Upper Cape Fear River Basin Association (UCFRBA)

UCFRBA 2021 Annual Report

Prepared for NC Division of Water Resources

Submitted: April 2022

Submitted by:

Grace Messinger
Water Resources Planner
Piedmont Triad Regional Council
1398 Carrollton Crossing Dr.
Kernersville, NC 27284

Maya Cough-Schulze
Water Resources Planner
Triangle J Council of Governments
4307 Emperor Blvd, Suite 110
Durham, NC 27703

UCFRBA 2021 Annual Report

Table of Contents

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 19 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.

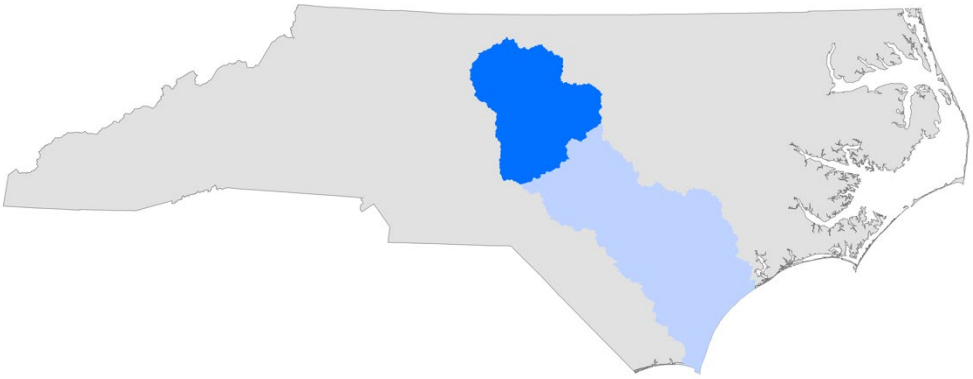


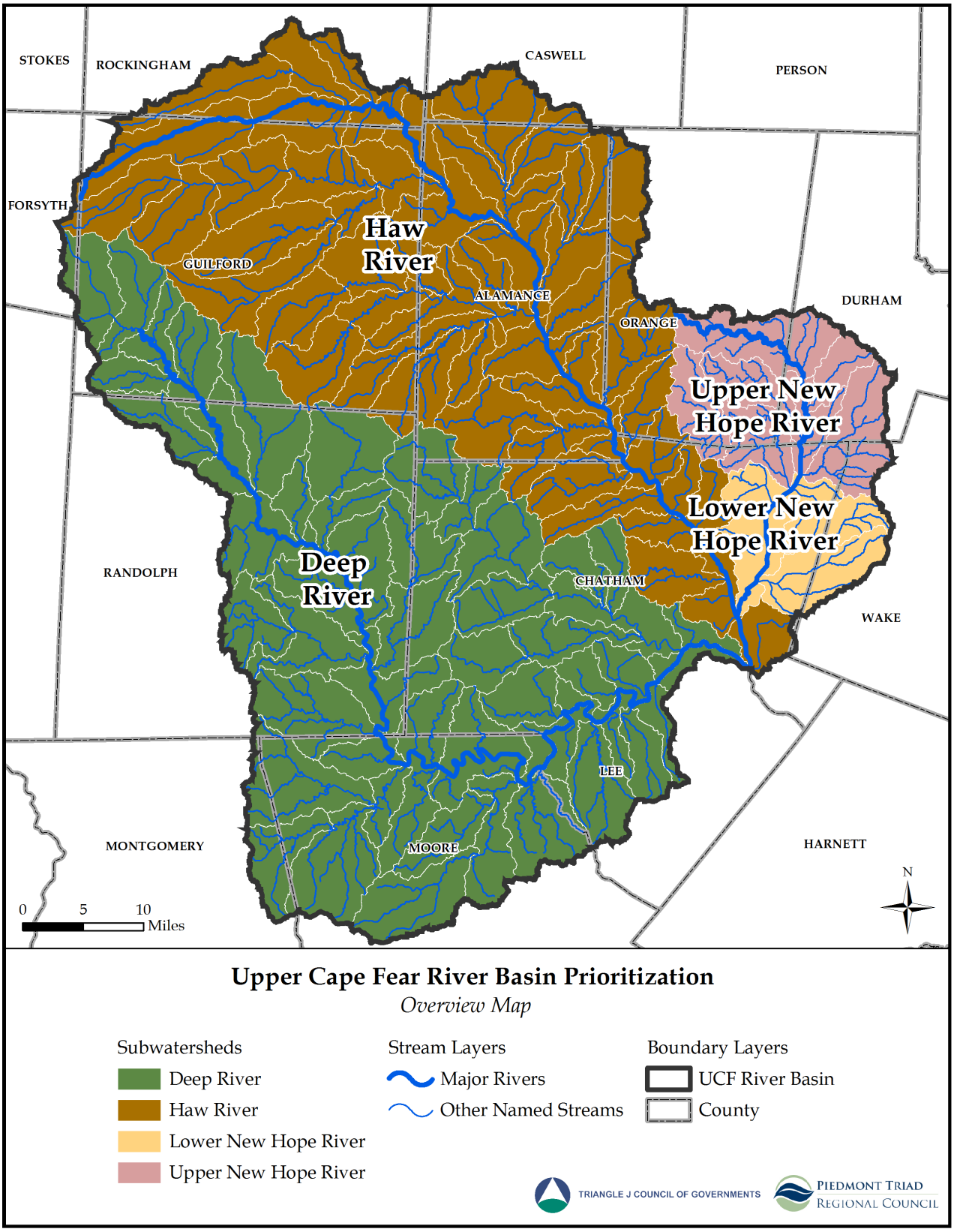
Figure 1: Upper Cape Fear River Basin

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 are 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.

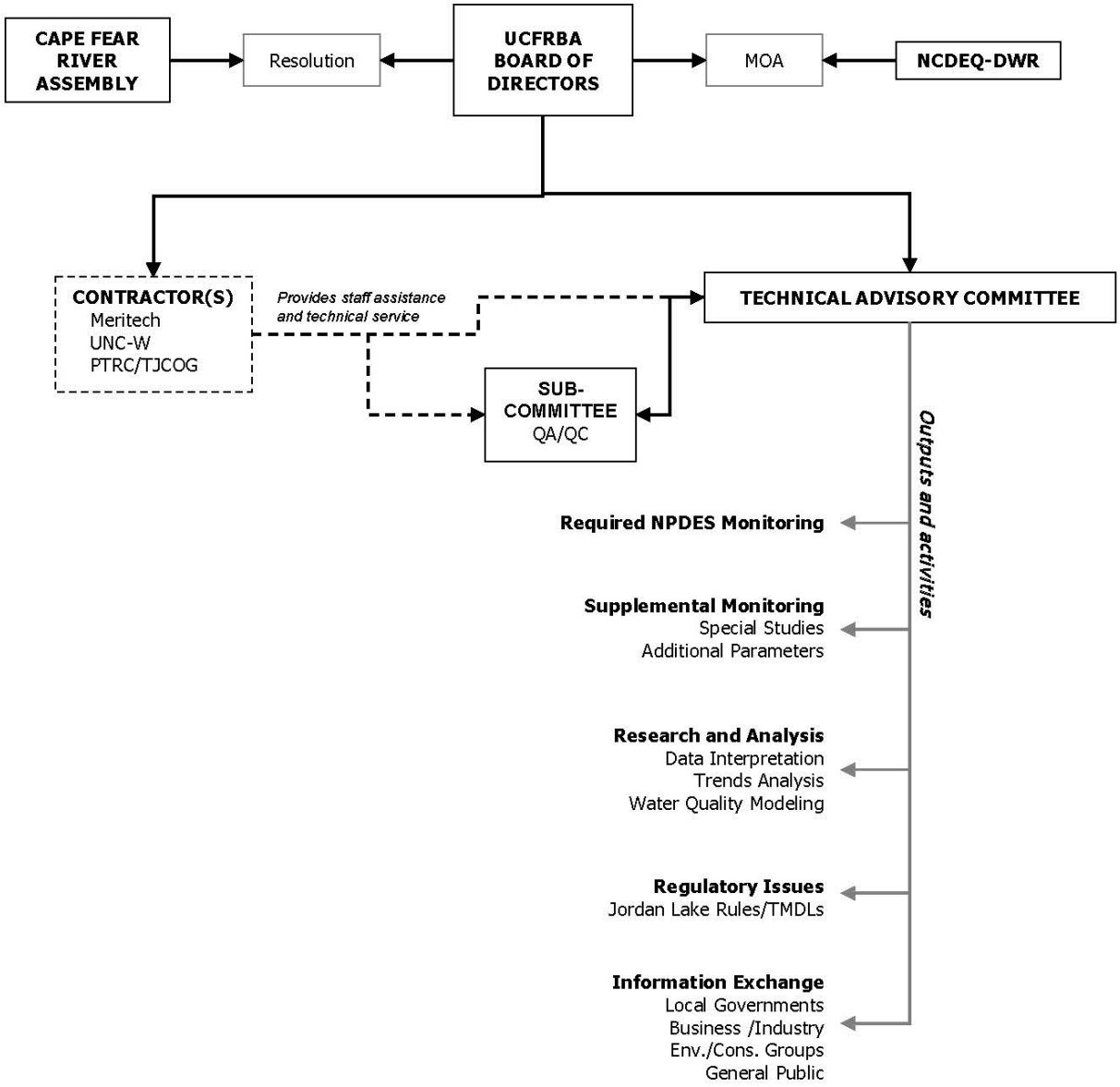
In addition to its monitoring program, the UCFRBA provides an ongoing forum for interested parties to work together on water resource planning, management and protection issues of mutual concern in the Jordan Lake watershed (including the Haw River and New Hope Creek subwatersheds), the Deep River watershed, and the Rocky River watershed in the uppermost part of the Cape Fear River Basin. The UCFRBA has undertaken several specials 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 calendar year 2021. 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 19 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.

Corporate Members	Discharger	Public Water System	Representatives		NPDES Permit Number(s)
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	Sarah Braman		None
Chatham Park	Yes	Yes	Tim Smith	Robin Rose	NC0020354
City of Durham	Yes	Yes	Charlie Cocker	Vicki Westbrook	NC0047597
Graham	Yes	Yes	Tonya Mann	Cris Routh	NC0021211
Greensboro	Yes	Yes	Elijah Williams	Martie Groome	NC0047384
High Point	Yes	Yes	Terry Houk	Derrick Boone	NC0024210
Mebane	Yes	Yes	Dennis Hodge	Chris Rollins	NC0021474
OWASA	Yes	Yes	Jennifer Hunter	Wil Lawson	NC0025241
Pilgrim's Pride	Yes	No	Tina Pedley		NC0072575, NCG590000
Pittsboro	Yes	Yes	Kent Jackson	Chris Kennedy	NC0020354
Ramseur	Yes	Yes	Terry Lewallen	Vicki Caudle	NC0026565
Randleman	Yes	Yes	Michael Glass	William Johnson	NC0025445
Reidsville	Yes	Yes	Jerry Rothcock	Scott Bryan	NC0024881
Sanford	Yes	Yes	Scott Siletzky	Victor Czar	NC0024147
Siler City	Yes	Yes	Roy Lynch	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 officer elections occurred in 2020.

