	28%	0%	1%	8%	4%	1%	4,300,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-08A	9%	2%	4%	1%	1%	1%	47%	26%	1%	0%	1%	5%	0%	0%	1%	1%	0%	420,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-09	22%	3%	12%	5%	6%	1%	29%	19%	0%	1%	1%	1%	0%	0%	0%	0%	0%	190,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-10	27%	5%	12%	2%	1%	1%	33%	11%	0%	1%	3%	0%	0%	1%	0%	1%	2%	86,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	NAF-12	2%	4%	7%	3%	2%	1%	6%	1%	12%	4%	4%	20%	0%	10%	13%	7%	2%	5,400,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-13	17%	3%	8%	1%	1%	2%	42%	23%	0%	0%	1%	1%	0%	0%	0%	0%	1%	260,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-14	25%	4%	11%	2%	2%	2%	38%	13%	0%	0%	1%	0%	0%	0%	0%	0%	0%	130,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-15	18%	5%	17%	2%	2%	2%	35%	14%	0%	1%	2%	0%	0%	0%	0%	0%	1%	54,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-19R	26%	12%	24%	3%	3%	2%	18%	8%	0%	1%	2%	0%	0%	0%	0%	0%	1%	25,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-20R	33%	8%	24%	2%	2%	2%	19%	8%	0%	1%	1%	0%	0%	0%	0%	0%	0%	11,000
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-21R	30%	13%	25%	3%	3%	2%	14%	6%	0%	1%	1%	0%	0%	0%	0%	0%	1%	7,100
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-26	38%	0%	30%	0%	0%	9%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	630
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-28	17%	6%	16%	2%	2%	1%	39%	13%	0%	1%	2%	0%	0%	0%	0%	0%	1%	8,200
Aerial - Mixture of PFAS	Onsite	Perched Zone	PZ-35	24%	8%	22%	4%	6%	6%	16%	8%	0%	2%	1%	0%	0%	0%	0%	0%	1%	6,700
Aerial - Mixture of PFAS	Onsite	Perched Zone	SMW-02	23%	4%	26%	4%	1%	0%	27%	13%	0%	0%	1%	0%	0%	0%	0%	0%	1%	78,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	INSITU-01	24%	9%	19%	1%	0%	0%	33%	10%	0%	1%	2%	0%	0%	0%	0%	0%	1%	2,400
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-16D	31%	12%	10%	2%	1%	0%	31%	8%	1%	1%	1%	2%	0%	0%	0%	0%	0%	4,200
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-17D	18%	7%	13%	2%	0%	0%	45%	13%	0%	1%	1%	0%	0%	0%	0%	0%	0%	3,800
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-18D	53%	4%	7%	0%	0%	0%	28%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1,500
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-19D	25%	16%	19%	4%	2%	0%	25%	8%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4,400
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-21D	19%	6%	15%	1%	0%	0%	43%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	MW-22D	38%	6%	12%	2%	1%	0%	30%	9%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4,700
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PIW-10S	25%	8%	17%	3%	1%	0%	32%	12%	0%	1%	1%	0%	0%	0%	0%	0%	1%	18,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PIW-5S	22%	10%	11%	3%	2%	1%	28%	12%	1%	0%	1%	5%	0%	0%	1%	0%	1%	350,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-03	20%	1%	5%	1%	0%	0%	33%	19%	0%	0%	3%	12%	0%	2%	0%	1%	3%	400,000

TABLE J-1
MONITORING WELL LOCATIONS SHOWING PROPOSED PFAS SIGNATURES
Chemours Fayetteville Works, North Carolina

