

American Rivers • NC Conservation Network

August 16, 2010

Environmental Management Commission
c/o John Huisman – Division of Water Quality
1617 Mail Service Center
Raleigh, NC 27699-1617

Re: Comments on the Draft Falls Lake Rules

Dear Commissioners,

Thank you for the opportunity to provide comments on the draft nutrient management rules for Falls Lake. We appreciate the hard work and long hours that Department of Environment and Natural Resources (DENR) staff and Hearing Officers are putting in to develop a set of rules that will restore the health of Falls Lake.

Falls Lake is an important resource for the region. It provides drinking water for roughly 450,000 people, attracts over 2,000,000 visitors annually, and has been identified as a state Important Bird Area by the National Audubon Society. The NC Conservation Network and American Rivers represent thousands of North Carolinians who visit, fish, swim in, or drink the waters of Falls Lake. We are committed to working with DENR Division of Water Quality (DWQ) and the Environmental Management Commission (EMC) to ensure that the Falls Lake rules adequately reduce nitrogen and phosphorus pollution and return the lake to full compliance with water quality standards.

We offer the following recommendations to strengthen the rules and improve their ability to achieve the water quality standards required by federal law and demanded by North Carolina citizens. We know that a number of our supporters or members have submitted comments independently; in addition, we attach a petition from concerned citizens in support of a strong package of rules.

OVERVIEW

While our recommendations are organized below in order of the rules they would modify, the changes we propose fall into two basic categories: clarification of the conceptual structure of implementation (including the timeline); and a list of modifications that we think would improve the efficiency and effectiveness of specific rules. Public comments critical of the rules – at least those offered at the public hearings – have emphasized concerns about cost and efficacy. We think our first group of recommendations could resolve some of these arguments and place the package of rule in a stronger posture to address others during legislative review and rule implementation. In brief, we recommend:

- Expanding the 'stair step' (segment by segment) targets for achieving water quality standards in the lake, outlined in proposed .0275 (5)(a), the adaptive implementation section of the goals and purpose rule;

- Shifting timelines for achieving those water quality targets up three years to match the Neuse basinwide planning cycle (this is consistent with a seven year Stage I); and
- Shifting timelines for various management measures to deliver the improvements needed to achieve water quality targets in lake segments on schedule (most notably, moving the second set of point source upgrades from 2036 to 2028).

Table 1 provides a side-by-side comparison of the timeline (and options) in the proposed rule and the adjusted timeline we are recommending. We have also attached a set of charts (A - F) to help illustrate why we think the adjusted timeline is preferable as a matter of policy. While discussions of specific management measures appropriately focus on the 40% nitrogen and 77% phosphorus reductions required of each source of pollution, compliance with water quality standards will be delivered by the total reduction in loadings across sources. Charts A and B show the ‘curve’ of reductions of total nitrogen and phosphorus loadings, respectively, under the timeline in the proposed rule. For existing development and agriculture, we assume that reductions are achieved gradually from the beginning of a segment date to the end; point source reductions are achieved in lumps. Charts C and D show the curve of total reductions under the adjusted timeline we recommend.

Why choose the adjusted timeline? Charts E (nitrogen) and F (phosphorus) put the cumulative reduction curves from the two timelines on the same chart, and add two versions of another curve – the curve of loading reductions needed to meet the target dates for stair step compliance with water quality standards. The target curve we draw is rough and based on a handful of unscientific points: (1) no loading reductions (from baseline) appear to be needed for the lowest segment of the lake to comply with water quality standards¹; (2) the proposed rule aims to achieve 20% N and 40% P reductions for Stage I, more than enough to protect water quality in the lower lake; and (3) the full 40% and 77% reductions are needed to deliver compliance at NEU013B, above I-85. It is hard to get beyond a conceptual target curve given the weak data (more on this below), but it seems clear that the curve of needed reductions starts nearly flat but increases to a steep slope as one moves up the lake. Our key argument: the timeline in the proposed rule will not deliver timely compliance with water quality standards, largely because it is impossible to climb the target curve for the segments above I-85 without implementing the second stage point source reductions, and reductions need to be made several years before water quality targets are supposed to be met to account for the lag time needed to clean out nutrients already cycling in the water column. The adjusted timeline we recommend – especially, moving the Stage II point source upgrades from 2036 to 2028 – allows the strategy to climb the target curve and deliver the needed loading reductions on time – or, at least, closer to on-time than the proposed rule.

Beyond delivering a cleaner lake on schedule, the adjusted timeline may help simplify the political controversy associated with the rule. As proposed, the rule package artificially gathers

¹ This statement takes no account of loadings that were already inevitable by 2006 but whose impacts hadn’t shown up yet. For example, some earlier developments with inadequate volume control may not have reached a peak rate of downstream streambank scour (a source of phosphorus) by 2006, and so the baseline chlorophyll-a observations may not have been as bad as they were already doomed to be in the future. Similarly, the cycling of nutrients in the tributaries creates a lag time as well, not accounted for in the baseline data. As a result, some load reductions (from the 2006 baseline – this is a separate issue from reductions needed to offset development since 2006) may in fact be needed to assure compliance in the lowest segments of the lake, to offset loadings that were triggered before 2006 but wouldn’t show up and cause impairment until later. For simplicity’s sake, we ignore this in drawing the target curve.

several different management measures on either side of the Stage I/ Stage II divide. In fact, there is no clear distinction in the on-the-ground practices needed to address existing development or agriculture; compliance for those sources of pollution is best advanced through an ongoing cycle of five-year plans. In contrast, because point source reductions are lumpy, it makes a great deal of sense to address these upgrades in two distinct stages. The greatest political controversy is associated with the Stage II point source reductions, which are essential to deliver compliance in the upper lake but are still 25 years away under the proposed rule. If local governments want to fight now over whether those reductions are legally necessary, there is no reason to delay them for 25 years; the EMC may as well schedule them for 2028, which still offers plenty of time for local governments to collect and submit remodeling data as allowed in the proposed rule, and to build payment strategies into their capital improvement programs, none of which uses a horizon longer than eight years into the future.

