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September 13, 2007

Dr. David H. Moreau, Chair
North Carolina Environmental Management Commission
1617 Mail Service Center
Raleigh, NC 27699-1617

Mr. Rich Gannon
DENR – Division of Water Quality, Planning Section
1617 Mail Service Center
Raleigh, NC 27699-1617

***RE: TOWN OF CHAPEL HILL STAFF COMMENTS ON THE PROPOSED NUTRIENT STRATEGY
RULES FOR THE B. EVERETT JORDAN RESERVOIR***

Dear Dr. Moreau and Mr. Gannon:

Enclosed are comments from the Town of Chapel Hill staff regarding the proposed Nutrient Management Strategy Rules ("Jordan Rules") for the B. Everett Jordan Reservoir. Our comments and questions involve elements of the Jordan Rules that require further clarification/explanation, requirements in the Jordan Rules that are contradictory and/or will impair the ability of local governments to achieve reasonable compliance, and issues that need further consideration and study to assure that the most practical and effective approaches are implemented to reduce nutrient levels and algal blooms in the Reservoir.

We strongly support the over-arching goals of improving the water quality of the B. Everett Jordan Reservoir and improving the health of the streams flowing to the reservoir. The Town of Chapel Hill has been a leader among local governments in supporting the goals of water quality protection as demonstrated through implementation of a number of environmental protection initiatives over the past quarter century. During this time, the Town Council and staff have created and refined local development ordinances that reflect current scientific understanding of environmental processes, the latest engineering practices, and the importance of environmental quality and protection as emphasized in the Town's Comprehensive Plan. We have involved the public at all levels of this process, from holding public hearings and receiving public comment, to soliciting review and comment by Town Boards and Commissions.

We are concerned, however, that the Town's established and continuing pro-active environmental protection efforts have not been acknowledged in the process of devising methods for managing water quality in Jordan Reservoir. This is especially evident in the selection of the baseline(s) proposed for measuring compliance with the rules, since the Town's initiatives prior to implementation of the rules would receive no credit.

We believe that the control of nutrients solely through the management of stormwater runoff and point source discharges will fail to significantly improve the Reservoir's water quality. We think

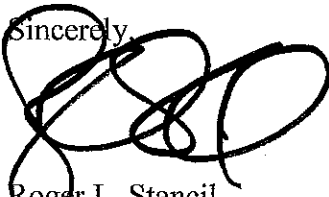
that a more thorough and multi-faceted assessment of all sources of nitrogen and phosphorus in the Jordan Reservoir basin needs to be conducted, including not only the Division of Water Quality but also the Division of Air Quality, the Division of Environmental Health, the Division of Waste Management, and the Division of Land Resources. Since these divisions function under the Environmental Management Commission and the Department of Environment and Natural Resources, we believe this presents an excellent opportunity for cooperation between and among the divisions to consider a number of different perspectives in creating a comprehensive regional plan to manage nutrients in the watershed draining to the Jordan Reservoir. This approach would be consistent with the three key aspects of pollution management strategy - identify the sources, eliminate or reduce the sources as much as possible, and then establish treatment as close to the sources as possible.

We believe that, although adaptive management is encouraged as part of the Jordan Rules and has been shown to encourage more effective and affordable changes in environmental practices, much more information is necessary and better techniques and options must be made available such that local governments and state agencies can better target management tactics to nutrient sources. We strongly recommend that the State further study and evaluate all possible nutrient management strategies and solutions, including a comprehensive evaluation of the role of the Farrington Road (SR 1008) causeway, in the processes of lake circulation, nutrient cycling, and algal population dynamics.

We are also concerned that the fiscal analysis significantly underestimates the costs for implementing the prescribed nutrient management measures for both local governments and state agencies. Given the potential costs, we consider a thorough evaluation of alternative strategies and solutions essential to good stewardship of taxpayers' money.

We appreciate this opportunity to comment on the proposed Nutrient Strategy Rules for B. Everett Jordan Reservoir. We have attached our detailed comments and questions regarding the proposed rules, and we look forward to the development and implementation of a practical, effective, comprehensive, regional, multi-source nutrient management strategy that will ultimately result in a cleaner, healthier B. Everett Jordan Reservoir. Please contact Ms. Sue Burke, PE at 919-969-7266 if you have questions or require additional information.

