

Upper Cape Fear River Basin Association (UCFRBA)

UCFRBA 2022 Annual Report

Prepared for NC Division of Water Resources

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UCFRBA 2022 Annual Report

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Background

The Upper Cape Fear River Basin Association (UCFRBA) has been monitoring the waters of the Cape Fear River basin from its headwaters to the confluence of the Haw and Deep Rivers for the past twenty-one years. This non-profit organization was established in February 2000, as part of the NC Monitoring Coalition Program, to provide more effective and efficient means to monitor water quality throughout the watershed. The NC Monitoring Coalition Program allows individual wastewater dischargers to collectively fund and implement an instream monitoring program in exchange for a waiver of the ambient monitoring requirements in their individual National Pollutant Discharge Elimination System (NPDES) permits. The UCFRBA is currently comprised of 20 local governments and private industries that rely upon the river for wastewater discharge and/or water supply. It was the last basin association to be formed in the Cape Fear River Basin, following the Lower and Middle Basin programs which were established in 1996 and 1998 respectively.

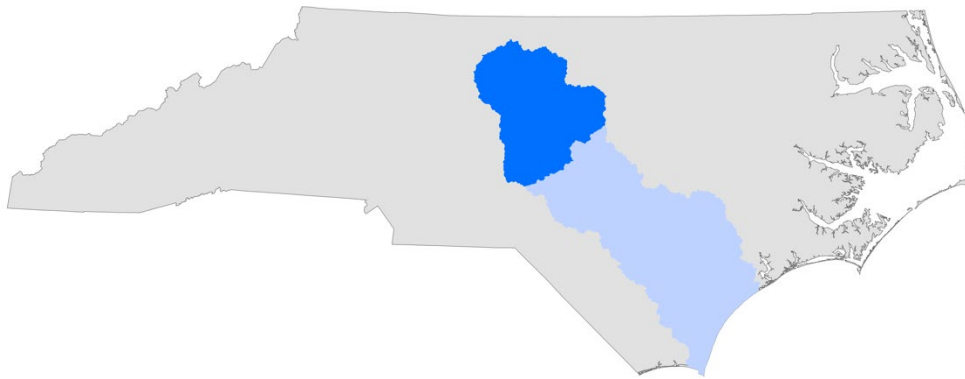


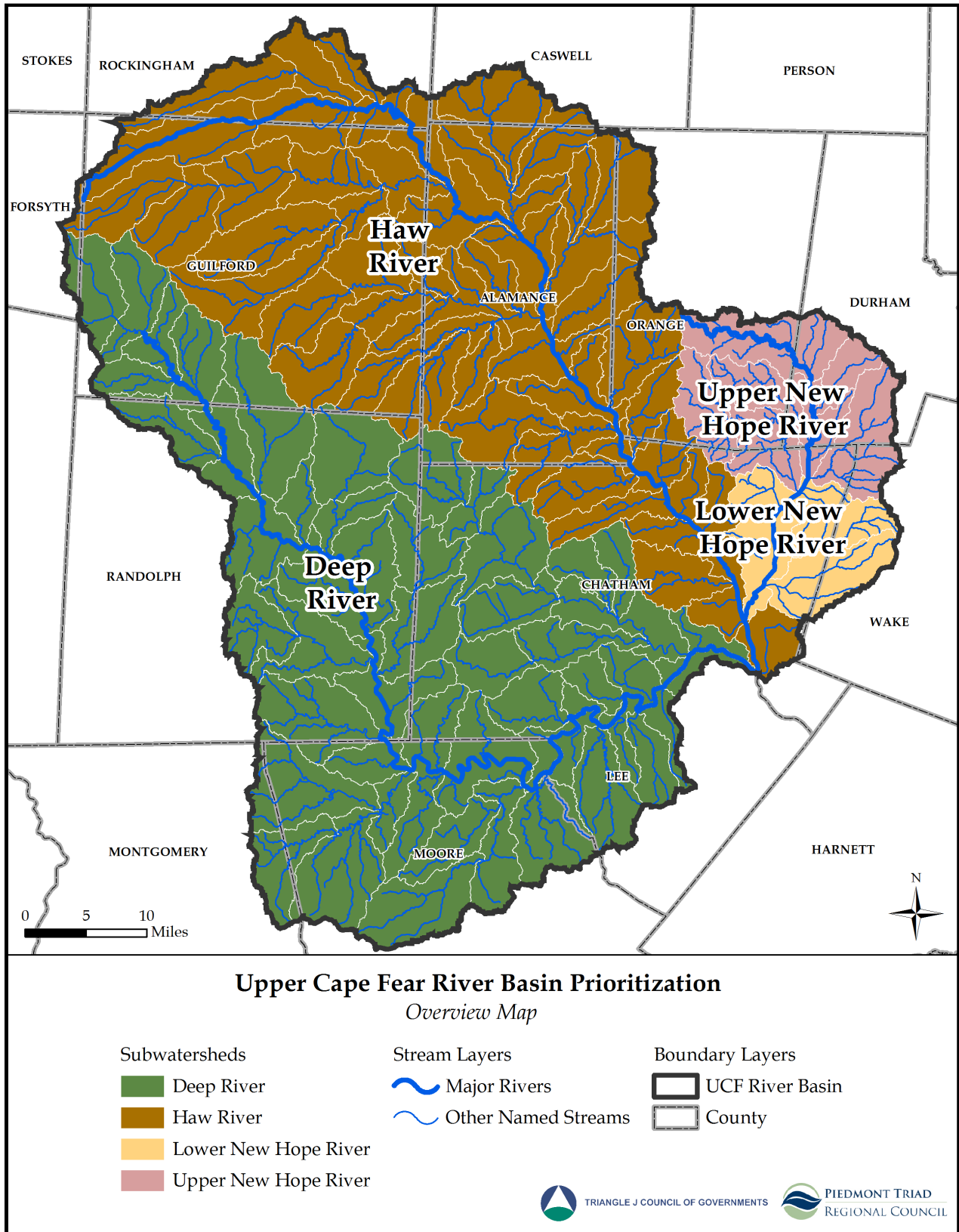
Figure 1: Upper Cape Fear River Basin

The UCFRBA maintains a robust monitoring network of forty-one (41) monitoring stations throughout the Upper Cape Fear River Basin, which are sampled on a monthly and bi-monthly basis. Monitoring locations is coordinated with the State's existing ambient and biological monitoring networks, to provide a more comprehensive picture of watershed conditions without duplicating efforts. The UCFRBA has a Memorandum of Agreement (MOA) with the North Carolina Division of Water Resources (NCDWR) binding its members to participate in the monitoring program, which began in April 2000. The Association has since renewed its MOA with NCDWR every five years. This agreement was last renewed in spring 2020 for 2020-2025.

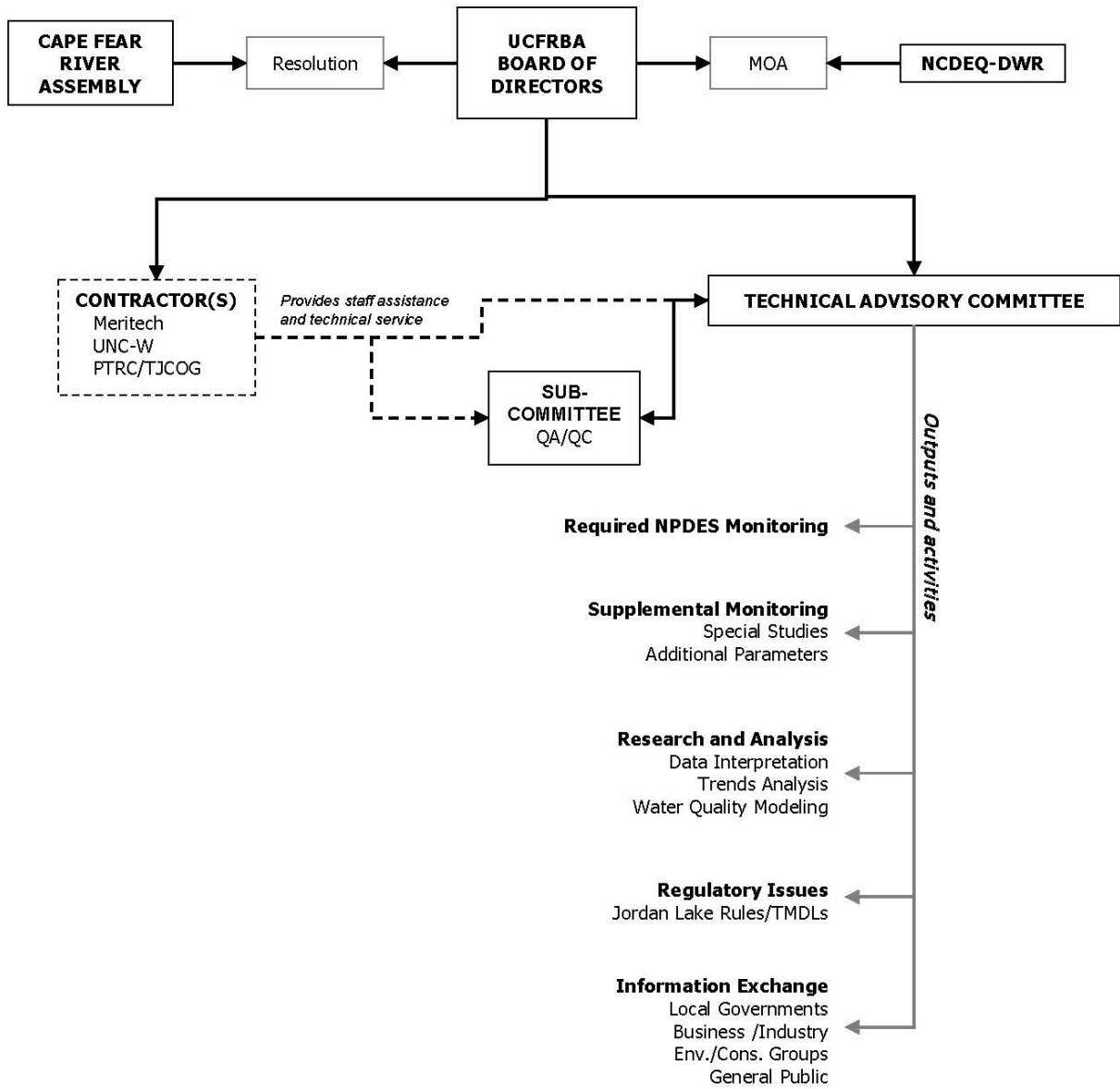
In addition to its monitoring program, the UCFRBA provides an ongoing forum for interested parties to work together on water resource planning, management and protection issues of mutual concern in the Jordan Lake watershed (including the Haw River and New Hope Creek subwatersheds), the Deep River watershed, and the Rocky River watershed in the uppermost part of the Cape Fear River Basin. The UCFRBA has undertaken several special studies in the past to provide supplemental data and better understand the forces driving water quality in the Upper Cape Fear River. Previous studies have included working with the US Geological Society (USGS) to study sediment and nutrients within the watershed, a four-month pilot study of dissolved metals, and additional sampling to support the development of a watershed model for the Deep River, Rocky River and (most recently) Upper and Middle Cape Fear River watersheds. Members were also active in the development of the Jordan Lake TMDL and are currently participating in the Jordan Lake One Water initiative.

This report has been prepared to provide interested parties with general information regarding the UCFRBA's monitoring and research activities during the calendar year 2022. The report describes the Association's organizational structure, current and future monitoring efforts, and provides a summary of monitoring data collected over the past year.

Figure 2: Upper Cape Fear Overview Map



Organizational Structure



Board of Directors

The UCFRBA is governed by a Board of Directors, which is made up of one representative from each corporate (dues paying) member. This includes 20 local governments and industries that use the Upper Cape Fear River Basin for water supply or treating and discharging wastewater. Each corporate member is afforded one vote and has the authority to appoint one Director and one Alternate Director to the Board of Directors. The Town of Cary is a special exception, as they have no permit responsibilities within the Basin, but do have an interest in water supply quality and are therefore accorded voting rights with lower dues. The Board of Directors has ultimate responsibility for all financial actions, membership, election of officers, and decisions affecting the Association and typically meets on a bi-annual basis.

Listed below are the organizations that make up the Board of Directors, their designated representatives, and NPDES permit numbers. The full-board list with addresses and contact information can be found in APPENDIX B.

<u>Corporate Members</u>	<u>Discharger</u>	<u>Public Water System</u>	<u>Representatives</u>		<u>NPDES Permit Number(s)</u>
Arclin	Yes	No	Bowman Harvey	Brad Crawford	NC0000892
Asheboro	Yes	Yes	Michael Rhoney	John Ogburn II	NC0026123
Burlington	Yes	Yes	Bob Patterson	Ben Bani	NC0023868, NC0023876
Cary	No	Yes	Donald Smith	Sarah Braman	None
Chatham Park	Yes	Yes	Tim Smith	Robin Rose	NC0020354
City of Durham	Yes	Yes	Charlie Cocker	Jennifer Hunter	NC0047597
Durham County	Yes	Yes	Stephanie Brixey	<i>vacant</i>	NC0026051
Graham	Yes	Yes	Tonya Mann	Cris Routh	NC0021211
Greensboro	Yes	Yes	Alicia Goots	Elijah Williams	NC0047384
High Point	Yes	Yes	Robby Stone	Derrick Boone	NC0024210
Mebane	Yes	Yes	Dennis Hodge	Chris Rollins	NC0021474
OWASA	Yes	Yes	Ronnie Weed	Wil Lawson	NC0025241
Pilgrim's Pride	Yes	No	Tina Pedley	<i>vacant</i>	NC0072575, NCG590000
Pittsboro	Yes	Yes	Kent Jackson	<i>vacant</i>	NC0020354
Ramseur	Yes	Yes	Terry Lewallen	Vicki Caudle	NC0026565
Randleman	Yes	Yes	Michael Glass	<i>vacant</i>	NC0025445
Reidsville	Yes	Yes	Josh Beck	Summer Woodard	NC0024881
Sanford	Yes	Yes	Scott Siletzky	Victor Czar	NC0024147
Siler City	Yes	Yes	Hank Raper	Chris McCorquodale	NC0026441
Star	Yes	Yes	Wesley Brown	Mary O'Brien	NC0058548

Officers

The Officers of the Board of Directors consist of a Chair, a Vice Chair, and a Secretary/Treasurer. Officers are elected biannually by the Board of Directors and each officer serves a term of two (2) years. The most recent Board of Directors Officers' elections took place in July 2022.

Officers of the Board of Directors through 6/30/2022

Chairman: *Charles Cocker, City of Durham*
Vice-Chairman: *Elijah Williams, City of Greensboro*

Officers of the Board of Directors 7/1/2022 to 6/30/2024

Chairman: *Elijah Williams, City of Greensboro*
Vice-Chairman: *Charles Cocker, City of Durham*

Technical Advisory Committee

The Technical Advisory Committee (TAC) is responsible for providing the Board of Directors with assistance and recommendations concerning the development of proposed annual work programs, specific project plans, and alternative funding sources and strategies. Technical Committee members represent a range of stakeholders with expertise in water quality research and management issues and they serve on a volunteer basis. The Technical Committee is open to participation to anyone that would like to attend. A complete list of current TAC committee members is provided in Appendix C.

Technical Advisory Committee (TAC) Chair: *Alicia Goots, City of Greensboro*
TAC Vice-Chair: *Vacant*

QA/QC Subcommittee

The Quality Assurance/Quality Control Subcommittee reviews monthly monitoring data to ensure its accuracy and reliability. The following are members of the QA/QC Subcommittee:

<i>Alicia Goots</i>	<i>City of Greensboro</i>
<i>Dawn Molnar, QA/QC Chair</i>	<i>City of High Point</i>
<i>Elaine Sellars</i>	<i>City of High Point</i>
<i>Martie Groome</i>	<i>City of Greensboro</i>
<i>Amy Varinoski</i>	<i>City of Greensboro</i>
<i>Amanda Hancock</i>	<i>Meritech, Inc.</i>
<i>Grace Messinger, Staff Support</i>	<i>PTRC</i>

Administrative Staff

The UCFRBA contracts with the Triangle J Council of Governments (TJCOG) and Piedmont Triad Regional Council (PTRC) for administrative, financial, and technical services. These two organizations jointly manage the association and provide ongoing staff support.

