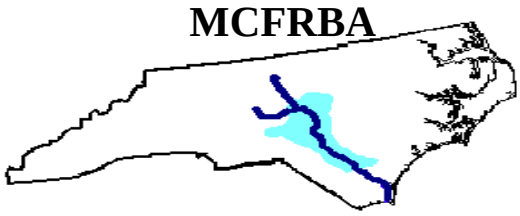
Memorandum of Agreement
Between
The State of North Carolina's Division of Water Quality
And
The Middle Cape Fear River Basin Association Permittees

Effective:
July 1, 2008 through June 30, 2013

MCFRBA



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MEMORANDUM OF AGREEMENT

This Memorandum of Agreement (MOA) is made by and between the NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES'S DIVISION OF WATER QUALITY (DWQ) and the NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) DISCHARGERS who have voluntarily approved this MOA. This group of NPDES Dischargers will be known and referenced collectively as the Middle Cape Fear River Basin Association (MCFRBA) PERMITTEES. The MOA includes all the attached tables and sections. This MOA does not affect any of the NPDES permit requirements of individual permit holders, with the one exception of performing upstream and downstream water quality monitoring. Participants in this MOA are exempted from instream monitoring as specified in their individual NPDES permits beginning on the effective date of this MOA and continuing for the duration of each permittee's participation in this MOA. Subsequent to the execution of this MOA, the NPDES Unit will issue a letter to each MCFRBA PERMITTEE notifying the permittee that the instream monitoring requirements of its permit are suspended for as long as this MOA is in place and the permittee remains a party to this MOA.

The purpose of this MOA is to establish a formal agreement between the DWQ and the MCFRBA PERMITTEES. This MOA authorizes the MCFRBA to act on behalf of the PERMITTEES as described herein. This MOA identifies the MCFRBA PERMITTEE responsibilities for surface water monitoring and reporting within the Middle Cape Fear River Basin. The water quality monitoring will occur at strategically located surface water sites to obtain information on water quality in the basin. Monitoring sites and parameters were established by the DWQ, and are listed in Table A-1, such that the instream monitoring is efficient, effective, and basin-oriented.

The MCFRBA will perform the monitoring activities described herein on behalf of the MCFRBA PERMITTEES who are members in good standing of the MCFRBA. Each MCFRBA PERMITTEE agrees to remain a member in good standing of the MCFRBA and to make timely payments of annual MCFRBA dues for as long as it remains a party to this MOA. The MCFRBA shall contract, as necessary, with a lab(s) appropriately certified by the DWQ for the required field and laboratory analysis. It will be the responsibility of the MCFRBA and their contractor(s) to coordinate the collection and analyses of the water quality monitoring data for the locations, parameters, and frequencies specified in Section A of this MOA. Sample collection, field measurements, and target reporting limits are specified in Section B of this MOA. Monthly and annual reporting requirements, including data format and data summaries are described in Section C of this MOA.

The MCFRBA PERMITTEES or their contractor shall submit the water quality data to the DWQ using the format documented in Section C of this MOA preferably in Microsoft® Excel version 2000, a subsequent version, or the equivalent. The MCFRBA PERMITTEES or their contractor shall submit the water quality data to the DWQ within 90 days of the end of the month in which the sampling was performed. All data shall be archived by the MCFRBA PERMITTEES or their contractor for a period of 10 years. Each MCFRBA PERMITTEE has the right to review and comment on work, data or reports prepared by any contractor on behalf of the MCFRBA PERMITTEES and to notify the DWQ of any objection or disagreement with any portion of the work, data, or reports. Unless such notice is made within thirty (30) days of submission of the annual report or other reports to the DWQ, it shall

be deemed to be waived and the work, data and reports submitted shall be deemed to be approved by the MCFRBA PERMITTEES. Failure by the MCFRBA PERMITTEES or their contractor to collect or analyze the water quality data as described in this MOA or to provide the data to the DWQ in the required format may result in the revocation of this MOA by the DWQ and the return to individual upstream and downstream monitoring requirements, as specified in the individual NPDES permits of the MCFRBA PERMITTEES.

The MCFRBA PERMITTEES, or their contractor shall submit an annual written report that summarizes the year's sampling results and formally finalizes the water quality data for the previous calendar year. The report shall be submitted no later than April 30th each year that this MOA is in effect. Section C of this MOA describes the required annual report content. Two copies, signed by the MCFRBA PERMITTEES' chairman, of these and any other reports required herein, shall be submitted to the DWQ Coalition Coordinator at the following address: 1621 Mail Service Center, Raleigh, NC 27699-1621.

Stream sampling may be temporarily suspended at such times as flow conditions in the receiving waters, extreme weather conditions, or other monitoring site conditions will result in a substantial risk of injury or death to persons collecting samples. Sampling may also be temporarily suspended due to environmental conditions such as a dry stream. In such cases, on each day that sampling is discontinued, the DWQ coalition coordinator shall be notified within one week of the temporary suspension and written justification for the temporary suspension shall be required in the data submittal sheet of the month in which the event occurred. This provision shall not be utilized to avoid the requirements of this MOA when performance of these requirements is attainable. When there is a sampling discontinuance pursuant to this provision, sampling shall be resumed at the first opportunity after the risk period has ceased.

This MOA may be modified by the written consent of both parties. The DWQ or the MCFRBA PERMITTEES may determine that it is necessary to request changes in monitoring frequency, parameters or sites to be sampled. Any such changes can only be made by a written amendment to this MOA agreed to by the DWQ and a majority of the MCFRBA PERMITTEES. The amendment shall be signed by the MCFRBA PERMITTEES' chairman and by the DWQ director. Such amendments may be entered into at any time.

The MCFRBA PERMITTEES may allow additional dischargers to enter into this MOA that meet the following criteria:

1) Dischargers who receive a NPDES permit within the Middle Cape Fear River Basin.
2) Dischargers who have NPDES permits within the Middle Cape Fear River Basin but are not parties to this Agreement.

Such parties may enter into this MOA subsequent to the effective date hereof. Any such changes may only be made by a written amendment to this MOA agreed to by the DWQ and a majority of the MCFRBA PERMITTEES then party to the MOA. The amendment shall be signed by the MCFRBA PERMITTEES' chairman, by the DWQ director, and by an authorized representative of any such discharger who wishes to enter into the MOA. The DWQ will consider modification of the existing monitoring program described in this MOA for the addition of any discharger. Such amendments may be made at any time that this MOA is in effect.

This MOA shall be effective until June 30, 2013 unless extended by the consent of both the DWQ and

the MCFRBA PERMITTEES. Upon 60 days written notice, the DWQ or a majority of the MCFRBA PERMITTEES then party to the MOA may terminate this MOA for any reason. Upon termination of this MOA, the monitoring requirements contained in the individual NPDES permit of the MCFRBA PERMITTEE shall become effective immediately. An individual permit holder may terminate and cancel its participation in this MOA by providing 60 days written notice to the MCFRBA, the DWQ Coalition Coordinator, the appropriate DWQ Regional Office, and the DWQ NPDES Unit. The monitoring requirements contained in the individual NPDES permit shall become effective immediately upon such cancellation or termination.

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 DWQ.