Sincerely,



Roger L. Stancil
Town Manager

Attachment: Chapel Hill Town staff comments and questions regarding the proposed Nutrient Strategy Rules for the B. Everett Jordan Reservoir

cc: Bruce Heflin, Assistant Town Manager
Ralph Karpinos, Town Attorney
George Small, PE, Engineering Director
Sue Burke, PE, Stormwater Management Engineer
Patricia D'Arconte, Stormwater Specialist

**TOWN OF CHAPEL HILL STAFF COMMENTS AND QUESTIONS REGARDING PROPOSED
JORDAN LAKE NUTRIENT STRATEGY RULES – SUBMITTED SEPTEMBER 13, 2007**

15A NCAC 02B.0262: WATERSHED NUTRIENT REDUCTION GOALS

1. Rule .0262(3) states reduction goals are in terms of a percentage reduction in delivered nutrient loads to the lake. What transport factors were used, if any, to determine how much of an individual site's nutrient load is delivered to the lake? Does this transport factor apply to both percentage reductions (as for existing development – see §.0266(3)(a)) and the unit-area mass loading rates (as for new development – see §.0265(3)(a)(i))?

2. Aerial deposition of nitrogen (from local and distant combustion sources) is a significant contributor to nitrogen loads in area water bodies. Aerially-deposited nitrogen as a nutrient source is addressed by the rules in §.0262(8) only as an acknowledged limitation, and suggests the EMC could undertake separate rule-making in the future to support the Jordan Rules.

Achieving success in reducing nitrogen loads to Jordan Lake may be highly dependent on addressing aerial sources. Urban impervious surfaces such as sidewalks and roofs typically do not produce nitrogen and phosphorus; they do collect dry particulates that get washed off during precipitation events.

Addressing local combustion sources such as the heavy traffic in the Triangle and Triad regions is certainly feasible and has a variety of human health and environmental benefits. Emissions control has worked very well in the past for controlling lead pollution. Current methods for emissions control also offer carbon-reduction benefits. Carbon reduction is a stated goal of both the Chapel Hill Town Council and the University of North Carolina, and will become increasingly adopted by other jurisdictions as our climate shows signs of change.

Is it more cost-effective to be treating aerially-deposited nitrogen using stormwater management rather than limiting its creation through combustion sources? Wouldn't it be cheaper to control nitrogen at the source rather than try to treat it secondarily through stormwater management?

3. Biosolids application is currently allowed in the Upper New Hope Arm subwatershed. What is the estimated nutrient contribution from this application? Would it be considered a fertilizer? Since biosolids application has the potential to be a significant nutrient source, it needs to be regulated as part of the Jordan Rules, in spite of the fact that it's already subject to existing regulatory and compliance programs. These existing programs were not developed with the goal of watershed nutrient management.
4. There are no existing programs to control nutrient loads from onsite wastewater systems (e.g. septic systems). Land uses with septic systems were considered to contribute a large amount of nutrients in the Division of Water Quality's reckoning of nutrient allocations by land use type. It is not clear if local governments have the authority to require regular inspections and/or maintenance of onsite wastewater systems or must rely on the county or state environmental health programs to enforce these provisions.
5. The Division of Water Quality held four stakeholder meetings to design an adaptive management plan for the lake. The results of this plan would revise the lake model to have more computational "cells" to better model in-lake processes. The plan would also add new lake monitoring sites, and new watershed monitoring sites on small tributaries in the Lower New Hope Arm and in the Haw Arm of the lake to better estimate nutrient delivery loads. No new sites would be added in the Upper New Hope Arm (there are

currently three at the “bottom” of the drainage area). Furthermore, the watershed model which was used to model sources of nutrients in the three respective watersheds was not to be revised. Currently, the watershed model is of insufficient scale and precision for any kind of targeted management practices, such as to allow local governments the ability to trace and correct highly localized sources of nutrients or determine true land use nutrient loading rates (rather than using published sources, none of which are calibrated for our soils and geology). Revising the lake model alone would not contribute the kind of information needed for adaptive management.