Staff Contacts

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Official Website

The UCFRBA maintains a dedicated website at <https://www.ptrc.org/ucfrba>. This website provides up-to-date information about the UCFRBA and its monitoring program, including station locations, monitoring schedules, organizational documents, and meeting notices and materials.

Summary of Monitoring Program

The UCFRBA renewed its MOA with NCDWR in May 2020 to comply with the federal NPDES program. The current monitoring program required by the MOA for the Upper Cape Fear includes forty-one (41) stations, which were established in cooperation with the NCDWR to monitor water quality near point source discharges. Stations are dispersed throughout the Upper Cape Fear River Basin, covering the main stems of the Haw and Deep Rivers, as well as most major tributaries. In 2019, Station B3040000 on New Hope Creek at SR 1107 was relocated due to safety concerns. The station was assigned a new station number (B3039000) and is now located above SR 1107 at a concrete impoundment. The UCFRBA also re-added one station (B3300000) in Durham County along Northeast Creek at SR1102 in March 2020 at the request of the City of Durham Stormwater Department. In August 2021, the UCFRBA also added a new station on Robeson Creek (B2300000) as part of Chatham Park joining the coalition.

Water quality samples are collected and analyzed monthly for a range of parameters including temperature, dissolved oxygen, conductivity, pH, fecal coliform, turbidity, total suspended solids, ammonium, nitrite-nitrate, TKN, and total phosphorus. Field parameters (temperature, dissolved oxygen, conductivity, and pH) are sampled bi-monthly during the growing season (May – September) at thirty-two (32) of the UCFRBA's forty-one (41) monitoring stations. Through 2007, the UCFRBA also monitored metals quarterly and low-level mercury at seven (7) sites. However, in April 2007, NCDWR released a memo suspending the metals monitoring requirement in the MOA for all monitoring coalitions while they re-evaluate new approaches regarding metals data and the use of water quality standards and criteria for metals. As a result, there is no metals data to report for this year. A complete list of UCFRBA monitoring stations and their monitoring frequencies has been provided in Table 1 .

Certified Lab

Laboratory services are currently provided by Meritech Inc., based in Reidsville, NC. Meritech is certified by NCDWR to perform environmental analysis and report monitoring data to DEQ for NPDES compliance and has provided these services for the UCFRBA since 2005. SimaLabs, Inc., was the UCFRBA's laboratory for conducting instream monitoring and analyses until August 2004.

Data Access

All monitoring data collected by the UCFRBA is reviewed by the QA/QC subcommittee and submitted to NCDWR on a quarterly basis. Data can be accessed from two online databases – the U.S. EPA's [Water Quality Portal \(WQP\) Database](#) and the [Cape Fear River Water Quality Database](#), which is a joint effort between the Upper, Middle, and Lower Cape Fear programs. This database is maintained by the University of North Carolina-Wilmington (UNCW) and provides additional analysis and reporting capabilities. Data is typically compiled and uploaded to both databases on an annual basis.

Monitoring Stations

Table 1: UCFRBA Water Quality Monitoring Stations

DWR Station Number	Location	Station Information	Latitude (dd.ddd)	Longitude (dd.ddd)	County	Stream Class	Stream Index	Field Parameters	Fecal Coliform	Turbidity	TSS	² Nutrients	³ Metals
B0050000	Haw Riv at US 29 Bus nr Benaja	ups Reidsville WWTP	36.2652	-79.6523	ROCKINGHAM	C, NSW	16-(1)	M + 2SM	M	M	M	M	M
B0070010	Troublesome Crk at US 29 Bus nr Reidsville	major tributary, nps inputs	36.2768	-79.6499	ROCKINGHAM	C, NSW	16-6-(3)	M	M	M	M	M	M
B0170000	Haw Riv at SR 2620 High Rock Rd nr Williamsburg	below Reidsville WWTP	36.2514	-79.5647	ROCKINGHAM	C, NSW	16-(1)	M + 2SM	M	M	M	M	M
B0400000	Reedy Fork at SR 2719 High Rock Rd nr Monticello	model verification	36.1778	-79.6177	GUILFORD	C, NSW	16-11-(9)	M	M	M	M	M	M
B0480050	N Buffalo Crk at N Buffalo Crk WWTP Influent Conduit Pier at	ups N. Buffalo WWTP	36.1074	-79.7502	GUILFORD	C, NSW	16-11-14-1	M + 2SM	M	M	M	M	M
B0540050 ⁴	N Buffalo Crk at SR 2770 Huffine Mill Rd nr McLeansville	dns N. Buffalo WWTP	36.1299	-79.6626	GUILFORD	C, NSW	16-11-14-1	M + 2SM	M	M	M	M	M
B0670000	S Buffalo Crk at SR 3000 McConnell Rd nr Greensboro	USGS gage, ups TZ Osborne WWTP	36.0598	-79.7256	GUILFORD	C, NSW	16-11-14-2	M + 2SM	M	M	M	M	M
B1020000	Haw Riv at SR 1700 Low er Hopedale Rd at Hopedale	ups Burlington East WWTP	36.1531	-79.4894	ALAMANCE	C, NSW	16-(1)	M + 2SM	M	M	M	M	M
B1200000	Haw Riv at NC 54 nr Graham	btw Burlington East and Graham	36.0481	-79.3667	ALAMANCE	C, NSW	16-(1)	M + 2SM	M	M	M	M	M
B1350000	Moadams Crk at Corridor Rd nr Mebane	ups Mebane WWTP	36.0885	-79.2844	ALAMANCE	C, NSW	16-18-7	M + 2SM	M	M	M	M	M
B1380000	Moadams Crk at SR 1940 Gibson Rd nr Florence Town	dns Mebane WWTP	36.0891	-79.3074	ALAMANCE	C, NSW	16-18-7	M + 2SM	M	M	M	M	M
B1440000	Haw Riv at SR 2158 Sw eptonville Rd nr Sw eptonville	dns Graham WWTP	36.0256	-79.3682	ALAMANCE	C, NSW	16-(1)	M + 2SM	M	M	M	M	M
B1940000	Big Alamance Crk at NC 87 nr Sw eptonville	ups Burlington S. WWTP	36.0242	-79.3943	ALAMANCE	C, NSW	16-19-(4.5)	M + 2SM	M	M	M	M	M
B2000000	Haw Riv at SR 1005 nr Saxpawah	Rural area, dns Cane Creek	35.8953	-79.2585	ALAMANCE	C, NSW	16-(1)	M	M	M	M	M	M
B2100000	Haw Riv at SR 1713 nr Bynum	USGS Gage, ups Jordan L., DWR ambient stn	35.7716	-79.1449	CHATHAM	WS-IV, NSW	16-(28.5)	M	M	M	M	M	M
B2300000 ⁵	Robeson Crk at HWY 15 in Pittsboro	ups Pittsboro/CPWRC WWTP	35.7155	-79.1791	CHATHAM	WS-IV, NSW	16-38-(3)	M + 2SM	M	M	M	M	M
B3020000	New Hope Crk at NC 54 nr Durham	ups S. Durham WRF, below waterfowl imp.	35.9167	-78.9704	DURHAM	WS-IV, NSW	16-41-1-(11.5)	M + 2SM	M	M	M	M	M
B3025000	Third Fork Crk at NC 54 nr Durham	Urban runoff	35.9187	-78.9548	DURHAM	WS-IV, NSW	16-41-1-12-(2)	M	M	M	M	M	M
B3039000	New Hope Crk above SR 1107 at concrete impoundment	DWR ambient stn, USGS gage, Jordan Lake TMDL	35.8858	-78.9653	DURHAM	WS-IV, NSW	16-41-1-(11.5)	M + 2SM	M	M	M	M	M
B3300000	Northeast Crk at SR 1102 (Sedwick Rd) nr RTP	ups Durham Co. RTP WWTP	35.8870	-78.8994	DURHAM	WS-IV, NSW	16-41-1-17-(0.7)	M + 2SM	M	M	M	M	M
B3670000	Northeast Crk at SR 1731 O Kelly Church Road nr Durham	dns Durham Co. RTP WWTP, Jordan Lake TMDL	35.8555	-78.9397	CHATHAM	WS-IV, NSW	16-41-1-17-(0.7)	M + 2SM	M	M	M	M	M

DWR Station Number	Location	Station Information	Latitude (dd.ddd)	Longitude (dd.ddd)	County	Stream Class	Stream Index	Field Parameters	Fecal Coliform	Turbidity	TSS	² Nutrients	³ Metals
B3999180	Morgan Crk at Mason Farm WWTP entrance at Chapel Hill	ups OWASA	35.8987	-79.0263	ORANGE	WS-IV, NSW	16-41-2-(5.5)	M+2SM	M	M	M	M	
B3900000	Morgan Crk at SR 1726 Old Farrington Rd nr Farrington	dns OWASA, DWR ambient stn	35.8612	-79.0100	CHATHAM	WS-IV, NSW, CA	16-41-2-(5.5)	M+2SM	M	M	M	M	
B4080000	Haw Riv at SR 1011 Old US 1 nr Haywood	dns Honeywell, ups Neste Resins	35.6164	-79.0569	CHATHAM	WS-IV	16-42	M+2SM	M	M	M	M	
B4350000	Deep Riv at SR 1113 Kivett Dr nr Hayworth Spring	ups Richland Crk	35.9594	-79.9061	GUILFORD	WS-IV, CA*	17-(4)	M+2SM	M	M	M	M	
B4380000	Richland Crk at SR 1154 Kersey Valley Rd nr High point	ups High Point Eastside WWTP, fecal coliform TMDL	35.9410	-79.9322	GUILFORD	WS-IV, CA*	17-7-(4)	M+2SM	M	M	M	M	
B4621000	Muddy Crk at SR 1917 Suits Rd nr Glenola	fecal coliform TMDL	35.8836	-79.8950	RANDOLPH	WS-IV, *	17-9-(1)	M	M	M	M	M	
B4770500	Deep Riv at 220 Bus Main St at Randleman	ups Randleman WWTP ups Hasketts Crk	35.8233	-79.8033	RANDOLPH	C	17-(10.5)	M+2SM	M	M	M	M	
B4800000	Deep Riv at SR 2122/2128 Worthville Rd at Worthville	dns Randleman WWTP dns Worthville dam	35.8021	-79.7771	RANDOLPH	C	17-(10.5)	M+2SM	M	M	M	M	
B4870000	Haskett Crk at Asheboro WWTP Bridge nr Asheboro	ups Asheboro WWTP	35.7649	-79.7864	RANDOLPH	C	17-12	M	M	M	M	M	
B4920000	Deep Riv at SR 2261 Old Liberty Rd nr Central Falls	dns Asheboro WWTP, below Hasketts Crk	35.7642	-79.7734	RANDOLPH	C	17-(10.5)	M+2SM	M	M	M	M	
B5070000	Deep Riv at SR 2615 Brooklyn Ave at Ramseur	ups Ramseur WWTP	35.7302	-79.6558	RANDOLPH	C	17-(10.5)	M+2SM	M	M	M	M	
B5100000	Deep Riv at SR 2628 Hinshaw Town Rd nr Parks Crossroads	dns Ramseur WWTP	35.6724	-79.6274	RANDOLPH	C	17-(10.5)	M+2SM	M	M	M	M	
B5390800	Cotton Crk at SR 1372 Auman Rd nr Star	dns Star WWTP	35.3782	-79.7551	MONTGOMERY	WS-III	17-26-5-3	M+2SM	M	M	M	M	
B5685000	Deep Riv at Deep River Park Bridge nr Cummock	ups Golden Poultry	35.5704	-79.2411	CHATHAM	C	17-(38.7)	M+2SM	M	M	M	M	
B5820000	Sanford	dns Sanford WWTP	35.5704	-79.1942	LEE	C	17-(38.7)	M+2SM	M	M	M	M	
B5950000	Rocky Riv at US 64 nr Siler City	dns reservoir, ups Siler City WWTP	35.7351	-79.4233	CHATHAM	C	17-(43)-8	M+2SM	M	M	M	M	
B5980000	Rocky Riv at SR 2170 Rives Chapel Rd nr Siler City	dns Siler City WWTP	35.6985	-79.3756	CHATHAM	C	17-(43)-8	M+2SM	M	M	M	M	
B6040300	Deep Riv at SR 1011 Old US 1 nr Moncure	ups of confluence with Haw River, DWR ambient stn	35.6176	-79.0912	CHATHAM	WS-IV	17-(43.5)	M	M	M	M	M	
B5890000	Loves Creek at Waste Treatment Plant Rd at Siler City	ups Siler City WWTP	35.7298	-79.4289	CHATHAM	C	17-(43)-10	M+2SM	M	M	M	M	
B5920000	Loves Creek at Progress Blvd at Siler City	ds Siler City WWTP	35.7322	-79.4246	CHATHAM	C	17-(43)-10	M+2SM	M	M	M	M	

¹Field Parameters include Temperature, Dissolved Oxygen, pH, Conductivity

²Nutrients include Ammonia as N, Nitrate/Nitrite as N, Total Kjeldahl Nitrogen as N, and Total Phosphorus as P

³No requirements for metals monitoring are included in this MOA, as the DWR is currently in the process of reviewing metals water quality assessment techniques, evaluation criteria and relevant standards. However, the DWR may conclude the review within the life cycle of this MOA.

⁴Station will be monitored until the City of Greensboro North Buffalo Creek WWTP is decommissioned.

⁵New station added 8/2021 when Chatham Park joined UCFRBA.

M=Monthly M+2SM=Monthly with Twice Monthly Summer Sampling May, June, July, August, and September. Samples are to be collected at least 10-days apart except when extenuating circumstances arise.

Q=Quarterly March, June, September, and December ups=upstream dns=downstream

Laboratory Methods

The following are the EPA approved (40 CFR Part 136) wastewater laboratory methods used by Meritech for UCFRBA analysis:

pH-----	SM 4500 HB
Temperature-----	SM 2550 B
Conductivity-----	EPA 120.1
DO -----	SM 4500 O G
Fecal Coliform-----	SM 9222 D
TSS -----	SM 2540 D
Turbidity -----	EPA 180.1
Ammonia -----	EPA 350.1
TKN-----	EPA 351.2
NO2/NO3-----	EPA 353.2
Ptot -----	EPA 200.7
Metals (except Hg)-----	EPA 200.7 (discontinued 08/2007)
Mercury-----	EPA 1631 (discontinued 08/2007)

A complete list of sampling procedures has been included in APPENDIX D.

Quality Assurance/Quality Control Issues

Meritech Labs provides all data collection and lab analysis services for the UCFRBA. All known QA/QC issues were denoted in the remarks section of the monthly spreadsheets that are submitted to NCDWR on a quarterly basis. The UCFRBA's QA/QC subcommittee also met quarterly to review and approve monthly samples. Additional QA/QC issues, such as transcription or calculation errors, identified by the QA/QC subcommittee were summarized in their quarterly reports (see Appendix E) and corrected before datasheets were submitted to NCDWR. Samples in 2022 were collected and analyzed as required by the MOA without disruption. We would like to commend Meritech and the QA/QC subcommittee for their outstanding efforts.

2022 UCFRBA Organizational Developments

The following are topics that occupied significant UCFRBA staff and members' time in 2022.

Durham County Re-Joins UCFRBA

In October 2022, Durham County's Triangle Wastewater Plant asked to rejoin the UCFRBA per recommendation of their new wastewater permit. All UCFRBA BOD members voted in favor of Durham County rejoining the coalition. No new station additions were requested by NCDEQ-DWR as part of joining the UCFRBA.