Officers of the Board of Directors

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

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:

Alicia Goots	*City of Greensboro*
Dawn Molnar, QA/QC Chair	*City of High Point*
Elaine Sellars	*City of High Point*
Martie Groome	*City of Greensboro*
Amy Varinoski	*City of Mebane*
Jennifer Hunter	*OWASA*
Amanda Hancock	*Meritech, Inc.*
Grace Messinger, Staff Support	*PTRC*

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

Grace Messinger
Piedmont Triad Regional Council
gmessinger@ptrc.org
(336) 904-0300

Maya Cough-Schulze
Triangle J Council of Governments
mcough-schulze@tjcog.org
(919) 558-9389

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 have 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 UNC-Wilmington 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	Lattitude (dd.dddd)	Longitude (dd.dddd)	County	Stream Class	Stream Index	[1]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	
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	
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	
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	
B0480050	N Buffalo Crk at N Buffalo Crk WWTP Influent Conduit Pier at Greensboro	ups N. Buffalo WWTP	36.1074	-79.7502	GUILFORD	C, NSW	16-11-14-1	M +2SM	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	
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	
B1020000	Haw Riv at SR 1700 Lower Hopedale Rd at Hopedale	ups Burlington East WWTP	36.1531	-79.4894	ALAMANCE	C, NSW	16-(1)	M +2SM	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	
B1350000	Moadams Crk at Corrigdor Rd nr Mebane	ups Mebane WWTP	36.0885	-79.2844	ALAMANCE	C, NSW	16-18-7	M +2SM	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	
B1440000	Haw Riv at SR 2158 Swepsonville Rd nr Swepsonville	dns Graham WWTP	36.0256	-79.3682	ALAMANCE	C, NSW	16-(1)	M +2SM	M	M	M	M	
B1940000	Big Alamance Crk at NC 87 nr Swepsonville	ups Burlington S. WWTP	36.0242	-79.3943	ALAMANCE	C, NSW	16-19-(4.5)	M +2SM	M	M	M	M	
B2000000	Haw Riv at SR 1005 nr Saxpahaw	Rural area, dns Cane Creek	35.8953	-79.2585	ALAMANCE	C, NSW	16-(1)	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	
B2300000[5]	Robeson Crk at HWY15 in Pittsboro	ups Pittsboro/CPWRC WWTP	35.7155	-78.1791	CHATHAM	WS-IV, NSW	16-38-(3)	M +2SM	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	
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	
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	
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	
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	

B3899180	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 Cumnock	ups Golden Poultry	35.5704	-79.2411	CHATHAM	C	17-(38.7)	M +2SM	M	M	M	M	
B5820000	Deep Riv at US 15 and 501 nr 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	us 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	

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

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

[3] No 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.

[4] The City of Greensboro recently decommissioned its North Buffalo Creek WWTP at this location.
[5]New 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 2021 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 during these difficult times.

2021 UCFRBA Organizational Developments

The following are topics that occupied significant UCFRBA staff and members' time in 2021.

Chatham Park Joins UCFRBA

In May 2021, the new Chatham Park Water Recovery Facility (WRC) became a new wastewater discharger in the Upper Cape Fear River Basin. Due to operating a separate facility from Pittsboro despite being co-permittees on the renewal of Pittsboro's NPDEQ Wastewater permit NC0020354, the DWR Coalition Coordinator and NPDES permit writer encouraged Chatham Park to join the UCFRBA, which they did in July 2021 by UCFRBA BOD vote.

New Station to Support Addition of Chatham Park in UCFRBA

In summer 2021, DWR Coalition Coordinator requested the UCFRBA add one of two new monitoring stations to assess the impact of increased wastewater discharge from the new Chatham Park WRC on Robeson Creek because existing UCFRBA monitoring stations would not capture this data. The UCFRBA voted to add one station on Robeson Creek upstream of Chatham Park and Pittsboro's joint discharge point, while DWR committed to establishing a downstream station.

2020-2025 MOA and Meritech Contract Amendments

The MOA between the NCDWR, UCFRBA, and UCFRBA members for 2020-2025 was amended in summer 2021 to include Chatham Park in the UCFRBA and provide for the new associated station. The contract with Meritech was likewise amended to include all costs and parameters to be monitored at the new UCFRBA station on Robeson Creek, B2300000.

Amendment to Bylaws Providing for New Member Joining Protocol

The UCFRBA Bylaws were amended to include the following to further clarify for new members who might want to join in future:

3. Joining the Corporation: Any eligible local government, agency, organization, or business may become a member of the Corporation between July and December annually by signing the Memorandum of Agreement between the UCFRBA and Division of Water Resources, and by paying the current annual membership fees established pursuant to Section 6 of this Article, including costs associated with the addition of any new monitoring stations that may be required in the fiscal year the member joins.

6. Membership Fees: The Board of Directors shall determine the annual Corporation Membership fees which shall be reflected in the annual budget adopted by the Board of Directors. Fees collected from Corporate Members and/or other sources shall be used to fund the monitoring, analysis, research, public education, and other activities of the Corporation as approved by the Board of Directors. Membership fees may be based on population, rates of water withdrawal and/or wastewater discharge, applicability of Corporation projects to the member, the availability of supplemental funding, and other factors the Board of Directors determines appropriate to consider in establishing such fees. Each annual budget shall identify the basis for membership fees applicable to corporate members that are permitted dischargers. The budget shall also identify the basis for membership fees applicable to any corporate members that are not permitted dischargers and do not participate in the water quality monitoring, sampling or analysis performed on behalf of dischargers. If a new monitoring station is proposed, the Board must determine whether data from the monitoring station is relevant to the new member, all members or a subset, with membership fees assessed accordingly.

NPDES Reporting Requirements, Nutrient Removal Technology, & ARPA Wastewater Funding

This year, UCFRBA staff invited guest speakers on a range of topics relevant to wastewater NPDES permitting and regulations, treatment technology, and American Rescue Plan Act (ARPA) funding. In February, NCDEQ-DWR permitting section chief gave high-level insight into UCFRBA members' questions about current and potential NPDES requirements. In April, engineers from Black and Veatch shared information on the latest industry practice in nutrient removal technology to achieve low effluent

nitrogen and phosphorus levels. In October, a speaker form the NC Pandemic Relief Office provided resources about timeline and eligible uses of federal relief funds for wastewater operations.

Officer Elections

The UCFRBA held officer elections in 2020 for the 2020-2022 term. Charlie Cocker (previously Board Vice-Chair) was elected as Board Chair, with Elijah Williams as the Board Vice-Chair. Alicia Goots was elected to continue as the TAC Chair and the TAC Vice-Chair position remains vacant.

UCFRBA Administrative Changes

In March 2021 there was a staff change at PTRC, Cameron Colvin resigned. Starting in June 2021, Grace Messinger replaced Cameron Colvin as UCFRBA Co-Administrator.

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 2021 sampling year:

- August 2021: due to staffing challenges at Meritech, station B3900000 for parameters sampling was not captured.
- August 12, 2021: via communications with Meritech, through lab analysis, high N was noted for station #B5920000
- September 21, 2021: At station #B4920000, a heavy algal bloom was observed; no previous record of an algal bloom at this site this year; information was shared with NCDEQ, a follow-up was conducted; the NCDWR-DEQ Algal Bloom Response Coordinator was notified, a sample was collected and analyzed at the State lab, very low concentrations of cyanobacteria, diatoms and green algae were identified in the sample, this is not indictive of a bloom, weather conditions during follow-up sampling were noted as a misting/rain that could have flushed the area

APPENDIX A: UCFRBA Station Summaries

01/01/2021-12/31/2021 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	6.3	30.20	18.53	20.15	8.88
pH(su)	12	0	6~9	0	6.73	7.09	6.90	6.90	0.11
Diss. Oxy.(mg/L)	12	0	4	0	5.19	11.54	7.99	7.97	2.37
Conductivity(umhos/cm)	12	0	NA	0	54	102.00	69.17	70.50	12.80
Fecal Coliform(col/100ml)	12	0	400	0	1	300.00	22.06	26.00	83.60
Lab Turbidity(NTU)	12	0	50	0	3.30	32.70	12.62	5.75	11.31
TSS(mg/L)	12	3	NA	0	2.50	10.00	5.18	4.50	2.52
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.08	0.03	0.02	0.02
TKN-N(mg/L)	12	0	NA	0	0.36	1.87	0.68	0.58	0.42
NO2-NO3(mg/L)	12	0	NA	0	0.05	0.43	0.23	0.20	0.13
T. Phos.(mg/L)	12	2	NA	0	0.02	0.04	0.03	0.02	0.01
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.

01/01/2021-12/31/2021 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	4.70	27.50	18.78	21.40	8.14
pH(su)	17	0	6~9	0	6.60	7.07	6.91	6.89	0.12
Diss. Oxy.(mg/L)	17	0	4	0	5.36	11.72	7.69	6.59	2.10
Conductivity(umhos/cm)	17	0	NA	0	47.00	122.00	98.47	104.00	20.81
Fecal Coliform(col/100ml)	12	0	400	0	38.00	1800.00	102.09	97.00	495.87
Lab Turbidity(NTU)	12	0	50	1	7.50	81.30	21.23	13.70	20.28
TSS(mg/L)	12	1	NA	0	2.60	34.00	9.80	8.00	8.57
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	1	NA	0	0.20	0.71	0.50	0.52	0.15
NO2-NO3(mg/L)	12	0	NA	0	0.07	0.32	0.19	0.20	0.19
T. Phos.(mg/L)	12	2	NA	0	0.02	0.11	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.

01/01/2021-12/31/2021 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	4.90	26.80	17.56	20.30	7.98
pH(su)	17	0	6~9	0	6.58	7.31	7.01	7.07	0.20
Diss. Oxy.(mg/L)	17	0	4	0	6.31	11.69	8.32	7.01	2.09
Conductivity(umhos/cm)	17	0	NA	0	53.00	205.00	123.22	116.50	39.66
Fecal Coliform(col/100ml)	12	0	400	0	26.00	676.00	103.29	67.00	209.49
Lab Turbidity(NTU)	1	0	50	1	5.30	117.00	20.80	14.80	29.53
TSS(mg/L)	12	1	NA	0	2.80	67.00	10.22	5.00	17.39
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	9	NA	0	0.02	0.21	0.04	0.02	0.06
TKN-N(mg/L)	12	0	NA	0	0.20	0.80	0.54	0.59	0.16
NO2-NO3(mg/L)	12	0	NA	0	0.27	0.59	0.39	0.43	0.10
T. Phos.(mg/L)	12	0	NA	0	0.02	0.13	0.05	0.04	0.04
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.

01/01/2021-12/31/2021 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	5.80	26.60	17.03	18.50	8.69
pH(su)	12	0	6~9	0	6.64	7.29	7.02	7.07	0.18
Diss. Oxy.(mg/L)	12	0	4	0	6.81	11.47	8.86	8.57	1.77
Conductivity(umhos/cm)	12	0	NA	0	82.00	122.00	97.92	98.50	13.43
Fecal Coliform(col/100ml)	12	0	400	0	10.00	650.00	58.95	49.00	2.55
Lab Turbidity(NTU)	12	0	50	0	2.10	18.20	7.72	5.50	5.82
TSS(mg/L)	12	4	NA	0	2.50	10.00	4.59	4.00	2.55
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	0	NA	0	0.02	0.02	0.02	0.02	0.02
TKN-N(mg/L)	12	1	NA	0	0.20	0.20	0.20	0.20	0.20
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.02	0.02	0.02	0.02
T. Phos.(mg/L)	12	2	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.