6. One possibility proposed by stakeholders prior to the first publication of the Rules in 2005 was the removal of the Farrington Road (SR 1008) causeway that crosses the lake. The causeway turns the Upper New Hope Arm into a de facto stormwater forebay for the Lower New Hope Arm. The narrow opening of the causeway limits the flow of water out of the Upper New Hope Arm, leading to a residence time of over a year. This nearly stagnant flow leads to increased sedimentation (easily visible from the causeway but also attested to by people canoeing up the tributaries), increased temperatures, and decreased dissolved oxygen. These conditions are very favorable for the proliferation of algae.
7. The need to revise the lake model (primarily, the cost to do so) was one of two main reasons given by DWQ in early stakeholder meetings for not modeling lake processing for the scenario where the Farrington Road causeway were to be removed and replaced with a bridge. The other reason given was the supposition that allowing water from the Upper New Hope Arm to mix with that of the Lower New Hope Arm would necessarily worsen the water quality in the Lower New Hope Arm. There are scientific reasons to believe, however, that were increased mixing allowed the Upper New Hope Arm (no longer strongly segmented from other areas) would experience improved nutrient processing without a concomitant reduction in nutrient processing in the Lower New Hope Arm. The very purpose of a revised lake model would be to truly test the assumption that water quality would worsen if the causeway were to be removed.

15A NCAC 02B.0263: NUTRIENT MANAGEMENT

1. The ten-acre threshold established in §.0263(3)(d) should be deleted. All contracted nutrient applicators should be subject to these requirements.
2. Please provide a definition for “nutrient management consultants.” (§.0263(3)(e))
3. Nutrient management training or completing and implementing a nutrient management plan is insufficient to modify any behavior tending towards overapplication of fertilizers (§.0263(4)). A statewide licensing and certification program is needed so that persons hiring an applicator can readily check that the applicator has been properly trained ((§.0263(4)(b)).

15A NCAC 02B.0264: AGRICULTURE

1. In §.0264(7), “sufficient level of farm stewardship” appears to establish a standard for compliance. Please provide a definition for this term.

15A NCAC 02B.0265: STORMWATER MANAGEMENT FOR NEW DEVELOPMENT

1. Revise §.0265(3)(a)(i) by adding the following underlined language: Stormwater BMPs and/or offsets are employed such that "Nitrogen and phosphorus loads contributed by the proposed new development activity shall not exceed certain unit-area mass loading rates," "based on BMP efficiencies published by the Division of Water Quality. Requirements for urban stormwater, both new development and existing development, need to reflect the use of best management practices to reduce the discharge of pollutants to the maximum extent practicable. This is consistent with the approach and language in the federal Clean Water Act (§ 402(p)(3)(B)) and the associated federal regulations addressing urban stormwater under the National Pollutant Discharge Elimination System (NPDES) program.
2. Similarly, revise the reference to a water quality standard at §.0265(3)(a)(iii) by deleting the following language (strikethrough): ~~"To ensure that the integrity and nutrient processing functions of receiving waters and associated riparian buffers are not compromised by erosive flows, stormwater flows from the new development shall not contribute to degradation of waters of the State."~~
3. According to Rule .0265(3)(a)(vi), developers may use an offset option for nutrient loading contingent on the acceptance of their proposals by the NC Ecosystem Enhancement Program (§.0240(a)). Both nutrient loading offset payments and riparian mitigation payments only have the restriction to be used for projects in the same river basin as the impact, but not the specific restriction to the same Jordan subwatershed as the impact. Similarly, the mitigation options of donated real property and restoration/enhancement of non-forested riparian buffer are required only to be located "the same distance from the Jordan Reservoir as the proposed impact, or closer to the Reservoir than the impact..." as stated in §.0268(4) with no restriction to the same Jordan subwatershed as the impact.
Do local governments have the authority to restrict the use of impact payments or mitigation projects/property for developments in their jurisdictions or to require that they be used/created in the same Jordan subwatershed as the impact? This would be consistent with §.0269(2)(b), in which parties seeking to sell excess loading reductions (credits) may make them available only in the same subwatershed as the impact.
4. Annual reports (from regulated parties) are specified in the rules at §.0265(4)(e) and §.0266(4)(h), but there are no details in the rules regarding exactly what regulated parties need to track and what/how to report it. Will instructions or guidance on annual reports be included in the State's model stormwater program and ordinance and/or the "tool" developed for nutrient reduction calculation?
5. The efficiencies assigned to urban stormwater BMPs for new development and existing development in the fiscal analysis appear to be lower than those assigned to comparable agricultural BMPs (e.g., filter strips, buffers). The urban BMP efficiencies need to be revised upward.