Siler City Remains in UCFRBA despite Removal of Monitoring Waiver

In 2022, DWR staff issued a new permit to Siler City that removed their monitoring waiver associated with UCFRBA membership due to noncompliance causing nutrient and other impacts to receiving waters. Siler City chose to remain in the UCFRBA as well as implementing more frequent monitoring as required by their new permit.

2020-2025 MOA and Meritech Contract Amendments

The MOA between the NCDWR, UCFRBA, and UCFRBA members for 2020-2025 was amended in November 2022 to include Durham County in the UCFRBA.

UCFRBA Data Use, Jordan Lake Rules, Emerging Contaminants, Cape Fear River Basin Plan

This year, UCFRBA staff invited guest speakers on a range of topics relevant to members. In February, Durham Stormwater Department staff presented on how UCFRBA data is used for TMDL compliance. In April, NPS Planning Branch supervisor gave an update on the Jordan Lake Rules stakeholder process and timeline. In July, Cape Fear River Assembly staff presented on their partnership with NCDWR Basin Planning staff on stakeholder engagement with the Cape Fear Basin Plan. In October, Cape Fear Basin Planning staff gave an overview of the draft plan takeaways. Also at this meeting, UCFRBA staff discussed forthcoming standards for emerging contaminants and their monitoring/lab capacity.

UCFRBA Monitoring

Throughout the monitoring year, if there were any abnormalities identified while in the field during the sampling or in the analysis of the samples, Meritech representatives informed the UCFRBA Co-Administrators. The following was identified as issues or abnormalities during the 2022 sampling year:

- July 13, 2022: At station #B4380000-Richland Creek@ Kersey Valley Rd, a discoloration was reported by Meritech Lab Field staff. Field observations noted dark blue/green, no DO; a dead fish floating. This was reported to NCDEQ, Mark Vander Borgh. Usually this site is clear, and a fish-filled stream this time of year.
 - Response to 7/13/2022 field abnormality from City of High Point Assistant Public Works Director: City was notified around 3:30pm today by NCDEQ about the discolored water and a representative from the NCDEQ Winston-Salem Regional office has been to the site. The City has tracked the blue dye back to a sewer aerial that was leaking and have notified NCDEQ. The City stopped the leak and are in the process of performing a temporary repair to the pipe. This sewer aerial is 1 of 16 aerials that are under contract to be replaced as part of the Richland Creek Aerial Sewer Line replacement project. The City will continue to monitor the downstream portion of Richland Creek.
- July 2022 sampling: (7/14/22 & 7/26/22) B5920000-46 had high nitrogen levels for July sampling
- August 1, 2022: B3300000 sample had odd ammonia and TKN discrepancy. Meritech reanalyzed both parameters several times with similar results. TKN should always be greater than ammonia, but that is not the case this time. There has to be some sort of interference with one of the tests but Meritech is unsure which one or what it could be. There is nothing obviously different about the sample and they are analyzed from the same sample bottle.
 - Ammonia: 4.87mg/L

- TKN: 0.71mg/L
- September 23, 2022: Meritech visited B2300000 morning of 9/23 and recorded DO 0.48mg/L (meter), DO 0.4mg/L (Winkler). There is low flow and the water has a gray tint. No other oddities were seen at the sight.
 - Response to 9/23/2022 notification if an issue: On September 28, 2022 the site was visited by Joe Myers, NCDEQ Environmental Specialist I: summary, B2420000 was looking really good when it was yesterday (9/27/22). Sampling results for parameters tested during visit are listed below, no observable oddities or discoloration to the water. It did have a higher conductivity. One other site (B6000000) had a similar conductivity reading as well.
 - Temp (C) – 17.49
 - pH – 7.4
 - DO mg/L – 8.29
 - DO % Sat – 87.22
 - Conductivity – 705.56 uS

APPENDIX A: UCFRBA Station Summaries

01/01/2022-12/31/2022 Summary Report

Station Id: Troublesome Crk at US 29 Bus nr Reidsville

B0070010/UCFRBA_01

Stream Class

C NSW

Sub Basin CPF01

County

Rockingham

Latitude 36.2768

Longitude -79.6499

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	5.1	28.00	16.58	16.10	6.85
pH(su)	12	0	6~9	0	6.62	7.13	6.95	6.97	0.15
Diss. Oxy.(mg/L)	12	0	4	2	2.04	11.53	7.38	7.98	2.78
Conductivity(umhos/cm)	12	0	NA	0	64	118.00	79.25	75.00	17.31
Fecal Coliform(col/100ml)	12	0	400	0	16	340.00	41.05	31.00	90.49
Lab Turbidity(NTU)	12	0	50	0	3.30	17.30	8.39	6.60	5.18
TSS(mg/L)	12	2	NA	0	2.80	8.00	4.89	4.50	1.96
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	7	NA	0	0.02	0.32	0.09	0.02	0.12
TKN-N(mg/L)	12	0	NA	0	0.21	1.05	0.50	0.46	0.27
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.30	0.11	0.10	0.08
T. Phos.(mg/L)	12	4	NA	0	0.02	0.03	0.02	0.02	0.00
Cadmium(ug/L)	0								
Chromium(ug/L)	0								
Copper(ug/L)	0								
Nickel(ug/L)	0								
Lead(ug/L)	0								
Zinc(ug/L)	0								
Aluminum(ug/L)	0								
Iron(ug/L)	0								
Manganese(ug/L)	0								
Mercury(ug/L)	0								
Arsenic(ug/L)	0								
Hardness(mg/L)	0								

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at US 29 Bus nr Benaja

B0050000/UCFRBA_02

Stream Class

C NSW

Sub Basin CPF01

County

Rockingham

Latitude 36.2652

Longitude -79.6523

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.80	27.90	18.03	18.70	8.12
pH(su)	17	0	6~9	0	6.72	7.09	6.87	6.84	0.12
Diss. Oxy.(mg/L)	17	0	4	1	3.66	11.74	7.12	6.82	2.19
Conductivity(umhos/cm)	17	0	NA	0	76.00	144.00	106.65	104.00	17.10
Fecal Coliform(col/100ml)	12	0	400	0	42.00	350.00	113.75	105.00	84.26
Lab Turbidity(NTU)	12	0	50	0	4.70	25.40	12.37	11.70	5.62
TSS(mg/L)	12	1	NA	0	2.50	12.00	6.29	5.50	3.19
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.10	0.03	0.02	0.02
TKN-N(mg/L)	12	2	NA	0	0.20	0.91	0.43	0.42	0.22
NO2-NO3(mg/L)	12	2	NA	0	0.02	0.35	0.13	0.09	0.30
T. Phos.(mg/L)	12	1	NA	0	0.02	0.12	0.04	0.03	0.03
Cadmium(ug/L)	0								
Chromium(ug/L)	0								
Copper(ug/L)	0								
Nickel(ug/L)	0								
Lead(ug/L)	0								
Zinc(ug/L)	0								
Aluminum(ug/L)	0								
Iron(ug/L)	0								
Manganese(ug/L)	0								
Mercury(ug/L)	0								
Arsenic(ug/L)	0								
Hardness(mg/L)	0								

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at SR 2620 High Rock Rd nr Williamsburg

B0170000/UCFRBA_03

Stream Class

C NSW

Sub Basin CPF01

County

Rockingham

Latitude 36.2514

Longitude -79.5647

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.40	27.70	17.66	18.90	7.38
pH(su)	17	0	6~9	0	6.81	7.65	7.22	7.21	0.24
Diss. Oxy.(mg/L)	17	0	4	0	6.79	11.53	8.51	8.19	1.41
Conductivity(umhos/cm)	17	0	NA	0	79.00	260.00	152.94	136.00	58.59
Fecal Coliform(col/100ml)	12	0	400	0	28.00	410.00	108.13	95.00	144.45
Lab Turbidity(NTU)	1	0	50		6.20	32.80	12.63	8.25	9.21
TSS(mg/L)	12	7	NA	0	2.50	17.00	6.04	4.50	4.67
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.24	0.06	0.02	0.07
TKN-N(mg/L)	12	5	NA	0	0.30	0.91	0.57	0.48	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.11	1.99	0.60	0.32	0.58
T. Phos.(mg/L)	12	9	NA	0	0.03	0.24	0.09	0.06	0.07
Cadmium(ug/L)	0								
Chromium(ug/L)	0								
Copper(ug/L)	0								
Nickel(ug/L)	0								
Lead(ug/L)	0								
Zinc(ug/L)	0								
Aluminum(ug/L)	0								
Iron(ug/L)	0								
Manganese(ug/L)	0								
Mercury(ug/L)	0								
Arsenic(ug/L)	0								
Hardness(mg/L)	0								

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Reedy Fork at SR 2719 High Rock Rd nr Monticello

B0400000/UCFRBA_04

Stream Class C NSW

Sub Basin CPF02

County Guilford

Latitude 36.1778 **Longitude** -79.6177

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	4.80	26.10	15.01	12.65	7.25
pH(su)	12	0	6~9	0	6.96	7.23	7.15	7.18	0.08
Diss. Oxy.(mg/L)	12	0	4	0	6.21	12.21	8.87	9.09	2.10
Conductivity(umhos/cm)	12	0	NA	0	93.00	121.00	106.58	105.50	9.21
Fecal Coliform(col/100ml)	12	0	400	0	18.00	300.00	61.29	55.00	4.54
Lab Turbidity(NTU)	12	0	50	0	1.90	18.90	7.38	5.40	5.20
TSS(mg/L)	12	7	NA	0	2.50	18.00	5.01	2.90	4.54
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.02	0.02	0.02	0.02
TKN-N(mg/L)	12	5	NA	0	0.20	0.20	0.20	0.20	0.20
NO2-NO3(mg/L)	12	0	NA	0	0.02	0.02	0.02	0.02	0.02
T. Phos.(mg/L)	12	9	NA	0	0.02	0.02	0.02	0.02	0.02
Cadmium(ug/L)	0								
Chromium(ug/L)	0								
Copper(ug/L)	0								
Nickel(ug/L)	0								
Lead(ug/L)	0								
Zinc(ug/L)	0								
Aluminum(ug/L)	0								
Iron(ug/L)	0								
Manganese(ug/L)	0								
Mercury(ug/L)	0								
Arsenic(ug/L)	0								
Hardness(mg/L)	0								

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: N Buffalo Crk at N Buffalo Crk WWTP Influent Conduit Pier at Greensboro

B0480050/UCFRBA_05

Stream Class

C NSW

Sub Basin CPF02

County

Guilford

Latitude 36.1074

Longitude -79.7502

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.80	27.50	17.86	19.40	7.65
pH(su)	17	0	6~9	0	6.81	7.63	7.27	7.24	0.16
Diss. Oxy.(mg/L)	17	0	4	0	5.51	11.65	8.54	7.97	2.02
Conductivity(umhos/cm)	17	0	NA	0	129.00	531.00	236.71	234.00	94.33
Fecal Coliform(col/100ml)	12	0	400	0	28.00	400.00	142.91	152.50	128.10
Lab Turbidity(NTU)	12	0	50	0	1.90	15.30	5.53	4.35	3.64
TSS(mg/L)	12	8	NA	0	2.50	8.00	3.37	2.90	1.55
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	7	NA	0	0.02	0.12	0.05	0.02	0.03
TKN-N(mg/L)	12	1	NA	0	0.20	0.84	0.45	0.43	0.18
NO2-NO3(mg/L)	12	0	NA	0	0.15	0.74	0.40	0.42	0.19
T. Phos.(mg/L)	12	1	NA	0	0.02	0.09	0.07	0.07	0.02
Cadmium(ug/L)	0								
Chromium(ug/L)	0								
Copper(ug/L)	0								
Nickel(ug/L)	0								
Lead(ug/L)	0								
Zinc(ug/L)	0								
Aluminum(ug/L)	0								
Iron(ug/L)	0								
Manganese(ug/L)	0								
Mercury(ug/L)	0								
Arsenic(ug/L)	0								
Hardness(mg/L)	0								

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: N Buffalo Crk at SR 2770 Huffine Mill Rd nr McLeansville

B0540050/UCFRBA_06

Stream Class C NSW

Sub Basin CPF02

County Guilford

Latitude 36.1299 **Longitude** -79.6626

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.30	27.60	17.74	18.70	7.58
pH(su)	17	0	6~9	0	7.13	7.81	7.37	7.39	7.13
Diss. Oxy.(mg/L)	17	0	4	0	6.33	11.86	8.92	8.31	1.89
Conductivity(umhos/cm)	17	0	NA	0	109.00	634.00	216.47	209.00	116.62
Fecal Coliform(col/100ml)	12	0	400	0	20.00	370.00	170.58	166.50	110.43
Lab Turbidity(NTU)	12	0	50	0	2.40	28.00	10.53	8.60	7.50
TSS(mg/L)	12	4	NA	0	2.50	13.00	4.64	3.50	3.18
Chlorophyll-a(ug/L)	0	0			0.00				
NH3-N(mg/L)	12	8	NA	0	0.02	0.09	0.04	0.02	0.03
TKN-N(mg/L)	12	4	NA	0	0.20	0.75	0.36	0.34	0.18
NO2-NO3(mg/L)	12	0	NA	0	0.10	0.64	0.36	0.37	0.17
T. Phos.(mg/L)	12	0	NA	0	0.02	0.09	0.06	0.06	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

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*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: S Buffalo Crk at SR 3000 McConnell Rd nr Greensboro

B0670000/UCFRBA_07

Stream Class C NSW

Sub Basin CPF02

County Guilford

Latitude 36.0598

Longitude -79.7256

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.2	28	17.93	18.9	7.67
pH(su)	17	0	6~9	0	7	7.71	7.27	7.29	0.18
Diss. Oxy.(mg/L)	17	0	4	0	5.67	11.53	8.54	8.03	2.01
Conductivity(umhos/cm)	17	0	NA	0	121.00	897.00	244.00	205.00	178.25
Fecal Coliform(col/100ml)	12	0	400	0	43.00	1200.00	261.92	152.50	320.93
Lab Turbidity(NTU)	12	0	50	0	1.70	23.50	9.07	7.70	6.48
TSS(mg/L)	12	6	NA	0	2.60	9.00	4.08	2.95	2.01
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	8	NA	0	0.02	0.44	0.07	0.02	0.12
TKN-N(mg/L)	12	2	NA	0	0.20	1.07	0.49	0.45	0.29
NO2-NO3(mg/L)	12	0	NA	0	0.06	0.53	0.30	0.31	0.17
T. Phos.(mg/L)	12	1	NA	0	0.02	0.09	0.05	0.05	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

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*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw River at SR 1700 (Lower Hopedale Road) nr Hopedale

B1020000/UCFRBA_09A

Stream Class C NSW

Sub Basin CPF02

County Alamance

Latitude 36.1531 **Longitude** -79.4894

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3.9		18.16	20.30	7.79
pH(su)	17	0	6~9	0	7.04	8.5	7.57	7.51	0.33
Diss. Oxy.(mg/L)	17	0	4	0	6.44	12.18	8.84	8.86	1.91
Conductivity(umhos/cm)	17	0	NA	0	93	623	300	270	146.45
Fecal Coliform(col/100ml)	12	0	400	0	16	460	159	86	171.67
Lab Turbidity(NTU)	12	0	50	1	2.8	69	15	9	18.31
TSS(mg/L)	12	2	NA	0	3	34	8	6	8.78
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	7	NA	0	0.02	0	0	0	0.03
TKN-N(mg/L)	12	0	NA	0	0.50	1	1	1	0.22
NO2-NO3(mg/L)	12	0	NA	0	0.24	1	0	0	0.17
T. Phos.(mg/L)	12	0	NA	0	0.037	1	0	0	0.40
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Moadams Crk at Corrigdor Rd ups of Discharge nr Mebane