We offer a final argument for moving to our recommended implementation timeline, even if the EMC decides to retain the draft rule's dates for segment by segment compliance with water quality standards. As noted above, the segment by segment target curve will look flat for the near future, then climb rapidly to achieve needed reductions above I-85. The longer we wait to begin substantial reductions, the more infeasible the later reductions will appear to be to the communities tasked to complete them. An implementation schedule that requires little for the first ten years plays into the hands of those who will oppose later stages of the cleanup. In contrast, an aggressive start that accomplishes early load reductions will make the later years of the strategy substantially less burdensome.

REMODELING FALLS LAKE

Before diving into recommendations about the language of specific rules, it is worth spending a moment on remodeling. The lake model that underpins the rule package is based on a limited amount of data, collected in years with climactic conditions (drought and flood) that may or may not prove characteristic of the watershed over the next three decades. Partly in response to the local government 'Consensus Principles' (although not tracking them precisely), the proposed rule allows any party to collect additional monitoring data and/or remodel the lake, then bring that to the EMC at any time after 2014. Such remodeling may in fact indicate that greater reductions are necessary to restore and maintain water quality in the lake.

We support the remodeling provisions of the proposed rules, and recommend that the EMC add an additional criterion to them. Above, we note that the concept of a target curve for reductions is useful for thinking about the relationship between timing (and scale) of management measures and the timeline of restoring compliance of segments of the lake with water quality standards. However, the capacity of the lake model to generate a robust target curve from existing data is weak. For example, as Durham's Tetrattech study illustrates, the lake model doesn't provide useful feedback about what reductions are needed to achieve the 40 mg/l chlorophyll-a standard at NEU0171B and points further down the lake. Indeed, Tetra-tech's runs suggest that *no* reductions are needed to deliver compliance at NEU0171B (Ledge and Little Lick Creek), which can't be right since that part of the lake is already impaired with exceedances more than 20% of the time. On the upper end of the lake, the Tetrattech study asserts that even 75% reductions of nitrogen *and* phosphorus wouldn't deliver compliance at points NEU010 and ELL10 – but then acknowledges that the model ignores phosphorus already cycling in lake sediments, and treats indirect loadings from the tributaries (nutrients washing into the lake as algae) as exogenous, unaffected by the management measures that reduce

direct loadings to the lake. These assumptions veer from reality: the management measures will assuredly reduce indirect loading through the tributaries; and the backlog of phosphorus in sediment will have a pronounced (but temporary) impact for at least a few years. All of this is to say, based on the current model, it is impossible to draw a precise target curve, and also impossible to conclude how steep the target curve will be between I-85 and the upper corners of the lake. Additional monitoring and remodeling could help greatly to refine this. We recommend that the EMC finalize the remodeling provisions of .0275 as proposed, with one addition: a requirement that any remodeling submitted for consideration must identify (and ground in the data) a target curve that covers all segments of the lake, to ground the EMC's further analysis.

While we support additional monitoring and the option for remodeling, we flatly oppose a blanket re-evaluation of the feasibility of cleaning Falls Lake. Although the city has not put it in these terms, Durham has essentially argued that the target curve to achieve compliance above I-85 is so steep, so potentially costly to climb, that the rules should make a formal provision for a feasibility analysis. In the next section, our discussion of .0275, Purpose and Scope, we offer reasons for the EMC to issue a rules package that cleans up the entire lake, and to reject proposals to create an 'escape hatch' that abandons water quality in the upper end of the lake.

RULE .0275 – PURPOSE AND SCOPE

We urge the EMC to adopt a final package of rules that will clean up all the segments of Falls Lake, as required by the Clean Water Act. The reductions needed to achieve this goal are significant. Some upstream governments have argued that it isn't possible to clean the upper lake and that they shouldn't be made to try. We disagree for three reasons:

- The upper reaches of Falls Lake are an important resource for hundreds of thousands of North Carolinians and home for numerous fish and wildlife, and these must be protected from nutrient pollution. Elevated levels of nitrogen and phosphorus in rivers and reservoirs have been linked to a number of environmental and human health problems. One of these is the development of cyanobacteria (blue-green algae) blooms and cyanotoxins (WHO 1999, Oliver & Ganf 2000, Burkholder 2002, Bauer 2007). According to the U.S. Environmental Protection Agency, cyanotoxins can cause respiratory distress and neurological problems in people who swim in or drink contaminated water (Grumbles 2007, Cullen 2008). The World Health Organization notes that cyanobacteria generating a chlorophyll-a level of 50 mg/l can rapidly evolve from a moderate hazard to high hazard in a matter of hours (WHO 1999, at 5.2).

Violations of the chlorophyll-a standard in the upper lake, and the algal blooms they reflect, deny the recreational and wildlife uses of the lake. Since the 40 mg/l standard is for class C waters – there is no laxer standard for waters in North Carolina – there is no legal way to loosen the targets of the proposed rules, apart from conducting a Use Attainability Analysis (discussed below), which the EMC has not done. For that reason, the rules package must provide a credible pathway to achieve water quality standards in both the upper and lower lakes.