Proposed PFAS Signature	Area	Aquifer	Location ID	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PFESA-BP1	PFESA-BP2	Byproduct 4	Byproduct 5	Byproduct 6	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	Total Table 3+ (ng/L)
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-04	27%	8%	22%	8%	2%	0%	20%	9%	0%	0%	3%	0%	0%	0%	0%	0%	1%	3,500
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-05	35%	0%	16%	2%	3%	0%	35%	9%	0%	1%	0%	0%	0%	0%	0%	0%	0%	4,600
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-06	32%	0%	17%	2%	0%	0%	36%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	PW-07	24%	9%	22%	3%	2%	0%	30%	9%	0%	0%	1%	0%	0%	0%	0%	0%	0%	4,600
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	SMW-01	34%	6%	16%	3%	1%	0%	27%	9%	0%	1%	2%	0%	0%	0%	0%	0%	1%	6,200
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	SMW-09	13%	2%	3%	1%	1%	0%	4%	1%	20%	1%	2%	50%	0%	0%	1%	2%	0%	110,000
Aerial - Mixture of PFAS	Onsite	Surficial Aquifer	SMW-11	31%	13%	19%	3%	1%	0%	23%	6%	0%	1%	1%	0%	0%	0%	0%	0%	1%	13,000
Aerial - Mixture of PFAS	Offsite	Black Creek Aquifer	BLADEN-1D	24%	4%	11%	1%	0%	0%	43%	14%	0%	0%	2%	0%	0%	0%	0%	0%	1%	760
Aerial - Mixture of PFAS	Offsite	Black Creek Aquifer	CUMBERLAND-3D	0%	59%	0%	0%	0%	0%	41%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	BLADEN-3S	10%	13%	27%	3%	3%	1%	33%	5%	0%	3%	2%	0%	0%	0%	0%	0%	0%	120
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-1S	0%	0%	39%	7%	3%	0%	46%	0%	0%	6%	0%	0%	0%	0%	0%	0%	0%	29
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-2S	0%	48%	9%	0%	0%	0%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	46
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-3S	5%	14%	30%	5%	4%	4%	21%	0%	0%	2%	10%	0%	0%	0%	0%	0%	5%	210
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-4S	20%	7%	20%	3%	1%	0%	25%	7%	0%	1%	13%	0%	0%	0%	0%	0%	3%	560
Aerial - Mixture of PFAS	Offsite	Surficial Aquifer	CUMBERLAND-5S	0%	61%	0%	0%	0%	0%	39%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	36
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	BCA-01	8%	61%	19%	3%	0%	0%	5%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	110,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	BCA-02	9%	61%	15%	4%	2%	0%	4%	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	200,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	BCA-03R	2%	68%	14%	3%	0%	0%	6%	1%	0%	0%	0%	4%	0%	0%	0%	0%	0%	490,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	LTW-02	12%	49%	21%	4%	0%	0%	8%	3%	0%	0%	1%	2%	0%	0%	0%	0%	1%	78,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	LTW-05	7%	65%	18%	6%	1%	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	1%	370,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PIW-2D	9%	69%	14%	0%	0%	0%	6%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	20,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PIW-7D	6%	76%	14%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	200,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PIW-8D	8%	57%	20%	7%	1%	0%	2%	1%	0%	0%	1%	1%	0%	1%	0%	1%	1%	700,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PIW-9D	13%	57%	16%	5%	1%	0%	4%	1%	0%	0%	1%	1%	0%	1%	0%	1%	1%	260,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PW-10R	6%	77%	14%	1%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	170,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PW-11	4%	66%	13%	8%	4%	0%	2%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	420,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PW-14	0%	53%	19%	6%	3%	2%	8%	2%	0%	1%	1%	1%	0%	1%	0%	1%	1%	18,000,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PW-15R	2%	67%	13%	3%	0%	0%	7%	2%	1%	0%	0%	4%	0%	1%	0%	0%	0%	490,000
Combined Process Water - Predominant PFMOAA	Onsite	Black Creek Aquifer	PZ-22	4%	74%	16%	2%	0%	0%	2%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	240,000
Combined Process Water - Predominant PFMOAA	Onsite	Floodplain Deposits	LTW-03	6%	69%	16%	2%	0%	0%	4%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	220,000
Combined Process Water - Predominant PFMOAA	Onsite	Floodplain Deposits	LTW-04	9%	52%	17%	3%	0%	0%	10%	4%	0%	0%	1%	2%	0%	1%	0%	0%	1%	190,000
Combined Process Water - Predominant PFMOAA	Onsite	Floodplain Deposits	PIW-6S	6%	70%	15%	2%	0%	0%	4%	1%	0%	0%	0%	1%	0%	0%	0%	0%	0%	230,000
Combined Process Water - Predominant PFMOAA	Onsite	Floodplain Deposits	PIW-7S	8%	69%	14%	1%	0%	0%	6%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	17,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	MW-24	2%	77%	14%	3%	1%	0%	1%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	940,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	MW-27	3%	68%	18%	5%	1%	0%	2%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	350,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	NAF-02	3%	62%	17%	5%	2%	1%	2%	1%	0%	0%	0%	5%	0%	1%	0%	0%	0%	4,700,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	PZ-12	6%	58%	12%	3%	1%	0%	5%	1%	7%	1%	0%	5%	0%	0%	0%	0%	0%	110,000
Combined Process Water - Predominant PFMOAA	Onsite	Perched Zone	PZ-27	5%	59%	13%	3%	2%	1%	7%	3%	0%	2%	0%	4%	0%	1%	0%	0%	0%	9,900
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	MW-13D	11%	52%	19%	5%	2%	0%	6%	2%	0%	1%	0%	1%	0%	0%	0%	0%	1%	340,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	MW-14D	4%	71%	14%	3%	1%	0%	3%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	250,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	MW-20D	8%	59%	14%	3%	1%	0%	11%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	24,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	PIW-9S	3%	69%	16%	4%	1%	0%	3%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	220,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	PW-02	0%	65%	19%	5%	2%	1%	3%	1%	0%	0%	1%	2%	0%	1%	0%	0%	0%	15,000,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	SMW-03B	2%	70%	11%	2%	0%	0%	9%	2%	0%	0%	0%	4%	0%	1%	0%	0%	0%	660,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	SMW-04B	18%	58%	10%	2%	1%	0%	7%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	70,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	SMW-05P	5%	63%	13%	4%	1%	0%	8%	1%	0%	0%	0%	2%	0%	1%	0%	0%	0%	350,000
Combined Process Water - Predominant PFMOAA	Onsite	Surficial Aquifer	SMW-08B	2%	74%	13%	3%	1%	0%	2%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	350,000