DIVISION OF WATER QUALITY

By:_____received June 17, 2008
Coleen H. Sullins
Director
NC Division of Water Quality

Dated:_____

MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION PERMITTEES

By:_____received June 17, 2008
Charles W. Ham Jr.
Chairman
Middle Cape Fear River Basin Association

Dated:_____

MCFRBA COALITION MEMBER SIGNATURES

Permittee	NPDES Number	Signature
Carolina Power & Light Company (CP&L) dba Progress Energy Carolinas, Inc. Cape Fear Steam Electric Plant	NC0003433	received May 23, 2008 Teresa Wilson Plant Manager

Permittee	NPDES Number	Signature
Carolina Power & Light Company (CP&L) dba Progress Energy Carolinas, Inc. Shearon Harris Nuclear Plant	NC0039586	received May 27, 2008 Kelvin Henderson Plant Manager

Permittee	NPDES Number	Signature
Carolina Trace Utilities Inc. Carolina Trace Utilities	NC0038831	received June 5, 2008 Carl Daniel Vice President

Permittee	NPDES Number	Signature
City of Dunn AB Uzzle WTP	NC0078955	received May 27, 2008 Ronald D. Autry City Manager

Permittee	NPDES Number	Signature
City of Dunn Dunn WWTP	NC0043176	received May 27, 2008 Ronald D. Autry City Manager

Permittee	NPDES Number	Signature
City of Raeford Raeford WWTP	NC0026514	received May 23, 2008 Richard Douglas City Manager

Permittee	NPDES Number	Signature
DAK Americas DAK Resins-Cedar Creek	NC0003719	received June 11, 2008_ Penny Mahoney Operations Director

MCFRBA COALITION MEMBER SIGNATURES

Permittee	NPDES Number	Signature
Dupont Corporation E.I. DuPont Fayetteville Works	NC0003573	received May 23, 2008 Karen B. Wrigley Plant Manager

Permittee	NPDES Number	Signature
Dynapar Corporation Danaher Sensors & Controls	NC0001121	received May 23, 2008 Kenneth J. Verhulst Director of Operations

Permittee	NPDES Number	Signature
Harnett County Public Utilities Erwin WWTP	NC0064521	received June 16, 2008 Rodney Tart Director, Public Utilities

Permittee	NPDES Number	Signature
Harnett County Public Utilities Harnett Co. Regional WTP	NC0007684	received June 16, 2008 Rodney Tart Director, Public Utilities

Permittee	NPDES Number	Signature
Harnett County Public Utilities North Harnett Regional WWTP	NC0021636	received June 16, 2008 Rodney Tart Director, Public Utilities

Permittee	NPDES Number	Signature
Harnett County Public Utilities Cooper's Ranch WWTP	NC0031470	received June 16, 2008 Rodney Tart Director of Public Utilities

MCFRBA COALITION MEMBER SIGNATURES

Permittee	NPDES Number	Signature
PWC/Fayetteville Cross Creek WWTP	NC0023957	received May 29, 2008 Mick Noland Director of Public Works

Permittee	NPDES Number	Signature
PWC/Fayetteville Hoffer WTP	NC0076783	received May 29, 2008 Mick Noland Director of Public Works

Permittee	NPDES Number	Signature
PWC/Fayetteville Rockfish Creek WWTP	NC0050105	received May 29, 2008 Mick Noland Director of Public Works

Permittee	NPDES Number	Signature
Town of Broadway Broadway WWTP	NC0059242	received May 23, 2008 Robert W. Stevens Town Manager

Permittee	NPDES Number	Signature
Town of Elizabethtown Elizabethtown WWTP	NC0026671	received June 4, 2008 Alton Bryant Director of Public Works

Permittee	NPDES Number	Signature
Town of Holly Springs Town of Holly Springs WWTP	NC0063096	received May 30, 2008 Amy Moore Interim Director of Water Quality

MCFRBA COALITION MEMBER SIGNATURES

Permittee	NPDES Number	Signature
Town of Spring Lake Spring Lake WWTP	NC0030970	received June 6, 2008 Danny Gerald Director of Public Works

Permittee	NPDES Number	Signature
Smithfield Packing Co. Inc. Tarheel Plant	NC0078344	received June 3, 2008 Larry Johnson Vice President

Permittee	NPDES Number	Signature
U.S. Army Fort Bragg WWTP	NC0003964	received June 10, 2008 Dr. Christine Hull Directorate of Public Works

Permittee	NPDES Number	Signature
Wakefield Communities Fuquay Varina LLC Senter's Rest Home	NC0048101	received June 4, 2008 Dianne McLamb Manager

Table 1. MCFRBA PERMITTEES IN BASIN ORDER

NPDES Permit Number	Middle Cape Fear Basin Association Permittees, Ownership and Facility	Authorized Representative and Title	County	Region	8 digit HUC
NC0003433	CP&L - A Progress Energy Company - Cape Fear Steam Electric Power Plant	Teresa Wilson, Plant Manager	Chatham	RRO	03030004
NC0063096	Town of Holly Springs - Town of Holly Springs WWTP	Amy Moore, Interim Director of Water Quality	Wake	RRO	03030004
NC0039586	CP&L - A Progress Energy Company -Shearon Harris Nuclear Power Plant	Kelvin Henderson, Plant Manager	Wake	RRO	03030004
NC0059242	Town of Broadway - Broadway WWTP	Robert W. Stevens, Town Manager	Lee	RRO	03030004
NC0048101	Wakefield Comminities-Fuquay Varina LLC– Senter's Rest Home	Diane McLamb Manager	Harnett	FRO	03030004
NC0007684	Harnett County Public Utilities - Harnett County Regional WTP	Rodney Tart, Director of Public Utilities	Harnett	FRO	03030004
NC0021636	Harnett County Public Utilities - North Harnett Regional WWTP	Rodney Tart, Director of Public Utilities	Harnett	FRO	03030004
NC0038831	Carolina Trace Utilities Inc. - Carolina Trace Utilities Inc	Carl Daniel, Vice President	Lee	RRO	03030004
NC0078955	City of Dunn – Dunn WTP	Ronald D. Autry, City Manager	Harnett	FRO	03030004
NC0064521	Harnett County Public Utilities – Erwin WWTP	Rodney Tart, Director of Public Utilities	Harnett	FRO	03030004
NC0043176	City of Dunn – Dunn WWTP	Ronald D. Autry, City Manager	Harnett	FRO	03030004
NC0003964	US Army - Fort Bragg WWTP & WTP	Dr. Christine Hull, Director ate of Public Works	Cumberland	FRO	03030004
NC0031470	Harnett County Public Utilities – Cooper's Ranch WWTP	Rodney Tart, Director of Public Utilities	Harnett	FRO	03030004
NC0030970	Town of Spring Lake - Spring Lake WWTP	Danny Gerald, Director of Public Works	Cumberland	FRO	03030004
NC0076783	PWC/Fayetteville - Hoffer WTP	Mick Noland, Director of Public Works	Cumberland	FRO	03030004
NC0023957	PWC/Fayetteville - Cross Creek WWTP	Mick Noland, Director of Public Works	Cumberland	FRO	03030004
NC0050105	PWC/Fayetteville - Rockfish Creek WWTP	Mick Noland, Director of Public Works	Cumberland	FRO	03030004
NC0026514	City of Raeford - Raeford WWTP	Richard Douglas, City Manager	Hoke	FRO	03030004
NC0003719	DAK Americas –DAK Resins-Cedar Creek	Penny Mahoney, Operations Director	Cumberland	FRO	03030004
NC0003573	Dupont Corporation - E.I. DuPont Fayetteville works	Karen B. Wrigley, Plant Manager	Bladen	FRO	03030005
NC0078344	Smithfield Packing Company Inc. – Tarheel Plant	Larry Johnson, Vice President	Bladen	FRO	03030005
NC0001121	Dynapar Corporation – Danaher Sensors and Controls	Kenneth J. Verhulst, Plant Manager	Bladen	FRO	03030005
NC0026671	Town of Elizabethtown - Elizabethtown WWTP	Alton Bryant, Director of Public Works	Bladen	FRO	03030005