- Pollution in the upper portion of the lake will not remain there. Polluted water will flow from the upper into the lower lake, threatening the lower lake's usefulness for recreation and water supply.

- Technological innovations are continually being developed that will allow for much higher level of pollutant control than is currently possible, and their costs are dropping over time as communities across the country apply the new technologies. It would be a mistake at this stage to back away from requiring needed reductions when the mandate to achieve those reductions helps drive research and lowers the costs of new approaches.

Expand the use of “milestone” assessments to judge progress on the goals. The Purpose and Scope Rule includes the use of milestone markers in Section 2(a) as part of an adaptive management approach. Instead of an all-or-nothing approach, milestones allow us to measure incremental achievements on the way to meeting water quality standards throughout the lake. If the standards are met early, DWQ may notify affected parties that additional reductions are not required. If the standards are not attained by the goal date, DWQ may request approval to strengthen the rules. Milestones are an effective and practical tool for guiding and measuring progress toward the ultimate goal of cleaning the lake. We recommend milestones be referenced in the existing development and agriculture rules, as well.

Consistent with our belief that water quality standards can be achieved more quickly than is required by the proposed rules, we suggest that all the milestones should be met earlier. In addition, a new milestone should be added to provide more feedback during Stage I.

- Attainment of nutrient-related water quality standards downstream of the Highway 98 crossing of Falls Reservoir no later than 2015.
- Attainment of nutrient-related water quality standards throughout Lower Falls Reservoir no later than 2018.
- Attainment of nutrient-related water quality standards in the Lick Creek arm of Falls Reservoir and points downstream no later than 2023.
- Attainment of nutrient-related water quality standards in the Ledge and Little Lick Creek arms of Falls Reservoir and points downstream no later than 2028.
- Attainment of nutrient-related water quality standards at points downstream of the Interstate 85 crossing of Falls Reservoir no later than 2033.
- Attainment of nutrient-related water quality standards throughout Falls Reservoir no later than 2038.

Implement management measures faster to achieve milestones. The proposed rule invites comment (p.4) on whether Stage I should last seven years or ten years. When the question is presented this way, we support seven years. However, the proposed rule leaves ambiguous what happens after that time: does the timeline for Stage II also advance by three years? Also, the question of seven versus ten years is moot for point source reductions, as the first round of those are pegged at 2016 either way. The adjusted timeline we propose retains the distinction between Stage I and Stage II for the point sources, and is consistent with a seven-year Stage I, but focuses more on achieving substantial, efficient loading reductions that will place the lake on a path to full compliance.

Retain the draft rule's flexibility provisions, but do not include a blanket re-evaluation of the feasibility of the Falls Lake strategy. The proposed rule (p.4) invites public comment on whether, 'prior to setting Stage II limits ... the results of Stage I be reviewed and an opportunity for establishing Stage II results or numbers be considered at the end of Stage I'. Several local governments, through their 'Consensus Principles', have urged that the final rules make some provision for a re-assessment of the cost and feasibility of Stage II reductions near the end of Stage I. We oppose adding such provisions to the final rule for three reasons: the rule already provides sufficient flexibility to avoid perverse implementation; a blanket reassessment is the wrong way to handle concerns about burdensome mandates, as it is unlikely to generate useful information about feasibility; and incorporating reassessment provisions would violate the federal Clean Water Act.

Sufficient flexibility. Language calling for a reassessment before Stage II is unnecessary because the draft rules already take care to avoid unfair or perverse mandates. Specifically, .0275(5)(b) allows any party to submit supplemental monitoring and modeling. In addition, .0275(5)(d) calls for the Division to report every five years to the EMC – we recommend that the first report be moved to 2018 to align with the basinwide planning cycle and our recommended timeline – and that report includes discussion of '(i) [t]he state of wastewater and stormwater nitrogen and phosphorus control technology, including technological and economic feasibility'. We have no objection to allowing any party to contribute information to this report. Further, .0275(5)(c) already acknowledges – and this is the compromise sought by Durham and granted by the NC General Assembly in the Jordan Lake rules – that the EMC retains authority to reclassify waters of the State under G.S. 143-214.1; revise water quality standards under G.S. 143-214.3; and grant variances under G.S. 143.215.3. We would fight any effort by the EMC to use the first two of these authorities, as they would amount to giving up on key uses of the lake – but the point is, those potential authorities exist without any additional process being written into the Falls Lake rules. The variance authority, in particular, provides all the flexibility the EMC could need to prevent the Stage II upgrades from becoming overly burdensome. Finally, .0278(5), the existing development rule, states that the EMC shall approve a local government's retrofit plan 'if it finds that the plan achieves the maximum level of reductions that is technically and economically feasible within the proposed timeframe of implementation.' This provision provides sufficient flexibility to ensure that the existing development rule, by its own terms, cannot require local governments to take infeasible actions.

Blanket reassessment is poor public policy. The flexibility provisions in the proposed rule are wisely tailored to address specific mandates, rather than opening the door to a blanket renunciation of nutrient reductions after the early 2020s. One overwhelming weakness of allowing a blanket reassessment – at any time, but especially in 2018 or 2020 – is that it isn't likely to provide much of a reliable basis for a determination about the feasibility of specific management measures, and without that, it isn't logically possible to evaluate the feasibility of the package as a whole. The blanket reassessment also offers the wrong remedy; if one management measure proves infeasible, it is still worth proceeding apace with others. Whether the lake is impaired may be binary – it is or it isn't – but water quality in the lake surely has many shades of gray, and every load reduction increases the percentage of the time that the lake is likely to be in compliance with water quality standards and safe for its designated uses.