01/01/2021-12/31/2021 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	6.10	28.20	19.75	22.30	7.93
pH(su)	17	0	6~9	0	6.58	7.69	7.25	7.21	0.19
Diss. Oxy.(mg/L)	17	0	4	0	5.88	11.20	8.13	7.11	1.87
Conductivity(umhos/cm)	17	0	NA	0	98.00	281.00	201.35	185.00	63.23
Fecal Coliform(col/100ml)	12	0	400		20.00	6800.00	799.36	1400.00	2287.20
Lab Turbidity(NTU)	12	0	50	1	2.60	58.10	10.36	4.10	15.56
TSS(mg/L)	12	4	NA	0	2.50	59.00	8.46	3.00	16.08
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	1	NA	0	0.20	1.06	0.52	0.49	0.28
NO2-NO3(mg/L)	12	0	NA	0	0.02	6800.00	0.35	0.30	0.18
T. Phos.(mg/L)	12	0	NA	0	0.02	0.14	0.06	0.05	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.

01/01/2021-12/31/2021 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	5.10	27.50	19.13	21.80	7.79
pH(su)	17	0	6~9	0	7.02	8.34	7.33	7.24	7.02
Diss. Oxy.(mg/L)	17	0	4	0	6.77	12.87	8.66	7.53	2.17
Conductivity(umhos/cm)	17	0	NA	0	98.00	277.00	204.94	228.00	54.72
Fecal Coliform(col/100ml)	12	0	400	0	26.00	10400.00	1128.67	138.00	2945.32
Lab Turbidity(NTU)	12	0	50	0	2.20	24.40	9.24	4.95	8.36
TSS(mg/L)	12	7	NA	0	2.50	14.00	4.79	2.55	3.93
Chlorophyll-a(ug/L)	0				0.00				
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	2	NA	0	0.20	0.77	0.43	0.45	0.18
NO2-NO3(mg/L)	12	2	NA	0	0.02	0.67	0.35	0.37	0.22
T. Phos.(mg/L)	12	0	NA	0	0.02	0.11	0.05	0.05	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.

01/01/2021-12/31/2021 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	5.8	28.4	20	21.8	7.81
pH(su)	17	0	6~9	0	6.98	8.03	7.34	7.24	0.30
Diss. Oxy.(mg/L)	17	0	4	0	5.80	11.21	8.45	7.69	1.88
Conductivity(umhos/cm)	17	0	NA	0	121.00	326.00	223.59	203.00	69.81
Fecal Coliform(col/100ml)	12	0	400	0	30.00	2000.00	513.83	167.00	725.17
Lab Turbidity(NTU)	12	0	50	1	2.60	77.70	13.12	5.55	21.24
TSS(mg/L)	12	8	NA	0	2.50	95.00	11.80	2.65	26.47
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.21	1.66	0.73	0.67	0.44
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.65	0.29	0.28	0.18
T. Phos.(mg/L)	12	0	NA	0	0.02	0.15	0.05	0.04	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.

01/01/2021-12/31/2021 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	5.5	29.2	19.25	22.10	8.01
pH(su)	17	0	6~9	0	6.92	8.31	7.34	7.31	0.32
Diss. Oxy.(mg/L)	17	0	4	0	6.91	12.13	8.69	7.78	1.83
Conductivity(umhos/cm)	17	0	NA	0	117	696	299	249	168.25
Fecal Coliform(col/100ml)	12	0	400	0	7	1000	168	50	288.27
Lab Turbidity(NTU)	12	0	50	0	4	49	14	9	13.20
TSS(mg/L)	12	2	NA	0	3	83	13	4	22.99
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	7	NA	0	0.02	0	0	0	0.17
TKN-N(mg/L)	12	0	NA	0	0.64	2	1	1	0.28
NO2-NO3(mg/L)	12	0	NA	0	0.15	1	1	1	0.18
T. Phos.(mg/L)	12	0	NA	0	0.038	2	0	0	0.43
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.

01/01/2021-12/31/2021 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	7.1	26.9	18.74	21.40	6.78
pH(su)	17	0	6~9	0	6.64	7.41	7.12	7.16	0.18
Diss. Oxy.(mg/L)	17	0	4	0	6.52	10.93	8.40	8.12	1.51
Conductivity(umhos/cm)	17	0	NA	0	117	224	164.65	170.00	23.85
Fecal Coliform(col/100ml)	12	0	400	0	31	6400	1382.08	435.00	1986.85
Lab Turbidity(NTU)	12	0	50	1	7.8	139	27.98	17.95	36.56
TSS(mg/L)	12	0	NA	0	3	232	27.42	10.00	64.56
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	2	NA	0	0.20	0.97	0.34	0.30	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.45	0.93	0.67	0.66	0.17
T. Phos.(mg/L)	12	1	NA	0	0.02	0.239	0.05	0.02	0.06
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.

01/01/2021-12/31/2021 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		7	27.8	19.78	22.50	7.06
pH(su)	17	0	6~9	0	7.07	7.68	7.44	7.51	0.18
Diss. Oxy.(mg/L)	17	0	4	0	6.49	11.05	8.33	7.27	1.68
Conductivity(umhos/cm)	17	0	NA	0	225	633	411.29	390.00	121.48
Fecal Coliform(col/100ml)	12	0	400	0	30	133	77.25	76.00	38.81
Lab Turbidity(NTU)	12	0	50	0	3.9	39.6	10.01	6.55	9.72
TSS(mg/L)	12	4	NA	0	3	33	6.51	3.50	8.52
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	2.10	0.22	0.02	0.59
TKN-N(mg/L)	12	0	NA	0	0.50	2.55	1.00	0.90	0.56
NO2-NO3(mg/L)	12	0	NA	0	0.68	4.34	1.80	1.45	1.26
T. Phos.(mg/L)	12	0	NA	0	0.158	0.704	0.35	0.31	0.16
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.

01/01/2021-12/31/2021 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	5.3	29.6	19.84	22.70	8.33
pH(su)	17	0	6~9	0	6.83	8.27	7.45	7.43	0.40
Diss. Oxy.(mg/L)	17	0	4	0	6.91	12.08	8.81	8.07	1.95
Conductivity(umhos/cm)	17	0	NA	0	114	547	278.35	250.00	135.75
Fecal Coliform(col/100ml)	12	0	400	0	9	4500	458.67	52.50	1277.67
Lab Turbidity(NTU)	12	0	50	1	2.4	66.9	14.18	6.75	18.40
TSS(mg/L)	12	4	NA	0	3	40	7.76	4.00	10.74
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.32	0.07	0.02	0.11
TKN-N(mg/L)	12	0	NA	0	0.61	1.79	0.93	0.90	0.33
NO2-NO3(mg/L)	12	0	NA	0	0.27	1.16	0.70	0.73	0.23
T. Phos.(mg/L)	12	0	NA	0	0.035	0.816	0.22	0.10	0.26
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.

01/01/2021-12/31/2021 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	5.3	29.5	19.84	23.40	8.35
pH(su)	17	0	6~9	0	6.93	8.06	7.47	7.47	0.33
Diss. Oxy.(mg/L)	17	0	4	0	6.42	12.02	8.66	8.14	1.99
Conductivity(umhos/cm)	17	0	NA	0	115	592	279.65	238.00	142.51
Fecal Coliform(col/100ml)	12	0	400	0	18	800	155.17	64.50	217.66
Lab Turbidity(NTU)	12	0	50	0	2.7	37.5	11.55	6.65	11.21
TSS(mg/L)	12	4	NA	0	3	31	7.41	4.50	8.37
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	9	NA	0	0.02	0.35	0.07	0.02	0.12
TKN-N(mg/L)	12	0	NA	0	0.38	1.24	0.93	0.92	0.25
NO2-NO3(mg/L)	12	0	NA	0	0.28	1.15	0.73	0.70	0.27
T. Phos.(mg/L)	12	0	NA	0	0.026	0.683	0.21	0.09	0.23
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.

01/01/2021-12/31/2021 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	6.1	26.8	18.94	22.10	7.43
pH(su)	17	0	6~9	0	6.73	7.31	7.08	7.11	0.16
Diss. Oxy.(mg/L)	17	0	4	0	5.22	11.53	7.72	7.39	1.93
Conductivity(umhos/cm)	17	0	NA	0	79	172	128.88	128.00	26.93
Fecal Coliform(col/100ml)	12	0	400	0	26	5300	564.00	104.50	1495.24
Lab Turbidity(NTU)	12	0	50	0	2.8	27.6	10.57	9.20	7.23
TSS(mg/L)	12	3	NA	0	3	11	4.88	3.00	2.90
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.20	0.93	0.47	0.48	0.19
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.40	0.21	0.20	0.13
T. Phos.(mg/L)	12	0	NA	0	0.02	0.45	0.07	0.04	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.

01/01/2021-12/31/2021 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	7.4	27.3	16.58	16.25	8.02
pH(su)	12	0	6~9	0	6.5	8.03	7.21	7.16	0.39
Diss. Oxy.(mg/L)	12	0	4	0	5.23	12.23	8.78	8.67	2.41
Conductivity(umhos/cm)	12	0	NA	0	105	400	229.92	189.50	108.47
Fecal Coliform(col/100ml)	12	0	400	0	12	1600	231.50	100.00	443.58
Lab Turbidity(NTU)	12	0	50	0	3.1	67.4	15.21	11.75	17.31
TSS(mg/L)	12	3	NA	0	3	62	12.16	6.00	16.47
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.03	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.57	1.31	0.80	0.74	0.24
NO2-NO3(mg/L)	12	0	NA	0	0.27	0.98	0.60	0.59	0.24
T. Phos.(mg/L)	12	0	NA	0	0.02	0.279	0.13	0.12	0.09
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.

01/01/2021-12/31/2021 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	7.3	30.3	19.94	21.20	8.37
pH(su)	17	0	6~9	0	6.73	8.56	7.56	7.54	0.52
Diss. Oxy.(mg/L)	17	0	4	0	7.01	12.21	9.02	8.33	1.84
Conductivity(umhos/cm)	17	0	NA	0	94	428	218.71	178.00	121.41
Fecal Coliform(col/100ml)	12	0	400	0	11	1000	163.92	50.00	280.81
Lab Turbidity(NTU)	12	0	50	1	2.6	81.7	14.53	8.10	22.10
TSS(mg/L)	12	4	NA	0	3	89	11.76	5.00	24.42
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.40	1.27	0.82	0.75	0.31
NO2-NO3(mg/L)	12	0	NA	0	0.19	1.24	0.54	0.52	0.29
T. Phos.(mg/L)	12	2	NA	0	0.02	0.218	0.09	0.09	0.06
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.

01/01/2021-12/31/2021 Summary Report

Station Id:	Robeson Crk at Pittsboro							
B2300000/UCFRBA_18		**Stream Class**	WS-IV, NSW			**Sub Basin**	CPF04	
County	Chatham	**Latitude**	35.7155	**Longitude**	-78.1791	**HUC**	3030002	

Parameter	**Count**	**< DT**	**WQS**	**#Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature(C)	7	0	32	0	6.5	27.1	20.15	21.40	7.60
pH(su)	7	0	6~9	0	6.55	7	6.87	6.93	0.17
Diss. Oxy.(mg/L)	7	0	4	**3**	3.08	6.13	4.26	3.99	1.16
Conductivity(umhos/cm)	7	0	NA	0	126	160	136.33	134.50	12.21
Fecal Coliform(col/100ml)	5	0	400	0	76	300	163.00	138.00	108.44
Lab Turbidity(NTU)	5	0	50	0	4.2	7.9	5.93	5.80	1.55
TSS(mg/L)	5	**1**	NA	0	3	5	4.00	4.00	0.82
Chlorophyll-a(ug/L)	3	0			4.08	10.9	7.49	7.49	4.82
NH3-N(mg/L)	5	**5**	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	5	0	NA	0	0.53	0.85	0.68	0.66	0.14
NO2-NO3(mg/L)	5	0	NA	0	0.17	0.25	0.20	0.19	0.04
T. Phos.(mg/L)	5	0	NA	0	0.03	0.061	0.04	0.04	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.

