

Study Plan for the Ongoing Assessment of Water Quality in Jordan Lake

Purpose

The objective of this study is to evaluate progress in reducing nutrient and nutrient related pollution in Jordan Lake, as required under section 3.(c) of S.L. 2009 – 216.

Study Plan

Nine monitoring stations will be sampled in this study as shown in Figure 1. These stations will be sampled twice monthly during the growing season (May - September) and monthly during the non-growing season.

Parameters to be evaluated in this study are shown in Table 1. The photic zone is assumed to range from the water surface to a depth equal to two times the secchi depth. Depth stratified physical parameters will be collected at the surface (0.15 m), 1 m increments to a depth of 10 m, and every 5 m thereafter.

Table 1. Parameters to be Evaluated

Transparency			
Secchi Depth			
Photic Zone Composite Samples			
Chlorophyll <i>a</i>	Nutrients (TP, TKN, NH ₃ , NO ₂ +NO ₃)		Turbidity
Depth Stratified Physical Measurements			
Temperature	pH	Dissolved Oxygen	Conductivity

Sampling will begin in July 2009, and will continue “until such time as the lake is no longer impaired by nutrient pollution”, at which point this study plan will be re-evaluated.

Quality Assurance

Samples will be collected according to the DWQ Intensive Survey Unit Standard Operating Procedures. QA/QC procedures will adhere to the Ambient Lakes Quality Assurance Project Plan. Both of these documents can be found on the DWQ Intensive Survey Unit website at: <http://h2o.enr.state.nc.us/esb/isu.html>.

In addition to the QA/QC processes described in the Ambient Lakes Quality Assurance Project Plan, the following procedures will also be performed.

*Chlorophyll *a* Round Robin*

In light of the challenges associated with chlorophyll *a* analysis, DWQ will continue to conduct annual chlorophyll *a* round robins so that confidence in laboratory results for this parameter can be assured. To date, three round robins have taken place with approximately 17 laboratories participating.

Duplicate Sampling

At one station per sampling event (11% frequency), duplicate samples will be collected for all parameters evaluated in this study. Duplicate samples will be collected by filling a churn sample splitter at that station with the required volume for two sets of sample bottles. Both sets of samples will be analyzed by the DWQ laboratory. The duplicate samples will be collected at each monitoring station on a rotating basis.

Split Sampling

S.L. 2009 – 216 allows for the use of “water quality sampling data from a monitoring program implemented by a local government or nonprofit organization if the data meets quality assurance standards established by the Department.” If other entities do conduct additional monitoring and analyses and their data are approved by DWQ, the Division will split samples with those entities to document data comparability. Split samples will be collected in the same manner as the duplicate samples described above, except that two different laboratories would perform the analyses. The frequency of split sampling will depend on the frequency of monitoring by other entities, thus detailed schedules for split sampling would be developed on a case-by-case basis.

Figure 1. Jordan Lake Monitoring Stations

