

Summary of the Jordan Nutrient Rules February 9, 2009

Strategy Synopsis and Status

The proposed B. Everett Jordan Reservoir Water Supply Nutrient Strategy is a comprehensive set of rules designed to address excess nutrients in Jordan Lake that can lead to algae blooms and other water quality problems. Jordan Lake is an impoundment in the central Piedmont that drains a mixture of agricultural and urbanized lands forming the upper Cape Fear River Basin, including the west side of the Triangle and much of the Triad region. The lake serves as a water supply for the Town of Cary and also has significant recreational use. The rules are similar to those already in place in the Neuse and Tar-Pamlico River Basins. The rules would require all major sources of nutrients to reduce their loading to the three arms of Jordan Lake to meet specific percent reduction goals, established through modeling, that are needed to restore water quality standards and full uses of the lake.

Nutrient sources addressed by the rules include agriculture, fertilizer application, wastewater discharges, and stormwater runoff from both new development and existing developed lands. Local governments would be required to reduce the discharge of nutrients from wastewater treatment plants and implement programs to address nutrient pollution from both existing and new development. The nutrient management strategies implemented in the Neuse and Tar Pamlico river basins do not address pollution coming from existing development. A strategy for existing development was needed in the Jordan Lake watershed because of the significant nutrient contributions from developed lands in this watershed. Also new is a separate trading rule that would allow use of the most cost-effective management options to meet the goals.

The set of thirteen Jordan nutrient rules was approved by the Environmental Management Commission in May 2008, followed by approval of the Rules Review Commission over five meetings from June through November 2008. The rules await review by the 2009 session of the General Assembly, having all received the requisite number of objections during the RRC process. Prior to the EMC undertaking rule-making, a modeling process was initiated by the Haw watershed dischargers in 1998, and was followed by an extensive stakeholder input process begun in 2003 and carried through the formal public comment period in summer 2007.

Lake History: The potential for excess nutrients was recognized when B. Everett Jordan Reservoir was proposed in 1945. The reservoir was approved by Congress in 1963. After years of construction delay due to projected water quality concerns, the lake was impounded in 1983. It was designated a Nutrient Sensitive Water that same year by the Environmental Management Commission. The lake has consistently tested as eutrophic or hyper-eutrophic since impounded, indicating high to excessive levels of nutrients in the water. Nutrients make their way to the lake from sources such as wastewater discharges, rainfall runoff from agriculture, and stormwater runoff from new and existing developed lands. Excessive nutrient inputs drive excessive growth of microscopic algae, which imparts a greenish, murky appearance to the water, causes taste and odor problems in finished water, and robs the water of oxygen, stressing or killing fish and other aquatic life. Excess nutrients also favor the growth of undesirable algae that does not support the food chain and can release toxins into the water. While not necessarily making the lake unfit for fishing, swimming, or drinking uses, excess nutrients are impacting these uses, and undesirable algae are present in the lake. While only

one fish kill has been reported to date, taste and odor problems prompted Cary to add chemical treatment to its drinking water process, and unsightly, smelly water deters swimmers, boaters, and other sportsmen.

In 2002, the Division of Water Quality determined that the Upper New Hope Creek Arm no longer met its designated uses due to exceedences of the chlorophyll *a* standard, which measures algal growth, and in 2006 made the same determination for the rest of the lake. The Haw River arm was also impaired in 2006 for pH exceedences. Both parameters are indicative of excessive nutrients. These impairments place the reservoir on North Carolina's list of impaired waters under Section 303(d) of the federal Clean Water Act.

Regulatory Mandates: The Clean Water Responsibility Act of 1997, Session Law 1997-458, required the EMC to set concentration limits on wastewater facilities discharging to Nutrient Sensitive Waters. The next year, Session Law 1998-212 allowed the EMC to grant a compliance extension if a facility chose to develop a calibrated nutrient response model for the water body and adhere to the results. The Clean Water Responsibility Act also required the EMC to set restoration goals for nutrient-impaired waters, require steady progress toward those goals and impose nutrient reduction measures in a fair, reasonable, and proportionate manner on point source and nonpoint sources relative to their contributions. In 2005, the General Assembly also enacted SL 2005-190 that directed the EMC to adopt rules to establish and implement nutrient strategies to protect drinking water supply reservoirs. In addition to state requirements, the determination that the reservoir has impaired water quality triggers federal Clean Water Act requirements to set and enforce nutrient load reduction limits, known as a total maximum daily load (TMDL).