B1350000/UCFRBA_10

Stream Class C NSW

Sub Basin CPF02

County Alamance

Latitude 36.0885 **Longitude** -79.2844

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	6.3	24.4	16.10	19.10	6.48
pH(su)	17	0	6~9	0	6.78	7.51	7.07	7.07	0.18
Diss. Oxy.(mg/L)	17	0	4	0	5.39	11.46	8.44	8.33	2.04
Conductivity(umhos/cm)	17	0	NA	0	47	191	160.24	167.00	32.07
Fecal Coliform(col/100ml)	12	0	400	0	67	1600	549.42	290.00	519.97
Lab Turbidity(NTU)	12	0	50	0	5	17.7	9.31	8.10	4.30
TSS(mg/L)	12	5	NA	0	3	7	3.98	3.50	1.53
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.11	0.03	0.02	0.03
TKN-N(mg/L)	12	5	NA	0	0.20	0.72	0.32	0.26	0.16
NO2-NO3(mg/L)	12	0	NA	0	0.23	0.91	0.61	0.69	0.22
T. Phos.(mg/L)	12	10	NA	0	0.02	0.027	0.02	0.02	0.00
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Moadams Crk at SR 1940 Gibson Rd nr Florence Town

B1380000/UCFRBA_11

Stream Class C NSW

Sub Basin CPF02

County Alamance

Latitude 36.0891

Longitude -79.3074

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32		6.8	27.6	17.75	20.20	6.83
pH(su)	17	0	6~9	0	7.04	7.78	7.44	7.43	0.20
Diss. Oxy.(mg/L)	17	0	4	0	6.71	11.78	8.74	8.13	1.90
Conductivity(umhos/cm)	17	0	NA	0	244	726	465.35	467.00	121.06
Fecal Coliform(col/100ml)	12	0	400	0	34	300	102.83	76.00	75.99
Lab Turbidity(NTU)	12	0	50	0	1.9	30.9	8.68	6.75	7.90
TSS(mg/L)	12	5	NA	0	3	12	4.73	3.00	3.14
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	3	NA	0	0.02	2.78	0.43	0.05	0.85
TKN-N(mg/L)	12	0	NA	0	0.70	3.12	1.25	0.92	0.88
NO2-NO3(mg/L)	12	0	NA	0	0.64	2.57	1.44	1.43	0.53
T. Phos.(mg/L)	12	0	NA	0	0.122	3.09	0.72	0.24	0.92
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at SR 2158 Swepsonville Rd nr Swepsonville

B1440000/UCFRBA_12

Stream Class C NSW

Sub Basin CPF02

County Alamance

Latitude 36.0256

Longitude -79.3682

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.5	29.5	18.98	20.70	8.28
pH(su)	17	0	6-9	0	7.09	8.64	7.62	7.47	0.45
Diss. Oxy.(mg/L)	17	0	4	0	6.56	12.01	8.98	9.03	1.73
Conductivity(umhos/cm)	17	0	NA	0	95	646	295.00	236.00	163.59
Fecal Coliform(col/100ml)	12	0	400	0	18	1200	198.25	71.50	352.98
Lab Turbidity(NTU)	12	0	50	2	2.3	77.6	19.43	10.20	26.60
TSS(mg/L)	12	4	NA	0	3	39	9.73	5.50	12.46
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	8	NA	0	0.02	0.06	0.03	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.43	2.05	0.83	0.75	0.42
NO2-NO3(mg/L)	12	0	NA	0	0.26	0.84	0.57	0.58	0.17
T. Phos.(mg/L)	12	0	NA	0	0.05	0.696	0.18	0.13	0.18
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at NC 54 nr Graham

B1200000/UCFRBA_13

Stream Class

C NSW

Sub Basin CPF02

County Alamance

Latitude 36.0481

Longitude -79.3667

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.4	28.7	18.65	20.60	8.07
pH(su)	17	0	6~9	0	7.06	8.51	7.52	7.42	0.37
Diss. Oxy.(mg/L)	17	0	4	0	6.29	12.11	8.68	8.27	1.91
Conductivity(umhos/cm)	17	0	NA	0	92	641	289.00	244.00	156.26
Fecal Coliform(col/100ml)	12	0	400	0	9	600	143.75	62.00	207.67
Lab Turbidity(NTU)	12	0	50	2	2.2	78.5	18.43	9.75	24.49
TSS(mg/L)	12	0	NA	0	3	44	9.74	5.00	12.56
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.06	0.03	0.02	0.02
TKN-N(mg/L)	12	0	NA	0	0.48	1.91	0.82	0.73	0.38
NO2-NO3(mg/L)	12	0	NA	0	0.26	0.89	0.59	0.59	0.20
T. Phos.(mg/L)	12	0	NA	0	0.033	1.08	0.21	0.12	0.29
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Big Alamance Crk at NC 87 nr Swepsonville

B1940000/UCFRBA_14

Stream Class

C NSW

Sub Basin CPF02

County

Alamance

Latitude

36.0242

Longitude

-79.3943

HUC

3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.4	27.6	17.38	20.20	7.73
pH(su)	17	0	6~9	0	6.78	7.27	7.14	7.18	0.13
Diss. Oxy.(mg/L)	17	0	4	0	5.31	11.27	7.94	7.58	2.02
Conductivity(umhos/cm)	17	0	NA	0	109	189	134.41	134.00	19.29
Fecal Coliform(col/100ml)	12	0	400	0	65	800	229.83	128.50	219.35
Lab Turbidity(NTU)	12	0	50	0	3.5	32.1	10.79	6.95	9.17
TSS(mg/L)	12	2	NA	0	3	20	6.28	4.00	5.26
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.14	0.04	0.02	0.04
TKN-N(mg/L)	12	0	NA	0	0.20	0.69	0.46	0.50	0.16
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.36	0.16	0.17	0.10
T. Phos.(mg/L)	12	3	NA	0	0.02	0.061	0.03	0.03	0.01
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at SR 1005 nr Saxpahaw

B2000000/UCFRBA_16

Stream Class

C NSW

Sub Basin CPF04

County Alamance

Latitude 35.8953

Longitude -79.2585

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	2.9	32	16.75	15.90	9.11
pH(su)	12	0	6~9	0	7.11	8.16	7.35	7.26	0.29
Diss. Oxy.(mg/L)	12	0	4	0	5.73	11.88	8.74	8.33	2.12
Conductivity(umhos/cm)	12	0	NA	0	104	366	214.08	195.50	91.27
Fecal Coliform(col/100ml)	12	0	400	0	22	4800	593.08	59.00	1365.46
Lab Turbidity(NTU)	12	0	50	2	3.2	172	31.67	10.80	49.72
TSS(mg/L)	12	1	NA	0	3	207	29.73	8.50	58.08
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	8	NA	0	0.02	0.98	0.12	0.02	0.27
TKN-N(mg/L)	12	0	NA	0	0.43	1.56	0.80	0.73	0.36
NO2-NO3(mg/L)	12	0	NA	0	0.21	0.99	0.48	0.47	0.25
T. Phos.(mg/L)	12	0	NA	0	0.06	0.496	0.17	0.13	0.12
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at SR 1713 nr Bynum

B2100000/UCFRBA_17

Stream Class

WS-IV NSW

Sub Basin CPF04

County

Chatham

Latitude 35.7716

Longitude -79.1449

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.1	32.7	19.95	20.80	8.72
pH(su)	17	0	6~9	0	7.1	8.55	7.75	7.88	0.44
Diss. Oxy.(mg/L)	17	0	4	0	6.11	12.41	8.94	8.58	1.81
Conductivity(umhos/cm)	17	0	NA	0	90	445	220.76	187.00	111.44
Fecal Coliform(col/100ml)	12	0	400	0	10	5800	1071.75	48.50	2219.36
Lab Turbidity(NTU)	12	0	50	2	2.4	235	40.56	9.15	73.69
TSS(mg/L)	12	3	NA	0	3	398	47.43	6.50	113.96
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	8	NA	0	0.02	1.81	0.19	0.02	0.51
TKN-N(mg/L)	12	0	NA	0	0.40	2.31	0.87	0.58	0.63
NO2-NO3(mg/L)	12	0	NA	0	0.07	0.78	0.38	0.37	0.22
T. Phos.(mg/L)	12		NA	0	0.05	0.766	0.20	0.11	0.21
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary
Report

Station Id:	Robeson Crk at Pittsboro
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B2300000/UCFRBA_18	Stream Class	WS-IV, NSW	Sub Basin	CPF04			
County	Chatham	Latitude	35.7155	Longitude	79.1791	HUC	3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.5	27.6	17.92	17.60	7.01
pH(su)	17	0	6~9	0	6.49	7.01	6.81	6.85	0.15
Diss. Oxy.(mg/L)	17	0	4	6	0.48	12.08	6.43	6.21	3.49
Conductivity(umhos/cm)	17	0	NA	0	48	203	125.41	116.00	50.45
Fecal									
Coliform(col/100ml)	12	0	400	0	32	5000	778.00	100.00	1467.59
Lab Turbidity(NTU)	12	0	50	1	2.7	86.9	18.03	7.95	23.80
TSS(mg/L)	12	3	NA	0	3	29	7.07	4.50	7.35
Chlorophyll-a(ug/L)	12	2			1.00	22.20	4.82	2.43	7.12
NH3-N(mg/L)	12	4	NA	0	0.02	0.22	0.05	0.02	0.06
TKN-N(mg/L)	12	1	NA	0	0.20	0.81	0.54	0.55	0.19
NO2-NO3(mg/L)	12	0	NA	0	0.05	0.81	0.37	0.34	0.23
T. Phos.(mg/L)	12	2	NA	0	0.02	0.092	0.05	0.06	0.03
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: New Hope Creek at NC 54 nr Durham

B3020000/UCFRBA_19

Stream Class

WS-IV NSW

Sub Basin CPF05

County

Durham

Latitude

35.9167

Longitude

-78.9704

HUC

3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3.2	26.6	17.54	21.70	8.05
pH(su)	17	0	6~9	0	6.46	7.07	6.77	6.78	0.15
Diss. Oxy.(mg/L)	17	0	4	7	2.16	11.72	5.58	4.36	3.13
Conductivity(umhos/cm)	17	0	NA	0	81	259	148.53	142.00	40.85
Fecal Coliform(col/100ml)	12	0	400	0	22	6000	672.33	152.50	1686.96
Lab Turbidity(NTU)	12	0	50	1	8.4	50.5	19.61	14.40	12.51
TSS(mg/L)	12	0	NA	0	3	28	10.00	9.50	7.47
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	5	NA	0	0.02	0.07	0.04	0.03	0.02
TKN-N(mg/L)	12	1	NA	0	0.20	0.85	0.49	0.47	0.20
NO2-NO3(mg/L)	12		NA	0	0.02	0.31	0.13	0.11	0.08
T. Phos.(mg/L)	12	1	NA	0	0.02	0.286	0.08	0.06	0.07
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: New Hope Crk at SR 1107 Stagecoach Rd nr Blands

B3040000/UCFRBA_20

Stream Class WS-IV NSW

Sub Basin CPF05

County Durham

Latitude 35.8847 **Longitude** -78.9656

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.9	26.9	19.02	22.30	7.32
pH(su)	17	0	6-9	0	6.31	7.24	6.95	6.94	0.22
Diss. Oxy.(mg/L)	17	0	4	0	4.63	10.71	6.84	6.12	1.74
Conductivity(umhos/cm)	17	0	NA	0	132	511	334.71	320.00	118.82
Fecal Coliform(col/100ml)	12	0	400	0	6	4600	635.17	138.00	1293.88
Lab Turbidity(NTU)	12	0	50	1	7.1	83.1	22.87	15.70	20.90
TSS(mg/L)	12	1	NA	0	3	46	15.63	13.00	12.19
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	4	NA	0	0.02	0.80	0.11	0.04	0.22
TKN-N(mg/L)	12	0	NA	0	0.71	2.02	1.02	0.97	0.35
NO2-NO3(mg/L)	12	0	NA	0	0.38	5.90	2.24	1.68	1.60
T. Phos.(mg/L)	12	0	NA	0	0.05	0.71	0.20	0.14	0.18
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id:	Northeast Crk at SR 1102 (Sedwick Rd) nr RTP
B3300000/UCFRBA_21	Stream Class WS-IV NSW
County Chatham	Latitude 35.887 Longitude -78.8994

Sub Basin CPF05
HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3.4	26.4	14.99	14.95	8.24
pH(su)	17	0	6~9	0	6.62	7.09	6.86	6.88	0.17
Diss. Oxy.(mg/L)	17	0	4	2	2.52	12.03	6.72	6.75	2.94
Conductivity(umhos/cm)	17	0	NA	0	97	411	201.83	194.50	92.41
Fecal Coliform(col/100ml)	12	0	400	0	20	15400	1768.75	191.50	4432.96
Lab Turbidity(NTU)	12	0	50	9	20.7	191	82.91	66.50	52.04
TSS(mg/L)	12	0	NA	0	12	90	37.42	32.00	25.76
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	4	NA	0	0.02	4.87	0.47	0.06	1.39
TKN-N(mg/L)	12	0	NA	0	0.33	1.30	0.67	0.67	0.27
NO2-NO3(mg/L)	12	3	NA	0	0.02	0.19	0.08	0.06	0.06
T. Phos.(mg/L)	12	0	NA	0	0.03	0.127	0.07	0.06	0.03
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Northeast Crk at SR 1731 O Kelly Church Road nr Durham

B3670000/UCFRBA_22

Stream Class WS-IV NSW

Sub Basin CPF05

County Chatham

Latitude 35.8555 **Longitude** -78.9397

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.8	27.1	18.79	23.50	7.56
pH(su)	17	0	6~9	0	6.77	7.55	7.25	7.33	0.24
Diss. Oxy.(mg/L)	17	0	4	0	5.59	11.28	7.63	7.02	1.71
Conductivity(umhos/cm)	17	0	NA	0	125	652	445.41	471.00	159.72
Fecal Coliform(col/100ml)	12	0	400	0	76	12000	1390.83	220.50	3425.99
Lab Turbidity(NTU)	12	0	50	2	11.2	114	42.28	25.65	36.36
TSS(mg/L)	12	0	NA	0	6	91	25.50	16.00	26.11
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	5	NA	0	0.02	1.83	0.19	0.04	0.52
TKN-N(mg/L)	12	0	NA	0	0.27	3.11	0.94	0.84	0.72
NO2-NO3(mg/L)	12	0	NA	0	0.21	7.71	2.38	1.28	2.68
T. Phos.(mg/L)	12	0	NA	0	0.05	1.33	0.31	0.16	0.40
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Third Fork Crk at NC 54 nr Durham

B3025000/UCFRBA_23

Stream Class

WS-IV NSW

Sub Basin CPF05

County

Durham

Latitude 35.9187

Longitude -78.9548

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	3.3	26.1	15.10	15.30	8.33
pH(su)	12	0	6~9	0	6.73	7.22	7.01	7.01	0.14
Diss. Oxy.(mg/L)	12	0	4	0	4.34	11.61	7.60	7.98	2.44
Conductivity(umhos/cm)	12	0	NA	0	130	576	242.00	222.00	116.14
Fecal Coliform(col/100ml)	12	0	400	0	86	9300	1379.17	410.00	2601.95
Lab Turbidity(NTU)	12	0	50	1	8.9	53.5	21.81	18.20	13.27
TSS(mg/L)	12	0	NA	0	4	41	12.58	11.00	10.47
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	6	NA	0	0.02	0.08	0.04	0.02	0.02
TKN-N(mg/L)	12	1	NA	0	0.20	0.88	0.54	0.52	0.19
NO2-NO3(mg/L)	12		NA	0	0.02	0.41	0.19	0.19	0.11
T. Phos.(mg/L)	12	0	NA	0	0.04	0.181	0.12	0.12	0.04
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id:	Morgan Crk at Mason Farm WWTP Entrance at Chapel Hill
B3899180/UCFRBA_24	Stream Class WS-IV NSW
County Orange	Latitude 35.8987 Longitude -79.0263