15A NCAC 02B.0266: STORMWATER MANAGEMENT FOR EXISTING DEVELOPMENT

1. Section .0266(3)(a)(i) should be revised with the following added (underlined) or deleted (strikethrough) language: "In addressing this long-term objective, a local government shall include estimates of, and plans for offsetting, nutrient loading increases from lands developed subsequent to the baseline period but prior to implementation of new development programs of these rules." Implementation may have occurred at any time

before, during, or after the baseline period, and compliance shall be contingent on the continued implementation and maintenance of such practices.

This language is needed to acknowledge the efforts made by those jurisdictions that have implemented stormwater and buffer requirements for many years prior to these regulations and it is consistent with language contained in §.0264(7) for agriculture.

The Town has been a local leader in adopting environmental protection practices such as stream buffers, runoff volume and rate control, total suspended solids in runoff control, tree/forest stand protection, erosion and sedimentation control, and a variety of practices now known as Low Impact Development which includes cluster development, pedestrian- and transit-oriented development layout, lot-level stormwater management, etc. The Town has been implementing these progressive planning and stormwater management practices over the past two decades but will only get "credit" for stormwater management installed from 2002 onwards. Furthermore, since the Town has already required buffers and BMPs in recent developments, the "easy projects" to increase nutrient removal in existing developments are already done, leaving the Town with fewer locations and options for installing BMPs or restoring riparian buffers.

2. Section .0266(3)(a)(i) notes that local governments may seek supplemental funding for implementation of load-reducing activities through grant sources such as the North Carolina Clean Water Management Trust Fund, the North Carolina Clean Water Act Section 319 Grant Program, or other funding programs for nonpoint sources. What funding sources is the State identifying or making available for the performance of the feasibility studies?

As the area under the Town of Chapel Hill's planning jurisdiction is more than 93% developed (Source: Chapel Hill Data Book, 2007), this requirement has significant fiscal and practicable impacts for the town.

The Fiscal Analysis states a total cost of \$1.7M for conducting the planning studies (Table RP.3 Annual Planning Costs/Savings, for local government); however, this estimate is too low and needs to be revised.

3. Rule .0266(3)(a)(ii) states that a locally-conducted feasibility study will determine the extent to which the loading goals may be achieved from existing development. Is this equivalent to the standard engineering definition of "maximum extent practicable" or an extent currently technologically feasible?

Does feasibility in this case include some measure of financial cost? Is there a penalty for a jurisdiction if the feasibility study determines that the loading reduction goals cannot be met across the entire jurisdiction practicably? Will local governments need to undertake the full set of BMP installations whether or not it is practicable and whether or not it actually reduces nitrogen exports to the lake?

4. The nutrient accounting tool referred to in §.0265(4)(a) is to be developed by DWQ within 12 months after the effective date of the Rule. According to §.0266(3)(a)(i) local governments must include estimates of and plans for offsetting nutrient loading increases from lands developed subsequent to the baseline period but prior to implementation of new development programs. According to §.0266((3)(a)(ii) a feasibility study to determine the extent to which loading goals may be achieved from existing development must be conducted by local governments. In order to estimate nutrient loads from recently-developed lands and to conduct a feasibility study, local governments should be using the same loading calculation methods that will be in the nutrient accounting tool, especially in

light of any transport factors not explicitly stated in the rules. Will a draft version of this tool be available early enough for local governments to use in their calculations and studies?