Rulemaking Process and Public Comments: To comply with the Clean Water Responsibility Act, wastewater dischargers in the Haw River watershed developed a reservoir model in the late 1990's to estimate the lake's nutrient reduction needs. The EMC approved the reservoir model in 2002. During 2003-2004 Division staff conducted a 1 ½ year, 22-meeting stakeholder process to apply the reservoir model and seek a consensus on lake nutrient loading goals, discharger allocation methods, and a conceptual nonpoint source strategy¹. In 2005, staff solicited public comment on a rules framework and brought draft rules before the EMC's Water Quality Committee. In January 2006, the committee directed staff to conduct additional stakeholder meetings, which continued thru 2006. A TMDL for the entire reservoir was approved by the EPA in August 2007¹.

Pursuant to the EMC's authorization of draft rules in March 2007 and subsequent notice in the North Carolina Register, the Division held three public hearings and provided a 90-day written comment period from June 15 through September 15, 2007 on the proposed rules. Approximately 400 people attended the hearings, 150 of whom spoke. Staff received more than 7,000 documents, postcards, and emails providing written comment¹. A detailed, 80-page commenter-indexed summary of all public comments along with staff replies is provided as Appendix D of the Report of Proceedings¹.

In general, recreational lake users, watershed residents, and several local governments voiced strong support for the rules, while many local governments and development interests expressed strong objections. Local governments in support of the rules were those that rely on Jordan Lake as a drinking water source – Chatham County, Cary, Apex and Chapel Hill. Dissenting local

¹ Report or other supporting document(s) available on DWQ's Jordan nutrient strategy website, at <http://h2o.enr.state.nc.us/nps/JordanNutrientStrategy.htm>.

governments were those at greater distances from the lake that consequently do not share the water supply benefit, see less recreational benefit, and whose nutrient inputs from runoff sources are less significant.

GROUNDINGS FOR SUPPORT OF THE RULES. Supporters of the rules cited:

1. The longstanding knowledge of Jordan Lake's water quality problems and need for restoration of the lake's water quality.
2. Federal and state mandates to act to address water quality problems in the lake.
3. The steadily eroding quality of their lake use experience, the regional importance of the lake, and the collateral benefits to numerous degraded streams in the watershed from the proposed rules.
4. Rule supporters attached urgency to the lake's restoration need given the rapidly growing nature of watershed communities.
5. Commenters advocated holding point source dischargers to the original 2011 compliance date. They noted the key role of wastewater discharges in water quality impairment and the ample notice already provided to the owners and operators of wastewater treatment plants and other facilities discharging nutrients that additional controls would be needed.
6. Commenters argued against waiting for implementation of the Phase II stormwater program before deciding whether to impose requirements on existing development. Those commenters noted that the Phase II program only addresses new development and the lake is impaired now as a result of existing land uses.
7. Rule supporters observed that the Division of Water Quality's cost estimates reflect only part of a full and fair cost/benefit assessment. The short-term costs of the rules are not compared to the long-term benefits in protecting Jordan Lake as a drinking water supply and recreation area. Supporters also believe some of the cost estimates put forward by rule opponents represent an avoidable, worst-case scenario for the Existing Development requirements, since the Existing Development Rule provides great latitude to use alternative nutrient-reducing practices.

OBJECTIONS TO THE RULES. Comments in opposition to the rules fell into several categories:

1. Questions about the scientific basis for concluding that Jordan Lake has impaired water quality, including challenges to the water quality data used for the lake model and modeling process.
2. Doubt about the need for rules in general and for additional stormwater rules in particular.
3. Concern about the likely effectiveness of the measures required under the rules.
4. Costs associated with the stormwater and wastewater rules. (Those objecting to the rules often projected higher costs than those estimated by the Division of Water Quality and projected substantial economic impact to Piedmont Triad communities.)

5. Some commenters questioned the EMC's statutory authority to impose various requirements, including requiring local ordinances.
6. Many commenters expressed concern about the equity of imposing additional costs on upstream communities to protect the water supply for downstream users. Some suggested that the regional nature of benefits should compel the N.C. General Assembly to fund restoration actions.
7. People frequently commented that adaptive management should mean implementing less costly measures first and evaluating the effects before contemplating costlier actions.