TABLE J-1
MONITORING WELL LOCATIONS SHOWING PROPOSED PFAS SIGNATURES
Chemours Fayetteville Works, North Carolina

Proposed PFAS Signature	Area	Aquifer	Location ID	HFPO-DA	PFMOAA	PFO2HxA	PFO3OA	PFO4DA	PFO5DA	PMPA	PEPA	PFESA-BP1	PFESA-BP2	Byproduct 4	Byproduct 5	Byproduct 6	NVHOS	EVE Acid	Hydro-EVE Acid	R-EVE	Total Table 3+ (ng/L)
Combined Process Water - Mixture of PFAS	Onsite	Black Creek Aquifer	PIW-10DR	17%	40%	17%	5%	1%	0%	8%	3%	0%	0%	1%	6%	0%	0%	0%	1%	1%	110,000
Combined Process Water - Mixture of PFAS	Onsite	Black Creek Aquifer	SMW-12	18%	41%	14%	1%	0%	0%	20%	5%	0%	0%	1%	0%	0%	0%	0%	0%	1%	9,600
Combined Process Water - Mixture of PFAS	Onsite	Floodplain Deposits	LTW-01	14%	33%	22%	4%	1%	0%	17%	6%	0%	0%	1%	1%	0%	0%	0%	0%	1%	140,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	MW-1S	21%	32%	17%	2%	2%	2%	15%	5%	0%	2%	1%	1%	0%	0%	0%	0%	1%	66,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	MW-23	62%	3%	8%	1%	1%	0%	16%	6%	0%	1%	2%	0%	0%	0%	0%	0%	1%	27,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	MW-28	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2,900
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	MW-2S	20%	33%	14%	3%	2%	3%	14%	5%	0%	2%	1%	0%	0%	0%	0%	1%	1%	84,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	NAF-03	8%	37%	16%	6%	3%	3%	7%	3%	8%	1%	1%	5%	0%	1%	1%	0%	1%	700,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	NAF-06	6%	47%	17%	7%	4%	3%	3%	1%	4%	2%	0%	5%	0%	0%	0%	0%	0%	1,700,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	NAF-07	13%	33%	16%	5%	3%	2%	9%	4%	0%	1%	2%	11%	0%	1%	0%	0%	1%	280,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	PW-01	15%	45%	18%	4%	2%	1%	7%	2%	1%	1%	1%	2%	0%	1%	0%	0%	1%	56,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	PZ-11	19%	27%	18%	3%	2%	3%	13%	4%	2%	1%	1%	5%	0%	1%	0%	0%	0%	26,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	PZ-24	57%	2%	6%	1%	1%	0%	22%	8%	0%	0%	1%	0%	0%	0%	0%	0%	0%	63,000
Combined Process Water - Mixture of PFAS	Onsite	Perched Zone	SMW-07	62%	4%	11%	1%	1%	0%	14%	4%	0%	1%	1%	0%	0%	0%	0%	0%	1%	19,000
Combined Process Water - Mixture of PFAS	Onsite	Surficial Aquifer	MW-15DRR	4%	38%	8%	1%	0%	0%	4%	1%	11%	1%	1%	26%	0%	0%	1%	0%	0%	81,000
Combined Process Water - Mixture of PFAS	Onsite	Surficial Aquifer	PIW-1D	21%	27%	19%	4%	1%	0%	19%	7%	0%	0%	1%	0%	0%	0%	0%	0%	1%	51,000

Notes:
ng/L - nanograms per liter
Table 3+ compounds reported as percentage of Total Table 3+ concentrations.
PES, PFECA B, and PFECA-G had no detections and are therefore omitted from this table.