5. According to Rule .0266(3)(a)(ii) the feasibility study shall propose an implementation rate and schedule for load reducing activities. Rule .0269 also allows a jurisdiction to buy nutrient credits to meet its load reduction requirements. However, there are no benchmarks for progress or a suggested timeline for meeting load reduction requirements. How are proposed implementation rates and schedules judged to be adequate? If a feasibility study indicates that load reducing activities and projects are insufficient to meet reduction goals across the jurisdiction, is the jurisdiction then required to buy nutrient credits to meet its goals?
6. What exactly constitutes "retrofitting" as referred to in §.0266(3)(a)(iv)? One assumes it includes installation of new BMPs in existing developments. According to DWQ staff, BMPs existing during the baseline period cannot be counted towards nutrient load reduction. However, could improvement or modification of existing BMPs to treat nutrients or increase treatment be considered for credit? Could repair of broken/poorly-functioning BMPs to restore nutrient treatment capacity be considered for credit? Given the potential for these activities to improve nutrient management can repair or improvement of these existing BMPs be used for full or even partial nutrient credit?
7. When stormwater infrastructure is shared or crosses boundaries between local jurisdictions, which entity bears the responsibility for nutrient reduction? Local governments, such as towns and counties, are encouraged to work with each other to jointly meet loading targets in §.0266(3)(a)(vi), which does allow a method to address such shared infrastructure. Similarly, NCDOT-maintained roads and UNC properties are scattered throughout Chapel Hill's jurisdiction such that the stormwater infrastructure of these three entities is highly interconnected. However, there is no clear guidance in these rules on responsibilities for nutrient reduction when stormwater infrastructure is shared between local governments and state agencies. While it would probably be highly beneficial and reduce inefficiency, it is similarly unclear whether NCDOT or UNC is allowed to enter into joint nutrient management agreements with local governments.
8. According to discussions with DWQ staff and based on similar calculations for the Neuse and Tar-Pamlico, installation of a new stormwater BMP upstream of an existing BMP being used for nutrient reduction has the potential to lower the nutrient removal credit for the downstream BMP (through the "BMPs in series" calculations). What is the minimum separation distance between BMPs in order to be considered separate? Or are nutrient treatment loads for BMPs in series, even if separated, calculated only using the drainage area flowing to them that doesn't already pass through a BMP? This is likely to be an extraordinarily complex calculation of BMP nutrient removal. How is treatment capacity managed under this scenario?

15A NCAC 02B.0267: PROTECTION OF EXISTING RIPARIAN BUFFERS

1. In §.0267(9), Table of Uses, Vegetation Maintenance includes the removal of understory nuisance vegetation as defined in "Exotic Plant Guidelines," by Cherri L. Smith, Dept. of Environment and Natural Resources, Division of Parks and Recreation, Raleigh, NC. This reference does not provide a definition of "understory nuisance vegetation." Please provide a definition or change to "invasive exotic species," which is defined in the cited reference.

2. In §.0267(9), Table of Uses, "wildlife passage" is considered an Allowable Use in the riparian buffer only if a determination of no practical alternatives is made. "Wildlife passage" is not defined in §.0267(2). If "wildlife passage" is the maintenance of a forested or other natural corridor connecting natural areas (as the term is used in conservation biology), why is it considered a land use impacting the riparian buffer to the extent that a determination of no practical alternatives is necessary?

15A NCAC 02B.0268: MITIGATION FOR RIPARIAN BUFFERS

No comments.

15A NCAC 02B.0269: OPTIONS FOR OFFSETTING NUTRIENT LOADS

No comments.

15A NCAC 02B.0270: WASTEWATER DISCHARGE REQUIREMENTS

No comments.

15A NCAC 02B.0271: STORMWATER REQUIREMENTS FOR STATE AND FEDERAL ENTITIES

The requirements and schedule for the state and federal agencies need to be identical to those for local government. The state agency implementation schedule appears to lag local government by 18 months. Further, comparable requirements to those contained in §.0266(3)(c-e) for local governments appear to be missing for non-DOT agencies.

15A NCAC 02B.0272: RIPARIAN BUFFER MITIGATION FEES

No comments.

15A NCAC 02B.0311: CAPE FEAR RIVER BASIN

No comments.