Blanket reassessment is inconsistent with the federal Clean Water Act. Finally, a blanket reassessment violates the Clean Water Act by essentially committing the EMC to conduct a Use Attainability Analysis well before that is legally appropriate. Section 303(d) of the Clean Water

Act (“CWA”) requires the Division to identify waters that are failing to meet water quality standards. 40 C.F.R. § 130.7(b)(1). The Environmental Protection Agency’s guidance states that if 10% of the samples exceed water quality standards, then the water body is considered impaired. See EPA, Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, 39 (July 29, 2005). Once a water body is declared impaired, it must have a Total Maximum Daily Load (TMDL). A TMDL must take into consideration seasonal variations in water quality conditions and must include a margin of safety to account for any lack of knowledge concerning the relationship between effluent limitations and water quality. 33 U.S.C. § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1).

The North Carolina General Assembly also requires all nutrient-sensitive waters to have a nutrient management plan that “reduce[s] the average annual mass load of nutrients that are delivered to surface waters within the river basin from point and non-point sources.” N.C. Gen. Stat. § 143-215.8B. The Division must develop nutrient reduction targets that insure that any degraded uses are improved and the nutrient sensitive water is no longer impaired. The EMC is given broad powers and direction to insure that all sources of nutrient pollution are abated to achieve compliance with water quality standards. North Carolina General Statute § 143B-282(d) provides as follows:

[T]he Environmental Management Commission may adopt rules setting out strategies necessary for assuring that water quality standards are met by any point or non-point source or by any category of point or non-point sources that is determined by the Commission to be contributing to the water quality impairment. These strategies may include, but are not limited to, additional monitoring, effluent limitations, supplemental standards or classifications, best management practices, protective buffers, schedules of compliance, and the establishment of and delegations to intergovernmental basin wide groups.

Federal and state laws require DWQ to evaluate the nutrient contributions from point sources, NPDES storm water dischargers, and non-point sources. The proposed rules appropriately recognize the multiple sources of nutrients. Because Falls Lake is impaired, both the CWA and the North Carolina General Statutes require the nitrogen and phosphorous loading to be met by some or all of the contributing sources. Although many of the stakeholders think of the Falls Lake rules as TMDL-driven, that is only indirectly true. A TMDL has not been established for Falls Lake or for any of its impaired tributaries, including Lick Creek, Ellerbe Creek, Knapp of Reeds Creek, or the Eno River. The proposed rules are a state construct that may avert the need for a lengthy and expensive TMDL process – but not if the final rules are weakened.

The rules as currently written are fair and equitable because they address the variety of sources that are responsible for the pollution in Falls Lake and provide flexibility for interested parties to submit additional information for the EMC to consider. Adding a pause for the EMC to reassess, with the option (default or otherwise) to renounce further management measures, would effectively build in a Use Attainability Analysis mid-way through the rule implementation process. Indeed, advocates for a blanket reassessment have described it using language that mirrors the statutory standard for a Use Attainability Analysis. However, the EMC has a responsibility to see that TMDLs are developed for all the impaired tributaries as well as for the lake itself before turning to a use attainability analysis process or any state equivalent process. Because the state has not yet conducted, and EPA has not approved, a full TMDL for Falls Lake or any of the tributaries, it is far too early for the EMC to make a commitment to conduct a Use Attainability Analysis at any specific point in the future.

RULE .0277 – NEW DEVELOPMENT

Establish a land disturbance threshold of 5,000 square feet for new development. The proposed rule (p.13) requests public comment on whether to set the threshold trigger for the new development rule at (option A) one acre residential and ½ acre commercial, industrial, and multifamily residential; or at (option B) 5,000 square feet for all new development. We strongly support option B.

Nutrient problems in Falls Lake are extreme and strong action from all sources will be needed to achieve the targeted reductions. As the Fiscal Analysis notes, nonpoint sources contribute “over half of all nitrogen inputs to Falls Reservoir and two-thirds of phosphorus inputs,” with developed land contributing “at least one-third of nonpoint inputs to the lake.” (pp. 42, 71) Projects of less than one or one-half acre are common enough to have significant cumulative impacts as the watershed approaches buildout. Exempting any portion of new development from the rules means that other sources will have to make larger reductions.

At the same time, we recognize that some projects are so minor they have virtually no effect on stormwater runoff, such as building a shed or paving a driveway. The 5,000 square foot threshold is high enough to exempt truly minor disturbances, and low enough to address most impacts and to encourage landowners to minimize impervious surfaces.

Designing and constructing sites to include stormwater control features from the beginning is easier and cheaper than retrofitting existing development. In addition, because small projects are more likely to carry a higher marginal cost and profit per unit, complying with stormwater rules is less of an added burden than it is for large developments. Small projects are often well positioned to make use of low impact development techniques such as rainwater capture, landscape design, and reduced impervious surface, as well.

Require that new development achieve 80% reduction of both nitrogen and phosphorus onsite before seeking to offset their nutrient load offsite. The proposed rule (p.14) invites public comment on whether to require (option A) 50% N and 60% P reductions onsite, or (option B) 60% N and 60% P reductions onsite. We continue to believe that much higher reductions will be needed from all sources in order to meet the overall nutrient reduction targets for Falls Lake, and so we recommend that the final rules require 80% N and 80% P reductions onsite – numbers we believe are achievable with low impact development techniques. As between the options offered for comment, we of course prefer option B to option A.

