



**Upper Neuse River Basin Association  
Special Study Plan  
Date Issued: August 4, 2015**

**Special Study Name, ID# and Origination:**

Storm Event Sampling, SS.LR.1

This Special Study originated within Cardno FY 2015 monitoring contract and continued in 2016 monitoring contract. A detailed planning and methodology document (entitled **Storm Event Sampling Study**) was prepared for this effort during FY2015. DWR reviewed the **Storm Event Sampling Study** and had no objections to the monitoring plan or associated quality assurance procedures. That document is attached to this study plan overview.

**Responsible Contractor(s):**

**Cardno** – Project planning, management, oversight, sampling, data analysis and reporting

**Environment 1** – Laboratory analysis

**Purpose of Study:**

This special study is focused on obtaining additional water quality data from the major tributaries to Falls Lake under varying storm conditions over time. In contrast to the twice monthly grab samples taken under the Routine Monitoring process, this data collection effort employs automated sampling equipment to collect multiple discrete samples over time as stream flows rise and then fall following a storm event. Such data allow for a better understanding of the contribution of nutrients and related parameters associated with storm events. Data from this study will be used to better inform model calibration for simulating water quality conditions in Falls Lake.

**This Special Study supports these objectives of the UNRBA Monitoring Program:**

- Lake response modeling,
- Support of regulatory options, and
- Source allocation and estimation of jurisdictional loading

**Anticipated Schedule:**

A total of four sampling events are anticipated during FY 2016 (July 1, 2015 through June 30, 2015). Sampling events are based on actual storm events and target rainfall amounts between 0.75 and 2.0 inches from a single storm. Cardno determines when Storm Event Sampling occurs based on weather forecasts and observations. The attached **Storm Event Sampling Study** document provides a detailed discussion of the rationale for determining when sampling is to occur.

### **Summary of Study Methods:**

The attached ***Storm Event Sampling Study*** document provides a detailed overview of the study methods, including parameters, use of specialized equipment, record-keeping, QA/QC, QAPP and health and safety considerations. Parameters to be quantified include total Kjeldahl nitrogen, ammonia, nitrate plus nitrite, total nitrogen (calculated from total Kjeldahl nitrogen and nitrate plus nitrite), total phosphorus, total organic carbon and total suspended solids. The plan targets the collection and analysis of approximately 15-20 individual samples associated with a single storm event to characterize pollutant concentrations over the course of the rising and falling storm hydrograph.

Because of the logistic demands for doing this study and to limit costs to the established study budget, Storm Event Sampling is only conducted at two locations for any given event. Sampling is planned for FY 2016 at one station on Ellerbe Creek (downstream of the City of Durham wastewater treatment facility) and one station on the Eno River (downstream of Highway 501). Specific locations for the sampling stations are provided in the attached ***Storm Event Sampling Study*** document. Cardno is evaluating locations on the other three major tributaries to Falls Lake (Little River, Flat River and Knap of Reeds Creek) for possible future Storm Event Sampling. However, storm event/streamflow relationships are more complex on those streams due to reservoirs on each of them, making streamflow predictions and sampling logistics more difficult.

### **Quality Assurance/Quality Control:**

The attached ***Storm Event Sampling Study*** document provides details of QA/QC considerations for this effort. All laboratory analyses will be performed by the same state-certified lab that analyzes samples for the UNRBA Routine Monitoring and will follow the DWR-approved UNRBA QAPP for sample analysis. Specific provisions associated with use of autosampling equipment were developed for the UNRBA QAPP and those have been reviewed and accepted by DWR.

### **Reporting/Deliverables:**

Cardno will communicate with the UNRBA Executive Director on a regular basis on the progress of this Special Study. Status updates will be provided to the UNRBA Path Forward Committee and the Board of Directors at their regular meetings during Cardno's updates on the overall Monitoring Program status.

Discussion of the status and any available results from this Special Study will be included as part of the Mid-Year and Annual Reports. Data generated by this Special Study will largely be used to inform future lake modeling efforts, thus there will not necessarily be a separate detailed analysis of the storm event data, but summary statistics and graphics are expected to be developed.

Data from the Storm Event Sampling will be included in the overall UNRBA database and will thus be available online to UNRBA members, agencies, and the general public.