FISCAL ANALYSIS

1. The Fiscal Analysis includes no new costs to the Division to implement these rules (pg. xviii), which is not realistic.
2. To avoid complexity, cost calculations were carried out at the scale of the entire watershed (pg. xx). This likely greatly overestimates costs for those in the Lower New Hope Arm subwatershed, somewhat overestimates costs for the Haw Arm, and underestimates costs for those in the Upper New Hope Arm. This is attributable to the significantly greater amount of nutrient reduction that must be achieved in the Upper New Hope Arm. The Fiscal Analysis needs to provide more realistic cost analyses for the separate subwatersheds. Further, the estimated costs for each local government should be identified.
3. At the Carrboro public hearing, some Haw dischargers asserted that they will be required to remove closer to 20% in order to meet the 8% nitrogen reduction at the lake because of

transport factors. The transport factors describe the attrition of nutrients as they travel down through a subwatershed. If the local export was reduced by 8%, the delivered load would also be reduced by 8%. The local export and delivered load would not be the same "mass," but they will be the same "percent mass." Can the DWQ provide some clarification?

4. The cost estimates for additional regulatory transactions on the part of local governments for new development (pg. 35) and for riparian buffer protection are significantly underestimated. Cost estimates assume negligible costs for additional regulatory transactions on the part of local governments for new development (pg. 35) and for riparian buffer protection, partly because local governments already have programs that deal with new development stormwater controls and stream buffer protection to some degree. However, the Jordan Rules for new development stormwater treatment and riparian buffer protection are sufficiently different in many ways, and much more strict in other ways, to require extra time and effort from local jurisdictions for increased inspection and enforcement costs (in order to ensure compliance, which is the responsibility of local governments), increased plan review costs (experience has shown that more complex engineering calculations require significantly more plan review), and increased public education and outreach.
5. Cost calculations for new developments use a weighted average for the entire Jordan watershed, rather than different calculations for the different subwatersheds (pg. 37). This greatly underestimates costs for those in the Upper New Hope Arm subwatershed and overestimates costs for others.
6. In the section concerning new development, the calculation methodology assumes no regulatory costs to developers in 2009 or 2010 (for some reason they are merged with riparian buffer protection – but not all riparian impacts happen in the course of development) (pg. 49). However, prudent jurisdictions are likely to attempt to modify their development ordinances to approximate the expected stormwater program rules in order to minimize the amount of retrofitting they have to do to very new developments. Similarly, it assumes there will be no maintenance costs for BMPs in 2009 and 2010 as well (pg. 46).
7. In the section concerning new development, costs are likely underestimated for Chapel Hill as proportionately more of its development will be moderate-to-higher density residential and mixed development, incurring much greater treatment requirements (average TN load 15.0 lb/ac/yr) than for residential (average TN load 4.04 lb/ac/yr) (pg. 40). A likely unintended side effect of the nutrient management strategy encourages sprawling residential development over compact forms that set aside open space because the nutrient treatment requirement is so much greater for compact development.
8. Cost calculation methods for new development also used an allowable nitrogen value of 3.66 lb/ac/yr, higher than the 2.2 lb/ac/yr that Upper New Hope Arm (UNHA) developers will be allowed (pg. 40). Using the designated UNHA target, developers will have to treat up to 85% of nitrogen coming off their sites. With an average BMP efficiency for nitrogen of 36%, and the problems of using BMPs in series (lower BMPs in series only remove a portion of what is left), developers would have to install a minimum of three BMPs to get down to the 4.0 lb/ac/yr threshold for buying nitrogen credits and would have to use five BMPs per acre to get below the ultimate 2.2 lb/ac/yr goal. Even residential, with 1/3 acre lots, would require two BMPs per acre. Calculations only use a single BMP cost-effectiveness value, which you can only assume if you use only one BMP. BMPs in series will have progressively poorer cost-effectiveness. Treatment efficiencies for BMPs are

only listed for a certain size of BMP as well. It is not calculated/determined whether an oversized BMP will perform better for these development cases that need so much more nutrient removal.