Encourage new development to match pre-development stormwater runoff patterns. Such an approach, also called “hydrologic matching,” would ensure that runoff volumes from a developed site would be similar to those found on the site prior to development. From conversations with Bill Hunt at NC State, we believe that containing 90% of the runoff resulting from the reference storm (i.e. the two-year, 24-hour storm) would fully reduce nutrient loadings to the target level of 2.2 lbs N/ acre-yr and 0.33 lbs P/ acre-year. This approach would not only keep nutrients from washing off of developed sites, it would also decrease the volume of flows leaving the site, which in turn would decrease scouring in nearby streams. Because phosphorous binds to and travels with sediment, stream bank erosion contributes to overall phosphorus loading in a watershed. The rules do place limits on the nutrients and peak flow that leave a site, but do not address the total runoff volume and consequently ignore a potentially important source of loading. We fear the new development rule cannot deliver the required reductions to restore Falls Lake unless it also controls total stormwater volume.

Achieving hydrologic matching need not be burdensome. Traditional stormwater management focuses on large structures, encouraging for example, that developers set aside a large portion of a site for a single large detention basin to control peak discharges from large storms. More recent research (by the National Research Council, EPA, and others) has shown that such approaches are inadequate to protect water quality. Instead, the focus should be on infiltration, evapotranspiration, and reuse of water from smaller, more frequent storms. Such controls do not require a lot of space – they require thoughtful site design and regional planning. A recent National Research Council report determined that “stormwater control measures such as product substitution, better site design, downspout disconnection, conservation of natural areas, and watershed and land-use planning can dramatically reduce the volume of runoff and pollutant load from new development” (EPA, 2009). (p.4)

RULE .0278 – EXISTING DEVELOPMENT

Achieve more rapid reductions from existing development. The proposed .0278, Existing Development rule, gives upstream governments have ten years to offset the nutrient load from development that occurred since 2006 (the baseline year). Given the slow pace of development over the last few years, and the fact that local governments have known since at least 2004 that their development decisions would affect their liability for retrofits, this is unnecessarily weak. We recommend launching implementation of the cycle of local government five-year existing development plans in early 2014 (so the first plans would be developed in 2013), and foregoing the distinction between Stage I and Stage II for existing development. We believe this approach offers two substantial policy advantages over the proposed rule.

First, the main argument we have heard for including a lightweight Stage I is to allow time for the Division to develop full accounting methods for various types of retrofits. However, it will be difficult to develop these methods in the absence of ongoing projects. Instead of padding Stage I with extra time, the rule should focus on tools to encourage local governments to begin work on retrofits immediately. For example, early reduction credits can be made retroactive, to offer assurance that local governments will get full credit for the projects they initiate before accounting methods are finalized. Existing watershed restoration plans can be used to guide initial retrofit efforts. We know that the required nutrient reductions will necessitate retrofits to more than just the last four years of development.

Second, there are some low-cost measures that local governments can take to sharply reduce nutrient loadings – especially phosphorus loadings – right away. For example, a phosphorus fertilizer ban in Ann Arbor, Michigan resulted in a dramatic 28% reduction in phosphorus loadings within one year (Lehman, 2009). Local governments should not wait seven or ten years to begin tackling these projects; the less communities do now, the more burdensome needed reductions will appear in the 2020s. We recommend that the rule specify that local governments design their load reduction programs to address their total nutrient load reduction goals (40% reduction in nitrogen and 77% reduction in phosphorus) from inception. These programs should be submitted to the Division within two years of the effective date of the rules (2013) and every five years thereafter.

Use milestones to gauge and guide implementation of existing development programs. Milestones that target specific percentage reductions along the path to full implementation provide extra assurance that progress is being made toward the goals, while maintaining flexibility for local governments. These milestones should present reductions that, in DWQ’s professional judgment, would likely result in attainment of water quality standards in the lake

segments outlined in the Purpose and Scope Rule. We offer the percentages below as examples, but the specific percentages matter less than the concept.

- For the plan beginning implementation in 2014, reduce annual mass loads of nitrogen by 5% and phosphorus by 10% no later than 2019.
- For the plan beginning implementation in 2019, reduce annual mass loads of nitrogen by 10% and phosphorus by 20% no later than 2024.
- For the plan beginning implementation in 2014, reduce annual mass loads of nitrogen by 15% and phosphorus by 35% no later than 2029.
- For the plan beginning implementation in 2018, reduce annual mass loads of nitrogen by 25% and phosphorus by 50% no later than 2034.
- For the plan beginning implementation in 2034, reduce annual mass loads of nitrogen by 35% and phosphorus by 65% no later than 2039.
- For the plan beginning implementation in 2039, reduce annual mass loads of nitrogen by 40% and phosphorus by 77% no later than 2041.

RULE .0278 – REDEVELOPMENT

Require redevelopment projects to meet the same stormwater management requirements as new development (including the recommendations made in this letter). We believe that redevelopment does belong under the New Development Rule, where it is currently located, and suggest that it should not be exempted from the responsibilities that apply to other new developments. Such an exemption unnecessarily delays until Stage II reductions that can and should begin now. Redevelopment typically includes large changes to a building and site, even when the total square footage of built-upon area does not change. For this reason, redevelopment offers an important opportunity for obtaining load reductions in developed areas – perhaps a much better opportunity than retrofits of existing development can provide. For example, one of the few times that installing pervious pavement is likely to make financial sense as a retrofit is when a property is being redeveloped or repaved. The rules should take advantage of the opportunity for site-wide stormwater management changes that redevelopment projects present.