01/01/2021-12/31/2021 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	4.5	28.2	17.31	19.65	7.81
pH(su)	17	0	6~9	0	6.64	7.13	6.88	6.86	0.15
Diss. Oxy.(mg/L)	17	0	4	3	2.62	10.96	5.83	5.05	2.49
Conductivity(umhos/cm)	17	0	NA	0	91	209	141.39	142.00	27.89
Fecal Coliform(col/100ml)	12	0	400	0	9	2800	351.69	95.00	780.34
Lab Turbidity(NTU)	12	0	50	1	3.9	55.5	17.73	14.10	13.04
TSS(mg/L)	12	0	NA	0	3	31	9.50	8.00	7.64
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.05	0.02	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.33	1.12	0.53	0.42	0.22
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.28	0.12	0.12	0.08
T. Phos.(mg/L)	12	0	NA	0	0.02	0.088	0.05	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.

** 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.

01/01/2021-12/31/2021 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	5.2	27.4	19.51	22.30	6.60
pH(su)	17	0	6~9	0	6.8	7.41	7.14	7.11	0.18
Diss. Oxy.(mg/L)	17	0	4	0	4.63	11.03	7.34	6.69	1.87
Conductivity(umhos/cm)	17	0	NA	0	110	629	328.82	335.00	140.06
Fecal Coliform(col/100ml)	12	0	400	0	12	5400	544.92	67.00	1532.82
Lab Turbidity(NTU)	12	0	50	1	4.3	98.2	18.92	9.85	26.09
TSS(mg/L)	12	0	NA	0	3	100	15.08	7.50	26.98
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	1	NA	0	0.20	1.25	0.84	0.88	0.30
NO2-NO3(mg/L)	12	0	NA	0	0.46	9.06	4.54	4.84	3.10
T. Phos.(mg/L)	12	0	NA	0	0.04	1.82	0.36	0.14	0.53
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.

01/01/2021-12/31/2021 Summary Report

Station Id:	Northeast Crk at SR 1102 (Sedwick Rd) nr RTP						
B3300000/UCFRBA_21		**Stream Class**	WS-IV NSW			**Sub Basin**	CPF05
County	Chatham	**Latitude**	35.887	**Longitude**	-78.8994	**HUC**	3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	3.3	26.9	17.96	19.90	7.65
pH(su)	17	0	6~9	0	6.72	7.55	7.01	6.97	0.23
Diss. Oxy.(mg/L)	17	0	4	**2**	2.96	11.62	6.43	6.28	2.62
Conductivity(umhos/cm)	17	0	NA	0	94	605	216.76	181.00	117.61
Fecal Coliform(col/100ml)	12	0	400	0	33	18000	2371.42	123.50	5542.34
Lab Turbidity(NTU)	12	0	50	**4**	13.6	136	54.75	34.05	40.90
TSS(mg/L)	12	0	NA	0	5	99	32.17	24.00	32.23
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**9**	NA	0	0.02	0.21	0.04	0.02	0.05
TKN-N(mg/L)	12	0	NA	0	0.31	1.77	0.73	0.65	0.40
NO2-NO3(mg/L)	12	**3**	NA	0	0.02	0.19	0.10	0.12	0.06
T. Phos.(mg/L)	12	0	NA	0	0.03	0.135	0.07	0.06	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.

01/01/2021-12/31/2021 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	5.5	28.7	19.59	22.10	6.82
pH(su)	17	0	6~9	0	6.88	7.61	7.26	7.28	0.23
Diss. Oxy.(mg/L)	17	0	4	0	5.8	11.23	7.84	6.84	1.78
Conductivity(umhos/cm)	17	0	NA	0	142	650	406.76	450.00	170.50
Fecal Coliform(col/100ml)	12	0	400	0	16	14400	1494.00	152.50	4096.65
Lab Turbidity(NTU)	12	0	50	4	8.7	220	40.72	17.50	58.92
TSS(mg/L)	12	0	NA	0	5	149	27.83	15.00	40.15
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.46	1.13	0.81	0.82	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.10	6.09	1.23	0.74	1.61
T. Phos.(mg/L)	12	0	NA	0	0.04	0.841	0.17	0.10	0.22
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.

01/01/2021-12/31/2021 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	4.9	28.1	16.76	17.35	7.89
pH(su)	12	0	6~9	0	6.88	7.26	7.06	7.07	0.13
Diss. Oxy.(mg/L)	12	0	4	0	4.22	11.66	7.86	7.42	2.42
Conductivity(umhos/cm)	12	0	NA	0	68	354	246.75	259.00	84.32
Fecal Coliform(col/100ml)	12	0	400	0	58	13400	2397.75	255.00	4461.42
Lab Turbidity(NTU)	12	0	50	1	5.4	121	23.63	10.70	33.76
TSS(mg/L)	12	2	NA	0	3	127	16.17	4.00	35.51
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.04	0.02	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.20	1.60	0.64	0.57	0.35
NO2-NO3(mg/L)	12	1	NA	0	0.03	0.45	0.23	0.22	0.12
T. Phos.(mg/L)	12	0	NA	0	0.02	0.182	0.11	0.12	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.

01/01/2021-12/31/2021 Summary Report

Station Id:	Morgan Crk at Mason Farm WWTP Entrance at Chapel Hill				
B3899180/UCFRBA_24		**Stream Class**	WS-IV NSW	**Sub Basin**	CPF06
County	Orange	**Latitude**	35.8987	**Longitude** -79.0263	**HUC** 3030002

Parameter	Count	< DT	WQS	#Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature(C)	17	0	32	0	5.3	27.7	18.40	21.00	7.04
pH(su)	17	0	6~9	0	6.51	7.56	7.17	7.21	0.28
Diss. Oxy.(mg/L)	17	0	4	0	6.22	11.63	8.32	7.81	1.72
Conductivity(umhos/cm)	17	0	NA	0	103	570	191.53	147.00	112.31
Fecal Coliform(col/100ml)	12	0	400	0	8	14000	1479.42	177.00	3987.71
Lab Turbidity(NTU)	12	0	50	0	2	18.6	7.18	4.05	6.15
TSS(mg/L)	12	7	NA	0	3	24	5.83	2.70	6.69
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	0	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.20	0.69	0.43	0.46	0.15
NO2-NO3(mg/L)	12	11	NA	0	0.17	0.80	0.45	0.43	0.20
T. Phos.(mg/L)	12	1	NA	0	0.02	0.181	0.05	0.04	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.

01/01/2021-12/31/2021 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)	16	0	32	0	5.6	28.3	19.16	20.65	6.77
pH(su)	16	0	6~9	0	6.79	7.57	7.26	7.31	0.21
Diss. Oxy.(mg/L)	16	0	4	0	6.17	11.61	7.92	7.30	1.77
Conductivity(umhos/cm)	16	0	NA	0	155	624	387.31	365.00	180.31
Fecal Coliform(col/100ml)	12	0	400	0	18	3600	436.92	81.00	1018.82
Lab Turbidity(NTU)	12	0	50	0	2.3	16.3	7.86	5.55	5.17
TSS(mg/L)	12	3	NA	0	3	69	11.23	4.50	18.79
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.10	0.03	0.02	0.02
TKN-N(mg/L)	12	0	NA	0	0.20	0.95	0.55	0.48	0.26
NO2-NO3(mg/L)	12	2	NA	0	0.23	11.90	4.43	3.76	3.58
T. Phos.(mg/L)	12	1	NA	0	0.02	0.369	0.10	0.05	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.

** 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.

01/01/2021-12/31/2021 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	7.8	27.5	19.62	22.80	7.20
pH(su)	17	0	6~9	0	6.71	7.18	6.98	7.01	0.14
Diss. Oxy.(mg/L)	17	0	4	1	3.86	11.22	7.19	6.53	2.17
Conductivity(umhos/cm)	17	0	NA	0	88	236	157.82	162.00	47.08
Fecal Coliform(col/100ml)	12	0	400	0	2	900	95.83	15.00	254.38
Lab Turbidity(NTU)	12	0	50	0	4.4	25.3	11.15	7.25	7.19
TSS(mg/L)	12	0	NA	0	5	13	7.67	7.00	2.61
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	3	NA	0	0.02	0.30	0.08	0.05	0.09
TKN-N(mg/L)	12	0	NA	0	0.54	1.40	0.87	0.81	0.25
NO2-NO3(mg/L)	12	0	NA	0	0.04	0.57	0.26	0.22	0.14
T. Phos.(mg/L)	12	0	NA	0	0.03	0.155	0.06	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.

01/01/2021-12/31/2021 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	8	29.7	17.18	17.70	8.10
pH(su)	12	0	6~9	0	6.85	7.51	7.11	7.08	0.19
Diss. Oxy.(mg/L)	12	0	4	0	6.23	11.07	8.83	8.83	1.87
Conductivity(umhos/cm)	12	0	NA	0	83	236	135.58	115.00	52.72
Fecal Coliform(col/100ml)	12	0	400	0	7	9200	922.67	105.00	2614.11
Lab Turbidity(NTU)	12	0	50	1	2.9	69	21.86	16.40	20.80
TSS(mg/L)	12	4	NA	0	3	130	22.53	11.50	35.50
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.03	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.35	1.64	0.82	0.86	0.39
NO2-NO3(mg/L)	12	0	NA	0	0.17	0.82	0.58	0.67	0.14
T. Phos.(mg/L)	12	0	NA	0	0.04	0.214	0.12	0.12	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.

01/01/2021-12/31/2021 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	6.1	28.6	19.61	21.90	7.52
pH(su)	17	0	6~9	0	6.9	7.85	7.34	7.32	0.28
Diss. Oxy.(mg/L)	17	0	4	0	6.51	11.71	8.91	8.71	1.79
Conductivity(umhos/cm)	17	0	NA	0	71	244	181.59	194.00	46.21
Fecal Coliform(col/100ml)	12	0	400	0	38	4000	609.50	143.00	1155.42
Lab Turbidity(NTU)	12	0	50	0	1.5	35.8	6.63	3.70	9.46
TSS(mg/L)	12	7	NA	0	3	21	4.80	2.85	5.28
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.05	0.02	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.24	0.89	0.50	0.40	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.07	0.63	0.38	0.39	0.15
T. Phos.(mg/L)	12	1	NA	0	0.02	0.059	0.03	0.02	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.

01/01/2021-12/31/2021 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	6.2	30.9	20.51	24.50	8.45
pH(su)	17	0	6~9	0	6.93	7.93	7.22	7.14	0.27
Diss. Oxy.(mg/L)	17	0	4	0	5.69	11.81	7.97	7.54	1.79
Conductivity(umhos/cm)	17	0	NA	0	86	210	131.65	125.00	30.42
Fecal Coliform(col/100ml)	12	0	400	0	2	1600	288.58	45.00	533.65
Lab Turbidity(NTU)	12	0	50	0	3	36	11.02	7.35	9.75
TSS(mg/L)	12	1	NA	0	3	24	9.25	7.00	6.68
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.28	3.52	0.81	0.54	0.88
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.26	0.15	0.17	0.07
T. Phos.(mg/L)	12	2	NA	0	0.02	0.097	0.04	0.03	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.