9. In the section regarding new development (pg. 45), it is noted that credits can easily be generated for overtreating phosphorus, but that these credits could not be used to cover nitrogen reduction needs. However, for existing development (pg. 55) it is asserted that local governments would be able to trade excess phosphorus reduction credits in order to meet nitrogen reduction needs, contradicting the methods used for calculating costs for new development. That credit value is used towards reducing the estimated costs for existing development retrofits. By their calculation this comes to \$5.4 million per year (pg. 66).
10. In the section regarding existing development, the calculation methodology assumes no costs until the fifth year (pg. xxi and 69). However, local governments will need to start feasibility studies immediately upon Rule adoption, and will need to go through the lengthy process of writing and adopting new ordinances. The cost of conducting feasibility studies is completely absent. Calculations also assume that DWQ will be the entity developing regulations, monitoring and recordkeeping, and inspection and enforcement, in addition to installation, operation, and maintenance of BMPs, when in fact these responsibilities are also the responsibility of the local governments because they must keep track of these issues for their annual reports (pg. 70). In any case, DWQ calculates these costs to be zero, when they most certainly will not be.
11. For calculating existing development retrofit costs for DOT, DWQ used an areal loading value supplied by DOT, of 3.17 lb N/ac/yr (pg. 129). No other entities were allowed to estimate their nutrient contribution or loads in this way. This very likely significantly underestimates loads generated from DOT roads, as the supplied loading rate is just slightly less than that used for urban parkland/open space (3.57 lb N/ac/yr) (calculated to have 0% imperviousness for the TetraTech model) and less than all residential values (sewered, ranging from 9.37 to 15.03 lb N/ac/yr) except for very low density (sewered only, more than 2 acres per dwelling unit).
12. The "co-mingled drainage treatment" scenario for DOT refers to the treatment of runoff from both DOT and non-DOT land in order to be most efficient in runoff treatment. It proposes that DOT may sell treatment credits at higher rates than it costs to DOT to local jurisdictions for treating their runoff (pg. 130). This is a significantly lower estimate of costs for DOT (\$71 million) compared to the estimate for putting a BMP on every outfall on all of their existing roads in the watershed (\$595 million) (pg. 129). This suggests that DOT may transfer much of the BMP costs to local governments, but this cost to governments is not included. DOT's lowest cost alternative (\$58 million) was to use only EEP offsets. There is concern whether there are a sufficient number of sites in the Upper New Hope Arm that meet the EEP project criteria to offset all the miles of DOT roads in the UNHA.
13. Costs for regulation of new development are rolled into those for riparian buffer protection, including estimates for plan review, permitting, variance process, etc. Cost estimates for these are all rolled into one value including inspection and enforcement, permitting, plan review, program development (pg. 94). Some regulatory costs are presented, all based on the assumption that NPDES Phase 2 would require riparian buffer protection anyway (pg. 78) (a dubious assumption), but they are likely significantly underestimated. In our experience, inspection and enforcement will likely be extensive as many property owners

will impact the buffer for both activities that would need a development permit, as well as activities that currently do not (such as clearing, other activities currently considered "maintenance" that affect the buffer). Enforcement would have to include the collection of data on location of different buffer cover types and monitoring to ensure that forested buffers are not impacted and the footprints of uses in buffers did not increase. No costs are included for the extensive education that will be required for landowners, developers, engineers, surveyors, real estate agents, and attorneys.

14. The Fiscal Analysis asserts that the NPDES Phase 2 requirements include a 30-foot setback for impervious surfaces for all perennial and intermittent streams (pg. 78) and that therefore the additional costs associated with the Jordan requirements for the protection of existing riparian buffers are minimal. The NPDES requirements state that "built-upon areas are at least 30 feet landward of perennial and intermittent surface waters." The NPDES requirement does not prohibit the disturbance (e.g., clearing and grading) within the 30-foot setback and it should not be interpreted as affording the same protection as a buffer protection requirement.
15. The Fiscal Analysis assumes landowners would likely take steps to revegetate cleared riparian areas in existing developments regardless of the rule's requirement (pg. 81), and therefore pose no new costs. We have found that most landowners are usually only willing to revegetate to lawn. Even those with interest to reforest their riparian areas will require guidance, and possibly assistance, from local governments.
16. Costs for mitigating riparian buffer impacts are supposedly rolled into those for riparian buffer protection (pg. 100), but any costs for administering this program are not explicitly mentioned in the cost estimates for riparian buffer protection. In the experience of staff, costs associated with plan review, inspection, recordkeeping, and ensuring maintenance, even for restoration projects not undertaken by the Town, are significant.