Sub Basin CPF06
HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	2.5	27.2	17.82	20.50	8.33
pH(su)	17	0	6~9	0	7.09	7.58	7.27	7.23	0.14
Diss. Oxy.(mg/L)	17	0	4	0	5.69	12.18	8.36	7.63	1.95
Conductivity(umhos/cm)	17	0	NA	0	104	259	179.41	187.00	43.24
Fecal Coliform(col/100ml)	12	0	400	0	40	5100	889.50	121.50	1575.07
Lab Turbidity(NTU)	12	0	50	0	1.7	13.2	6.78	6.15	3.82
TSS(mg/L)	12	4	NA	0	3	11	4.95	3.50	2.92
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.11	0.03	0.02	0.03
TKN-N(mg/L)	12	0	NA	0	0.20	0.68	0.39	0.39	0.16
NO2-NO3(mg/L)	12		NA	0	0.13	0.69	0.36	0.36	0.17
T. Phos.(mg/L)	12	2	NA	0	0.02	0.077	0.04	0.04	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Morgan Crk at SR 1726 Old Farrington Rd nr Farrington

B3900000/UCFRBA_25

Stream Class WS-IV NSW

Sub Basin CPF06

County Chatham

Latitude 35.8612 **Longitude** -79.01

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	6	26.6	18.81	22.40	7.02
pH(su)	17	0	6~9	0	6.89	7.5	7.23	7.22	0.16
Diss. Oxy.(mg/L)	17	0	4	0	6.12	11.4	7.61	6.98	1.62
Conductivity(umhos/cm)	17	0	NA	0	156	651	429.76	449.00	159.63
Fecal Coliform(col/100ml)	12	0	400	0	48	5600	639.83	142.50	1575.18
Lab Turbidity(NTU)	12	0	50	0	4.3	23.4	10.74	7.75	6.84
TSS(mg/L)	12	0	NA	0	3	24	9.67	6.50	7.56
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	7	NA	0	0.02	0.13	0.04	0.02	0.03
TKN-N(mg/L)	12	4	NA	0	0.20	1.01	0.53	0.57	0.29
NO2-NO3(mg/L)	12	0	NA	0	0.84	9.55	4.40	3.54	2.95
T. Phos.(mg/L)	12	0	NA	0	0.03	0.424	0.10	0.06	0.11
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haw Riv at SR 1011 Old US 1 nr Haywood

B4080000/UCFRBA_26

Stream Class

WS-IV

Sub Basin CPF04

County

Chatham

Latitude 35.6164

Longitude -79.0569

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	6.5	30.9	19.56	21.00	7.20
pH(su)	17	0	6~9	0	6.72	7.22	6.96	6.94	0.16
Diss. Oxy.(mg/L)	17	0	4	1	3.77	11.83	7.45	7.33	2.44
Conductivity(umhos/cm)	17	0	NA	0	90	246	187.88	190.00	38.84
Fecal Coliform(col/100ml)	12	0	400	0	3	310	72.42	26.50	102.87
Lab Turbidity(NTU)	12	0	50	1	5.1	63.1	14.73	8.20	16.46
TSS(mg/L)	12	0	NA	0	4	22	9.75	8.50	5.55
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	3	NA	0	0.02	0.64	0.15	0.10	0.19
TKN-N(mg/L)	12	0	NA	0	0.46	1.30	0.79	0.74	0.24
NO2-NO3(mg/L)	12	0	NA	0	0.03	0.48	0.22	0.17	0.14
T. Phos.(mg/L)	12	0	NA	0	0.03	0.212	0.08	0.05	0.05
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 1011 Old US 1 nr Moncure

B6040300/UCFRBA_27

Stream Class WS-IV

Sub Basin CPF11

County Chatham

Latitude 35.6176

Longitude -79.0912

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	4.5	31.4	17.98	17.30	9.05
pH(su)	12	0	6~9	0	6.96	7.698	7.25	7.20	0.20
Diss. Oxy.(mg/L)	12	0	4	0	6.02	12.22	8.88	8.74	2.01
Conductivity(umhos/cm)	12	0	NA	0	80	220	141.50	124.50	45.17
Fecal Coliform(col/100ml)	12	0	400	0	14	6600	851.00	47.50	1962.15
Lab Turbidity(NTU)	12	0	50	1	3.3	212	34.58	12.15	59.92
TSS(mg/L)	12	1	NA	0	3	290	34.66	5.50	82.14
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	9	NA	0	0.02	0.13	0.04	0.02	0.03
TKN-N(mg/L)	12	0	NA	0	0.40	1.89	0.76	0.71	0.40
NO2-NO3(mg/L)	12	0	NA	0	0.07	0.93	0.55	0.57	0.26
T. Phos.(mg/L)	12	0	NA	0	0.08	0.444	0.18	0.15	0.10
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

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*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Richland Crk at SR 1154 Kersey Valley Rd nr High point

B4380000/UCFRBA_28

Stream Class

WS-IV CA*

Sub Basin CPF08

County

Guilford

Latitude 35.941

Longitude -79.9322

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	6	28.7	18.035294	18.5	7.79
pH(su)	17	0	6~9	0	8.68	8.68	7.3394118	7.22	0.38
Diss. Oxy.(mg/L)	17	0	4	1	0.18	11.44	8.7788235	8.56	2.65
Conductivity(umhos/cm)	17	0	NA	0	104	591	214	191	111.26
Fecal Coliform(col/100ml)	12	0	400	0	19	1800	28.7	375	486.15
Lab Turbidity(NTU)	12	0	50	1	2.1	50.2	11.625	6.6	14.13
TSS(mg/L)	12	6	NA	0	3	27	6	3	7.01
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	4	NA	0	0.02	0.21	0.08	0.07	0.07
TKN-N(mg/L)	12	0	NA	0	0.23	4.01	0.76	0.46	1.04
NO2-NO3(mg/L)	12	0	NA	0	0.18	0.80	0.42	0.39	0.21
T. Phos.(mg/L)	12	5	NA	0	0.02	0.102	0.03	0.102	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 1113 Kivett Dr nr Hayworth Spring

B4350000/UCFRBA_29

Stream Class WS-IV CA

Sub Basin CPF08

County Guilford

Latitude 35.9594 **Longitude** -79.9061

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.5	29.9	19.358824	18.9	7.793672
pH(su)	17	0	6~9	0	6.8	8.08	7.2552941	7.18	0.3676465
Diss. Oxy.(mg/L)	17	0	4	0	4	12.27	7.6817647	7.83	2.2105662
Conductivity(umhos/cm)	17	0	NA	0	95	258	133	127	39.718587
Fecal Coliform(col/100ml)	12	0	400	0	15	600	182	124	199
Lab Turbidity(NTU)	12	0	50	0	4.3	25	10.725	8.9	5.8273844
TSS(mg/L)	12	0	NA	0	5	14	8	8	3
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.06	0.03	0.02	0.01
TKN-N(mg/L)	12	3	NA	0	0.42	0.90	0.59	0.57	0.14
NO2-NO3(mg/L)	12	0	NA	0	0.02	0.19	0.09	0.09	0.06
T. Phos.(mg/L)	12	1	NA	0	0.02	0.07	0.02	0.02	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Muddy Creek at SR 1917 (Suites Road) nr Glenola

B4621000/UCFRBA_31A

Stream Class WS-IV

Sub Basin CPF08

County Randolph

Latitude 35.8836 **Longitude** -79.895

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	6	25.9	14.575	14.6	6.9481358
pH(su)	12	0	6~9	0	6.89	7.37	7.0891667	7.09	0.1194273
Diss. Oxy.(mg/L)	12	0	4		6.41	11.14	8.6766667	8.32	1.9487214
Conductivity(umhos/cm)	12	0	NA	0	88	292	151	138	55
Fecal Coliform(col/100ml)	12	0	400	0	63	2000	696	335	700
Lab Turbidity(NTU)	12	0	50	0	2.9	36.5	12.008333	6.1	11.823125
TSS(mg/L)	12	5	NA	0	3	26	6	3	7
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.09	0.03	0.02	0.02
TKN-N(mg/L)	12	2	NA	0	0.20	0.94	0.51	0.55	0.23
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.55	0.33	0.29	0.16
T. Phos.(mg/L)	12	0	NA	0	0.03	0.07	0.05	0.06	0.01
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Haskett Crk at Asheboro WWTP Bridge nr Asheboro

B4870000/UCFRBA_32

Stream Class C

Sub Basin CPF09

County Randolph

Latitude 35.7647 **Longitude** -79.7862

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	12	0	32	0	3.4	25	15.091667	15.85	6.8893143
pH(su)	12	0	6~9	0	6.89	7.41	7.0525	7.03	0.1642684
Diss. Oxy.(mg/L)	12	0	4	0	4.91	12.01	8.3166667	8.335	2.1099303
Conductivity(umhos/cm)	12	0	NA	0	71	157	113	119	31.807542
Fecal Coliform(col/100ml)	12	0	400	0	24	12000	2332	345	4529.2089
Lab Turbidity(NTU)	12	0	50	1	3.7	144	29.858333	10.9	40.449305
TSS(mg/L)	12	4	NA	0	2.5	98	14.291667	4	26.920065
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	5	NA	0	0.02	0.17	0.05	0.04	0.0429235
TKN-N(mg/L)	12	1	NA	0	0.20	0.97	0.52	0.51	0.2342153
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.31	0.20	0.24	0.1066856
T. Phos.(mg/L)	12	1	NA	0	0.02	0.093	0.0465833	0.043	0.0208347
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at Bus 220 Main St at Randleman

B4770500/UCFRBA_33

Stream Class

C

Sub Basin CPF08

County

Randolph

Latitude 35.8233

Longitude -79.8033

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	6.9	28.9	19.594118	21.1	7.0314002
pH(su)	17	0	6~9	0	7.23	7.64	7.4029412	7.37	0.1132345
Diss. Oxy.(mg/L)	17	0	4	0	6.01	11.71	8.2941176	7.82	1.678787
Conductivity(umhos/cm)	17	0	NA	0	154	183	169	169	8
Fecal Coliform(col/100ml)	12	0	400	0	6	1400	208	64	393
Lab Turbidity(NTU)	12	0	50	0	4.9	14	7.45	6.5	2.6599727
TSS(mg/L)	12		NA	0	4	8	6	6	1
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.36	0.08	0.02	0.10
TKN-N(mg/L)	12	0	NA	0	0.34	0.94	0.55	0.47	0.19
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.36	0.12	0.06	0.12
T. Phos.(mg/L)	12	5	NA	0	0.02	0.047	0.0243333	0.0215	0.0078083
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 2122/2128 Worthville Rd at Worthville

B4800000/UCFRBA_34

Stream Class C

Sub Basin CPF09

County Randolph

Latitude 35.8007 **Longitude** -79.77623

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.4	29.8	19.552941	21.6	7.5179051
pH(su)	17	0	6~9	0	7.31	7.66	7.44	7.41	0.1080509
Diss. Oxy.(mg/L)	17	0	4	0	6.83	11.87	8.6058824	7.82	1.5423645
Conductivity(umhos/cm)	17	0	NA	0	116	177	159	162	14
Fecal Coliform(col/100ml)	12	0	400	0	10	3400	578	111	987
Lab Turbidity(NTU)	12	0	50	1	5.1	59	13.491667	8.35	14.917071
TSS(mg/L)	12	0	NA	0	3	31	9	7	7
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	8	NA	0	0.02	0.31	0.05	0.02	0.08
TKN-N(mg/L)	12	0	NA	0	0.43	0.80	0.61	0.62	0.12
NO2-NO3(mg/L)	12	0	NA	0	0.10	0.39	0.24	0.26	0.09
T. Phos.(mg/L)	12	0	NA	0	0.036	0.127	0.0784167	0.069	0.0342888
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 2261 Old Liberty Rd nr Central Falls

B4920000/UCFRBA_35

Stream Class C

Sub Basin CPF09

County Randolph

Latitude 35.7635 **Longitude** -79.77213

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.3	29.6	19.65	21.50	7.41
pH(su)	17	0	6~9	0	7.06	8.84	7.5523529	7.37	0.4332512
Diss. Oxy.(mg/L)	17	0	4	0	6.09	11.74	8.8935294	9.03	1.414527
Conductivity(umhos/cm)	17	0	NA	0	77	341	197	182	62
Fecal Coliform(col/100ml)	12	0	400	0	25	6000	751	86	1704
Lab Turbidity(NTU)	12	0	50	9	5.3	31.7	12.016667	9.4	7.4147756
TSS(mg/L)	12	0	NA	0	4	22	9	8	5
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	1	NA	0	0.02	0.29	0.05	0.02	0.08
TKN-N(mg/L)	12	0	NA	0	0.50	0.93	0.67	0.65	0.13
NO2-NO3(mg/L)	12	0	NA	0	0.21	1.37	0.67	0.57	0.38
T. Phos.(mg/L)	12	0	NA	0	0.042	0.11	0.07225	0.068	0.0223937
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 2615 Brooklyn Ave at Ramseur

B5070000/UCFRBA_36

Stream Class C

Sub Basin CPF09

County Randolph

Latitude 35.7302 **Longitude** -79.6558

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.6	30.6	19.90	23.50	7.93
pH(su)	17	0	6~9	0	7.06	8.31	7.4611765	7.33	0.3258812
Diss. Oxy.(mg/L)	17	0	4	0	6.07	12.17	8.28	7.91	1.83
Conductivity(umhos/cm)	17	0	NA	0	122	261	189.00	181.00	37.69
Fecal Coliform(col/100ml)	12	0	400	0	12	2200	282.58	38.00	642.60
Lab Turbidity(NTU)	12	0	50	1	3.3	58	13.45	8.00	7.93
TSS(mg/L)	12		NA	0	3	36	9.80	5.00	10.49
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.20	0.05	0.02	0.05
TKN-N(mg/L)	12	0	NA	0	0.35	0.99	0.59	0.54	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.31	1.17	0.71	0.72	0.29
T. Phos.(mg/L)	12	0	NA	0	0.04	0.114	0.07	0.07	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at SR 2628 Hinshaw Town Rd nr Parks Crossroads

B5100000/UCFRBA_37

Stream Class C

Sub Basin CPF09

County Randolph

Latitude 35.6724 **Longitude** -79.6274

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.1	29.9	19.41	22.90	7.84
pH(su)	17	0	6~9	0	7.01	7.83	7.35	7.28	0.22
Diss. Oxy.(mg/L)	17	0	4	0	5.89	12.02	8.11	7.71	1.77
Conductivity(umhos/cm)	17	0	NA	0	124	255	184.47	181.00	31.88
Fecal Coliform(col/100ml)	12	0	400	0	12	1600	227.58	44.50	459.59
Lab Turbidity(NTU)	12	0	50	1	3	51.2	12.76	6.80	7.84
TSS(mg/L)	12	4	NA	0	3	37	10.43	3.50	13.15
Chlorophyll-a(ug/L)	0	0							
NH3-N(mg/L)	12	9	NA	0	0.02	0.20	0.04	0.02	0.05
TKN-N(mg/L)	12	0	NA	0	0.20	1.00	0.54	0.48	0.24
NO2-NO3(mg/L)	12	0	NA	0	0.32	1.25	0.78	0.79	0.31
T. Phos.(mg/L)	12	0	NA	0	0.04	0.118	0.07	0.08	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Cotton Crk at SR 1372 Auman Rd nr Star

B5390800/UCFRBA_39

Stream Class WS-III

Sub Basin CPF10

County Montgomery

Latitude 35.3782

Longitude -79.7551

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3.4	24.1	15.77	18.30	6.42
pH(su)	17	0	6~9	0	6.68	7.76	7.11	6.90	0.26
Diss. Oxy.(mg/L)	17	0	4	0	5.63	11.84	8.26	7.35	2.02
Conductivity(umhos/cm)	17	0	NA	0	94	331	209.47	207.00	70.36
Fecal Coliform(col/100ml)	12	0	400	0	162	7200	1530.58	367.50	2160.81
Lab Turbidity(NTU)	12	0	50	1	1.2	85.5	18.50	7.25	6.42
TSS(mg/L)	12	2	NA	0	3	44	9.18	4.50	11.92
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	7	NA	0	0.02	0.07	0.04	0.02	0.02
TKN-N(mg/L)	12	3	NA	0	0.20	1.52	0.64	0.54	0.43
NO2-NO3(mg/L)	12	0	NA	0	1.70	11.70	5.77	3.82	3.79
T. Phos.(mg/L)	12	0	NA	0	0.20	1.89	0.80	0.48	0.62
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at Deep River Park Bridge nr Cumnock