The Hearing Officers reviewed the public comments and deliberated extensively over the course of 14 meetings from August 2007 to April 2008. Given the level of concern over the scientific basis for the rules, the Hearing Officers closely reviewed the questions raised and reached several conclusions. The Hearing Officers concluded that the chlorophyll a data used by the Division of Water Quality was valid. They also found that the data supported the impairment determination and the modeling conclusions.

The Hearing Officers agreed that it is necessary to establish separate reduction goals for the three arms of the lake and adopted the percentage reduction goals established by the reservoir modeling. The hearing officers noted that in the absence of a reservoir model, the Clean Water Responsibility Act would have required wastewater dischargers in the Haw subwatershed to meet very similar nitrogen concentration limits in 2003. They affirmed that the EMC was acting within its statutory authority in proposing these rules. The Hearing Officers also agreed with the necessity for a set of rules addressing all major sources and they supported the design of the strategy.

Nutrient Management Strategy Design: The strategy is designed around nitrogen and phosphorus percentage reduction goals for each of the three arms of Jordan Reservoir because each arm of the lake responds independently to nutrient inputs received from its watershed. For example, goals for the Haw Arm of Jordan Lake and corresponding reduction requirements for Haw watershed sources are driven by existing nutrient inputs from those sources. State law requires fair, reasonable and proportionate requirements, so each category of sources in a given watershed faces the same percentage reduction requirements relative to its baseline inputs. The rules are designed to give all of the regulated entities maximum flexibility in meeting the reduction goals. One key addition to maximize options is a new, separate trading rule that provides load-reducing options across regulated sources. Nutrient sources addressed by the rules include agriculture, fertilizer application, wastewater discharges, and stormwater runoff from both new development and existing developed lands. Local governments would implement the wastewater and development rules, including requirements to protect existing riparian buffers. The existing development component, not included in previous strategies, is necessitated by the significant nutrient contributions from developed lands in this watershed. The strategy also recognizes the importance of adaptive management, and provides for periodic review of the lake's recovery progress to inform potential management revisions.

Rules Content: All rules fall under T15A NCAC 2B. The following is a brief summary of each of the thirteen rules as approved by the RRC:

□ **Rule .0262, Purpose and Scope**

Describes strategy purpose, scope, and objectives; identifies the set of rules comprising the strategy; designates Jordan watershed as a ‘critical water supply watershed’, which allows the EMC to require more stringent measures than minimum Water Supply Watershed requirements; defines geographically the three subwatersheds draining to Jordan Reservoir; identifies the baseline time period; establishes nitrogen and phosphorus (N and P) percentage reduction goals and corresponding point and nonpoint source lake loading targets for each arm relative to the baseline; establishes that all local governments – eight counties and 26 municipalities– are subject to certain rules; and provides for adaptive management following a period of implementation. Each subsequent Rule references parameters set forth in this Rule.

□ **Rule .0263, Definitions**

Defines terms that apply across rules and are specific to the set of Jordan rules.

□ **Rule 0264, Agriculture**

Establishes collective nitrogen and phosphorus reduction goals for agricultural operations in the watershed. The goals include numeric thresholds for livestock operations. Three years after effective date, the Watershed Oversight Committee (formed by the Director) will determine the extent to which the nitrogen goal has been achieved relative to the baseline period. If the goal has not been achieved, Local Advisory Committees (LACs) must be formed to develop a strategy to meet the goal. Six years after effective date, the EMC will determine whether LACs have achieved subwatershed N and P goals based on collective implementation. If not, the EMC will require additional BMP implementation as deemed necessary to achieve the goals within nine years after effective date. The Rule allows trading of reductions that exceed collective compliance goals. Annual reports are required.

□ **Rule .0265, Stormwater Management for New Development**

Requires all local governments in the Jordan watershed – eight counties and 26 municipalities – to implement stormwater programs for new development activities. Those programs must be designed to meet nutrient loading rate targets. Developers will be required to control nutrient export to certain levels onsite, but can meet remaining reduction needs through offsite measures including payment of fees for nutrient offset projects or through purchase of reduction credits from private sellers pursuant to the Jordan trading rule .0273. Within eighteen months after effective date, the Division submits a model local program to the EMC for approval. Within another six months, local governments submit programs for Division review and EMC approval. Within three years after effective date, local governments implement permitting requirements. Annual reports are required.