01/01/2021-12/31/2021 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	6.7	26.4	16.21	17.85	6.74
pH(su)	12	0	6~9	0	6.64	7.34	7.03	6.97	0.20
Diss. Oxy.(mg/L)	12	0	4	1	3.58	11.22	8.39	8.50	2.25
Conductivity(umhos/cm)	12	0	NA	0	70	263	162.75	168.00	51.63
Fecal Coliform(col/100ml)	12	0	400	0	28	800	249.08	119.00	242.37
Lab Turbidity(NTU)	12	0	50	0	1.5	34.9	7.53	4.45	9.09
TSS(mg/L)	12	8	NA	0	3	19	4.19	2.60	4.72
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	1	NA	0	0.20	0.67	0.41	0.39	0.15
NO2-NO3(mg/L)	12	0	NA	0	0.09	0.63	0.32	0.27	0.17
T. Phos.(mg/L)	12	0	NA	0	0.02	0.062	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.

01/01/2021-12/31/2021 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	5.3	24.7	16.54	17.45	6.16
pH(su)	12	0	6~9	0	6.79	7.31	7.11	7.18	0.18
Diss. Oxy.(mg/L)	12	0	4	0	7.03	12.33	8.89	8.45	1.80
Conductivity(umhos/cm)	12	0	NA	0	61	140	116.50	124.00	22.55
Fecal Coliform(col/100ml)	12	0	400	0	143	4600	650.17	277.50	1251.80
Lab Turbidity(NTU)	12	0	50	0	2.9	39.6	10.93	6.95	10.87
TSS(mg/L)	12	7	NA	0	3	20	5.05	2.55	5.57
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	2	NA	0	0.20	1.25	0.57	0.58	0.30
NO2-NO3(mg/L)	12	0	NA	0	0.03	0.40	0.20	0.21	0.12
T. Phos.(mg/L)	12	2	NA	0	0.02	0.056	0.03	0.02	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.

01/01/2021-12/31/2021 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	7.3	28.9	20.50	22.00	7.46
pH(su)	17	0	6~9	0	6.89	7.43	7.20	7.22	0.15
Diss. Oxy.(mg/L)	17	0	4	0	6.39	11.63	8.38	7.82	1.59
Conductivity(umhos/cm)	17	0	NA	0	112	156	134.88	130.00	17.52
Fecal Coliform(col/100ml)	12	0	400	0	12	133	46.83	28.00	40.26
Lab Turbidity(NTU)	12	0	50	0	3.6	11.5	6.04	5.40	2.11
TSS(mg/L)	12	**0**	NA	0	3	10	5.33	4.50	2.19
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**10**	NA	0	0.02	0.14	0.03	0.02	0.03
TKN-N(mg/L)	12	0	NA	0	0.24	0.91	0.55	0.60	0.20
NO2-NO3(mg/L)	12	0	NA	0	0.04	0.58	0.19	0.14	0.18
T. Phos.(mg/L)	12	**2**	NA	0	0.02	0.042	0.03	0.02	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.

01/01/2021-12/31/2021 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	7.3	29.8	21.04	24.80	7.52
pH(su)	17	0	6~9	0	6.99	7.56	7.30	7.34	0.16
Diss. Oxy.(mg/L)	17	0	4	0	6.54	11.81	8.56	8.01	1.60
Conductivity(umhos/cm)	17	0	NA	0	104	167	135.82	129.00	20.85
Fecal Coliform(col/100ml)	12	0	400	0	19	470	119.00	46.00	149.00
Lab Turbidity(NTU)	12	0	50	0	3.3	13.7	7.53	7.05	3.51
TSS(mg/L)	12	**2**	NA	0	3	11	5.61	4.50	2.93
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**10**	NA	0	0.02	0.04	0.02	0.02	0.01
TKN-N(mg/L)	12	0	NA	0	0.24	1.01	0.60	0.56	0.20
NO2-NO3(mg/L)	12	0	NA	0	0.14	0.50	0.30	0.30	0.12
T. Phos.(mg/L)	12	0	NA	0	0.04	0.228	0.09	0.08	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.

01/01/2021-12/31/2021 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	6.7	30.3	21.26	25.40	8.07
pH(su)	17	0	6~9	0	7.01	9.24	7.48	7.31	0.56
Diss. Oxy.(mg/L)	17	0	4	0	6.83	12.09	8.97	8.61	1.72
Conductivity(umhos/cm)	17	0	NA	0	112	271	169.59	159.00	44.99
Fecal Coliform(col/100ml)	12	0	400	0	23	280	107.00	76.00	85.79
Lab Turbidity(NTU)	12	0	50	0	5.1	15.2	8.69	8.15	2.91
TSS(mg/L)	12	0	NA	0	3	12	6.50	6.00	2.32
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.33	1.04	0.70	0.74	0.21
NO2-NO3(mg/L)	12	0	NA	0	0.34	1.88	0.95	0.89	0.49
T. Phos.(mg/L)	12	0	NA	0	0.04	0.154	0.08	0.07	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.

01/01/2021-12/31/2021 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	6.4	29.9	21.14	25.60	7.96
pH(su)	17	0	6~9	0	7.03	8.81	7.35	7.14	0.45
Diss. Oxy.(mg/L)	17	0	4	0	6.11	12.21	8.56	8.62	1.88
Conductivity(umhos/cm)	17	0	NA	0	103	264	163.88	151.00	49.71
Fecal Coliform(col/100ml)	12	0	400	0	6	1800	196.08	33.50	507.39
Lab Turbidity(NTU)	12	0	50	0	3.3	28.6	8.92	5.55	7.19
TSS(mg/L)	12	4	NA	0	3	20	5.79	3.50	5.03
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.42	1.06	0.68	0.64	0.18
NO2-NO3(mg/L)	12	0	NA	0	0.56	1.54	0.89	0.75	0.33
T. Phos.(mg/L)	12	0	NA	0	0.05	0.08	0.06	0.05	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.

01/01/2021-12/31/2021 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	6.5	29.5	21.09	25.50	7.95
pH(su)	17	0	6~9	0	6.91	8.84	7.32	7.14	0.46
Diss. Oxy.(mg/L)	17	0	4	0	6.09	12.14	8.39	8.30	1.83
Conductivity(umhos/cm)	17	0	NA	0	104	289	166.12	158.00	50.08
Fecal Coliform(col/100ml)	12	0	400	0	17	1200	170.58	55.00	333.98
Lab Turbidity(NTU)	12	0	50	0	3.1	29.5	9.83	8.50	7.14
TSS(mg/L)	12	2	NA	0	3	24	7.33	7.00	5.89
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	11	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.42	2.05	0.80	0.72	0.44
NO2-NO3(mg/L)	12	0	NA	0	0.15	1.05	0.67	0.65	0.22
T. Phos.(mg/L)	12	0	NA	0	0.04	0.092	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.

** 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.

01/01/2021-12/31/2021 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	5.5	26.8	17.78	18.70	6.16
pH(su)	17	0	6~9	0	6.21	7.13	6.87	6.87	0.21
Diss. Oxy.(mg/L)	17	0	4	0	5.67	11.03	7.52	6.62	1.91
Conductivity(umhos/cm)	17	0	NA	0	94	273	178.53	179.00	46.19
Fecal Coliform(col/100ml)	12	0	400	0	105	4000	1333.92	1200.00	1139.09
Lab Turbidity(NTU)	12	0	50	0	3	37.9	11.69	8.05	10.92
TSS(mg/L)	12	4	NA	0	3	21	6.28	4.50	5.41
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.02	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.41	1.49	0.75	0.60	0.35
NO2-NO3(mg/L)	12	0	NA	0	0.34	8.50	3.32	2.32	3.10
T. Phos.(mg/L)	12	0	NA	0	0.02	1.03	0.36	0.35	0.31
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.

01/01/2021-12/31/2021 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	7.8	29.3	20.01	21.80	8.28
pH(su)	17	0	6~9	0	6.26	7.22	6.88	6.91	0.22
Diss. Oxy.(mg/L)	17	0	4	0	4.51	11.73	7.40	6.24	2.33
Conductivity(umhos/cm)	17	0	NA	0	70	183	114.71	103.00	32.35
Fecal Coliform(col/100ml)	12	0	400	0	21	4000	455.92	56.50	1127.56
Lab Turbidity(NTU)	12	0	50	0	2.9	61	19.88	14.85	17.86
TSS(mg/L)	12	2	NA	0	3	59	17.75	9.00	19.95
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	10	NA	0	0.02	0.03	0.02	0.02	0.00
TKN-N(mg/L)	12	0	NA	0	0.38	1.25	0.74	0.61	0.31
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.86	0.52	0.61	0.29
T. Phos.(mg/L)	12	2	NA	0	0.02	0.215	0.09	0.09	0.06
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.

01/01/2021-12/31/2021 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	7.8	29.4	20.04	21.00	8.22
pH(su)	17	0	6~9	0	6.31	7.27	6.92	6.94	0.20
Diss. Oxy.(mg/L)	17	0	4	0	4.46	11.33	7.32	6.12	2.27
Conductivity(umhos/cm)	17	0	NA	0	68	212	121.88	110.00	40.48
Fecal Coliform(col/100ml)	12	0	400	0	19	14000	1331.08	72.00	3995.93
Lab Turbidity(NTU)	12	0	50	0	2.8	73.7	21.26	12.75	20.75
TSS(mg/L)	12	3	NA	0	3	89	21.05	9.50	28.62
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	9	NA	0	0.02	0.21	0.04	0.02	0.05
TKN-N(mg/L)	12	0	NA	0	0.46	1.44	0.76	0.73	0.27
NO2-NO3(mg/L)	12	0	NA	0	0.16	0.86	0.57	0.68	0.21
T. Phos.(mg/L)	12	0	NA	0	0.03	0.198	0.11	0.10	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.

01/01/2021-12/31/2021 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	7.1	28.8	19.35	22.90	7.86
pH(su)	17	0	6~9	0	6.68	7.23	6.99	6.98	0.16
Diss. Oxy.(mg/L)	17	0	4	0	4.32	11.71	7.61	6.62	2.62
Conductivity(umhos/cm)	17	0	NA	0	71	116	95.00	95.00	11.97
Fecal Coliform(col/100ml)	12	0	400	0	11	3000	651.00	100.00	1086.54
Lab Turbidity(NTU)	12	0	50	0	2.9	29.6	12.85	11.10	8.94
TSS(mg/L)	12	1	NA	0	3	15	8.13	8.00	3.92
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	8	NA	0	0.02	0.38	0.06	0.02	0.10
TKN-N(mg/L)	12	0	NA	0	0.61	1.61	0.93	0.96	0.31
NO2-NO3(mg/L)	12	1	NA	0	0.02	0.62	0.27	0.25	0.22
T. Phos.(mg/L)	12	0	NA	0	0.03	0.156	0.08	0.08	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.