SECTION A - MCFRBA PERMITTEES MONITORING PROGRAM

Table A-1 MCFRBA PERMITTEES Monitoring Locations, Frequency and Parameters

Station No.	Station Location	Station Comments	Latitude (dd.dddd)	Longitude (dd.dddd)	County	8 digit HUC	Stream Classi-ficatio n	Fecal Coliform	Nutrients[1]	Low Level Metals [2]	Field Msmts.[3]	Suspended Residue and Turbidity	Chlorophyll *a*[4]	DWQ Regional Office
B6160000	Cape Fear River at NC 42 nr Corinth	Ups of Buckhorn dam, WQ issues, former DWQ ambient station, downstream of the Progress Energy facility	35.5491	-79.0246	Chatham	03030004	WS-IV CA	M	M[4]		M+2SM	M	M	RRO
B6204000	Buckhorn Creek beside SR1921 (Buckhorn Rd.) near Corinth	Below Harris Lake, dns Shearon Harris	35.5435	-78.9898	Chatham	03030004	C	M	M		M	M		RRO
B6252000	Neills Creek at US 401 nr Lillington	Dns Kenneth Creek, significant tributary, broad Ag. Concerns	35.4281	-78.8240	Harnett	03030004	WS-IV	M	M		M	M		FRO
B6370000	Cape Fear River at US 401 at Lillington	Ups North Harnett WWTP, former Buies Creek WWTP, Dunn WTP, Erwin WWTP, dns North Harnett WTP, DWQ ambient and benthic station	35.4067	-78.8149	Harnett	03030004	WS-IV	M	M	EOM	M+2SM	M		FRO
B6830000	Upper Little River at SR 2021 (Titan Roberts Road) nr Lillington	Measures Upper Little River input, significant tributary, DWQ ambient and benthic station, excellent bioassessment in 1998	35.3270	-78.7230	Harnett	03030004	WS-IV	M	M		M	M		FRO
B6820050	Upper Little River at SR 1222 (Broadway Road) nr Broadway	Dns Carolina Trace WWTP, DWQ benthic station	35.4067	-79.0628	Harnett	03030004	C	M	M		M	M		FRO
B6840000	Cape Fear River at NC 217 at Erwin	Dns N. Harnett WWTP, Dunn WTP, and Erwin WWTP, Ups Dunn WWTP, former DWQ ambient station	35.3121	-78.6932	Harnett	03030004	WS-V	M	M	EOM	M+2SM	M		FRO
B7300000	Lower Little River at NC 210 nr Spring Lake	Dns Spring Lake WWTP	35.2021	-78.9530	Cumberland	03030004	C	M	M		M	M		FRO
B7319100	Lower Little River at SR1609 (West Reeves Bridge Rd.) nr Walkertown	Dns Future South Harnett WWTP	35.2598	-78.8231	Cumberland	03030004	C	M	M		M	M		FRO
B7480000	Cape Fear River at Hoffer Water Treatment Plant intake at Fayetteville	Ups Cross Creek WWTP	35.0825	-78.8638	Cumberland	03030004	WS-IV CA	M	M		M+2SM	M		FRO
B7500000	Cape Fear River at I-95 below Fayetteville	Dns Cross Creek WWTP	34.9830	-78.8480	Cumberland	03030004	C	M	M	EOM	M+2SM	M		FRO
B7679300	Rockfish Creek at US 401 bypass near Raeford	Ups Raeford WWTP, USGS gage	34.9995	-79.2148	Hoke	03030004	B	M	M		M	M		FRO
B7700000	Rockfish Creek at SR 1432 (Golf Course Road) nr Rockfish and Raeford	~5 mi dns Raeford WWTP, DWQ ambient and benthic station	34.9680	-79.1100	Hoke	03030004	B	M	M		M	M		FRO
B8230000	Rockfish Creek at NC 87 S. of Fayetteville and I-95	Major tributary input, excellent IBI in 1998, an improvement since 1993	34.9561	-78.8441	Cumberland	03030004	C	M	M		M	M		FRO
B8290000	Cape Fear River at Dupont water intake just ups of L&D3	Dns DAK Cedar Creek Site and Rockfish Creek WWTP, Ups Dupont, WQ at Lock 3	34.8495	-78.8263	Cumberland	03030005	C	M	M[4]	EOM	M+2SM	M	M	FRO
B8302000	Cape Fear River at power lines (no road) nr Tolarsville	Ups of Smithfield Foods	34.7843	-78.7983	Bladen	03030005	C	M	M		M+2SM	M		FRO
B8305000	Cape Fear River at SR 1316 at Tar Heel	Dns of Smithfield Foods, former DWQ ambient station	34.7448	-78.7856	Bladen	03030005	C	M	M[4]		M+2SM	M	M	FRO
B8306000	Cape Fear River at RM 80 below Harrison Creek nr Ruskin	Ups Danaher	34.6831	-78.6847	Bladen	03030005	C	M	M		M+2SM	M		FRO
B8320000	Cape Fear River at US 701 at Elizabethtown	Ups Elizabethtown WWTP, dns Danaher	34.6324	-78.6029	Bladen	03030005	C	M	M		M+2SM	M		FRO
B8339000	Cape Fear River just above Lock & Dam 2	DWQ benthic and fish station, dns Elizabethtown WWTP	34.6270	-78.5780	Bladen	03030005	C	M	M[4]		M+2SM	M	M	FRO
B8340130	Cape Fear River at RM 70 (no road) dns Lock and Dam 2	Dns Turnbull and Browns Creeks, 2 mi below Lock and Dam 2	34.6246	-78.5505	Bladen	03030005	C	M	M		M+2SM	M		FRO
B8340650	Cape Fear River at RM 55 (no road) nr Bladen Springs	Mid Lower Basin WQ, beginning DO sag	34.5352	-78.4398	Bladen	03030005	WS-V	M	M		M+2SM	M		FRO
B8348000	Cape Fear River at SR 1730 (Elwell Ferry Rd.) nr Carvers	DWQ benthic station	34.4740	-78.3690	Bladen	03030005	WS-IV	M	M		M+2SM	M		FRO
B8349000	Cape Fear River above Lock & Dam 1 nr East Arcadia	WQ at Lock and Dam 1	34.4060	-78.2943	Bladen	03030005	WS-IV CA	M	M[4]	EOM	M+2SM	M	M	FRO

1--Nutrients include Ammonia as N, Nitrate/Nitrite as N, Total Kjeldahl Nitrogen as N, and Total Phosphorus as P
2--Low Level Metals sampling and analysis will be conducted as specified in the document "Attachment 1: Sampling Plan for Low Level Metals" that is included as an attachment to this MOA. Metals analysis will include the following metals: Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr) (total), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Zinc (Zn). Metals monitoring was suspended per DWQ April 2008 letter at the agreement of DWQ and MCFRBA.
3--Field Measurements include: Dissolved Oxygen, Temperature, Conductivity and pH
4-Chlorophyll a and nutrients shall be collected as a vertical composite sample over the photic zone (photic zone = twice the secchi depth) at B6160000, B8290000, B8305000, B8339000, B8349000.

Frequency: M=Monthly; EOM=Every other Month: January, March, May, July, September, and November; SM= Summer Months: May, June, July, August, September;
M+2SM=Once a Month in January, February, March, April, October, November, and December and Twice a Month in May, June, July, August, and September.
Twice monthly sampling events shall be collected at least ten days apart except when extenuating circumstances arise, including inclement weather or other emergency situations that may arise.
ups=upstream dns=downstream stn=station

<u>These MCFRBA voluntary stations and the associated monitoring are provided here only for convenience and communication; they are not part of the MOA requirements.</u>
Any changes made by the MCFRBA to this voluntary monitoring program will be reported to the DWQ. No amendment of the MOA is required to change the voluntary monitoring program.