B5685000/UCFRBA_41

Stream Class C

Sub Basin CPF11

County Chatham

Latitude 35.5704 **Longitude** -79.2411

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4	30.1	20.06	22.50	8.65
pH(su)	17	0	6~9	0	6.71	7.08	7.13	6.95	0.11
Diss. Oxy.(mg/L)	17	0	4	0	4.13	11.89	7.12	6.71	2.21
Conductivity(umhos/cm)	17	0	NA	0	82	215	128	120	34
Fecal Coliform(col/100ml)	12	0	400	0	25	11400	1896.08	57.00	4256.47
Lab Turbidity(NTU)	12	0	50	0	7.1	264	46.391667	13.7	76.150144
TSS(mg/L)	12	0	NA	3	4	156	31.00	10.50	49.55
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.10	0.04	0.02	0.03
TKN-N(mg/L)	12	0	NA	0	0.41	2.45	0.74	0.50	0.60
NO2-NO3(mg/L)	12	0	NA	0	0.02	0.87	0.43	0.46	0.30
T. Phos.(mg/L)	12	0	NA	0	0.05	0.65	0.15	0.09	0.18
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Deep Riv at US 15 And 501 nr Sanford

B5820000/UCFRBA_42

Stream Class C

Sub Basin CPF11

County Lee

Latitude 35.5782

Longitude -79.1942

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	4.8	29.9	19.98	22.50	8.36
pH(su)	17	0	6~9	0	6.69	7.12	7.17	6.94	0.12
Diss. Oxy.(mg/L)	17	0	4	1	3.92	11.71	6.81	6.18	2.52
Conductivity(umhos/cm)	17	0	NA	0	83	250	148.76	151.00	48.72
Fecal Coliform(col/100ml)	12	0	400	0	26	9000	1328.67	67.00	2990.33
Lab Turbidity(NTU)	12	0	50	2	7.8	210	38.32	14.15	59.61
TSS(mg/L)	12	0	NA	0	4	325	43.17	8.50	92.49
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.11	0.47	0.02	0.03
TKN-N(mg/L)	12	0	NA	0	0.20	2.22	0.77	0.61	0.50
NO2-NO3(mg/L)	12	0	NA	0	0.28	1.28	0.67	0.64	0.30
T. Phos.(mg/L)	12	0	NA	0	0.08	0.524	0.22	0.19	0.15
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Rocky Riv at US 64 nr Siler City

B5950000/UCFRBA_43

Stream Class C

Sub Basin CPF11

County Chatham

Latitude 35.7351 **Longitude** -79.4233

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5	28.4	19.65	20.70	7.86
pH(su)	17	0	6~9	0	6.36	7.31	7.23	6.88	0.22
Diss. Oxy.(mg/L)	17	0	4	1	3.67	12.41	7.28	6.77	2.82
Conductivity(umhos/cm)	17	0	NA	0	52	108	89.65	95.00	422.37
Fecal Coliform(col/100ml)	12	0	400	0	15	5400	945.08	90.50	1686.94
Lab Turbidity(NTU)	12	0	50	1	4.1	51.9	18.08	9.60	15.79
TSS(mg/L)	12	0	NA	0	4	22	11	8	6
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	5	NA	0	0.02	0.18	0.02	0.03	0.05
TKN-N(mg/L)	12	0	NA	0	0.60	1.31	0.60	0.60	0.60
NO2-NO3(mg/L)	12	0	NA	0	0.03	0.71	0.03	0.03	0.03
T. Phos.(mg/L)	12	0	NA	0	0.06	0.40	0.16	0.10	0.12
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Rocky Riv at SR 2170 Rives Chapel Rd nr Siler City

B5980000/UCFRBA_44

Stream Class C

Sub Basin CPF11

County Chatham

Latitude 35.6985 **Longitude** -79.3756

HUC 3030003

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5	27.4	18.9	21.2	7.4748746
pH(su)	17	0	6~9	0	6.79	7.67	7.2535294	7.24	0.2906231
Diss. Oxy.(mg/L)	17	0	4		5.01	11.66	7.4955294	7.53	2.2839215
Conductivity(umhos/cm)	17	0	NA	0	90	840	435	336	301
Fecal Coliform(col/100ml)	12	0	400	0	22	3400	801	72	1337
Lab Turbidity(NTU)	12	0	50	0	2.6	35.3	14.075	8.4	11.827328
TSS(mg/L)	12	1	NA	0	3	23	8	4	6
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	5	NA	0	0.02	1.92	0.24	0.05	0.54
TKN-N(mg/L)	12	0	NA	0	0.76	2.76	1.27	1.15	0.51
NO2-NO3(mg/L)	12	0	NA	0	0.45	1.79	1.03	0.97	0.37
T. Phos.(mg/L)	12	0	NA	0	0.03	0.26	0.12	0.08	0.08
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Loves Creek at Waste Management Plant Rd in Siler City

B5890000/UCFRBA_45

Stream Class C

Sub Basin CPF12

County Chatham

Latitude 35.7289 **Longitude** -79.4289

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3	29.4	17.81	17.90	6.81
pH(su)	17	0	6~9	0	6.79	7.74	7.13	7.15	0.23
Diss. Oxy.(mg/L)	17	0	4	2	2.42	12.31	7.78	7.48	3.00
Conductivity(umhos/cm)	17	0	NA	0	81	291	167.53	170.00	51.17
Fecal Coliform(col/100ml)	12	0	400	0	20	2400	617.00	142.50	903.05
Lab Turbidity(NTU)	12	1	50	1	1	60.6	14.01	6.00	17.47
TSS(mg/L)	12	6	NA	0	3	13	4.65	2.90	3.19
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	0	NA	0	0.02	0.05	0.03	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.20	0.65	0.35	0.31	0.16
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.72	0.39	0.43	0.21
T. Phos.(mg/L)	12	4	NA	0	0.02	0.08	0.04	0.04	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

01/01/2022-12/31/2022 Summary Report

Station Id: Loves Creek at Progress Blvd at Siler City

B5920000/UCFRBA_46

Stream Class C

Sub Basin CPF12

County Chatham

Latitude 35.7322 **Longitude** -79.4246

HUC 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3	28.8	21.08	21.70	6.78
pH(su)	17	0	6~9	0	7.22	8.21	7.66	7.64	0.29
Diss. Oxy.(mg/L)	17	0	4	2	3.31	11.29	7.82	7.17	2.48
Conductivity(umhos/cm)	17	0	NA	0	304	1497	895.53	788.00	481.21
Fecal Coliform(col/100ml)	12	0	400	0	5	2000	443.83	52.50	720.19
Lab Turbidity(NTU)	12	0	50	0	1	34.2	34.20	23.10	10.81
TSS(mg/L)	12	6	NA	0	3	15	5.07	2.90	4.01
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	3	NA	0	0.02	9.05	1.98	0.39	0.02
TKN-N(mg/L)	12	1	NA	0	0.55	9.88	3.06	1.57	0.55
NO2-NO3(mg/L)	12	0	NA	0	0.63	9.42	3.20	0.63	0.63
T. Phos.(mg/L)	12	0	NA	0	0.02	0.16	0.06	0.02	0.02
Cadmium(ug/L)									
Chromium(ug/L)									
Copper(ug/L)									
Nickel(ug/L)									
Lead(ug/L)									
Zinc(ug/L)									
Aluminum(ug/L)									
Iron(ug/L)									
Manganese(ug/L)									
Mercury(ug/L)									
Arsenic(ug/L)									
Hardness(mg/L)									

* Fecal Coliform Geomean

** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.

** Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.

*** Standard Deviation range of values is also affected by climate and storm events and etc.

APPENDIX B: UCFRBA Board of Directors

UPPER CAPE FEAR RIVER BASIN ASSOCIATION

DIRECTORS AND ALTERNATE DIRECTORS

(Primary Contact)

Arclin

Bowman Harvey Plant Manager 790 Corinth Road Moncure, NC 27759 Phone: 919-545-7053 Email: bowman.harvey@arclin.com	Brad Crawford 790 Corinth Road Moncure, NC 27759 Phone: Email: brad.crawford@arclin.com
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City of Asheboro

Michael Rhoney Water Resources Director PO Box 1106 Asheboro, NC 27204-1106 Phone: 336-626-1201 x258 Fax: 336-626-1218 Email: mrhoney@ci.asheboro.nc.us	John Ogburn III City Manager PO Box 1106 Asheboro, NC 27204-1106 Phone: 336-626-1201, ext. 213 Fax: 336-626-1218 Email: jogburn@ci.asheboro.nc.us
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City of Burlington

Bob Patterson Director of Water Resources PO Box 1358 Burlington, NC 27216-1358 Phone: 336-222-5130 Fax: 336-222-5019 Email: bpatterson@burlingtonnc.gov	Ben Bani Assistant Water Resources Director PO Box 1358 Burlington, NC 27216-1358 Phone: 336-222-5133 Fax: 336-570-6175 Email: bbani@burlingtonnc.gov
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Town of Cary

Donald Smith Wastewater Collection System Manager PO Box 8005 Cary, NC 27512-8005 Phone: (919) 319-4564 Email: donald.smith@townofcary.org	Sarah Braman Water Resources Engineer PO Box 8005 Cary, NC 27512-8005 Phone: 919-462-3846 Email: sarah.braman@townofcary.org
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City of Durham

<p>Charlie Cocker Plant Superintendent 6605 Farrington Road Chapel Hill, NC 27517 Phone: 919-560-4386, ext.35532 Email: charles.cocker@durhamnc.gov</p>	<p>Jennifer Hunter Senior Laboratory Manager Phone: (919) 560-4386 ext. 35533 Email: Jennifer.hunter@durhamnc.gov</p>
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City of Graham

<p>Tonya Mann Utilities Director PO Drawer 357 Graham, NC 27253 Phone: 336-570-6721 Fax: 336-513-5502 Email: tmann@cityofgraham.com</p>	<p>Cris Routh ORC/WWTP Supervisor PO Drawer 357 Graham, NC 27253 Phone: 336-570-6721 Fax: 336-513-5502 Email: crouth@cityofgraham.com</p>
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City of Greensboro

<p>Elijah Williams Waste Reclamation Manager PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-373-4632 Fax: Email: elijah.williams@greensboro-nc.gov</p>	<p>Alicia Goots Laboratory and Ind. Waste Section Supervisor PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-433-7229 Fax: 336-373-7720 Email: alicia.goots@greensboro-nc.gov</p>
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City of High Point

<p>Terry Houk Public Services Director PO Box 230 High Point, NC 27261 Phone: 336-883-3218 Email: terry.houk@highpointnc.gov</p>	<p>Derrick Boone Public Services Assistant Director PO Box 230 High Point, NC 27261 Phone: 336-883-3166 Email: derrick.boone@highpointnc.gov</p>
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City of Mebane

<p>Robby Stone Director of Public Services 106 E. Washington Street Mebane, NC 27302 Phone: 919-304-9215 Fax: 919-563-1007 Email: robby.stone@highpointnc.gov</p>	<p>Chris Rollins City Manager 106 E. Washington Street Mebane, NC 27302 Phone: 919-563-5901 Fax: 919-563-1007 Email: crollins@cityofmebane.com</p>
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Orange Water and Sewer Authority

Ronnie Weed Wastewater Treatment Plant Lab Supervisor 400 Jones Ferry Road Carrboro, NC 27510 Phone: 919-537-4206 Email: rweed@owasa.org	Wil Lawson Interim Wastewater Treatment and Biosolids Recycling Manager 400 Jones Ferry Road Carrboro, NC 27510 Phone: (919) 537-4351 Email: wlawson@owasa.org
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Pilgrim's Pride

Tina Pedley Environmental Manager 7401 Statesville Blvd Salisbury, NC 28147 Phone: 919-210-3527 Fax: 919-542-6324 Email: tina.pedley@pilgrims.com	<i>Vacant</i> Complex Manager 7401 Statesville Blvd Salisbury, NC 28147 Phone: Fax: Email:
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Town of Pittsboro

Kent Jackson Engineering Director Town of Pittsboro PO Box 759 480 Hillsboro St, Suite 400 Pittsboro, NC 27312 Phone: (919) 542-1519 Email: kjackson@pittsboronc.gov	<i>Vacant</i> Town Manager PO Box 759 635 East Street Pittsboro, NC 27312 Phone: 336-708-0425 Fax: 919-542-7109
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Town of Ramseur

Terry Lewallen WWTP Superintendent PO Box 545 Ramseur, NC 27316 Phone: 336-824-8530 Fax: 336-824-6624 Email: terry.lewallen@suez.com	Vicki Caudle Mayor PO 545 Ramseur, NC 27316 Phone: 336-824-8883 Fax: 336-824-6624 Email: mayor@townoframseur.org
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City of Randleman

Michael Glass WWTP Superintendent 204 South Main Street Randleman, NC 27317 Phone: 336-498-2254	<i>Vacant</i> City Manager 204 South Main Street Randleman, NC 27317 Phone: 336-495-7500
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City of Reidsville

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City of Sanford

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Town of Siler City

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Town of Star

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APPENDIX C: UCFRBA Technical Advisory Committee

NAME	AGENCY	TITLE	EMAIL
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Amanda Hancock	Meritech, Inc.	Lab Manager	Amanda.hancock@meritechlabs.com
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Victor Czar	Sanford	Public Works Director	victor.czar@sanfordnc.net
Wesley Brown	Star	Sewage Treatment Plant Superintendent	townofstar@gmail.com

APPENDIX D: UCFRBA Sampling Procedures

1669 Sampling Procedures

A. Supplies

1. Cooler (Hg Only) – Contains the following
 - a. Gloves (2x): Large bag with one pair, inside of which is a small bag with two pairs. Lone pair is a backup set.
 - b. Sample Bottles (2x): Large bag with bottle lot #, sampling site and date, inside of which is a small bag, also contains same information. The sampling bottle is in the small bag.
 - c. Sampling Tubing (1x): Double bagged with the lot # written on the bag. Single use tubing.
 - d. Backup Cooler: Items a. through d. will be kept in a separate cooler which will be used as a spare in the event that a problem is encountered with the original kit. Should this kit not be used; it may be used for a subsequent sampling event at the same site.
2. Sampling Supplies – Contains the following
 - a. DI Carboy – Wrapped in plastic bag sealed with rubber band.
 - b. Peristaltic pump (portable) – Battery operated pump for sampling.
 - c. Waste Carboy – Collects waste during the sampling process
 - d. Polypropylene Support and Clamp – Used to position the sample tubing for hands free operation.
 - e. Sampling Wand – PVC pipe 1" diameter x 10' with T glued to end for better handling. Pipe is notched to accept sample tubing.
 - f. Plastic Sheeting – Single use to cover the sampling table. Clamped to the bottom of table.
 - g. Garbage Bag – Standard white kitchen garbage bag to collect refuse from sampling event
 - h. Sampling Table – 2' x 4' used to setup sampling supplies.
 - i. COC (Chain of Custody) – Records sampling information i.e. Client, Date/Time, Lot #'s, Sampling Team, Sampling Conditions, etc.
 - j. Two Person Sampling Team (CH/DH) – Clean Hands and Dirty Hands Sampling Team; predetermined to help expedite sampling process.