01/01/2021-12/31/2021 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	7.6	29.1	19.01	21.80	7.54
pH(su)	17	0	6~9	0	6.57	7.28	7.04	7.07	0.19
Diss. Oxy.(mg/L)	17	0	4	1	3.36	11.33	7.56	6.81	2.15
Conductivity(umhos/cm)	17	0	NA	0	93	624	288.41	295.00	163.43
Fecal Coliform(col/100ml)	12	0	400	0	40	3400	557.50	121.50	1006.77
Lab Turbidity(NTU)	12	0	50	0	3.2	35.3	11.83	9.55	9.56
TSS(mg/L)	12	2	NA	0	3	18	8.12	6.50	5.12
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	9	NA	0	0.02	0.49	0.06	0.02	0.14
TKN-N(mg/L)	12	0	NA	0	0.50	1.50	1.10	1.12	0.30
NO2-NO3(mg/L)	12	0	NA	0	0.31	4.47	1.24	0.70	1.32
T. Phos.(mg/L)	12	2	NA	0	0.02	0.126	0.08	0.08	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.

01/01/2021-12/31/2021 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	6.3	25.8	17.39	19.50	6.84
pH(su)	17	0	6~9	0	6.87	7.47	7.15	7.14	0.15
Diss. Oxy.(mg/L)	17	0	4	0	6.26	11.42	8.30	7.84	1.87
Conductivity(umhos/cm)	17	0	NA	0	68	238	161.24	166.00	49.39
Fecal Coliform(col/100ml)	12	0	400	0	48	17600	1889.83	128.50	4983.97
Lab Turbidity(NTU)	12	0	50	**2**	2.3	246	34.97	9.80	68.43
TSS(mg/L)	12	**5**	NA	0	3	343	35.48	4.00	97.15
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.02	0.28	0.04	0.02	0.07
TKN-N(mg/L)	12	**1**	NA	0	0.20	2.30	0.70	0.56	0.56
NO2-NO3(mg/L)	12	0	NA	0	0.26	0.90	0.50	0.48	0.17
T. Phos.(mg/L)	12	**1**	NA	0	0.02	0.442	0.08	0.04	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.

01/01/2021-12/31/2021 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	8.8	29.2	20.57	22.50	6.50
pH(su)	17	0	6~9	0	7.01	7.66	7.40	7.43	0.19
Diss. Oxy.(mg/L)	17	0	4	1	3.77	11.21	7.87	7.73	2.23
Conductivity(umhos/cm)	17	0	NA	0	104	1296	680.47	693.00	343.68
Fecal Coliform(col/100ml)	12	0	400	0	26	16600	1985.50	142.50	4762.01
Lab Turbidity(NTU)	12	0	50	1	1.5	243	28.79	4.60	68.60
TSS(mg/L)	12	3	NA	0	3	358	35.58	4.50	101.70
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	6	NA	0	0.02	8.93	1.91	0.18	3.05
TKN-N(mg/L)	12	0	NA	0	0.87	9.88	3.33	1.68	3.31
NO2-NO3(mg/L)	12	0	NA	0	0.38	10.20	2.94	0.81	3.51
T. Phos.(mg/L)	12	0	NA	0	0.02	0.438	0.09	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.

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

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

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

Town of Cary

Sarah Braman Water Resources Engineer PO Box 8005 Cary, NC 27512-8005 Phone: 919-462-3846 Email: sarah.braman@townofcary.org	Vacant Utility Pretreatment Program Supervisor PO Box 8005 Cary, NC 27512-8005 Phone: (919) 319-4564 Email: maria.vanderloop@townofcary.org

City of Durham

Charlie Cocker Plant Superintendent 6605 Farrington Road Chapel Hill, NC 27517 Phone: 919-560-4386, ext.35532 Fax: Email: charles.cocker@durhamnc.gov	Vicki Westbrook Deputy Director of Water Management 101 City Hall Plaza Durham, NC 27701-3328 Phone: 919-560-4381 Fax: 919-560-4479 Email: vicki.westbrook@durhamnc.gov

City of Graham

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

City of Greensboro

Martie Groome Laboratory and Ind. Waste Section Supervisor PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-433-7229 Fax: 336-373-7720 Email: martie.groome@greensboro-nc.gov	Elijah Williams Waste Reclamation Manager PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-373-4632 Fax: Email: elijah.williams@greensboro-nc.gov

City of High Point

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

City of Mebane

Dennis J. Hodge Wastewater Director 106 E. Washington Street Mebane, NC 27302 Phone: 919-304-9215 Fax: 919-563-1007 Email: dhodge@cityofmebane.com	Chris Rollins City Manager 106 E. Washington Street Mebane, NC 27302 Phone: 919-563-5901 Fax: 919-563-1007 Email: crollins@cityofmebane.com

Orange Water and Sewer Authority

Jennifer Hunter Wastewater Treatment Plant Lab Supervisor 400 Jones Ferry Road Carrboro, NC 27510 Phone: 919-537-4206 Fax: Email: jhunter@owasa.org	Wil Lawson Interim Wastewater Treatment and Biosolids Recycling Manager 400 Jones Ferry Road Carrboro, NC 27510 Phone: (919) 537-4351 Fax: Email: wlawson@owasa.org

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	Vacant Complex Manager 7401 Statesville Blvd Salisbury, NC 28147 Phone: Fax: Email:

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	Chris Kennedy Town Manager PO Box 759 635 East Street Pittsboro, NC 27312 Phone: 336-708-0425 Fax: 919-542-7109 Email: ckennedy@pittsboronc.gov

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

City of Randleman

Michael Glass WWTP Superintendent 204 South Main Street Randleman, NC 27317	William Johnson City Manager 204 South Main Street Randleman, NC 27317

Phone: 336-498-2254 Fax: 336-498-7503 Email: wwtp@northstate.net	Phone: 336-495-7500 Fax: 336-495-7503 Email: wjohnson@cityofrandleman.com

City of Reidsville

Jerry Rothcock Interim Public Works Director 1100 Vance Street Reidsville, NC 27320 Phone: 336-349-1042 Fax: 336-634-1738 Email: jrothrock@ci.reidsville.nc.us	Scott Bryan City Manager 230 W. Morehead Street Reidsville, NC 27320 Phone: 336-349-1030 Fax: 336-342-3649 Email: sbryan@ci.reidsville.nc.us

City of Sanford

Victor Czar Public Works Director PO Box 3729 Sanford, NC 27330 Phone: 919-777-1118 Fax: 919-774-8179 Email: victor.czar@sanfordnc.net	Scott Siletzky Water Reclamation Administrator PO Box 3729 Sanford, NC 27330 Phone: 919-777-1781 Fax: 919-776-5037 Email: scott.siletzky@sanfordnc.net

Town of Siler City

Chris McCorquodale Director of Public Works and Utilities PO Box 769 Siler City, NC 27344-0769 Phone: 919-742-4732 ext 225 Fax: 919-663-3874 Email: cmccorquodale@silercity.org	Roy Lynch Town Manager PO Box 769 Siler City, NC 27344-0769 Phone: 919-742-4731 Fax: 919-663-3874 Email: rlynch@silercity.org

Town of Star

Wesley Brown Sewage Treatment Plant Superintendent PO Box 97 Star, NC 27356 Phone: 910-428-4623 Fax: 910-428-1170 Email: townofstar@gmail.com	Mary O'Brien Mayor PO Box 97 Star, NC 27356 Phone: 910-428-4623 Fax: 910-428-1170 Email: townofstar@gmail.com

APPENDIX C: UCFRBA Technical Advisory Committee

NAME	AGENCY	TITLE	EMAIL
Alicia Goots	Greensboro	Lab Coordinator	alicia.goots@greensboro-nc.gov
Amanda Hancock	Meritech, Inc.	Lab Manager	Amanda.hancock@meritechlabs.com
Amy Varinoski	Greensboro		
Anne Hershey	UNC-Greensboro: Dept. Biology	Distinguished Professor	anne_hershey@uncg.edu
Ben Bani	Burlington	Assistant Water Resources Director	bbani@burlingtonnc.gov
Bernadine Wardlaw	Asheboro	Water Quality Manager	bwardlaw@ci.asheboro.nc.us
Bill Frazier	High Point	Lab Services Manager	bill.frazier@highpointnc.gov
Bob Patterson	Burlington	Water Resources Director	bpatterson@burlingtonnc.gov
Bowman Harvey	Arclin	HSE Coordinator	bowman.harvey@arclin.com
Chris Kennedy	Pittsboro	Town Manager	ckennedy@pittsboronc.gov
Roy Lynch	Siler City	Town Manager	rlynch@silercity.org
Grace Messinger	Piedmont Triad Regional Council	Water Resources Planner	gmessinger@ptrc.org
Charles Cocker	Durham	Superintendent South Durham WRF	charles.cocker@durhamnc.gov
Chris McCorquodale	Siler City	Public Works and Utilities Director	cmccorquodale@silercity.org
Kent Jackson	Pittsboro	Engineering Director	kjackson@pittsboronc.gov
Cris Routh	Graham	ORC & Wastewater Treatment Plant Supervisor	crouth@cityofgraham.com
Danny Shaw	Ramseur	Mayor	shawdr1@hotmail.com
David Phelgar	Greensboro	Monitoring Coordinator – Stormwater	david.phlegar@greensboro-nc.gov
Chris Rollins	Mebane	City Manager	crollins@cityofmebane.com
David Merritt	Meritech, Inc.	Vice President	david.merritt@meritechlabs.com
Dawn Molnar	High Point	Laboratory Supervisor	dawn.molnar@highpointnc.gov
Dennis Hodge	Mebane	Wastewater Director	dhodge@cityofmebane.com
Derrick Boone	High Point	Assistant Public Services Director	derrick.boone@highpointnc.gov
Jennifer Hunter	Orange Water and Sewer Authority	WWTP Laboratory Supervisor	jhunter@owasa.org
Elaine Chiosso	Haw River Assembly	Executive Director	info@hawriver.org
Elaine Sellars	High Point		elaine.sellars@highpointnc.gov
Elijah Williams	Greensboro	Waste Reclamation Manager	elijah.williams@greensboro-nc.gov

Godfrey Uzochukwu	NC A&T	Director Management Institute	uzo@ncat.edu
Janet MacFall	Elon University	Professor of Environmental Studies and Biology	macfallj@elon.edu
John Kent	New Hope Audubon Society		newhopeaudubon@gmail.com
John Ogburn II	Asheboro	City Manager	jogburn@ci.asheboro.nc.us
Kevin Eason	Reidsville	Public Works Director	keason@ci.reidsville.nc.us
Kevin Wood	High Point	Wastewater Plants Manager	kevin.wood@highpointnc.gov
Linda Ehrlick	Spirogyra Diversified Environmental Services	Owner	spirogyra@juno.com
Mark Vander Borgh	DEQ DWR	Senior Environmental Biologist	mark.vanderborgh@ncdenr.gov
Martie Groome	Greensboro	Lab/Industrial Waste Supervisor	Martie.Groome@greensboro-nc.gov
Mary Darr	OWASA	General Manager of Operations	mdarr@owasa.org
Mary Giorgino	USGS		giorgino@usgs.gov
Mary O'Brien	Star	Mayor	townofstar@gmail.com
Maya Cough-Schulze	Triangle J Council of Governments	Water Resources Planner	maya.cough-schulze@tjcog.org
Michael Glass	Randleman	WWTP Superintendent	mglass816@gmail.com
Amy Cameron	Burlington	Stormwater Manager	acameron@burlingtonnc.gov
Michael Rhoney	Asheboro	Director	mrhoney@ci.asheboro.nc.us
Sharon Wagoner	Burlington	Laboratory Services Supervisor	swagoner@burlingtonnc.gov
Michelle Woolfolk	Durham	Water Resources Engineer	michelle.woolfolk@durhamnc.gov
Nick Holcomb	Randleman	City Manager	nholcomb@cityofrandleman.com
Parke Rublee	UNC-Greensboro: Dept. Biology	Professor	rublee@uncg.edu
Patrick Beggs	DEQ DWR	Nonpoint Source Planning	patrick.beggs@ncdenr.gov
Peter Raabe	American Rivers	Conservation Director	praabe@americanrivers.org
Scott Bryan	Reidsville	City Manager	sbryan@ci.reidsville.nc.us
Rich Gannon	DWR – Nonpoint Source Unit	Branch Chief	rich.gannon@ncdenr.gov
Ruth Rouse	Orange Water and Sewer Authority	Planning and Development Manager	RRouse@owasa.org
Ryan Rasmussen	USGS	Triangle Area Water Supply Monitoring	rbrasmus@usgs.gov
Sarah Braman	Cary	Water Resources Engineer	sarah.braman@townofcary.org