Table A-2 MCFRBA Voluntary Monitoring Locations, Frequency and Parameters

Station No.	Station Location	Station Comments	Latitude (dd.dddd)	Longitude (dd.dddd)	County	8 digit HUC	Stream Classi-fication	Fecal Coliform	Nutrients[1]	Low Level Metals [2]	Field Msmts.[3]	Suspended Residue and Turbidity	Chlorophyll *a*[4]	DWQ Regional Office
Voluntary Stations														
B6130500	Lick Creek at SR 1500 nr Corinth	Previously unmonitored tributary	35.5592	-79.0550	Lee	03030004	WS-IV	M	M		M	M		RRO
B6230000	Avents Creek at SR 1418 nr Cokesbury	Excellent IBI, fish reference site	35.4875	-78.9094	Harnett	03030004	WS-IV HQW	M	M		M	M		FRO
B6320000	Kenneth Creek at SR 1441 (Chalybeate Springs Road) nr Angier	Dns of former Fuquay-Varina WWTP and Senter's Rest Home, benthic concerns, DWQ benthic and fish station	35.5144	-78.7862	Harnett	03030004	WS-IV	M	M		M	M		FRO
B6485000	Buies Creek behind Keith Hills Golf Course Maintenance Shop nr Campbell University	Previously unmonitored tributary	35.3907	-78.7527	Harnett	03030004	WS-IV	M	M		M	M		FRO
B7590000	Cross Creek at Bus NC 301/Bus I-95 in Fayetteville	Urban tributary, poor water quality	35.0547	-78.8625	Cumberland	03030004	C	M	M		M	M		FRO
B8315000	Harrison Creek at SR 1320 at Burney	Benthic and fish station ~ 1 mile upstream	34.7317	-78.7164	Bladen	03030005	C	M	M		M	M		FRO
B8340100	Turnbull Creek at US 701, NC 53, and NC 41 nr Elizabethtown	Significant tributary	34.6470	-78.5567	Bladen	03030005	C	M	M		M	M		FRO
B7584900	Unnamed Tributary at CCWRF	Part of Cross Creek Watershed fecal coliform study	35.0599	-78.8647	Cumberland	03030004	C	M	M		M	M		FRO
B7547000	Cross Creek in Cross Creek Park	Part of Cross Creek Watershed fecal coliform study	35.0538	-78.8769	Cumberland	03030004	C	M	M		M	M		FRO
B7584000	Blount's Creek at Person Street Bridge	Part of Cross Creek Watershed fecal coliform study	35.0497	-78.8703	Cumberland	03030004	C	M	M		M	M		FRO
B7584800	Unnamed Tributary at Anne St.	Part of Cross Creek Watershed fecal coliform study	35.0622	-78.8718	Cumberland	03030004	C	M	M		M	M		FRO

1--Nutrients include Ammonia as N, Nitrate/Nitrite as N, Total Kjeldahl Nitrogen as N, and Total Phosphorus as P
2--Low Level Metals sampling and analysis will be conducted as specified in the document "Attachment 1: Sampling Plan for Low Level Metals" that is included as an attachment to this MOA. Metals analysis will include the following metals: Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr)(total), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Zinc (Zn). Metals monitoring was suspended per DWQ April 2008 letter at the agreement of DWQ and MCFRBA.
3--Field Measurements include: Dissolved Oxygen, Temperature, Conductivity and pH
4--4-Chlorophyll a and nutrients shall be collected as a vertical composite sample over the photic zone (photic zone = twice the secchi depth) at B6160000, B8290000, B8305000, B8339000, B8349000.

Frequency: M=Monthly; EOM=Every other Month: January, March, May, July, September, and November; SM= Summer Months: May, June, July, August, September;
M+2SM=Once a Month in January, February, March, April, October, November, and December and Twice a Month in May, June, July, August, and September.
Twice monthly sampling events shall be collected at least ten days apart except when extenuating circumstances arise, including inclement weather or other emergency situations that may arise.
ups=upstream dns=downstream stn=station

SECTION B- SAMPLE COLLECTION AND ANALYSIS

Sample Collection Procedures

Sample collection shall be performed by trained personnel employed with NC DWQ certified laboratories and in accordance with the DWQ NPDES Discharge Monitoring Coalition Program Field Monitoring Guidance.

Laboratory and Field Analysis

All laboratory and field analyses shall be performed by a DWQ certified laboratory using approved methods as prescribed by 40 CFR, part 136 or other methods certifiable by the DWQ Laboratory Certification Branch (http://h2o.enr.state.nc.us/lab/cert.htm) or the Director of DWQ. Section 40 of the Code of Federal Regulations part 136 (40CFR136) can be accessed on the web at the following address: http://h2o.enr.state.nc.us/lab/MethodsUpdateRuleMUR.htm.

Reporting levels will be at least as stringent as the target reporting levels achieved by the DWQ laboratory. For guidance purposes table B-1 lists a target reporting level for each parameter. The lowest possible analytical limits for all the parameters should be pursued.

Low Level Metals Collection Methods, Analyses, and Reporting

Low level metals sampling and analyses will follow the procedures outlined in the document, "Attachment 1: Sampling Plan for Low Level Metals," written for the MCFRBA PERMITTEES. The low level metals methods and sampling procedures discussed in the referenced document are those that have been agreed upon by both the DWQ and the MCFRBA PERMITTEES. Table B-2 documents the methods and target detection levels that will be utilized. The entire document is included in this MOA as Attachment 1.

Table B-1 DWQ Laboratory Reporting Limits

Parameters	Target Reporting Level	Comments
Temperature		Resolution to 0.1 degree Celsius
Dissolved Oxygen		Report results to the nearest 0.1 mg/l.
pH		Report results to the nearest 0.1 pH units.
Specific Conductivity		Report results to the nearest whole µmho/cm at 25 ºC.
Turbidity	1.0 NTU	
Suspended Residue	2.5 mg/l	
Fecal Coliform	1 colony/100 ml	At least 3 dilutions should be used to achieve optimum colony counts per membrane filter of 20-60 colonies.
Chlorophyll *a*	1 µg/l	Analysis by HPLC is not approved by DWQ.
Ammonia (NH3 as N)	0.02 mg/l	Address distillation requirement. See 40CFR136 Table 1B footnote 6.
Nitrate+Nitrite as N	0.02 mg/l	
Total Kjeldahl Nitrogen as N	0.2 mg/l	
Total Phosphorus as P	0.02 mg/l	

Table B-2 MCFRBA PERMITTEES Metals Reporting Limits and Methods

Parameter	Target Reporting Level	Comments
Aluminum (Al)	50 µg/l	
Arsenic (As)	10 µg/l	
Cadmium (Cd)	0.5 µg/l	
Total Chromium (Cr)	5 µg/l	
Copper (Cu)	2 µg/l	
Iron (Fe)	25 µg/l	
Mercury (Hg)	1 ng/l (0.001 ug/l)	report total Hg
Manganese (Mn)	10 µg/l	
Nickel (Ni)	5 µg/l	
Lead (Pb)	0.5 µg/l	
Zinc (Zn)	10 µg/l	

Data Qualification Codes

When reporting data, the DWQ's data qualifier codes must be used to provide additional information regarding data quality and interpretation. The current set (codes are subject to change) of qualifier codes to be used is provided in Table B-2. Review the data qualifier codes at least once a year and utilize the most current set being utilized by the DWQ laboratory. Use the following website to check for changes in the qualifier codes: http://h2o.enr.state.nc.us/lab/qa.htm.