Incentivize redevelopment by lowering the requirement for onsite nutrient reductions and increasing the percentage that can be obtained through offsite offsets. The primary argument for exempting redevelopment from stormwater management provisions is the desire to encourage redevelopment rather than greenfield development. While we appreciate this goal, such a policy unnecessarily sacrifices an opportunity to control nonpoint source discharges in developed areas. Instead of exempting redevelopment altogether, the rules should require that proposed redevelopment located within a local government’s designated downtown area attain a minimum of 40% reduction in both post-construction nitrogen and phosphorus loading rates before using offsite mitigation to achieve the remaining load reductions needed under the New Development Rule. Such an approach can incentivize downtown redevelopment without exempting a key source of nutrients to the lake.

Allow local governments to count load reductions from redevelopment toward the goals described under the Existing Development Rule. Local governments are responsible for establishing programs to reduce nutrient loading from existing developments. While it makes

sense that a property owner pay for stormwater management structures installed during the redevelopment of his or her site, the resulting reduction is most appropriately recorded under the relevant local government's existing development nutrient load reduction program.

RULE .0279 – WASTEWATER DISCHARGE

Advance the timeline for Stage II upgrades from 2036 to 2028. The proposed .0279, wastewater discharge rule, calls for the three large wastewater treatment plants in the watershed to complete their Stage I upgrades in 2016, and their Stage II upgrades in 2036. We support the first number but are frankly baffled by the second. As noted above, completion of the second round of upgrades is critical to restoration of water quality in the upper part of Falls Lake; moreover, given the dynamics of the lake and the lag time created by nutrients cycling in the water column, it will likely take several years for the benefits of the upgrade to translate into reductions of chlorophyll-a above I-85. Scheduling the Stage II upgrades for 2028 offers some hope of meeting (or coming close to meeting) the strategy's reduction targets and delivering a lake that meets water quality standards by the 2040s; scheduling the Stage II upgrades for 2036 offers none. We appreciate that the Stage II upgrades will be expensive, and we are eager to work with the upstream governments to find funding sources to assist. Moving Stage II to 2028 still gives local governments 18 years from now – nearly a generation – and a full dozen years following the Stage I upgrades, to prepare.

RULE .0280 – AGRICULTURE

Establish milestones for wastewater discharge nutrient load reductions. We suggest:

- Achieve a collective 15% reduction in nitrogen loading and 25% reduction in phosphorus loading no later than 2018.
- Achieve a collective 20% reduction in nitrogen loading and 40% reduction in phosphorus loading no later than 2023. Failure to meet these goals will trigger additional requirements for individual operators to buffer all cropland or pasture and exclude livestock from streams. This is two years later than the draft rule proposes, but we think it is reasonable given the substantial reductions agriculture is being asked to make.
- Achieve a collective 25% reduction in nitrogen loading and 50% reduction in phosphorus loading no later than 2028.
- Achieve a collective 35% reduction in nitrogen loading and 65% reduction in phosphorus loading no later than 2033.
- Achieve a collective 40% reduction in nitrogen loading and 77% reduction in phosphorus loading no later than 2038.

RULE .0281 – STATE & FEDERAL ENTITY

Strengthen new development standards for state and federal entities to mirror those established under the New Development Rule (including the recommendations made in this letter). We support this requirement for the reasons outlined above. In addition, the federal Energy Independence and Security Act (2007) has already established a requirement for federal entities to maintain pre-development stormwater runoff patterns when developing or redeveloping a site with a 5,000 square foot or larger footprint. This requirement is similar to,

although stronger than, our recommendation that new development and redevelopment maintain 90% of the 2-year storm onsite. (Federal entities are directed to maintain or restore pre-development hydrology of the property with respect to temperature, rate, volume, and duration of flow.) The EPA prepared a guidance document to assist federal entities in complying with the requirements of the Act, which we are attaching to this letter for your reference. Matching pre-development runoff patterns is achievable and should be the standard for all development and redevelopment in the Falls Lake watershed.

RULE .0282 – OPTIONS FOR OFFSETTING NUTRIENT LOADS

Allow land preservation to be used as an option for achieving nutrient reduction credit, with appropriate safeguards. The use of land conservation to generate nutrient offsets is controversial; the proposed rule requests public comment (p.59) on whether .0282, options for offsetting nutrient loads, should give credit for land conservation. Maintaining forested land as forested land provides no nutrient reduction from the baseline condition, thus it can be hard to imagine how land conservation can offset new loadings. However, we do see advantages from land conservation in the Falls Lake watershed, and believe that the watershed and lake models offer a defensible method for valuing the benefits of land conservation. The new development rule places limits on nutrient export from newly developed properties, but because these limits are higher than the load coming from forested land, any development constitutes an overall increase in nutrient loading. Considered from this perspective, the preservation of forested land would provide a nutrient offset, keeping the actual loading from a property below the loading that would be permitted if the property were built out. For example, the new development rule allows a net loading (at build out) of 2.1 lbs N/ acre-year; the model assumes undeveloped forest loads at 1.8 lbs N/ acre-year. That creates a margin of 0.3 lbs N/ acre-year of credits that could be generated through conservation.

The chief problem with this analysis is that it is not entirely clear whether we can trust either the 2.1 lbs as an allowable post-construction loading rate, or 1.8 as a pre-development loading rate. Still, the basic concept seems sound, if further development of accounting techniques can nail down credible values. So, we recommend that the trading rule explicitly address the question of land conservation by allowing it, provided that a defensible accounting measure is developed to determine more accurately the difference between the undeveloped loading of conserved land and post-construction loading allowed by the new development rule.

Tighten the rule to ensure that offsets are genuine and the trading process is transparent.