B. Initial Arrival Set-up.

1. Do not park in close proximity to the sampling site, and whenever possible approach site from downwind.
2. Note sampling site conditions with regards to wind and wind direction; also noting potential sources of contamination from the surrounding area.
3. Setup table close to the sampling site according to the orientation required for sampling the effluent
 - a. Clamp down a fresh sheet of plastic on the sampling table.
 - b. Put on set of gloves – non-bagged.
 - c. Place the DI Water Carboy, Peristaltic Pump, and Tubing Support Stand on the table.
 - d. Open the access area to the pump head so that the tubing may be quickly connected to the pump when the samplers are ready.
 - e. Place sampling wand on table
 - f. Place waste carboy on ground in proximity to the sampling tables.
 - g. Tie the garbage bag to the sampling table
 - h. Fill out paper work including the sampling conditions and lot #'s of sampling equipment and preservatives.
4. Make final check that the sampling area is accessible and logistically feasible from the table set-up area.
5. Remove any impedence from the sampling area.

C. Sampling – Clean Hands(CH)/Dirty Hands(DH).

1. Assign clean hands and dirty hands technicians.
2. Both CH and DH will now wait ten minutes for the sampling site to equilibrate from any destabilization resulting from the initial set-up.

D. Sampling Wand Collection

1. Field Blank
 - a. DH will open the cooler containing the sampling accessories (gloves, tubing, and bottles).
 - b. DH opens glove bag for CH to put on two sets of gloves.
 - c. DH opens 2nd glove bag and puts on two sets of gloves.
 - d. DH opens the bag for the DI carboy.
 - e. DH removes the bag containing the sampling tubing, and opens the bag.
 - f. CH removes the inner bag containing the tubing, and removes the tubing, but does not allow the ends to come in contact with anything. The ends of the tubing are facing down to avoid contamination.
 - g. DH installs the tubing while CH maintains the tubing ends facing down.
 - h. DH removes the cap from the carboy.
 - i. CH places one end of the tubing into the carboy so that it remains in the carboy, and the other end is placed into the clamp on the support stand.
 - j. DH positions the waste carboy under the exit tubing and starts the pump. Rinse tubing with 1L of DI water. DH stops the pump.
 - k. DH removes the waste carboy
 - l. DH removes the double bagged sample bottle (Field Blank) from the cooler and opens the outer bag. CH removes the bagged bottle, and removes the cap. All baggies should remain in the sampling cooler until the sample bottle is returned.
 - m. CH position the bottle under the exit tubing.
 - n. DH starts the pump; CH signals to turn off the pump once the bottle is full.
 - o. CH replaces the cap, and puts the bottle back to the small bag.
 - p. DH opens large bag and CH places bagged bottle into large bag.
 - q. DH seals the baggie and puts the sample back into the cooler.
2. Sample – Sampling Wand
 - a. DH removes the double bagged sample bottle (Sample) from the cooler and CH removes the single bagged bottle from the large bag placing it on the sampling table.
 - b. DH positions the waste carboy with the sampling tubing in the support stand.
 - c. DH secures the sampling wand across the sampling table, while CH removes the sampling tubing from the DI carboy.
 - d. CH positions the sampling tubing in the sampling wand while DH holds the wand firm.
 - e. DH starts the pump while holding the wand against the table.
 - f. DH places the sampling wand in the sampling area positioning the end of the wand downstream from the tip of the sampling tubing.
 - g. Once approximately 1L of sample is passed through the tubing (2 – 5 minutes) and collected in the waste carboy, CH removes the sample bottle from the small bag, removes the cap, and fills the bottle by placing the bottle above the waste carboy.
 - h. Once full, CH replaces the cap, and places the bottle back into the baggie.
 - i. DH removes the wand from the sampling area and turns off the pump.
 - j. DH puts down the sampling wand on the table, and opens the large baggie for CH to place the sample bottle into.
 - k. DH seals the large baggie and places the sample into the sample cooler.
 - l. DH and CH may now freely cleanup the sampling area disposing of the sampling tubing and gloves into a garbage bag attached to the sampling table.
 - m. CH will finish paper work noting times that the samples were taken and any potential problems with the sampling.

E. Sample – Direct Collection

1. Field Blank
 - a. DH will open the cooler containing the sampling accessories (gloves, and bottles).
 - b. DH opens glove bag for CH to put on two sets of gloves.
 - c. DH opens 2nd glove bag and puts on two sets of gloves.
 - d. DH gets double bagged field blank bottle from cooler, opens outer bag and CH removes inner bag setting it on the sampling table.
 - e. DH gets double bagged sample bottle, which is full of DI water from the lab, and opens the outer bag.
 - f. CH removes the inner bag and removes the bottle and takes off the cap.
 - g. CH then removes the field blank bottle from the inner baggie and transfers the DI water from the sample bottle to the field blank bottle.
 - h. CH caps the field blank bottle places it back into the baggie, which is placed back into the outer baggie being held open by DH.
 - i. DH then seals the baggie and places the bottle into the cooler.
2. Sample
 - a. CH takes the emptied sample bottle and fills it it with the waste stream from the sampling site.
 - b. CH replaces the cap and places the bottle back in the inner baggie.
 - c. DH opens the outer baggie and CH places the bagged sample into the outer baggie.
 - d. DH seals the outer baggie and places the bottle into the cooler.
 - e. CH and DH can now clean the sampling site and complete all necessary paperwork prior to leaving the site.

APPENDIX E: QA/QC SUMMARIES

Upper Cape Fear River Basin Association QA/QC Committee Report From QA/QC Data Review Meeting of Friday, April 22, 2022

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Grace Messinger (PTRC), Alicia Goots (City of Greensboro), Amy Varinoski (City of Greensboro)

Water Quality Standard (WQS) Exceedances January 2022 through March 2022

January 2022 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	1/21/2022	Turbidity	71.4	50 NTU
22	1/21/2022	Turbidity	71.1	50 NTU
45	1/10/2022	Turbidity	60.6	50 NTU

February 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
28	2/03/2022	Turbidity	50.2	50 NTU

March 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
9	3/14/2022	Turbidity	69.3	50 NTU
12	3/14/2022	Turbidity	73.6	50 NTU
13	3/14/2022	Turbidity	60.3	50 NTU
21	3/11/2022	Turbidity	56.7	50 NTU
26	3/21/2022	Turbidity	63.1	50 NTU
41	3/21/2022	Turbidity	58.9	50 NTU
43	3/21/2022	Turbidity	51.9	50 NTU

January 2022 through March 2022 – Upper Cape Fear Data Notations/Corrections				
Parameter	UCFRBA Site#	Date	Reported Value	Corrected Value
Fecal	2	1/7/2022	360	350
Fecal	3	1/7/2022	40	410
Fecal	28	1/7/2022	380	370
Fecal	31	1/7/2022	510	530
Fecal	35	1/28/2022	24	25
Fecal	39	1/28/2022	350	330
Fecal	2	2/3/2022	17	171

Fecal	5	2/14/2022	10	95
Fecal	7	2/14/2022	6	57
Fecal	22	2/1/2022	9	86
Fecal	23	2/1/2022	9	86
Fecal	29	2/3/2022	13	133
Fecal	34	2/25/2022	18	181
Fecal	35	2/25/2022	10	181
Fecal	36	2/25/2022	10	95
Fecal	37	2/25/2022	14	143
Fecal	33	3/8/2022	76	72

OTHER ISSUES AND COMMENTS				
N/A				

Revision Date: April 22, 2022

Upper Cape Fear River Basin Association QA/QC Committee Report

From QA/QC Data Review Meeting of Tuesday July 26, 2022

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Alicia Goots (Greensboro), Amy Varinoski (Greensboro), Grace Messinger (PTRC), Jennifer Hunter (OWASA)

Water Quality Standard (WQS) Exceedances April 2022 through June 2022

April 2022 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	4/4/2022	Turbidity	58.7	50 NTU
32	4/1/2022	Turbidity	51.4	50 NTU
34	4/1/2022	Turbidity	59.0	50 NTU
39	4/1/2022	Turbidity	50.1	50 NTU

May 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
NO ISSUES				

June 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	6/9/2022	Turbidity	114	50 NTU
23	6/9/2022	Turbidity	53.5	50 NTU
18	6/22/22	Dissolved Oxygen	3.5 mg/l	≥4.0 mg/l
19	6/9/22	Dissolved Oxygen	3.5 mg/l	≥4.0 mg/l
19	6/24/22	Dissolved Oxygen	2.6 mg/l	≥4.0 mg/l
21	6/9/22	Dissolved Oxygen	2.5 mg/l	≥4.0 mg/l

April 2022 through June 2022 – Upper Cape Fear Data Corrections/Notations				
Parameter	UCFRBA Site#	Date	Reported Value	Corrected Value
Total Phosphorus	1	6/2/22	0.002 mg/l	0.022 mg/l
Conductivity	10	5/27/22	47 NTU	35 NTU
Ammonia	4	6/1/22	0.02 mg/l	< 0.02 mg/l
Nitrate/Nitrite	44	6/6/22	1.57 mg/l	1.54 mg/l

OTHER ISSUES and COMMENTS				

Revision Date: July 26, 2022

**Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Wednesday October 19, 2022**

Reviewers: Chair: Dawn Molnar (High Point), Alicia Goots (City of Greensboro), Amy Varinoski (City of Greensboro), Martie Groome (City of Greensboro)

Water Quality Standard (WQS) Exceedances July 2022 through September 2022

July 2022 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
19	7/15/22	Turbidity	50.5	50 NTU
20	7/19/22	Turbidity	83.1	50 NTU
21	7/15/22	Turbidity	191	50 NTU
22	7/15/22	Turbidity	107	50 NTU
1	7/25/22	Dissolved Oxygen	2.0	≥4.0 mg/l
2	7/25/22	Dissolved Oxygen	3.7	≥4.0 mg/l
18	7/26/22	Dissolved Oxygen	3.4	≥4.0 mg/l
19	7/2/22	Dissolved Oxygen	2.2	≥4.0 mg/l
26	7/26/22	Dissolved Oxygen	3.8	≥4.0 mg/l
28	7/13/33	Dissolved Oxygen	0.2	≥4.0 mg/l
43	7/14/22	Dissolved Oxygen	3.7	≥4.0 mg/l
46	7/26/22	Dissolved Oxygen	3.9	≥4.0 mg/l

August 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	8/1/22	Turbidity	134	50 NTU
1	8/19/22	Dissolved Oxygen	3.4	≥4.0 mg/l
18	8/10/22	Dissolved Oxygen	2.9	≥4.0 mg/l
18	8/30/22	Dissolved Oxygen	3.2	≥4.0 mg/l
19	8/1/22	Dissolved Oxygen	2.8	≥4.0 mg/l
19	8/18/22	Dissolved Oxygen	3.1	≥4.0 mg/l
45	8/10/22	Dissolved Oxygen	3.5	≥4.0 mg/l
46	8/10/22	Dissolved Oxygen	3.3	≥4.0 mg/l

September 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	9/22/22	Turbidity	61.6	50 NTU
18	9/6/22	Dissolved Oxygen	3.6	≥4.0 mg/l
18	9/23/22	Dissolved Oxygen	0.5	≥4.0 mg/l
19	9/1/22	Dissolved Oxygen	3.3	≥4.0 mg/l
19	9/22/22	Dissolved Oxygen	2.3	≥4.0 mg/l
21	9/22/22	Dissolved Oxygen	3.4	≥4.0 mg/l
42	9/6/22	Dissolved Oxygen	3.9	≥4.0 mg/l

45	9/6/22	Dissolved Oxygen	3.9	≥4.0 mg/l
July, August, September 2022 – Upper Cape Fear Data Notations/Corrections				
Parameter	UCFRBA Site#	Date	Reported Value	Corrected Value
Total Phosphorus	20	9/22/22	Run said Site 10	Data was for Site 20
Time	2	7/13/22	14:04	17:04
pH	46	9/6/22	8.6 units	8.0 units
Ammonia	43	8/10/22	0.02 mg/l	<0.02 mg/l
TKN	21	8/1/22	0.71 mg/l	0.69 mg/l
TKN	46	9/6/22	0.92 mg/l	0.99 mg/l
Fecal	19	7/15/22	885	570
Fecal	21	7/15/22	15,400	>15,400

OTHER ISSUES AND COMMENTS

Comment: At Site 28 (Richland Creek at SR 1154-Kersey Valley Road-Upstream of High Point Eastside Treatment Plant) on July 13, 2022 the following was recorded by the field staff: “Water is a dark blue/green color. Doesn’t appear to be algae. Looks more like a dye. Never looked like this in the past.” “Fish visible, dead.” D. O. recorded was 0.18 mg/l.

Revision Date: October 19, 2022

**Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Thursday January 19, 2023**

Reviewers: Chair: Dawn Molnar (High Point), Alicia Goots (Greensboro), Elaine Sellars (High Point), Grace Messinger (PTRC), Martie Groome (Greensboro)

Water Quality Standard (WQS) Exceedances October 2022 through December 2022

October 2022 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
21	10/6/22	Turbidity	130	50 NTU

November 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
12	11/29/22	Turbidity	77.6	50 NTU
13	11/29/22	Turbidity	78.5	50 NTU
16	11/28/22	Turbidity	87.1	50 NTU
17	11/28/22	Turbidity	150	50 NTU
18	11/28/22	Turbidity	86.9	50 NTU
27	11/28/22	Turbidity	81.4	50 NTU
41	11/28/22	Turbidity	122	50 NTU
42	11/28/22	Turbidity	98.2	50 NTU

December 2022 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	Date	Parameter	Reported Value	NC WQ Standard
16	12/16/22	Turbidity	172	50 NTU
17	12/16/22	Turbidity	235	50 NTU
21	12/6/22	Turbidity	102	50 NTU
36	12/1/22	Turbidity	58.0	50 NTU
37	12/1/22	Turbidity	51.2	50 NTU
41	12/16/22	Turbidity	264	50 NTU
42	12/16/22	Turbidity	210	50 NTU

October 2022 through December 2022 – Upper Cape Fear Data Corrections/Notations				
Parameter	UCFRBA Site#	Date	Reported Value	Corrected Value
Phosphorus	13	12/12/22	.029	.059
Phosphorus	14	12/12/22	.059	.029

OTHER ISSUES and COMMENTS

Revision Date: January 19, 2023

APPENDIX F: Timeline of UCFRBA Organizational Contracts and Services

Contract Terms Timeline:				2019	2020	2021	2022	2023	2024	2025	2026
APPROVED	Start	Deadline	Extension								
UCFRBA Admin Services	7/1/2019	6/30/2021	6/30/2022								
Meritech Lab-Sampling Services	9/1/2020	8/31/2023									
NCDWR MOU UCFRBA Members	5/1/2020	4/30/2025									
NEW/PROPOSED											
UCFRBA Admin Services	7/1/2022	6/30/2024						new contract rate	new contract rate		
Meritech Lab-Sampling Services	9/1/2023	6/30/2026						NEW contract with new rate; 2% yearly increase			

Time Extension 
 New/Pending 
 Approved 

YEARLY CONTRACTS/SERVICES	Start	Deadline	Renewal By:
General Liability Ins (Covington)	8/5/2021	8/5/2022	7/1/2022
Public Officials Liability Ins (Great Amer)	8/5/2021	8/5/2022	7/1/2022
Cape Fear River Assembly	7/1/2021	6/30/2022	6/7/2022
UNCW Data Host	10/1/2021	6/30/2022	9/1/2022

APPENDIX G: Amendment 3 to UCFRBA-DWR MOU

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UCFRBA_DWR_MOA_2020 – 2025_ Amendment_3_Nov_22

Amendment to the Memorandum of Agreement Between the North Carolina Division of Water Resources and the Upper Cape Fear River Basin Association

WHEREAS, the NORTH CAROLINA DIVISION OF WATER RESOURCES, the UPPER CAPE FEAR RIVER BASIN ASSOCIATION, and NPDES PERMITTEES have entered into a MEMORANDUM OF AGREEMENT (MOA) dated May 1, 2020; and

WHEREAS, the MOA allows modification to add certain new parties to the MOA by written consent of the DWR and the UCFRBA; and

NOW THEREFORE, the MOA is hereby amended as follows:

The permittee TRIANGLE WASTE WATER TREATMENT PLANT (NC0026051) is added to the MOA; and Stephanie Brixey, POTW Director, is added as the signature authority.