Table B-2 Data Qualification Codes for Use with Coalition Data as of May 6, 2008

Data Qualifier Code	Code Definition
A	Value reported is the mean (average) of two or more determinations. This code is to be used if the results of two or more discrete and separate samples are averaged. These samples shall have been processed and analyzed independently (e.g. field duplicates, different dilutions of the same sample). This code is not required for BOD or coliform reporting since averaging multiple dilutions for these parameters is fundamental to those methods.
B	Results are based upon colony counts outside the acceptable range and should be used with caution. This code applies to microbiological tests and specifically to membrane filter (MF) colony counts. It is to be used if less than 100% sample was analyzed and the colony count is generated from a plate in which the number of coliform colonies exceeds the ideal ranges indicated by the method. These ideal ranges are defined in the method as: *Fecal coliform bacteria: 20-60 colonies Total coliform bacteria: 20-80 colonies* B1. Countable membranes with less than 20 colonies. Reported value is estimated or is a total of the counts on all filters reported per 100 mL. B2. Counts from all filters were zero. The value reported is based on the number of colonies per 100 mL that would have been reported if there had been one colony on the filter representing the largest filtration volume (reported as a less than "<" value). B3. Countable membranes with more than 60 or 80 colonies. The value reported is calculated using the count from the smallest volume filtered and reported as a greater than ">" value. B4. Filters have counts of both >60 or 80 and <20. Reported value is a total of the counts from all countable filters reported per 100 mL. B5. Too many colonies were present; too numerous to count (TNTC). TNTC is generally defined as > 150 colonies. The numeric value represents the maximum number of counts typically accepted on a filter membrane (60 for fecal and 80 for total), multiplied by 100 and then divided by the smallest filtration volume analyzed. This number is reported as a greater than value. B6. Estimated Value. Blank contamination evident. B7. Many non-coliform colonies or interfering non-coliform growths are present. In this competitive situation, the reported coliform value may under-represent actual coliform density.
C	Total residual chlorine was present in sample upon receipt in the laboratory; value is **estimated**. Generally applies to cyanide, phenol, NH_3, TKN, coliform, and organics)

Table B-2 Continued -Data Qualification Codes for Use with Coalition Data

Data Qualifier Code	Code Definition
G	A <u>single</u> quality control failure occurred during biochemical oxygen demand (BOD) analysis. The sample results should be used with caution. G1. The dissolved oxygen (DO) depletion of the dilution water blank exceeded 0.2 mg/L. G2. The bacterial seed controls did not meet the requirement of a DO depletion of at least 2.0 mg/L and/or a DO residual of at least 1.0 mg/L. G3. No sample dilution met the requirement of a DO depletion of at least 2.0 mg/L and/or a DO residual of at least 1.0 mg/L. G4. Evidence of toxicity was present. This is generally characterized by a significant increase in the BOD value as the sample concentration decreases. The reported value is calculated from the highest dilution representing the maximum loading potential and should be considered an **estimated** value. G5. The glucose/glutamic acid standard exceeded the range of 198± 30.5 mg/L. G6. The calculated seed correction exceeded the range of 0.6 to 1.0 mg/L. G7. Less than 1 mg/L DO remained for all dilutions set. The reported value is an **estimated** greater than value and is calculated for the dilution using the least amount of sample. G8. Oxygen usage is less than 2 mg/L for all dilutions set. The reported value is an **estimated** less than value and is calculated for the dilution using the most amount of sample. G9. The DO depletion of the dilution water blank produced a negative value.
J	**Estimated** value; value may not be accurate. This code is to be used in the following instances: J1. Surrogate recovery limits have been exceeded; J2. The reported value failed to meet the established quality control criteria for either precision or accuracy; J3. The sample matrix interfered with the ability to make any accurate determination; J4. The data is questionable because of improper laboratory or field protocols (e.g. composite sample was collected instead of grab, plastic instead of glass container) J5. Temperature limits exceeded (samples frozen or >6° C) during transport or not verifiable (e.g., no temperature blank provided);, non-reportable for NPDES compliance monitoring. J6. The laboratory analysis was from an unpreserved or improperly chemically preserved sample. The data may not be accurate. J7. This qualifier is used to identify analyte concentration exceeding the upper calibration range of the analytical instrument/method. The reported value should be considered estimated. J8. Temperature limits exceede (samples frozen or >6°C during storage. The data may not be accurate. J9. The reported value is determined by a **one-point estimation** rather than against a regression equation. The estimated concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit. J10. Unidentified peak; estimated value. J11. The reported value is determined by a **one-point estimation** rather than against a regression equation. The estimated concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit. *This code is used when an MDL has not been established for the analyte in question.* J12. The calibration verification did not meet the calibration acceptance criterion for **field parameters**. <u>Note</u>: A "J" value shall not be used if another code applies (ex. N, V, M).

Table B-2 Continued -Data Qualification Codes for Use with Coalition Data

Data Qualifier Code	Code Definition
M	Sample and duplicate results are "out of control." The sample is non-homogenous (e.g. VOA soil). The reported value is the lower value of duplicate analyses of a sample.
N	Presumptive evidence of presence of material; **estimated** value. This code is to be used if: N1. The component has been tentatively identified based on mass spectral library search; N2. There is an indication that the analyte is present, but quality control requirements for confirmation were not met (i.e., presence of analyte was not confirmed by alternate procedures). N3. This code shall be used if the level is too low to permit accurate quantification, but the **estimated** concentration is less than the laboratory practical quantitation limit and greater than the laboratory method detection limit. *This code is not routinely used for most analyses.* N4. This code shall be used if the level is too low to permit accurate quantification, but the estimated concentration is less than the laboratory practical quantitation limit and greater than the instrument noise level. *This code is used when an MDL has not been established for the analyte in question.* N5. The component has been tentatively identified based on a retention time standard.
P	Elevated practical quantitation limit (PQL)* due to matrix interference and/or sample dilution.
Q	Holding time exceeded. These codes shall be used if the value is derived from a sample that was received, prepared and/or analyzed after the approved holding time restrictions for sample preparation and analysis. The value does not meet NPDES requirements. Q1. Holding time exceeded prior to receipt by lab Q2. Holding time exceeded following receipt by lab
S	Not enough sample provided to prepare and/or analyze a method-required matrix spike (MS) and/or duplicate (MSD).
U	Indicates that the analyte was analyzed for but not detected above the reported practical quantitation limit (PQL)*. The number value reported with the "U" qualifier is equal to the laboratory's PQL*.
V	Indicates the analyte was detected in both the sample and the associated method blank. Note: The value in the blank shall not be subtracted from the associated samples.
X	Sample not analyzed for this constituent. This code is to be used if: X1. Sample not screened for this compound. X2. Sampled, but analysis lost or not performed-field error X3. Sampled, but analysis lost or not performed-lab error
Y	Elevated PQL* due to insufficient sample size
Z	The presence or absence of the analyte cannot be verified. The sample analysis/results are not reported due to: Z1. Inability to analyze the sample. Z2. Questions concerning data reliability.

* The Practical Quantitation Limit (PQL) is defined as the lowest level achievable among laboratories within specified limits during routine laboratory operation. The Practical Quantitation Limit (PQL) is "about three to five times the method detection limit (MDL) and represents a practical and routinely achievable detection level with a relatively good certainty that any reported value is reliable." (APHA, AWWA, WEF. 1992. Standard Methods for the Examination of Water and Wastewater, 18th ed.)

SECTION C - DATA FORMAT AND REPORTING REQUIREMENTS

Data Format for Monthly submittals

Table C-1 provides the required data submittal format. Do not use commas, tabs, pipes or other common file delimiters anywhere in the table. The first row should contain the column headings only. Column headings must include appropriate information on measurement units (mg/l, µg/l, cfu/100ml, etc.). The second row must contain the method code. It is very important that the format of the headings and the number and order of columns is consistent among all monthly submissions. The DWQ station number must be provided (e.g. B6140000). An additional column containing the location description is acceptable as long as it is consistently included. Include a comment column for describing pertinent information related to the sampling event or specific samples. Ensure no missing values for station, date, time, and depth. Place all remark codes in a separate column as demonstrated in Table C-1. If there is no result for a particular parameter leave the cell blank. Screen all data for inappropriate or improbable values, such as a pH of 21.2.