□ **Rule .0266, Stormwater Management for Existing Development**

Requires each local government to quantify nutrient loading from existing developed lands in its jurisdiction and identify the load reductions needed to achieve the nutrient reduction goals relative to these lands. Local governments must develop long-range plans to reduce nutrient loading to reach the reduction goals and propose implementation rate, nature and overall compliance timeframes. The nutrient reduction plans must be submitted to the Division within 3 ½ years after rule effective date. By the fifth year after effective date, the local government must obtain EMC approval for the plan and begin implementation. Load-reducing measures are not constrained to existing developed lands within a local government’s jurisdiction and may include credits obtained from other sources or from private sellers,

both pursuant to the Jordan trading rule .0273. Programs for public education and illegal discharge elimination are implemented within two and a half years. Annual reports are required.

□ ***Rule .0267, .0268, & .0269, Protection of and Mitigation for Existing Riparian Buffers***

Requires local governments to implement programs to protect existing vegetated riparian areas within 50 feet of and adjacent to intermittent and perennial streams, lakes, and ponds in the Jordan watershed. The first 30 feet adjacent to waters is largely undisturbed forest, while the outer 20 feet may be managed vegetation. Existing, ongoing activities within buffers may continue as long as these activities or uses meet the requirements of the rule, while a change in land use invokes the protections. These buffer requirements replace those under the current Water Supply Watershed rules, and provide local governments the option to require more stringent measures. Certain activities within the buffer are identified as exempt, allowable, or allowable with mitigation, while uses not listed are prohibited. The rules provide mitigation options (buffer restoration, land conservation, or mitigation fee payment) where no practical alternatives exist, as well as variance provisions. The Division of Water Quality implements the rule for activities conducted: by local governments; state or federal entities; agriculture; forestry; and in areas where no local buffer program currently exists.

□ ***Rule .0270, Wastewater Discharge Requirements***

Distributes the total point source annual N and P mass loading goals for each arm of the lake in the form of annual mass allocations to existing wastewater dischargers within each of the three subwatersheds. Discharge concentration equivalents at full flow range from 3.04 mg/L TN and 0.23 mg/L TP in the Upper New Hope Arm to 5.30 mg/L TN and 0.67 mg/L TP in the Haw River Arm. As in the Neuse River Basin nutrient strategy, there are provisions for new and expanding discharges; an option for group compliance; and potential for in-lieu fee payments to offset exceedence of the annual loading cap. There is also an option for transfer of allocation among individual dischargers. Phosphorus compliance date is the first full year after effective date, while the nitrogen compliance date is 2014, the maximum allowable timeframe under SL 1998-212 (amendments to the Clean Water Responsibility Act).

□ ***Rule .0271, Stormwater Requirements for State and Federal Entities***

Establishes stormwater requirements for state and federal entities that parallel those imposed on local governments for both new and existing development under rules .0265 and .0266. The NC DOT is treated differently than other state/federal entities based on the unique character of its activities. Annual reports would be required. New DOT road projects would be deemed compliant if they meet buffer protection rule treatment criteria. For existing development, DOT would meet a minimum implementation rate of 500 lb nitrogen reduction per 5-year period and at least 50 lb N/yr, to be obtained through retrofits or other measures.

□ ***Rule .0272, Fertilizer Management***

Beginning three years after effective date, the application of fertilizer to lands in the watershed is to be done either by applicators who have completed nutrient management training offered by the Cooperative Extension Service, or pursuant to a certified nutrient management plan developed for the lands to which fertilizer is applied. Also requires property owners to ensure that applicators to their lands have met one of these requirements. The rule does not apply to fertilization of residential lands done by the homeowner. Wastewater residuals and septage application have earlier compliance timeframes. Animal waste application in compliance with a permitted waste utilization plan is deemed compliant.

□ ***Rule .0273, Options for Offsetting Nutrient Loads***

Provides parties subject to the various rules - new development, existing development, State and Federal stormwater entities, agriculture, and point sources – the option to obtain more cost-effective reductions by purchasing reduction credit from other, offsite reduction sources or private sellers. This open, market-based framework provides options in addition to the NC EEP option currently used in the Neuse and Tar-Pamlico strategies. It requires that minimum onsite standards be met before seeking credit elsewhere. It sets criteria for those seeking to sell excess reductions, and would require Division approval.

□ ***Rule .0311, Cape Fear River Basin (Schedule of Classifications)***

Formalizes reclassification of the non-Water Supply Watershed half of Jordan watershed to WS-V.