By: Stephanie Brixey
Stephanie Brixey, POTW Director for the
TRIANGLE WASTE WATER TREATMENT PLANT

Date: 11/3/2022

IN WITNESS WHEREOF, the parties have caused the execution of this instrument by authority duly given, to be effective as of the date executed by DWR.

UPPER CAPE FEAR RIVER BASIN
ASSOCIATION

By: Elijah Williams
Elijah Williams, Chair
Upper Cape Fear River Basin
Association

Date: 11/1/2022

NORTH CAROLINA DIVISION OF
WATER RESOURCES

By: _____
Richard Rogers, Director
North Carolina Division of Water
Resources

Date: _____

11/1/2022

APPENDIX H: UCFRBA-Meritech Monitoring Services Contract

With the addition of a new station, the Meritech contract was amended as of 7/2021.

UPPER CAPE FEAR RIVER BASIN ASSOCIATION MONITORING SERVICES

BETWEEN UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC.
AND MERITECH, INC

This CONTRACT effective September 1, 2020 between the UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC., hereinafter called the ASSOCIATION, and MERITECH, INC., hereinafter called the CONTRACTOR.

WITNESSETH:

WHEREAS, on July 28, 2020 the Board of Directors of the Upper Cape Fear River Basin Association, Inc. authorized a new two-year monitoring services contract between the UPPER CAPE RIVER BASIN ASSOCIATION, INC and MERITECH, INC., such contract pending review and acceptance by the Board; and

WHEREAS, this CONTRACT is consistent with the Memorandum of Agreement (MOA) (EXHIBIT 1) between the Division of Water Resources, North Carolina Department of Environmental Quality (NCDEQ- DWR) and the ASSOCIATION for collection, analysis and reporting of water quality data for the period of May 1, 2020 to April 30, 2025; and

WHEREAS, CONTRACTOR attests that it is a fully certified laboratory approved by the Division of Water Resources, North Carolina Department of Environmental Quality and that it shall maintain continuous laboratory certification with DWR in accordance with 15 NCAC 2H.0800 for all contaminants and parameters required for data collection by the MOA; and

WHEREAS, the ASSOCIATION requires supplemental information related to sampling and analytical services to improve quality assurance and quality control in the testing and analysis process, such supplemental information detailed in EXHIBIT 2 of this CONTRACT;

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein, the parties do hereby contract and agree as follows:

SECTION I. SCOPE OF WORK

The CONTRACTOR does hereby covenant and agree with the ASSOCIATION that the CONTRACTOR will well and faithfully perform and execute such work and furnish such labor, materials, equipment, apparatus and supplies, in accordance with each and every one of the conditions, covenants, stipulations, terms and provisions contained in this CONTRACT and as generally described below, and will well and faithfully comply with and perform each and every obligation imposed upon the CONTRACTOR under this CONTRACT.

The CONTRACTOR shall promptly make payments to all persons supplying materials in the prosecution of the work, and to all laborers and others employed thereon.

A. Type of Work

The work to be done and fully performed by the CONTRACTOR pursuant to this CONTRACT shall consist of the following:

1. **Base Monitoring Services:** Base Monitoring Services shall be those specified in the requirements of the MOA between the ASSOCIATION and the NCDWR, dated May 1 2020, in EXHIBIT 1. Additional quality assurance/quality control (hereafter QA/QC) requirements are specified in EXHIBIT 2. The Base Monitoring Services are summarized in general as the following items, defined as explained in the narrative following each item:
 - a. **Water sampling:** The sampling sites listed in the MOA (Exhibit 1, Table 2 on page 9) shall be visited on the frequency specified in Table 2 on page 9 of the MOA by a qualified monitoring technician employed by CONTRACTOR. Water samples shall be field tested, collected, preserved, stored and transported by CONTRACTOR from each sampling site for analysis for the parameters required in Table 2 of the MOA for each sampling site, in accordance with the requirements specified in Appendix A and B of the MOA and the supplemental QA/QC measures specified in EXHIBIT 2. Also, CONTRACTOR will take field notes at each site using the field site sheet, example is found in EXHIBIT 4.
 - b. **Water sample analysis:** CONTRACTOR shall collect and analyze water samples by methods approved by NCDWR to the detection limits required by NCDWR listed in MOA Appendix A and B and Supplemental Exhibit 2 for each parameter found in Table 2. The analysis must be performed using the protocols included in NCDWR's "Standard Operating Procedures Manual, Physical and Chemical Monitoring", 40 CFR Part 136 and 15 NCAC 2B.0505(e)(4), Standard Methods, unless otherwise specified in this contract.
 - c. **Water sample analysis reporting to the ASSOCIATION:** The results of all of the water sample analyses from all of the sampling sites shall be reported to the ASSOCIATION'S members by means of emailing spreadsheets electronically on the form approved by the ASSOCIATION in EXHIBIT 3. These reports shall be distributed by email as soon as the analysis results are available (unless otherwise specified by the ASSOCIATION, not less frequently than monthly. CONTRACTOR will provide paper copies of field note sheets for every sampling site, monthly. The water quality monitoring results and data for each month shall be reported by the CONTRACTOR to the ASSOCIATION by the end of the following month.
 - d. **Water sample analysis reporting to NCDWR:** The ASSOCIATION shall be responsible for immediately contacting NCDWR to finalize arrangements for reporting the required data. Normally, a committee of the ASSOCIATION shall review the analysis for the QA/QC measures specified in EXHIBIT 2 before the data is reported to NCDWR.
 - e. **Data collection or analysis errors:** CONTRACTOR agrees to promptly notify the specified representatives of the ASSOCIATION in the event any samples are not collected or analyzed as required in the MOA and this contract, and to give a general reason and description of follow-up action, not later than 21 days after the scheduled sample collection date.

- f. Instream monitoring: Samples shall be collected at as close to mid-stream as possible.
- g. Same day monitoring: Sample stations in each sub-basin (as identified in Appendix A-1 shall be monitored on the same day.
- h. Frequency: Monitoring must be done at the frequency specified in Appendix A-1 of the MOA.
- i. Annual certification report: CONTRACTOR shall prepare and submit to the ASSOCIATION'S members and NCDWQ an annual (calendar year) certification report that confirms the amount of the prescribed work completed by CONTRACTOR. The narrative report must be submitted by February 28th of the following year. The report must identify the number of water samples that were not collected, analyzed and/or reported as required pursuant to the MOA and all data that was qualified.

2. Additional Monitoring Services

Upon mutual agreement of the ASSOCIATION and CONTRACTOR, this CONTRACT may be amended to include additional monitoring services that are determined desirable by the ASSOCIATION. MERITECH shall have sixty (60) days to respond to any changes in monitoring services before the CONTRACT is amended.

SECTION II. TERM OF AGREEMENT

The term of this CONTRACT is for three years from September 1, 2020 through August 31, 2023.

SECTION III. COMPENSATION

- 1. Amount due: The ASSOCIATION hereby covenants and agrees that the ASSOCIATION shall pay the CONTRACTOR, when due and payable under the following terms for the performance of the services described in Section I(A) as follows:

Contract Cost Breakdown

Vehicle /Miles	12390 miles X .57/ mile=	\$7,062.00
Labor/ Technicians	495 hrs.	
Management	200 hrs	
Reporting	<u>300 hrs</u>	
Field & admin Costs	995 hrs. @ \$39.73/ hr. ave	<u>\$39,571.00</u>
		\$46,633.00
Analysis		\$46,080.00
Equipment		<u>\$3,000.00</u>
Total/year 2020-2023		\$95,713.00

Field sampling events include pH, Temperature, DO and Conductivity at the surface of sampling site.

Analytical Costs

Test	Reporting Limit (mg/L)	Method	Quantity/ Year	Cost Per Test	Cost Per Year
Total Suspended Solids	1	SM 2540D	480	\$9.00	\$4,320.00
Ammonia, Nitrogen	0.1	EPA 350.1	480	\$12.00	\$5,760.00
TKN	0.20	EPA 351.1	480	\$21.00	\$10,080.00
Nitrate/Nitrite, Nitrogen	0.10	EPA 353.2	480	\$15.00	\$7,200.00
Phosphorus, total	0.020	EPA 200.7	480	\$12.00	\$5,760.00
Fecal Coliform	1 col/100 ml	SM 9222D	480	\$17.00	\$8,160.00
Turbidity	1.0 NTU	EPA 180.1	480	\$10.00	\$4,800.00
TOTAL	-	-			\$46,080.00

- a) **Addendum to Contract as of July 22, 2021: Addition of monitoring, Upstream Chatham Park WWTP, Roberson Creek, Pittsboro**

Analytical Costs per Station

Test	Reporting Limit (mg/L)	Method	Cost Per Test
Total Suspended Solids	2.5	SM 2540D	\$9.00
Ammonia, Nitrogen	0.02	EPA 350.1	\$12.00
TKN	0.20	EPA 351.1	\$21.00
Nitrate/Nitrite, Nitrogen	0.02	EPA 353.2	\$15.00
Phosphorus, total	0.020	EPA 200.7	\$12.00
Fecal Coliform	1 col/100 ml	SM 9222D	\$17.00
Turbidity	1.0 NTU	EPA 180.1	\$10.00
Chlorophyll A	1 ug/l	EPA 445	\$80.00
TOTAL Analytical/site	-	-	\$176.00

Total Analytical Sampling - 12 times/ yr. per station @ \$176 = \$2,112.00/ year

Field Services

Includes: time on site, transportation, field parameters & reporting.

Total 17 events per year/ per station - @ \$65.00/ site - \$1,105.00

Total per station - \$2,112.00 + \$1,105.00 = \$3,217/year

Year	% Increase	Annual Cost
September 2020 - August 2021	-	\$95,713.00
September 2021 - August 2022	2 %	\$100,844.26
September 2022 - August 2023	2 %	\$102,796.80

Additional Services Special studies

- b) Additional Sampling: at Stations B4800000 (UCF #34) and Station B5950000 (UCF #43) to continue through December 2020. Additional \$560/month (invoiced separately) for the first 4 months of the contract **\$2,240 total**
2. Payment requests: CONTRACTOR shall be eligible to submit monthly payment requests for a portion of the lump sum CONTRACT amount, provided for in the CONTRACT award notice. Payment requests shall not be submitted more frequently than monthly.
 3. Payment by ASSOCIATION: ASSOCIATION shall pay CONTRACTOR'S invoice within thirty (30) days of QA/QC verification (via on-site meeting or reviewing spreadsheets via email) by the ASSOCIATION.
 4. Reimbursement by CONTRACTOR: The ASSOCIATION shall not be required to pay CONTRACTOR for any unreportable or invalid data that does not meet the requirements of this CONTRACT. In the event of a disputed or contested billing, only that portion so contested will be withheld from payment, and the undisputed portion will be paid. In the event the ASSOCIATION has paid for monitoring services and data that are later determined to be unreportable or invalid, the CONTRACTOR shall promptly reimburse the ASSOCIATION for the cost of said monitoring. In such an event, the party discovering such invalid data shall promptly notify the other party of such unreportable or invalid data, and the CONTRACTOR shall reimburse the ASSOCIATION within 30 days of such notification.

SECTION IV. LIABILITY AND INDEMNIFICATION

1. Indemnification by CONTRACTOR: CONTRACTOR agrees to indemnify ASSOCIATION from any claims, damages, losses, and costs, including, but not limited to, reasonable attorney's fees and litigation costs, arising out of claims by third parties for property damage and bodily injury, including death, caused by the negligence or willful misconduct of the CONTRACTOR, CONTRACTOR'S employees, affiliated corporations, officers, agents and subcontractors in connection with the CONTRACT.
2. Indemnification by ASSOCIATION: ASSOCIATION agrees to indemnify CONTRACTOR from any claims, damages, losses, and costs, including, but not limited to, reasonable attorney's fees and litigation costs, arising out of claims by third parties for property damage and bodily injury, including death to the proportionate extent, caused by the negligence or willful misconduct of the ASSOCIATION, the ASSOCIATION'S employees, or agents in connection with the CONTRACT.
3. Proportionate Indemnification: If the negligence or willful misconduct of both ASSOCIATION and CONTRACTOR (or a person identified above for whom each is liable) is a cause of such damage or injury, the loss, cost, or expense shall be shared between the ASSOCIATION and CONTRACTOR in proportion to their relative degrees of negligence or willful misconduct and the right of indemnity shall apply for such proportion.

SECTION V. COMPLIANCE WITH LAWS

CONTRACTOR agrees that in performing the required services, CONTRACTOR will comply with applicable regulatory requirements including federal, state and local laws, rules, regulations, orders, codes, criteria and standards.

SECTION VI. CONTRACTOR'S INSURANCE

During the performance of this CONTRACT, the CONTRACTOR shall maintain the following insurance:

- a. Comprehensive General Liability Insurance with bodily injury limits of not less than \$1,000,000 for each occurrence and not less than \$1,000,000 in the aggregate, and with property damage limits of not less than \$100,000 for each occurrence and not less than \$1,000,000 in the aggregate.
- b. Automobile Liability Insurance with a combined single limit of not less than \$1,000,000 for each accident.
- c. Worker's Compensation Insurance in accordance with statutory requirements and Employers' Liability Insurance with limits of not less than \$100,000 for each accident.
- d. Professional Liability Insurance with limits of not less than \$1,000,000 annual aggregate.
- e. The CONTRACTOR shall name the ASSOCIATION as an additional insured on the policy.

SECTION VII. ASSOCIATION'S RESPONSIBILITIES

The ASSOCIATION shall be responsible for the following:

- a. Approve all procedures established to govern the relationship among the ASSOCIATION, CONTRACTOR, and third parties.
- b. Provide designated personnel to represent the ASSOCIATION in matters involving the CONTRACTOR.
- c. Payment of invoices for services in accordance with Section III.

SECTION VIII. TERMINATION OF CONTRACT FOR CAUSE

In the event of failure by the CONTRACTOR to perform in accordance with the terms of this CONTRACT, ASSOCIATION shall have the right to terminate the CONTRACT upon 14 days written notice to the CONTRACTOR, in which event CONTRACTOR shall have neither the obligation nor the right to perform further services under this CONTRACT.

SECTION IX. UNCONTROLLABLE FORCES

Neither CONTRACTOR nor the ASSOCIATION shall be considered to be in default of the provisions of this CONTRACT if delays in or failure of performance shall be due to uncontrollable forces. The term "uncontrollable forces" shall mean any event that results in the prevention or delay of performance by a party, and that is beyond the control of the non-performing party. The term "uncontrollable forces" includes, but is not limited to, fire, acts of God, flood, earthquakes, major storms, lightning, epidemic, war, riot, and civil disturbance.

SECTION X. GOVERNING LAW

The laws of the State of North Carolina shall govern this CONTRACT.

SECTION XI. ASSIGNMENT

The CONTRACTOR shall not assign, sublet or transfer any rights under or interest in this CONTRACT, including monies that are or may become due. Provided, however, for a period of 90 days from the initial date of this CONTRACT and upon written notice to the ASSOCIATION, CONTRACTOR may assign and transfer any rights under or interest in this Contract, including monies that are or may become due, to a purchaser of substantially all of the assets of CONTRACTOR without the prior consent, written or oral, of the OWNER. Nothing contained in this paragraph shall prevent the CONTRACTOR from employing such independent consultants, associates or subcontractors, as it may deem appropriate to assist the CONTRACTOR in the performance of the services rendered.

Upper Cape Fear River Basin Association

By: Charles Cocker
Charles Cocker, UCFRBA Chairman

Date: JULY 29, 2021

ATTEST

Trace Merritt
Secretary

Meritech, Inc

By: David Merritt
David Merritt, Vice President Meritech, Inc

Date: 7/29/2021

ATTEST

[Signature]