Annual Report

The MCFRBA PERMITTEES will be required to submit an annual report by April 30th for each year the MOA is in effect. The annual report will summarize all data collected in the past calendar year and contain the following elements:

- Monitoring Station List to include station number, station description, county, accurate latitude and longitude (in decimal degrees to 4 decimal places), stream classification, and 8 digit HUC.
- Coalition Web Site Links
- List of all certified laboratories that conducted work for the coalition in the past year and laboratory methods used for all parameters. Identify the time frame for each laboratory and each method. Summarize any laboratory issues for individual parameters.
- Submit a CD that includes all monitoring data for the past year and a statistical summary for each station. The annual statistical summary must describe for each parameter at each location:
    - Number of observations (N)
    - Number of observations less than the laboratory reporting level (N<RL)
    - Identify the appropriate water quality standard, action level, or other reference level (Ref)
    - Identify the number of observations that violate the reference level (N>Ref) or (N<Ref)
    - Maximum observed value (Max)
    - Minimum observed value (Min)
    - Annual mean (report geometric mean for fecal coliform)
- Submit a comprehensive low level metals report that includes all results and interpretations as well as Type 1, 2, 3 errors, and other QA/QC results.
- Include a list of active coalition members with authorized representative updates, contact names, email addresses and phone numbers. Identify the facility name and permit number.
- Provide a list of members that are no longer active in the coalition and their permit numbers.
- Provide a list of major changes in facilities' names, ownership, and discharge location.
- Summarize results of all quality assurance and quality control issues and any field audits conducted.
- Summarize any significant issues, special studies, or projects.
- Describe any required data collection that was missed and provide an explanation.
- Review and update the monitoring program and recommend potential MOA modifications.

Table C-1 File Format For Coalition Data Reporting

				Temp (°C)	Temp_rmk	DO (mg/l)	DOrmk	pH (su)	pH_rmk	Conductivity (µmhos/cm)	Conductivity_rmk	Fecal Coliform	Fecal Coliform_rmk	Suspended Residue (mg/l)	Suspended Residue_rmk	Turbidity (NTU)	Turbidity_rmk	Chlorophyll_a (µg/l)	Chlorophyll_rmk	NH3_N (mg/l)	NH3_N_rmk	TKN_N (mg/l)	TKN_N_rmk	NO2_NO3_N (mg/l)	NO2_NO3_N_rmk	TP_P (mg/l)	TP_P_rmk
Station	**Date (m/d/yyyy)**	**Time (hh:mm)**	**Depth (m)**	**10**	**10 rmk**	**300**	**300 rmk**	**400**	**400 rmk**	**94**	**94 rmk**	**31613**	**31613 rmk**	**530**	**530 rmk**	**82079**	**82079 rmk**	**32209**	**32209 rmk**	**610**	**610 rmk**	**625**	**625 rmk**	**630**	**630 rmk**	**665**	**665 rmk**
A1234567	8/19/2002	15:30	0.1	25.2		7.8		6.9		133		110		45		22		23	Q1	0.1		0.2		0.3			
B9876543	8/20/2002	11:50	0.1	27.2		7.1		7.2		125		30		4		5.6		5		0.14		0.6		0.31			
B9876543	8/20/2002	11:50	1	28		6.5		7		122																	
B9876543	8/20/2002	11:50	2	25		6.7		6.9		119																	
B9876543	8/20/2002	11:50	3	17		5.5		6.7		120																	
C1357924	8/21/2002	16:10	0.1	22.1		3.1		6.2		233		15	B1	55		11											
C0246813	9/1/2002	9:30	0.1	19.7		8.3		7		99		6000	B5	410		36				0.26		0.4		0.57			
C0246813	10/1/2002	11:30	0.1	12		8.9		7.3		115		1200	B3	95	A		X3			0.16	J2	0.2		0.09			

The reporting format table continues with metals and comment columns on the next page.

Table C-1 Continued. File Format For Coalition Data Submittals

Cadmium, Cd (µg/l)	Cadmium, Cd_rmk	Chromium, Cr (µg/l)	Chromium, Cr_rmk	Copper, Cu (µg/l)	Copper, Cu_rmk	Nickel, Ni (µg/l)	Nickel, Ni_rmk	Lead, Pb (µg/l)	Lead, Pb_rmk	Zinc, Zn (µg/l)	Zinc, Zn_rmk	Aluminum, Al (µg/l)	Aluminum, Al_rmk	Iron, Fe (µg/l)	Iron, Fe_rmk	Manganese, Mn (µg/l)	Manganese, Mn_rmk	Arsenic, As (µg/l)	Arsenic, As_rmk	Mercury, Hg (µg/l)	Mercury, Hg_rmk	Comments
1027	1027 rmk	1034	1034 rmk	1042	1042 rmk	1067	1067 rmk	1051	1051 rmk	1092	1092 rmk	1105	1105 rmk	1045	1045 rmk	1055	1055 rmk	1002	1002rmk	71900	71900rmk	
3		27		4.4		12		10		12		130		610					11	0.21		
2	U	25	U	2	U	10	U	10	U	10	U	120		510		10	U	10	U	0.2	U	
2	U	25	U	2	U	10	U	10	U	10	U	333		624		10	U	10	U	0.2	U	
2	U	25	U	2	U	10	U	10	U	10	U	120		510		10	U	10	U	0.2	U	2.5” of rain on 8/31/2002
2	U	25	U	2	U	10	U	10	U	10	U	120		510		10	U	10	U	0.2	U	Nutrient Sample Spilled

Attachment 1: Sampling Plan for Metals

Middle Cape Fear River Basin Association

April 2003

Introduction

The purpose of this document is to provide details on low level metals sampling and analytical methods proposed by the Middle Cape Fear River Basin Association (MCFRBA) to ensure quality data that are useful to the DWQ and the stakeholders within the basin. This document includes the following sections:

Metals Sampling Methods
Quality Assurance/Quality Control
Type 1: Field Surveys
Type 2: Field Sampling
Type 3: Laboratory Analysis
Chain-of-Custody and Shipping
Chain-of-Custody Record
Sample Labeling
Custody Seals

Metals Sampling Methods

In order to ensure quality data that can be used by the MCFRBA and DWQ, it is important that standard methods to collect and analyze the data be followed. Metals sampling will occur using clean sampling techniques based on EPA Method 1669. The proposed sampling methodology does not follow every aspect of Method 1669. It was designed to meet critical features outlined in the Method while being practical for collection of stream samples by a private contractor for the MCFRBA.
Sample containers used are I-Chem 300 Series bottles for metal analyses. After container receipt, sample containers are individually double bagged using Zip Lock bags by Field Analysts then placed in a storage container (usually a cooler). When preparing the sample containers for storage the analyst wears Safeskin Hypoclean Critical gloves.

A Field Blank is prepared in the laboratory for transport to every site that metals sampling activities will occur. The field blank is prepared using gloved hands and by filling an I-Chem bottle with Deionized water from the laboratory DI system. The bottle is then double bagged and placed in the cooler for transport to each site. One field blank is processed at each site.

Upon arrival at the sampling site, one member of the two-person sampling team is designated as “dirty hands”; the second member is designated as “clean hands”. The individual designated as “clean hands” is responsible for all operations involving contact with the sample bottle. The individual designated as “Dirty hands” is responsible for all other activities that do not involve direct contact with the sample.
Sampling personnel are required to wear clean, non-talc gloves (as described in the bottle preparation section) at all times when handling Zip Lock bags and sampling containers. Whenever possible, samples are collected facing upstream and upwind to minimize introduction of contamination. Samples are collected while working from a boat or while on shore. “Dirty hands” opens the cooler and removes the double-bagged bottles. “Dirty hands” opens the outer bag and presents this to “clean hands” “Clean hands” opens the inner bag and removes the bottle.

Subsurface samples are collected using a grab sampling technique. The grab technique involves completely immersing the bottle under the surface of the water, uncapping the bottle, allowing to completely fill, then recapping the bottle *before* removing it from below the surface of the water. This way the inner bottle is never exposed to airborne particulate matter while in the field. “Clean hands” then places the bottle back in the inner bag and closes the bag. “Dirty hands” then seals the outer bag and places in the sample storage container.

Acid preservation of samples with trace metal grade acid is performed in the laboratory to expedite field operations and minimize the potential for sample contamination.

Sampling activities are documented through paper and computerized sample tracking systems.

Quality Assurance/Quality Control (QA/QC)

QA/QC is designed to assure the reliability and quality of the analysis and data and identify any contamination that may result from lab methods, equipment, or sample collection. Sample collection, preservation, handling and storage, and analytical procedures will be in accordance with standard methods and practices. A summary of QA/QC sampling requirements for this project is shown in Tables 1 and 2.