Beyond the specific issue of land conservation (but applying to those trades along with all others), we strongly recommend that the final nutrient offset rule include the following safeguards to ensure that trading functions as intended:

- Land generating offsets must be protected from development in perpetuity (e.g. using a deed restriction) and managed to maintain background loading levels consistent with forested land.
- The Division should institute and oversee a certification process for offset credits, and inspect and enforce against fraudulent credits.
- A single clearinghouse for recordkeeping related to all offset credits (not just land preservation) should be maintained. It need not necessarily be managed by the Division, but it must be open, transparent, and routinely audited.

Handling WWTPs' sale of reserve allocation to facilities downstream of Falls Dam. Under the Neuse Estuary Rules, WWTPs that reduce their nutrient load below mandated levels may sell or lease their reserve allocation to other regulated facilities. Because the Draft Falls Lake Rules contain more stringent nutrient limits than the Neuse Estuary Rules, some facilities within the Falls Lake watershed will have excess nutrient allocation available to sell within the Neuse watershed. The revenue generated from such sales could help WWTPs finance the upgrades that will be needed to comply with the proposed Falls Lake Rules. There is some concern, however, that the nutrient allocations in the Neuse are not producing sufficient reductions in the estuary. Because of this, the Division is considering whether to prohibit transfers of reserve allocation from facilities in the Falls Lake watershed to facilities downstream of the dam (Fiscal Analysis, p. 108). We support eliminating credits under the Neuse strategy, but wonder if that may require a separate rulemaking. Whether accomplished through rulemaking or by administrative discretion, we recommend that the Division not forbid credit sales by dischargers above the Falls Lake dam, but instead reduce all Neuse dischargers' (Neuse) credits by the same percentage. That solution will protect the estuary, and actually increase the value of the credits remaining on the market, assisting the upstream dischargers in their efforts to pay for their needed upgrades.

RULE .0283 – FERTILIZER MANAGEMENT

Require that all fertilizer application be in accordance with a certified nutrient management plan. Most waste applicators for confined animal feeding operations (CAFO's) and many farmers already utilize nutrient management plans, in compliance with multiple state rules, including 15A NCAC 2T and the Neuse Nutrient Management rules (15A NCAC 02B). Certified plans can be an effective tool for nutrient management, potentially reducing the amount of nutrients that flow off fields into surface waters and saving growers money. In the absence of data specific to their individual fields, many farmers over-apply fertilizer as insurance against low crop yields. Organizations that work with growers on adaptive nutrient management, such as American Farmland Trust (AFT) and Iowa Soybean Association (ISA), have found that when farmers have better access to field-specific data or insurance against crop loss due to low nutrients, they will reduce the amount of fertilizer they apply. AFT's "BMP Challenge" program has seen participants' nitrogen application drop an average of 24 percent (41 pounds/acre) while maintaining or increasing crop yields. ISA's On-Farm Network, which provides a forum for growers to compare data and experiences with each other (in addition to other services), reports that participants reduce their nitrogen use an average of 30% (30 pounds/acre) while maintaining or increasing profits. Growers in North Carolina formed a group in early 2010 to work with the On-Farm Network and are set to conduct their first nitrogen studies this summer. We hope that promulgation of phosphorus limits in the Agriculture Rule will encourage growers to examine their phosphorus use, as well.

Fertilizer can be expensive. Reducing its use can represent an important savings for growers. Indeed, the Fiscal Analysis found that farmers who choose to develop and implement a certified plan are likely to realize a net savings as a result. (p 159) The state Division of Soil and Water Conservation and the federal Natural Resource and Conservation Service both offer cost share funding for development of nutrient management plans, further reducing the cost. Nutrient management plans are a win-win, providing cost savings for the grower and nutrient reductions for surface waters.

Specify that nutrient management plans be submitted to DWQ. This is important for two reasons. First, certified plans contain a wealth of information related to nutrient use across the basin – this information would be helpful to the Division during future modeling efforts. DWQ need not institute an approval process for the plans; merely keep copies on file for future basin-wide planning and related work. Second, the plans would provide the only record of nutrient reducing activities conducted on individual farms. This information can be used to give growers credit (under the Agriculture Rule’s individual compliance mandate) for the individual reductions made during the group compliance period. Without some means of tracking farm-specific reductions, farmers who do more to help during group compliance could be unfairly penalized when individual mandates come into effect.

COSTS AND BENEFITS

There has been much discussion of the potential financial cost of the proposed rules and little discussion of the potential benefits (financial or otherwise). Because the potential cost of the rules has been the basis for some of the loudest complaints, we devote the last portion of our letter to the topic of costs and benefits. We respectfully ask that the EMC consider the following.

The costs presented in the Fiscal Analysis overestimate the likely cost of implementing the rules. The process of calculating costs for a process that will take place over 25 years involves a large amount of uncertainty. DWQ staff handled this by making conservative, high-end estimates of costs and clearly explaining throughout the Fiscal Analysis the assumptions, alternatives, and sources of uncertainty that went into their calculations. This was a difficult task and staff completed it admirably. It is important to remember, though, that costs presented in the Fiscal Analysis are overestimations, as the document states repeatedly:

“There is good reason to believe that costs will ultimately be less than the values projected... (as a result of) technological innovation driven by an increasing need for water conservation, innovation driven by the rules themselves, improved accounting for known measures, and general advances in management of the impacts of developed lands and of nutrients at the federal level and nationwide.” (pp. ix-x)

The cost of mitigating nutrient impacts from existing development does not represent a new cost. These are costs that have been hidden up to now in the form of early expansion of water supply structures and water treatment systems, decreased recreation, reduced property values, declining estuary health, and in costs deferred to future generations. Retrofitting existing development will be expensive. But this cost is not new – it was incurred when the development occurred. The rules merely force municipalities to pay the bill.