Scott Siletzky	Sanford	Wastewater Treatment Plant Superintendent	scott.siletzky@sanfordnc.net
Shelby Smith	Graham	Pretreatment Program	ssmith@cityofgraham.com
Steve Tedder	Tedder Farm Consulting		tedderfarmconsulting@gmail.com
Steve Whalen	UNC-CH Dept. Environ. Science & Eng.	Associate Professor	steve_whalen@unc.edu
Jonathan Baker	Durham	Engineer, Stormwater Quality	jonathan.baker@durhamnc.gov
Terry Houk	High Point		Terry.houk@highpointnc.gov
Tina Pedley	Pilgrim's Pride	Wastewater Lab Tech	Tina.Pedley@pilgrims.com
Todd Taylor	Orange Water and Sewer Authority	Executive Director	ttaylor@owasa.org
Tom Duckwall	Friends of the Deep River/Blue Ridge Environmental Defense League	Coordinator	tomfduckwall@cs.com
Tonya Mann	Graham	Utilities Director	tmann@cityofgraham.com
Vicki Westbrook	Durham	Deputy Director of Water Management	vicki.westbrook@durhamnc.gov
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 impedance 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 Wednesday April 21, 2021

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

Water Quality Standard (WQS) Exceedances January 2021 through March 2021

January 2021 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
21	1/15/2021	Turbidity	77.3	50 NTU
45	1/26/2021	Turbidity	56.2	50 NTU

February 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
2	2/16/2021	Turbidity	81.3	50 NTU
3	2/16/2021	Turbidity	117	50 NTU
5	2/22/2021	Turbidity	58.1	50 NTU
7	2/22/2021	Turbidity	77.7	50 NTU
10	2/22/2021	Turbidity	139	50 NTU
21	2/4/2021	Turbidity	96.0	50 NTU
22	2/4/2021	Turbidity	50.6	50 NTU

March 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**

N/A	N/A	N/A	N/A	N/A

January 2021 through March 2021 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Total Phosphorus	1	2/16/2021	.038	.036
Total Phosphorus	1	3/15/2021	.043	.042
Fecal	31	1/25/2021	20	28
Fecal	19	2/4/2021	133	124
Ammonia	46	2/10/2021	6.90	6.85
D.O.	5	3/8/2021	11.3	11.2
pH	7	3/29/21	7.6	7.0

OTHER ISSUES AND COMMENTS
N/A

Revision Date: April 21, 2021

Upper Cape Fear River Basin Association QA/QC Committee Report

From QA/QC Data Review Meeting of Thursday, August 5, 2021

[Version #2 - Correction 8/5/2021]

1. *Reviewers: Chair: Dawn Molnar (High Point), Alicia Goots (City of Greensboro), Martie Groome (City of Greensboro), Grace Messinger (PTRC)*
2. *1,956 data points reviewed*

Water Quality Standard (WQS) Exceedances April 2021 through June 2021

April 2021 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
16	4/1/2021	Turbidity	67.4 NTU	50 NTU
17	4/1/2021	Turbidity	81.7 NTU	50 NTU

May 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
21	5/21/2021	Dissolved Oxygen	3.4 mg/l	≥ 4.0 mg/l
21	5/21/2021	Turbidity	75.8 NTU	50 NTU

June 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
19	6/23/2021	Turbidity	55.5	50 NTU
20	6/23/2021	Turbidity	98.2	50 NTU
21	6/23/2021	Turbidity	136	50 NTU
22	6/23/2021	Turbidity	220	50 NTU
23	6/23/2021	Turbidity	56.8	50 NTU

Upper Cape Fear Monitoring Data Corrections/Notations April 2021 - June 2021

April 2021 through June 2021 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Time	22	5/7/2021	15:25	15:29
Dissolved Oxygen	34	5/27/2021	8.0 mg/l*	8.6 mg/l
Fecal Coliform	44	6/8/2021	80	77

1. *May not be transcription error - Meritech is reviewing reported value with employee*

OTHER ISSUES AND COMMENTS
None

Revision Date: August 5, 2021

Upper Cape Fear River Basin Association QA/QC Committee Report

From QA/QC Data Review Meeting of Thursday, October 21, 2021

1. *Reviewers: Chair: Dawn Molnar (High Point), Alicia Goots (City of Greensboro), Martie Groome (City of Greensboro), Grace Messinger (PTRC)*

Water Quality Standard (WQS) Exceedances July 2021 through September 2021

July 2021 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
19	7/30/2021	Dissolved Oxygen	3.1 mg/l	≥ 4.0 mg/l
21	7/30/2021	Dissolved Oxygen	3.8 mg/l	≥ 4.0 mg/l
27	7/8/2021	Turbidity	69.0 NTU	50 NTU
41	7/8/2021	Turbidity	61.0 NYU	50 NTU
42	7/8/2021	Turbidity	73.7 NTU	50 NTU
45	7/8/2021	Turbidity	246 NTU	50 NTU
46	7/8/2021	Turbidity	243 NTU	50 NTU

August 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
18	8/12/2021	Dissolved Oxygen	3.4 mg/l	≥ 4.0 mg/l
18	8/24/2021	Dissolved Oxygen	3.4 mg/l	≥ 4.0 mg/l
19	8/27/2021	Dissolved Oxygen	3.6 mg/l	≥ 4.0 mg/l
19	8/6/2021	Dissolved Oxygen	3.4 mg/l	≥ 4.0 mg/l
26	8/12/2021	Dissolved Oxygen	3.9 mg/l	≥ 4.0 mg/l
31	8/13/2021	Dissolved Oxygen	3.6 mg/l	≥ 4.0 mg/l
44	8/24/2021	Dissolved Oxygen	3.4 mg/l	≥ 4.0 mg/l
46	8/12/2021	Dissolved Oxygen	3.8 mg/l	≥ 4.0 mg/l

12	8/17/2021	Turbidity	66.9 NTU	50 NTU
22	8/27/2021	Turbidity	61.0 NTU	50 NTU

September 2021 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
18	9/14/2021	Dissolved Oxygen	3.1 mg/l	≥ 4.0 mg/l

Upper Cape Fear Monitoring Data Corrections/Notations July 2021 – Sept 2021

July 2021 through September 2021 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
NONE!				

NOTE: Almost 2000 data points were reviewed and not a single error was found! Great job by the Meritech Laboratory!

OTHER ISSUES AND COMMENTS
Observation: Sites 45 and 46 had noticeably higher values for several parameters during this quarter: Fecal Coliform (July), Ammonia, TKN and Nitrate/Nitrite (Aug-Sep), TSS (July)

Revision Date: October 21, 2021

Upper Cape Fear River Basin Association QA/QC Committee Report

From QA/QC Data Review Meeting of Wednesday, January 26, 2022

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Martie Groome (City of Greensboro), Alicia Goots (City of Greensboro), Amy Varinoski (City of Greensboro), Grace Messinger (PTRC), Jennifer Hunter (OWASA) [Welcome Jennifer!]

Water Quality Standard (WQS) Exceedances October 2021 through December 2021

October 2021 Upper Cape Fear Monitoring Data				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
None Noted				

November 2021 Upper Cape Fear Monitoring Data				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
None Noted				

December 2021 Upper Cape Fear Monitoring Data				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
None Noted				

Upper Cape Fear River Basin Association QA/QC Committee Report

From QA/QC Data Review Meeting of Wednesday, January 26, 2022

October 2021 through December 2021 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Turbidity	19	12/3/21	2.1	12.1
Fecal Coliform	25	10/4/21	95	105
Fecal Coliform	7	11/22/21	94	95
Fecal Coliform	17	11/24/21	11	13

Fecal Coliform	1	12/10/21	17	16
Fecal Coliform	12	12/28/21	8	9
Fecal Coliform	13	12/28/21	17	18
Fecal Coliform	17	12/9/21	10	11
Fecal Coliform	29	12/10/21	3	4
Fecal Coliform	36	12/29/21	17	16
Fecal Coliform	43	12/9/21	10	11

OTHER INFORMATION October 2021 through December 2021
None

Revision Date: January 31, 2022

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

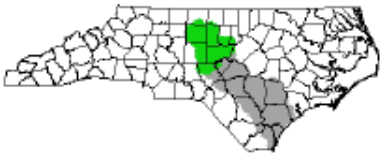
YEARLY CONTRACTS/SERVICES	Start	Deadline	Renewal By:
General Liability Ins (Covington)	8/5/2021	8/5/2022	7/1/2022
Public Officials Liability Ins (Great Amer	8/5/2021	8/5/2022	7/1/2022
Cape Fear River Assembly	7/1/2021	6/30/2022	6/7/2022
UNCW Data Host	10/1/2021	6/30/2022	9/1/2022

Appendix G: Revised MOA with DWR to Include Chatham Park in UCFRBA

Memorandum of Agreement
Among
The State of North Carolina's Division of Water Resources,
The Upper Cape Fear River Basin Association Permittees,
and
The Upper Cape Fear River Basin Association

DWR
Division of Water Resources

Upper Cape Fear River Basin Association



Effective:
May 1, 2020 through April 30, 2025

Amended 8-6-2021

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement (MOA) is entered into this 1st day of May 2020, by and among the NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY'S DIVISION OF WATER RESOURCES (DWR), the NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGERS in the Upper Cape Fear River Basin who have voluntarily executed this MOA (UCFRBA PERMITTEES), and the UPPER CAPE FEAR RIVER BASIN ASSOCIATION (UCFRBA), a non-profit corporation whose members include the UCFRBA PERMITTEES (see Table 1).

WITNESSETH, THAT,

Whereas, the UCFRBA Permittees have instream (e.g., upstream and downstream) monitoring requirements in their respective NPDES permits pursuant to Federal and State law.

Whereas, the DWR has obligations to collect water quality data, which it uses for various purposes, including but not limited to enforcement, regulatory, scientific, and educational purposes.

Whereas, DWR has discretion in determining instream sampling locations in the context of NPDES permitting.

Whereas, the UCFRBA Permittees are willing to combine their resources to provide for a more efficient and effective method for instream monitoring to meet the requirements of their respective NPDES permits.

Whereas, all parties to this MOA benefit from the collection of instream water quality data in the Upper Cape Fear River Basin.