Three types of QA/QC will be performed as part of this field effort, with each type having a different amount of supporting laboratory QA/QC. Type 1 includes proper documentation of sampling activities and field conditions by the field team members. Type 2 consists of sampling procedures intended to identify the type and estimate the level of contamination. Type 3 provides confirmation of the analytical procedures conducted by the laboratories. In combination, these types of QA/QC provide the equivalent of a modified Level 3 USEPA data quality objective.

Type 1–Field Surveys
For metals sampling, Type 1 QA/QC activities include documenting pertinent data concerning the sampling events such as weather conditions and time of sampling.

Type 2–Field Sampling
Two personnel with experience or special training in water quality sampling techniques will conduct field sampling. Type 2 activities include sample procedures designed to detect contamination from sampling equipment resulting from improper sample collection. Type 2 activities also include collection of QA/QC duplicate samples and use of field blanks. Table 1 lists the field QA/QC requirements.

TABLE 1
Field QA/QC Requirements
Middle Cape Fear River Basin Association

Analysis	Number of Field Samples per Sample Run	QA/QC Samples	Frequency of QA/QC	Total Number of QA/QC Samples [a]
Total Metals	5	Duplicate	1 per Sample Run	6 /yr
		Field Blank	1 per site per Trip	30 /yr

[a] A duplicate will be collected during each sample run at one of the stations and a field blank will be collected at each site during each trip.

Field Blanks
Field trip blanks are sample containers that are taken, as received, into the field and returned without

being used. These are used to evaluate any contamination that may have taken place before the containers were received by the sampling team.

Field Duplicates
Field duplicate samples are collected to measure the precision of the sampling process. The field team leader will choose at least one station per sample run to collect the duplicate sample.
In summary, Type 2 activities include:

- Proper identification and labeling of samples, duplicates and trip blanks
- Selection of duplicate sampling stations
- Documentation of sampling procedures that deviate from the sampling plan

Type 3–Laboratory Analysis

The laboratory selected by the MCFRBA for Clean Metals Analysis will use its internal QA/QC program. This program includes the analysis of blanks and spiked samples. The QA/QC samples are analyzed in the same manner as field samples and are interspersed with the field samples including the field duplicate samples during analysis. Analytical results of the QA/QC samples are used to document the validity of the data and to control data quality within predetermined acceptance limits.

The QA/QC samples listed in Table 2 will be used to assess the validity of the analytical results.

TABLE 2
Laboratory QA/QC Sample Frequency
Middle Cape Fear River Basin Association

QA/QC Sample	Frequency
Method Blank	Once every 20 samples
Matrix Spike/Matrix Spike Duplicate	Once every 20 samples
Blank Spike	Once every 20 samples

Method Blank
A method blank is a sample of analyte-free water that the laboratory treats as a sample, undergoing the same analytical process as the corresponding field samples. Method blanks are used to monitor laboratory performance and detect contamination introduced during the analytical procedure.

Matrix Spikes/Matrix Spike Duplicate
For inorganic analyses, a single sample is split and one portion is spiked with a known amount of reference material. Spike recovery is used to evaluate potential matrix interferences as well as accuracy. The duplicate spike results are compared to evaluate precision.

Blank Spike
Analytes of interest or surrogates are spiked into blank water rather than into a sample. The blank spike goes through the same analytical procedure as the corresponding field samples, and percent recovery is calculated to measure matrix effects.

Analytical Procedures

Laboratory analysis will be conducted using EPA-approved methods as listed in Table 3.

TABLE 3
Analytical Method Used for Metals
Middle Cape Fear River Basin Association

			Methods & Detection Levels for MOA				
Parameter	**Units**	**Water Quality Standard**	**200.7**	**GFAA**	**200.8**	**1631**	**Target Detection Levels**
Al	ug/L	87	50				**50 or better**
As	ug/L	50		5			**10**
Cd	ug/L	2			0.1		**0.5**
Cr	ug/L	50			5		**5**
Cu	ug/L	7			2		**2**
Fe	ug/L	1000	50				**25**
Hg	ng/L	12				1	**1**
Ni	ug/L	25			5		**5**
Pb	ug/L	25			0.5		**0.5**
Zn	ug/L	50			5		**10**
Mn	ug/L	200	10		10		**10**

Chain-of-Custody (COC) and Shipping

A required portion of any sampling and analytical program is the system for sample control from collection to data reporting. This includes the ability to trace the possession and handling of samples from the time of collection through analysis and final disposition. This documentation of the sample's history is referred to as "chain-of-custody" (COC). The components of the COC (COC record, sample labeling, custody seals, and field logs) and the procedures for their use are described below.
A sample is considered to be in a person's custody if it is:

- In the person's physical possession
- In view of the person after he/she has taken possession
- Secured by that person so that no one can tamper with the sample
- In a designated secure area

Chain-of-Custody Record

To establish the documentation necessary to trace sample possession from the time of collection, a COC record will be filled out and accompany every sample. The laboratory COC form will be used. In order to maintain COC, each person who has custody of the sample will sign, date, and note the time on the form. Field samples will not be left unattended unless placed in a secured location and a sealed

container with the COC record inside the container. Any special instructions for the clean metals sampling and analysis should be included on the COC forms.

Sample Labeling

For each water quality sample, the following information will be clearly marked and labeled on the sample container:

- Client: Middle Cape Fear River Basin Association
- Sample or Station Number:
- Location: _____River/Creek @ _____(Road Crossing)
- Analyses:
- Preservative:
- Date and Time:
- Sampled by:

During sampling, filled and labeled containers will be stored in coolers on ice to maintain a temperature of 4°C. The coolers will remain in the custody of the field crew until the end of the sampling event. Samples will be transported, in coolers on ice, by overnight courier if shipment of samples is necessary. If samples are collected on Friday, the laboratories will be notified for Saturday delivery.

Coolers prepared for shipping will be lined with a cooler liner and packed with ice in double-wrapped Ziploc bags so that movement of samples will be minimized. Each shipping container will contain a COC form indicating the parameters to be analyzed.

A COC form will be included in each shipment container describing: the type of sample, number of containers, type and kind of analysis, QA/QC instructions and samples, and special processing and handling procedures. It is imperative that the samples taken to fulfill the QA/QC requirements to be completed by the lab are included on the COC. The field team leader will keep the copy of the COC form.

Custody Seals

Custody seals are used to detect tampering with samples following collection, up to the time of analysis. If samples are packed for shipping, custody seals will be placed across the latch and across the lid opening of the coolers to confirm that they arrive at the laboratory unopened. The custody seal placed across the lid opening will be secured with strapping tape. The tape will be placed over the custody seal and wrapped completely around the cooler so that it remains closed during shipping.

AMENDMENT TO THE MEMORANDUM OF AGREEMENT
BETWEEN
THE NORTH CAROLINA DIVISION OF WATER QUALITY
AND
THE MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION

WHEREAS, the NORTH CAROLINA DIVISION OF WATER QUALITY (DWQ) and the MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION (MCFRBA) have entered into a MEMORANDUM OF AGREEMENT (MOA) dated July 1, 2008; and

WHEREAS, said MOA provided for the amendment to allow additional NPDES Dischargers to enter into said MOA with the agreement of DWQ and the majority of the MCFRBA PERMITTEES party to the MOA; and

NOW THEREFORE, the MOA is hereby amended as follows:

1. DWQ and the MCFRBA PERMITTEES agree to allow the SOUTH HARNETT REGIONAL WWTP (NC0088366) to participate in the MOA; and

2. All terms and conditions applicable to the MCFRBA PERMITTEES shall be applicable to the SOUTH HARNETT REGIONAL WWTP (NC0088366) as of the date of execution of this amendment by DWQ.

IN WITNESS WHEREOF, the parties have caused the execution of this instrument by authority duly given.