Low-cost opportunities exist to assist local governments in meeting their nutrient reduction obligations more economically. The Falls Lake rules and similar ones throughout the country will likely spur more innovation in this area. A few current options for local governments to consider are identified below:

- Ban residential use of fertilizers containing phosphorus.

The application of fertilizer to lawns and commercial landscaping has been estimated to contribute as much as 60% of the total phosphorus in some communities’ surface waters (USGS, 2002). A ban on fertilizers that contain phosphorus and an effort to reduce excess fertilizer use

in urban areas could remove a potentially important pathway of nutrient import to Falls Lake. Communities around the country have passed similar laws in recent years. One example is the statewide ban that Minnesota established in 2005. Their ordinance provides exceptions for special cases, such as during installation of a new lawn, and requires that any fertilizer spilled on sidewalks or streets be cleaned up immediately. Ordinances addressing citizen behavior can be a low-cost way to achieve nutrient reductions. Even if local governments do not devote staff time to enforcement, many citizens will comply voluntarily with the rule, making it a quick and economical option for reducing nutrient runoff. Falls Lake is an important regional resource and it is appropriate to ask local residents to make small changes to help clean up the lake.

- Require owners to pick up and properly dispose of their pets' waste.

Establishing an ordinance regarding pet owners' responsibility to clean up after their pets is a similarly appropriate and inexpensive means of minimizing nutrient runoff in developed areas. Public education on these topics can be incorporated into local stormwater programs which have existing outreach efforts. The Neuse River Basinwide Water Quality Plan (2009) supports this view and points out that some local governments in North Carolina already have pet waste ordinances. As these ordinances and education efforts would address nutrient contributions from existing development, any realized reductions could be counted toward local governments' requirements under the Existing Development Rule.

- Conduct stream restoration and bank stabilization as a form of retrofit.

One consequence of increased impervious cover in a region is an increase in both the peak flow and the total volume of stormwater that enters streams. This increased flow causes erosion along stream banks, releasing sediments – and their attached nutrients – into the stream and eventually into Falls Lake. Stream restoration and bank stabilization is one tool local governments can use to minimize the amount of erosion (and attendant nutrient loading) occurring along streams in their jurisdictions. Care must be taken to ensure that the restoration design is appropriate for a natural system, so that the strengthened banks can maintain themselves. Simply installing hardened structures along banks to stop erosion would be counter-productive, exacerbating the problems caused by other impervious cover. Restoration projects offer the added benefit of improving neighborhood aesthetics and provide an opportunity to partner with local non-profits and neighborhood groups.

The Fiscal Analysis underestimates the value of cleaning up Falls Lake. Many of the benefits of environmental improvements are difficult to capture in monetary terms. Some benefits have no obvious economic component: improved quality of life, more attractive landscapes, better tasting water, or the ability to take one's children fishing in a local stream, for example. Even items which clearly provide a financial benefit, such as improved health, increased property values, or additional tourism, can be a challenge to measure. The Fiscal Analysis does an excellent job identifying benefits that would flow from implementation of the rules. Staff lacked the resources to conduct research into the monetary contribution of many of these benefits, however, and had to limit themselves to a qualitative description in some cases. As a result, and as the document acknowledges, the benefit analysis underestimates the economic value of rule implementation.

The city of Philadelphia recently initiated an ambitious green infrastructure program, "Green City – Clean Water," which aims to convert 34% of impervious surfaces in the city into greenspace, primarily within public lands and rights-of-way. Included in the formal Plan document describing the program is a detailed analysis of the project benefits, using a "triple

bottom line” analysis, which evaluates the social, economic, and environmental impacts of the project (Philadelphia Water Department, 2009). The analysis makes use of extensive research specific to the Philadelphia area. While the conditions in Philadelphia are different in many ways from conditions in the Falls Lake watershed, the analysis provides an instructive example of both the range of benefits expected to accrue from green stormwater controls (both structural and non-structural) and a magnitude of scale for the value of the benefits. The identified benefits include:

- Increased recreational opportunities: \$524.5 million (from increased user days)
- Enhanced water quality/aquatic habitat: \$336.4 million (from surveys of willingness to pay showing approximately \$10-15 per household per year)
- Improved residential property value: \$574.7 million (average 3.5% increase)
- Reduced cost of poverty: \$124.9 million (from providing jobs for local unskilled, unemployed workers and the attendant social service, crime, and health costs avoided)
- Reduced heat-related deaths: \$1,057.6 million (in avoidable deaths)
- Improved air quality: \$131.0 million (health benefit from increase in trees)
- Saved energy: \$33.7 million (reduced need for heating/cooling because of increase in trees, reduced energy needed to transport and treat stormwater)
- Reduced damage from SO₂, NO_x, and CO₂ emissions: \$67.5 million (avoided energy use)

After considering both traditional and green stormwater infrastructure options, the city found green approaches to be preferable because these (1) begin providing benefits immediately, (2) offer more flexibility, and (3) when compared to costs, were less expensive.

The health of the lake directly affects the physical and economic health of our communities, as well as the surrounding natural environment. Even though it will be difficult to reach the nutrient reductions called for in the rules, we believe that the benefits far outweigh the costs. Strong rules that begin work immediately and require steady progress throughout clean up of the entire lake are needed to protect our communities and to meet our obligations under the Clean Water Act. We encourage the EMC to stand firm and ensure that the final rules chart the course of reductions needed to restore fully the health of Falls Lake.

Sincerely,

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