NOW, THEREFORE, in consideration of mutual benefits that will accrue to each party, the parties agree as follows:

Purpose:

- The purpose of this MOA is to:
  1) facilitate the collection of instream water quality data for parameters that are of interest to all parties to this MOA;
  2) facilitate the collection of instream water quality data at preferred sampling locations (i.e., to reduce duplicative sampling locations and to sample at locations that would otherwise not be sampled) which are mutually agreeable to the both parties;
  3) facilitate the collection of instream water quality data at frequencies that provide useful information to all parties to this MOA;
  4) leverage the resources available to the parties of this MOA for instream sampling; and
  5) provide all parties with consistent instream water quality data for the Upper Cape Fear River Basin.

General Provisions:

- This MOA only applies to the collection and submission of instream water quality monitoring data for the parameters, locations, and frequencies identified in Table 2.

- Nothing in this MOA precludes DWR from requesting UCFRBA Permittees or UCFRBA to take additional samples. Similarly, there is nothing in this MOA that precludes UCFRBA Permittees or

UCFRBA to voluntarily conduct and submit sampling data to DWR in addition to what is set forth in Table 2, including hardness and emerging contaminants.

- This MOA does not relieve UCFRBA Permittees from complying with other NPDES permit requirements, including influent and effluent monitoring requirements, or other Federal and State laws, including State water quality standards.

- By signing this MOA, the UCFRBA PERMITTEES authorize the UCFRBA to act as their agent and on their behalf in collecting and submitting instream monitoring data to DWR for the parameters listed in Table 2.

- The UCFRBA PERMITTEES are exempted from instream water quality monitoring for certain parameters *as specified in their individual NPDES permits*. If there is any discrepancy or conflict between this MOA and an UCFRBA Permittee's NPDES permit, the UCFRBA Permittee's NPDES permit shall prevail.

Collection of instream water quality data:

- The UCFRBA and its agents shall perform the collection and analyses of the instream water quality monitoring data for the parameters, locations and frequencies specified in Table 2 of this MOA.

- The UCFRBA will contract for the performance of the monitoring activities with a laboratory appropriately certified by DWR for the required laboratory and field analysis.

- The UCFRBA and its agents shall comply with the requirements and protocols set forth in Tables 3 and 4 located in Appendix A.

Submission of (monthly) instream water quality data to DWR:

- The UCFRBA shall submit the monitoring results to DWR on behalf of UCFRBA PERMITTEES.

- The UCFRBA shall submit the water quality data to the DWR within 90 days of the end of the month in which the sampling was performed to the Coalition Coordinator at coalitioncoordinator@ncdenr.gov.

- The UCFRBA or its agents shall submit the water quality data to the DWR in a format set forth in Table 5 located in Appendix B of this MOA and preferably in Microsoft® Excel.

- The UCFRBA shall archive all data for five (5) years.

- The UCFRBA PERMITTEES may provide comments to DWR on data and work submitted by UCFRBA to DWR.

- Failure by the UCFRBA PERMITTEES or the UCFRBA or their agents to collect or analyze the water quality data as described in this MOA, or to provide data to the DWR in the required format, may result in the termination of this MOA by the DWR and the return to individual upstream and downstream monitoring requirements, as specified in the individual NPDES permits for each of the UCFRBA PERMITTEES.

- Special and/or additional data collected (i.e., hardness) at a designated monitoring station concurrently with the regularly scheduled samples, should be submitted to the Coalition

Coordinator

Annual Report:

- The UCFRBA shall submit an annual written report that summarizes the previous calendar year's sampling activities.

- The UCFRBA shall submit the annual report no later than April 30th each year that this MOA is in effect and shall comply with the requirements set forth in Appendix B.

- The UCFRBA shall submit the annual report to the DWR Coalition Coordinator at 1621 Mail Service Center, Raleigh, NC 27699-1621 or electronically at coalitioncoordinator@ncdenr.gov.

Signatures for all Submissions to DWR:

- The UCFRBA Chair shall sign annual reports submitted to DWR pursuant to this MOA.

Special Circumstances affecting sampling:

- Stream sampling under this MOA may be suspended or discontinued under the following circumstances:
  1) If flow conditions in the receiving waters and/or extreme weather conditions will result in a substantial risk of injury to the person(s) collecting samples; or
  2) If environmental conditions, such as a dry stream, prevent sample collection.

- If sampling is suspended or discontinued for any reason, the UCFRBA shall provide a written explanation to DWR explaining why sampling was not performed. The written explanation shall be submitted to the DWR Coalition Coordinator with UCFRBA's monthly data submittal (electronic submittal is authorized).

- If sampling is suspended or discontinued under the provisions above, UCFRBA shall resume stream sampling as soon as possible.

Modification:

- This MOA may be modified by the written consent of the DWR and the UCFRBA. Either DWR or the UCFRBA may determine that it is necessary to request changes in monitoring frequency, parameters, and/or sampling locations. Any changes to sampling parameters, locations, or frequencies shall be made by a written amendment to this MOA agreed to by the DWR, the UCFRBA PERMITTEES, and the UCFRBA. The amendment shall be signed by the UCFRBA chair and by the DWR Director. Such amendments may be entered into at any time.

New Parties to this MOA:

- The following additional NPDES permit dischargers may enter into this MOA subsequent to the effective date hereof:
  1) Dischargers who receive a NPDES permit within the Upper Cape Fear River Basin, or
  2) Dischargers who have NPDES permits within the Upper Cape Fear River Basin but are not parties to this Agreement.

- The addition of such dischargers to this MOA may be made only with the consent of the DWR, the UCFRBA PERMITTEES, and the UCFRBA and shall require a written amendment to this MOA signed by the UCFRBA chairperson, by the DWR, and by an authorized representative of any such discharger who wishes to enter into the MOA. The DWR will not unreasonably withhold consent

to the addition of a discharger to the MOA. The DWR will consider modification of the existing monitoring program described in this MOA for the addition of a NPDES permit discharger to the MOA. Such amendments may be made at any time that this MOA is in effect. The UCFRBA PERMITTEES included in this MOA are listed in Table 1.

Term:

- This MOA shall be effective upon the signature until April 30, 2025 unless extended by the consent of both the DWR Director and the UCFRBA.

Withdraw/Termination as between DWR and UCFRBA:

- Upon sixty (60) days written notice, the DWR or the UCFRBA may terminate this MOA for any reason. Upon termination of this MOA, the monitoring requirements contained in the individual NPDES permit for each UCFRBA PERMITTEE shall become effective immediately.

Withdraw/Termination as between DWR and individual UCFRBA Permittees:

- An individual permit holder may withdraw and cancel its participation in this MOA by providing sixty (60) days written notice to the UCFRBA, and sixty (60) days written notice to the DWR Coalition Coordinator, the appropriate DWR Regional Office(s), and the DWR Water Quality Permitting Section. The monitoring requirements contained in the individual NPDES permit shall become effective upon the termination date specified in the notice.

- The withdrawal of an individual UCFRBA Permittee shall require a written amendment to this MOA signed by the UCFRBA chair and the DWR Director.

- In the event a UCFRBA NPDES permit holder terminates or cancels its participation in this MOA or its membership in the UCFRBA is terminated for any reason, the UCFRBA may request that DWR review the monitoring plan described in this MOA for a possible reduction in sampling effort and/or requirements.

No limitation on use of the data:

- There are no limitations on DWR's, UCFRBA, or UCFRBA Permittee's use of the data collected under this MOA.

Entire Agreement:

- This MOA constitutes the entire agreement between the parties and supersedes all previous agreements.

Incorporation:

- Appendices A and B are attached to and incorporated into this MOA.

Savings Clause:

- Should any part of this Agreement be declared invalid or unenforceable by a court of competent jurisdiction, invalidation of the affected portion shall not invalidate the remaining portions of the Agreement and they shall remain in full force and effect.

Remedies for Breach:

- The only remedy for breach of this MOA is an action for specific performance or injunction.

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 the DWR.

DIVISION OF WATER RESOURCES

By: *Signature on file*

Danny Smith
Director
Division of Water Resources

Date: 4/27/2020

UPPER CAPE FEAR RIVER BASIN ASSOCIATION

By: *Signature on file*

Michael Rhoney
Chair
Upper Cape Fear River Basin Association

Date: 4/21/2020

Table 1 – UCFRBA Permittees

NPDES Permit Number	UCFRBA Permittees Ownership and Facility	Authorized Representative Signature	Signature Date
NC0000892	Arclin Arclin WWTP	*Signature on file* Mr. Brian Reddy Plant Manager	2-25-2020
NC0020354	Town of Pittsboro Pittsboro WWTP & Chatham Park Investors Chatham Park Water Recovery Center	*Signature on file* Mr. Robert Morgan Interim Town Manager *Signature on file* Tim Smith Vice President	3-23-2020 7-15-2021
NC0021211	City of Graham Graham WWTP	*Signature on file* Ms. Tonya Mann Utilities Director	2-4-2020
NC0021474	City of Mebane Mebane WWTP	*Signature on file* Mr. Dennis Hodge Water Resources Manager	2-4-2020
NC0023868	City of Burlington Burlington East WWTP	*Signature on file* Mr. Bob Patterson Water Resources Director	2-4-2020
NC0023876	City of Burlington Burlington South WWTP	*Signature on file* Mr. Bob Patterson Water Resources Director	2-4-2020
NC0024147	City of Sanford Big Buffalo WWTP	*Signature on file* Mr. Scott Siletzkey Water Reclamation Administrator	2-4-2020
NC0024210	City of High Point East Side WWTP	*Signature on file* Mr. Terry Houk Director of Public Services	3-10-2020

NPDES Permit Number	UCFRBA Permittees Ownership and Facility	Authorized Representative Signature	Signature Date
NC0024881	City of Reidsville Reidsville WWTP	*Signature on file* Mr. Chuck Smith Public Works Director	2-4-2020
NC0025241	Orange Water and Sewer Authority Mason Farm WWTP	*Signature on file* Mr. Ed Kerwin Executive Director	2-18-2020
NC0025445	City of Randleman Randleman WWTP	*Signature on file* Mr. Zack Hewett City Manager	3-10-2020
NC0026123	City of Asheboro Asheboro WWTP	*Signature on file* Mr. Michael Rhoney Water Resources Director	2-4-2020
NC0026441	Town of Siler City Siler City WWTP	*Signature on file* Mr. Roy Lynch Town Manager	3-3-2020
NC0026565	Town of Ramseur Ramseur WWTP	*Signature on file* Ms. Vicki Caudle Mayor	2-4-2020
NC0047384	City of Greensboro T.Z. Osborne WWTP	*Signature on file* Mr. Michael Borchers Assistant Director of Water Resources	2-4-2020
NC0047597	City of Durham South Durham WRF	*Signature on file* Mr. Charlie Cocker Plant Superintendent - SDWRF	2-4-2020
NC0058548	Town of Star Star WWTP	*Signature on file* Ms. Mary H. O'Brien Mayor	2-4-2020
NC0072575	Pilgrim's Pride Pilgrim's Pride Processing Plant	*Signature on file* Mr. Jamal Mohammed Complex Manager	3-10-2020

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	300 hrs	
Field & admin Costs	995 hrs. @ $39.73/ hr. ave	$39,571.00
		$46,633.00
Analysis		$46,080.00
Equipment		$3,000.00
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 ATTEST

By: _____ _____
Charles Cocker, UCFRBA Chairman Secretary

Date: JULY 29, 2021

Meritech, Inc ATTEST

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

Date: 7/29/2021