SOUTH HARNETT REGIONAL WWTP
NC0088366

By: received 6/17/2009
Rodney Tart
Director of Public Utilities
Harnett County

Date: _____

NC DIVISION OF WATER QUALITY

By: received 6/19/2009
Coleen Sullins
Director
NC Division of Water Quality

Date: _____

MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION

By: received 6/15/2009
Chad Ham
Chairman
Middle Cape Fear River Basin Association

Date: _____

Amendment to the Memorandum of Agreement
Between
The North Carolina Division of Water Quality
And
The Middle Cape Fear River Basin Association

WHEREAS, the NORTH CAROLINA DIVISION OF WATER QUALITY (DWQ) and the MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION (MCFRBA) have entered into a MEMORANDUM OF AGREEMENT (MOA) dated July 1, 2008; and

WHEREAS, said MOA provided for its amendment with the written consent of both parties;

NOW THEREFORE, the MOA is hereby amended as follows:

Monitoring station B6215000 (Cape Fear River at Captain's Landing subdivision nr Cokesbury) at coordinates 35.4871, -78.9516 is added as a voluntary station. The station will be monitored monthly for suspended residue, turbidity, fecal coliform, and nutrients (TKN, NH_3, NO_2/NO_3, and TP). Field parameters (water temperature, pH, dissolved oxygen, and conductivity) will be monitored monthly October through April and twice monthly May through September. The data from the station will be submitted to DWQ in the monthly spreadsheets.

The MCFRBA will begin monitoring station B6215000 in July 2010.

IN WITNESS WHEREOF, the parties have caused the execution of this instrument by authority duly given.

DIVISION OF WATER QUALITY

By: signed May 25, 2010
Coleen Sullins
Director
NC Division of Water Quality

Dated: _____

MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION

By: signed May 17, 2010
Charles W. Ham Jr.
Chairman
Middle Cape Fear River Basin Association

Dated: _____

<u>These MCFRBA voluntary stations and the associated monitoring are provided here only for convenience and communication; they are not part of the MOA requirements.</u>
Any changes made by the MCFRBA to this voluntary monitoring program will be reported to the DWQ. No amendment of the MOA is required to change the voluntary monitoring program.

Table A-2 MCFRBA Voluntary Monitoring Locations, Frequency and Parameters (Amended 5/14/2010)

Station No.	Station Location	Station Comments	Latitude (dd.dddd)	Longitude (dd.dddd)	County	8 digit HUC	Stream Classi-fication	Fecal Coliform	Nutrients[1]	Low Level Metals[2]	Field Msmts.[3]	Suspended Residue and Turbidity	Chlorophyll *a*[4]	DWQ Regional Office
Voluntary Stations														
B6130500	Lick Creek at SR 1500 nr Corinth	Previously unmonitored tributary	35.5592	-79.0550	Lee	03030004	WS-IV	M	M		M	M		RRO
B6215000	Cape Fear River at Captain's Landing Subdivision near Cokesbury	Dns of future Western Wake WWTP discharge	35.4871	-78.9516	Harnett	03030004	WS-IV	M	M		M+2SM	M		FRO
B6230000	Avents Creek at SR 1418 nr Cokesbury	Excellent IBI, fish reference site	35.4875	-78.9094	Harnett	03030004	WS-IV HQW	M	M		M	M		FRO
B6320000	Kenneth Creek at SR 1441 (Chalybeate Springs Road) nr Angier	Dns of former Fuquay-Varina WWTP and Senter's Rest Home, benthic concerns, DWQ benthic and fish station	35.5144	-78.7862	Harnett	03030004	WS-IV	M	M		M	M		FRO
B6485000	Buies Creek behind Keith Hills Golf Course Maintenance Shop nr Campbell University	Previously unmonitored tributary	35.3907	-78.7527	Harnett	03030004	WS-IV	M	M		M	M		FRO
B7590000	Cross Creek at Bus NC 301/Bus I-95 in Fayetteville	Urban tributary, poor water quality	35.0547	-78.8625	Cumberland	03030004	C	M	M		M	M		FRO
B8315000	Harrison Creek at SR 1320 at Burney	Benthic and fish station ~ 1 mile upstream	34.7317	-78.7164	Bladen	03030005	C	M	M		M	M		FRO
B8340100	Turnbull Creek at US 701, NC 53, and NC 41 nr Elizabethtown	Significant tributary	34.6470	-78.5567	Bladen	03030005	C	M	M		M	M		FRO
B7584900	Unnamed Tributary at CCWRF	Part of Cross Creek Watershed fecal coliform study	35.0599	-78.8647	Cumberland	03030004	C	M	M		M	M		FRO
B7547000	Cross Creek in Cross Creek Park	Part of Cross Creek Watershed fecal coliform study	35.0538	-78.8769	Cumberland	03030004	C	M	M		M	M		FRO
B7584000	Blount's Creek at Person Street Bridge	Part of Cross Creek Watershed fecal coliform study	35.0497	-78.8703	Cumberland	03030004	C	M	M		M	M		FRO
B7584800	Unnamed Tributary at Anne St.	Part of Cross Creek Watershed fecal coliform study	35.0622	-78.8718	Cumberland	03030004	C	M	M		M	M		FRO

1--Nutrients include Ammonia as N, Nitrate/Nitrite as N, Total Kjeldahl Nitrogen as N, and Total Phosphorus as P
2--Low Level Metals sampling and analysis will be conducted as specified in the document "Attachment 1: Sampling Plan for Low Level Metals" that is included as an attachment to this MOA. Metals analysis will include the following metals: Aluminum (Al), Arsenic (As), Cadmium (Cd), Chromium (Cr)(total), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Nickel (Ni), and Zinc (Zn). Metals monitoring was suspended per DWQ April 2008 letter at the agreement of DWQ and MCFRBA.
3--Field Measurements include: Dissolved Oxygen, Temperature, Conductivity and pH
4--4-Chlorophyll a and nutrients shall be collected as a vertical composite sample over the photic zone (photic zone = twice the secchi depth) at B6160000, B8290000, B8305000, B8339000, B8349000.

Frequency: M=Monthly; EOM=Every other Month: January, March, May, July, September, and November; SM= Summer Months: May, June, July, August, September;
M+2SM=Once a Month in January, February, March, April, October, November, and December and Twice a Month in May, June, July, August, and September.
Twice monthly sampling events shall be collected at least ten days apart except when extenuating circumstances arise, including inclement weather or other emergency situations that may arise.
ups=upstream dns=downstream stn=station

AMENDMENT TO THE MEMORANDUM OF AGREEMENT
BETWEEN
THE NORTH CAROLINA DIVISION OF WATER QUALITY
AND
THE MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION

WHEREAS, the NORTH CAROLINA DIVISION OF WATER QUALITY (DWQ) and the MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION (MCFRBA) have entered into a MEMORANDUM OF AGREEMENT (MOA) dated July 1, 2008; and

WHEREAS, said MOA provided for the amendment to allow additional NPDES Dischargers to enter into said MOA with the agreement of DWQ and the majority of the MCFRBA PERMITTEES party to the MOA; and

NOW THEREFORE, the MOA is hereby amended as follows:

1. DWQ and the MCFRBA PERMITTEES agree to allow the ERWIN #2 WWTP (NC0001406) to participate in the MOA; and

2. All terms and conditions applicable to the MCFRBA PERMITTEES shall be applicable to the ERWIN #2 WWTP (NC0001406) as of the date of execution of this amendment by DWQ.

IN WITNESS WHEREOF, the parties have caused the execution of this instrument by authority duly given.

ERWIN #2 WWTP (NC0001406)

BY: __signed May 16, 2011_____

Steve Ward, Director of Public Utilities
Harnett County

Date: _____

NC DIVISION OF WATER QUALITY

By: __signed May 24, 2011_____

Coleen Sullins, Director
NC Division of Water Quality

Date: _____

MIDDLE CAPE FEAR RIVER BASIN ASSOCIATION

By: __signed May 20, 2011_____

Chad Ham, Chairman
Middle Cape Fear River Basin Association

Date: _____